



Water Supply Annual Report

For the year ended 30 June 2008

Quality for Life

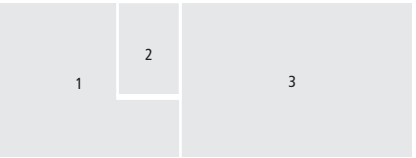
greater WELLINGTON REGIONAL COUNCIL | Water

Contents

Cover

Aspects of a dry summer: (1) low flow in the Hutt River during February 2008; (2) publicity for the sprinkler and fixed irrigation system ban introduced in late February; (3) the north lake at Te Marua empty, following a run on storage during February and March.

Photos: GWRC



Introduction

Reporting scope

This report covers the achievements and challenges for Greater Wellington Regional Council's bulk water supply activity, Greater Wellington Water, for the period 1 July 2007 to 30 June 2008.

Greater Wellington's Annual Report meets its statutory reporting requirements. This report is supplementary to the Annual Report. We intend it to provide our territorial authority customers and other stakeholders with a more detailed account of our bulk water supply operation.

The commentary on pages 2-21 reflects our long-term performance indicators and is referenced to objectives and targets from our quality (QMS) and environmental (EMS) management systems. It covers financial, social and environmental aspects of our activities, within the scope of our performance indicators and management systems.

Our purpose

We aim to provide enough high quality water each day to meet the reasonable needs of the people of greater Wellington, in a cost-effective and environmentally responsible way.

What we do

We collect, treat and distribute water to four city councils – Hutt, Porirua, Upper Hutt and Wellington – for their supply to consumers. We;

- operate four water treatment plants, 15 pumping stations and 183 kilometres of pipeline
- supply around 150 million litres of water daily on average – 1,730 litres every second – to meet the needs of about 380,000 people
- target at least an 'A' grade quality standard for our water treatment plants and distribution system, where consistent with customer requirements
- forecast future water needs and plan so those needs can be met at an acceptable cost to the community
- carry out our work with care for the environment, including promoting ways to conserve water, and the benefits to the public of water conservation
- manage infrastructure assets with a replacement value of $445 million[1].

The amount of water we supply every week could completely fill Wellington's Westpac stadium.

[1] At 30 June 2004, following the most recent independent valuation

Governance and organisation structure

The Wellington Regional Water Board Act (1972) defines Greater Wellington's bulk water supply role. Regional councillors are responsible for setting policy; Greater Wellington's Parks, Forests and Utilities Committee oversees the bulk water supply work carried out by its Water Supply, Parks and Forests Division. At 30 June 2008 Greater Wellington Water was being re-organised into four main functional areas: Water Supply (managing and operating the current supply assets, including production, distribution, asset management, engineering design, system modelling and compliance with quality and environmental standards); Development and Strategy (managing strategy, planning and investigations for new water sources and associated infrastructure); Marketing (including customer reporting and water conservation strategies); and Support (financial, administrative and secretarial services). Greater Wellington Water contracts in water quality testing services.

Performance indicators

We have five long-term performance indicators (PIs) for bulk water supply, encompassing water quality, security of supply, environmental management, customer service, business efficiency and health and safety. Each PI has related objectives and targets. Objectives for each PI and performance against short-term targets for 2007/08 are published from page 30.

Greater Wellington's Amended 2006-16 Ten-Year Plan – *a sustainable region* – includes annual targets for each PI for the next year (to 30 June 2009). The amended ten-year plan is available on our web site or by contacting us (see outside back cover for details).

Management systems

Our Quality Management System is certified to the international standard ISO 9001:2000. Our Environmental Management System is certified to ISO 14001:2004. An independent entity audits these management systems annually.

Business performance

Water supply volume

Total supply 55,642 million litres (ML); 0.7% less than during 2006/07

Average daily supply 152.0 ML

Where highlights are preceded by a coloured triangle, more information appears in the following section of the report, preceded by the same coloured triangle.

▶ Supply to Wellington decreased year on year; supply to Lower Hutt, Porirua and Upper Hutt increased

▶ Gross supply per resident averaged 399 litres per day

▶ Peak day supply 199.3 ML; 31% more than the average day

▶ Wellington used 2.1 percent less water year on year, while Lower Hutt (0.4 percent), Porirua (1.9 percent) and Upper Hutt (0.9 percent) each used more water than during 2006/07.

▶ Water supply per resident averaged 399 litres daily (L/h/d) within the region's four cities.

Total supply per Wellington resident equated to 428 L/h/d[2]. For the other three cities, the equivalent figures were: Lower Hutt 382 L/h/d, Upper Hutt 370 L/h/d and Porirua 347 L/h/d (see graph).

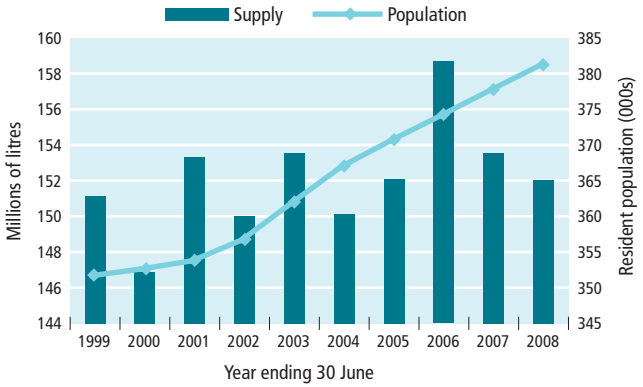
▶ Total water supply during summer (90 days from 1 December) was 14,923 ML, averaging 165.8 ML/d. This is an increase of 4.9 percent compared with 2006/07, and resulted from lower rainfall and a fine summer. The maximum day supply (199.3 ML) was on Thursday 31 January.

Total supply during winter (June – August) was 13,168 ML, or 143.1 ML/d on average; a decrease of 5.6 percent from 2006/07. The figure for 2006/07 was higher primarily due to a large leak in Wellington city.

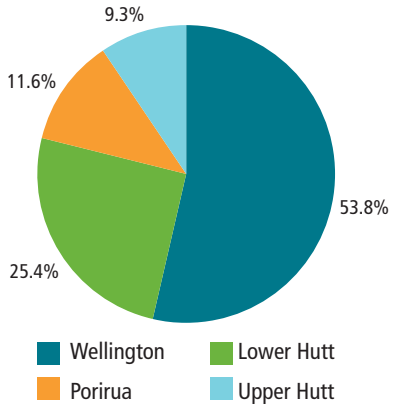
For further water supply statistics see pages 26-27.

[2] Average water supply per resident reflects water used for all purposes. Cities with a larger proportion of non-domestic water use within their total water use, such as Wellington, will tend to have a higher 'per capita' water use

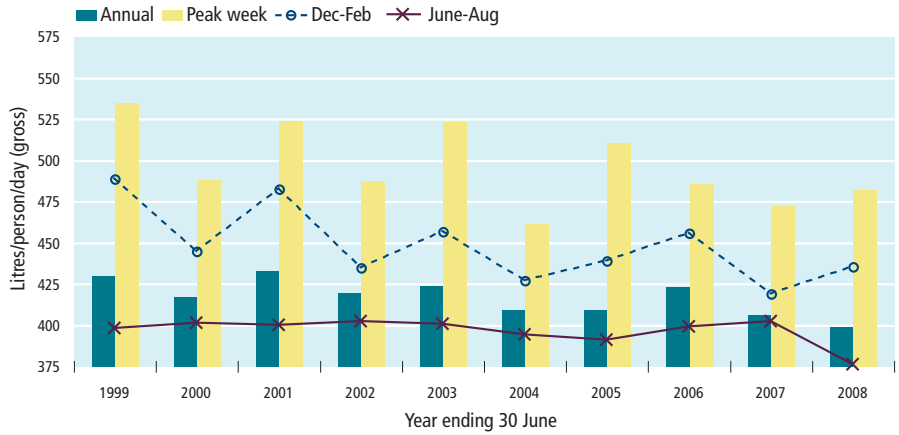
Average daily supply and population



Share of annual supply by city

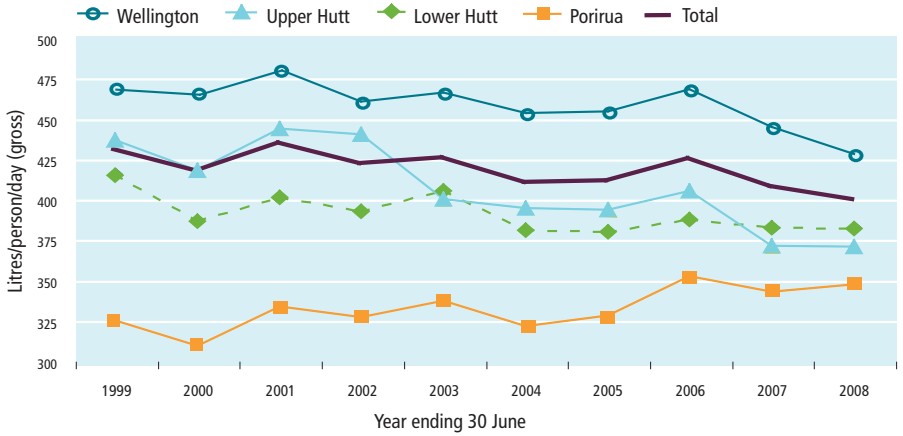


Water supply per resident



The trend in average annual water supply volume per resident is decreasing gradually, as are the 'peak week' and summer (December – February) supply trends per resident. 'Base' winter water supply per resident was showing a slightly increasing trend before the marked reduction in the current year.

Water supply per resident by city



Financial summary

Asset value $305 million; liabilities $47 million

▶ Operating costs $23.9 million
Surplus $1.2 million
Total debt $43 million
Interest charges $3.5 million

▶ Capital works spending $3.8 million

▶ Levy held at $26.4 million[3] for 2008/09

▶ Costs compare favourably with Watercare (Auckland)

▶ Total operating costs were reduced 3.6 percent year on year, to $23.9 million. Our operating surplus was above budget, at $1.2 million; interest charges were contained at $3.5 million, $0.6 million below budget; while debt was $42.7 million at 30 June 2008, $2.0 million less than a year earlier. (QMS target 4.2.3, page 36)

▶ Spending on capital works during 2007/08 was $3.784 million; a net $1.053 million under budget.This occurred mainly through reductions in the scope of projects, delays (funds re-budgeted) and cost reductions. Of this sum, $0.407 million has been transferred to the 2008/09 financial year to fund completion of delayed 2007/08 projects. (QMS target 4.2.5, page 36)

▶ The bulk water levy for 2008/09 has been held at $26.4 million (including GST), the same level as for 2007/08. Our 2006-16 ten-year plan[4] provided for a levy increase of six percent between 2007/08 and 2008/09, but budgeted expenditure for 2008/09 is $1.143 million less than that provided for in the ten-year plan. A one-year deferral of a river intake and pumping station at Te Marua is the main reason for the lower forecast.

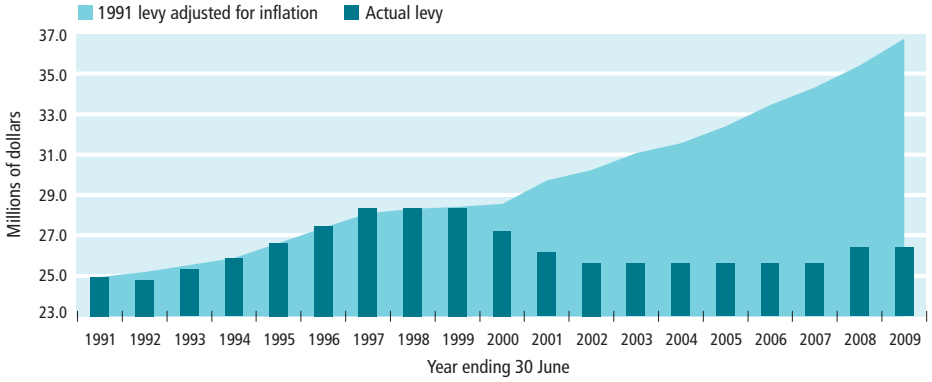
[3] GST inclusive

[4] Amended June 2007

More detailed financial information can be found from page 41.

Costs comparison with Watercare. The water supply levy charged to our four customers equated to 42.2 cents per 1,000 litres of water supplied. This unit cost compares favourably with Watercare; the bulk water supplier for the greater Auckland urban area. (See page 48)

Water levy and inflation



In June 2008, the water levy for the year to 30 June 2009 was set at $26.4 million; the same level as for the 2007/08 levy. This is the eleventh time in the past 12 years that the water levy has either been held or cut. As a comparison, if the levy had increased in line with inflation over the last 10 years, it would now stand at almost $37 million, or 39 percent more than the actual figure. (CPI inflation figures are 12 months to 31 December – year to December 2008 estimated. Source Asia-Pacific Risk Management)

Security of water supply

- Sprinkler ban imposed during summer; security of supply target not achieved
- Annual reservoir level and supply pressure targets largely met
- Negligible losses from bulk mains
- Annual risk of water shortfall now greater than our 2% target
- Water supply development strategy approved for customer consultation

Factors affecting supply. We did not achieve our target for maintaining security of water supply during the year[5]. For the first time in more than 20 years, a ban on the use of domestic sprinklers and in-ground irrigation systems was needed. Between February 2007 and March 2008, monthly rainfall totals were below the long-term averages for each of our three surface water catchments in every month except October. This developing situation led to low river levels in early summer, and a deteriorating supply position as water demand increased with the onset of the summer's more settled weather pattern. The ban on using sprinklers and in-ground irrigation systems was introduced to ensure higher priority water needs could be met in the event of summer's very low river flows continuing well into autumn.

The ban came into force across our supply area on 26 February and was maintained until 9 April. It was lifted following several rainfall episodes over the preceding 12 days, which sustained higher river flows and signalled the end of the summer 'drought'.

[5] For target definition see QMS targets 1.1.1 and 1.1.2, page 34

Although it was perhaps the toughest summer for water supply since Greater Wellington assumed responsibility for bulk supply in 1980, it was pleasing to see that the level of peak demand for water was not extreme in the context of the last 10 years. Our research and conversations with garden industry contacts indicates that the sprinkler and irrigation ban was widely known about by the public, and adhered to. (QMS target 1.1.1, page 34)

▶ **Annual reservoir level and supply pressure targets largely met.** We have twin time-related targets for maintaining water levels in customer reservoirs within specified limits. For the year in review, actual performance was 96 percent and 97 percent; 100 percent is required to fully meet both targets. For monthly reservoir records where we did not achieve the targets, a combination of high demand and low or no output from the Wainuiomata treatment plant were significant factors, as were (to a lesser extent) failures of remote telemetry units. Maintaining high water levels in reservoirs provides communities with the maximum available buffer to cope with peaks in water use – for fire fighting for instance – and short-term loss of supply to the reservoir. We fully met our twin targets for maintaining supply pressure at Thorndon[6], which feeds central Wellington's reticulation directly. Pressure and reservoir level targets are self-imposed. (QMS targets 1.2.1 and 1.3.1, page 34)

▶ **Distribution system losses were negligible.** The difference between the metered volumes of water treated and water supplied was 0.7 percent of the treated volume. This is less than the margin of error for our meters (+/– 1.0 percent) and indicates that our transmission losses continue to be negligible. (EMS target 4.1.1, page 38)

Long-term security planning

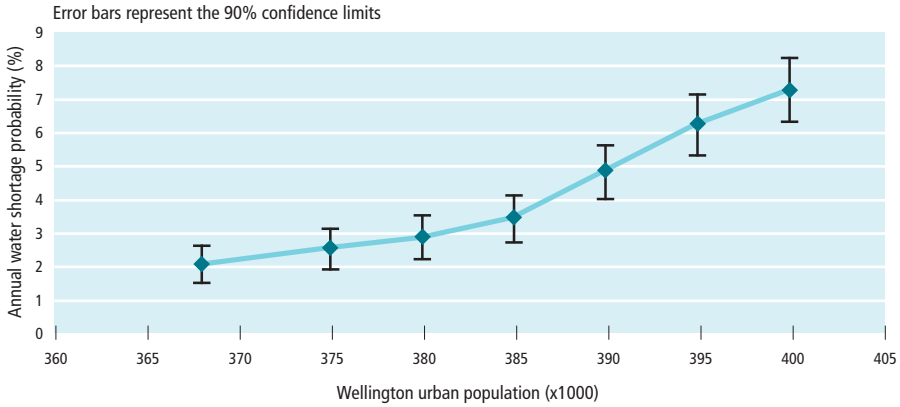
(QMS objective 1.1, page 34)

▶ We are currently operating with a modelled risk of water shortage greater than our annual target of two percent.

Planning to ensure the long-term security of water supply for the region's cities has been a major focus for several years. In the last year we have put forward a supply strategy for comment by our customers. Ultimately, the public will have an opportunity to comment on these proposals through the annual plan consultation process in 2009.

In June 2000, we agreed with our four city council customers to manage the bulk water supply system so that water shortages should not occur more than once in 50 years on average: an annual shortfall probability of two percent. This standard is conservative, but the consequences of water shortage can be severe. At that time the shortfall probability was half of one percent, and our supply system was expected to meet the projected demand for water until around 2020. However, high population growth and refined modelling of shortfall probability has since seen modelled shortfall risk increase sharply. The probability of a shortfall is now 2.9 percent, or once every 35 years on average, so our target level of service is not currently being met[7]. Modelling shows the risk of water shortages will continue to increase unless new supplies are developed or water use declines.

Water shortage probability



The resident population that we provide water for is currently estimated to be 381,000; the annual probability of a water shortage associated with this population is 2.9 percent. Without some form of intervention, the annual shortage probability is predicted to rise to 7.2 percent as the population reaches 400,000, which is anticipated by 2014[7].

[6] See QMS target 1.3.1, page 34

[7] Further modelling refinements since 30 June 2008 have seen this revised to a current annual water shortage probability of 3.6%, or 1-in-28 years

Bulk water supply development strategy

(QMS targets 1.1.1 and 1.1.2, page 34)

In 2005 it became apparent that new water supply capacity may be needed much sooner than 2020. Investigations were started into a range of options, which have been narrowed down over the intervening years following detailed investigations and consultation with our customers. During 2007/08 we have refined this work into the 'Wellington Metropolitan Water Supply Development Strategy 2008'.

Options that can be introduced in the short-term are needed to lower the annual risk of water shortage back to less than two percent. Three options have been identified, which together would provide that level of security until the population reaches 400,000 in about 2014. They are:

- Raise the top water level in the Stuart Macaskill Lakes, to increase storage
- Seek to increase the amount of water we can take from the Hutt River at Kaitoke
- In conjunction with Wellington City Council and, possibly, Capital & Coast District Health Board, construct a large new reservoir in Wellington.

Each of the three short-term supply augmentation options has some degree of risk attached, whether engineering, consenting or political, so no option can be assumed as a certainty for development. If any of these three could not be developed, then a fourth option – an aquifer beneath Upper Hutt – would be needed to reinstate our target level of security.

In May 2008, regional councillors approved consultation with Greater Wellington's city council water supply customers about the short-term source development projects and selection of a dam site at Whakatikei for development at such time as it is needed. This consultation was in progress at our year end. (EMS target 2.2.1, page 37)

You can read more about these options in the following section.

Projects – security of water supply

- More lake storage investigated
- Increased 'low flow' water take from the Hutt River investigated
- Increased Wellington storage proposal
- Upper Hutt aquifer investigated
- Whakatikei dam site proposal
- Sustainable yield modelling upgrade
- Water demand management 'toolkit' report completed
- Regional Water Strategy talks started

More lake storage investigated. We have received a detailed feasibility study and preliminary design for raising the top water level of the Stuart Macaskill storage lakes. This work indicates a 1.3 metre increase can be achieved without major civil works for between $4 million and $5 million dollars. Our maximum storage would be increased by 400 million litres; a 13 percent increase in usable capacity. That study is being peer reviewed.

More water from the Hutt River. A lower minimum flow requirement downstream of Kaitoke Weir would provide up to 17.3 million litres more water per day. This would involve reducing the minimum flow from 600 to 400 litres per second for about 500 metres of the river, between our weir and the confluence of the Pakuratahi and Hutt rivers. The change could be introduced quickly and cheaply if a resource consent is obtained.

During the last 12 months we have advanced preparations for a resource consent application. Four scientific reports on the impact of lower flows on the river habitat have been completed and peer reviewed. We have continued to consult with Fish and Game New Zealand and the Department of Conservation as key stakeholders in relation to this proposal.

A report on the assessment of environmental effects was being prepared at our year end. (EMS target 2.2.1, page 37)

Kaitoke Weir: increased water take is being investigated

More storage in Wellington. A new reservoir in Wellington would help us to overcome distribution bottlenecks during periods of high demand. Wellington City Council and Capital & Coast District Health Board (responsible for Wellington Hospital) also have interests in securing more water storage capacity. A proposal to share the costs and use of a large new reservoir near the hospital has been under discussion for several years now with the health board's ability to meet its proposed share of costs the main sticking point.

In December we and Wellington City Council made a joint approach to the district health board requesting they confirm their commitment to fund the new reservoir. It has since been agreed that a joint approach between the three parties will be made to the Ministry of Health, for funding assistance for the district health board's share of costs.

The maximum practical capacity of the proposed reservoir, on Prince of Wales Park, has been reassessed upwards: to 45 million litres[8] (ML). Wellington City Council has reviewed its water storage requirement at 17.5 ML and we understand that Capital & Coast District Health Board has confirmed a need for 20 ML. This leaves 7.5 ML for our use (the storage volume we had originally envisaged).

A Consultant has been commissioned to provide an estimate of cost for this larger capacity reservoir. A meeting with the Minister of Health will be arranged to pursue the hospital funding once the funding split between the three parties has been established for this larger reservoir.

Investigation of the Upper Hutt aquifer. Modelling of the Upper Hutt aquifer confirmed that 16–24 million litres of water per day is available; 16 million litres daily is estimated to support population growth of about 30,000 at current rates of water use. Continuous extraction would have an increasing effect on the Hutt River over time, during periods of low rainfall. The extent of the impact is being modelled and will have a bearing on the volume of water applied for, should this option be favoured for development. A report on water treatment options has also been received. A well-field, treatment plant and pumping station are estimated to cost $15–$19 million, with an additional $5 million for a distribution pumping upgrade. (EMS target 2.2.1, page 37)

Suitable future dam site identified. Also during the year, work was completed to identify a favoured site (from a shortlist of three) for a dam and storage lake: on the Whakatikei River in Akatarawa Forest. We anticipate this facility will be needed within the next 30 years, but exactly when will depend on many factors, including which of the shorter-term options can be developed and the degree to which the community supports water-use reduction and efficiency measures before a dam.

More information about the development strategy can be found on our web site (www.gw.govt.nz/water) under 'Planning for Regional Growth'.

Sustainable yield modelling. An upgraded version of our Sustainable Yield Model (SYM) programme was tested and installed during the year. The SYM was developed with the National Institute of Water and Air (NIWA) and is used to model sustainable water supply quantity and the population that it could support. The upgraded programme is more sophisticated than its predecessor and includes updated data for rainfall and river flows.

Unfortunately, the upgrades to the model have resulted in the sustainable yield of the existing water supply in a one-in-50-year drought being sufficient for a resident population of only 368,000, rather than 377,000 as modelled by the previous version of the SYM[9]. Figures released by Statistics New Zealand in November estimated the resident population in the four cities we supply as 379,100 at 30 June 2007. As a consequence, we could currently only supply for a one-in-35-year drought severity without water shortages[10].

[8] This capacity was revised upwards again, to 56 million litres (ML), after 30 June 2008. Wellington City Council's requirement has increased to 28.5 ML

[9] Revised to 364,000 after 30 June 2008

[10] Revised to 1-in-28-years after 30 June 2008

▶ **Water demand management.** Modelling of water needs is based on existing levels of water supply per resident. Supply development timing could be delayed by various measures that result in reduced and more efficient use of water.

Last year we reported progress towards finalising an assessment of water saving methods, intended as the forerunner to agreeing a water-use management plan for the greater Wellington urban area with our four city council water supply customers. This technical report – the Wellington Water Management Plan (WWMP) 'toolkit' – was completed in May.

▶ **Regional Water Strategy.** Greater Wellington also opened discussions with the region's city and district councils about a Regional Water Strategy, which is proposed to bring together all aspects of water delivery for the wider Wellington region – including, for example, river and ground water management, bulk supply, reticulation management, metering and usage-based pricing, conservation and domestic rainwater collection – within a single regional framework.

A consultant was engaged to develop the strategy and this was underway at our year end. We expect the proposed WWMP to be an integral part of the wider strategy. This will be considered alongside the water supply development strategy during 2009 in determining, with our city council customers, a preferred strategic approach to ensuring long-term security of water supply for the greater Wellington urban area. (EMS target 4.1.3, page 38)

Water quality

▶ Drinking-water standards compliance for treatment plants and bulk distribution zones

▶ 'A1' grading for Te Marua and Wainuiomata treatment plants, 'B' for Waterloo, 'U' for Gear Island

▶ 'a1' grading for bulk distribution

▶ **Compliance with drinking water standards.** Hutt Valley District Health Board is the Regional Public Health provider for the greater Wellington urban area. Its drinking water assessment unit has advised that, provisionally, we achieved full compliance with the drinking water standards for the year to 30 June 2008. This covers chemical and microbiological compliance for water leaving our treatment plants and within the bulk distribution system. We expect this provisional result to be confirmed in due course. (QMS targets 2.1.1 – 2.1.3, 2.2.1 – 2.2.3, pages 34 and 35)

The Health (Drinking Water) Amendment Act was passed into law during the year. This new law requires that all practicable steps are taken by water suppliers to comply with the drinking water standards, which has been our practice for many years already. We are required to prepare Public Health Risk Management Plans for the bulk water supply by July 2009; this work is underway. The requirements of the new act have no impact on our capital works programme.

▶ **Treatment plant grading.** Our Te Marua and Wainuiomata treatment plants are

graded 'A1', the highest available, while our Waterloo plant is graded 'B', the highest possible given Hutt City Council's preference for an unchlorinated supply. (QMS targets 5.2.1 and 5.3.1, page 36)

The grading assessment we had anticipated during the year for our Gear Island treatment plant was deferred. We identified minor technical issues which we believe would prevent an 'A1' grading being issued by the Hutt Valley District Health Board. At our year end we were reviewing whether operational changes will be required to achieve an 'A1' grading. In the meantime, Gear Island remains graded as 'U' (ungraded). (QMS target 5.4.5, page 36)

▶ **Bulk reticulation grading.** In the first quarter of the year, Hutt Valley District Health Board confirmed an 'a1' grading for each of the three zones within our bulk distribution network; 'a1' is the highest grading possible. This result is significant for our customers, as a 'downstream' reticulation zone cannot have a higher grading than the bulk zone that supplies it. (QMS targets 6.1.1 and 6.2.1, page 36)

Use of resources

▶ 58,535 ML of water taken from sources; 3.3% less than during 2006/07

▶ 94% of water taken measured as productive use

▶ Chemical use per litre supplied lower by 6%

▶ Power use per litre supplied higher by 2%

We are committed to operating in an environmentally responsible manner, consistent with the Resource Management Act 1991 (RMA) and providing high quality water at a reasonable price. The main impacts of our operations on natural and physical resources relate to water take, energy and chemical use, discharges and the disposal of waste. We operate an environmental management system to instil focus and discipline around these activities. Our Environmental Policy is published on our web site (www.gw.govt.nz/water).

▶ **Water take.** We abstracted 58,535 million litres; 3.3 percent less than during 2006/07. This reduction was due in part to lower water use, and abstraction for 2006/07 being affected by a large leak in Wellington city's reticulation. (See also page 23).

We complied with all conditions of our consents, except in regard to a condition of abstraction from the Orongorongo River and it tributaries. The requirement to retain a residual flow of at least 100 litres per second downstream of these abstractions was not achieved on three occasions. These incidents were of very short duration and, we believe, would have caused minimal effect on river ecology, even though the river flow on each occasion was quite low. Corrective actions have been programmed for each incident. (EMS target 1.3.1, page 37)

▶ **Metered use of water take.** We report annually on the difference between metered abstraction and production or lake filling, as an indication of whether the unmetered component of our water take is increasing. This year, 94.0 percent of our water take was measured as either being treated for supply or used to increase or refresh the reserve of untreated water in the Stuart Macaskill Lakes. Conversely, unmetered use of our water take was 6.0 percent of the total take, compared with 4.9 percent during 2006/07. Our water take that cannot be quantified as having been used for a purpose equates to around 7.6 million litres daily on average.

Most of the unaccounted-for volume occurs between Kaitoke Weir and the distribution main from our Te Marua treatment plant. An amount of this volume is simply unmetered treatment process water and evaporation from the Stuart

Macaskill Lakes. However, we have identified that the apparent water loss decreases when the weir is turned off and water is supplied to Te Marua from the Stuart Macaskill Lakes.

The wash water flows from the strainers at Kaitoke have been measured and some minor leakage stopped, but neither measure has significantly lowered apparent losses. Several small holes in the lining of the tunnel between the weir and strainer house were awaiting repair at our year end, and once that has been done testing will then be carried out to assess whether apparent losses are real or a result of errors or inaccuracy in abstraction flow measurement. This work will continue into 2008/09. (EMS targets 4.1.1 and 4.1.2, page 38)

Chemical and energy use

Our electricity requirement for water treatment and distribution is broadly equivalent to that used by 2,500 average households and represents about eight percent of total operating costs.

Historically, around two-thirds of our annual power use occurs at three sites: the Waterloo treatment plant (40-45 percent of total kilowatt hours), the Waterloo well field (about 10 percent) and the Te Marua Pumping Station (about 16 percent). Power use efficiency – kilowatt hours per million litres treated (kWh/ML) – is therefore influenced largely by the share of total supply from Waterloo, how much raw water treated at Te Marua is pumped from the Stuart Macaskill Lakes to the treatment plant, and how this pumping is managed.

Chemical use efficiency – kilograms per million litres treated (kg/ML) – is influenced by how much of our total production comes from river sources (which require more treatment than our aquifer source), how much water we treat from storage and variations in raw water quality associated with climatic variability.

Treating river water has a higher chemical demand, with associated impacts from chemical production and transportation. Aquifer water has a higher direct power demand for abstraction and distribution pumping. However, treating river water also generates solid and liquid waste, which we must dispose of. We don't have the means to quantify the relative environmental merits of production from rivers and the Hutt aquifer. Given this uncertainty, our approach is to produce water at minimum marginal cost, subject to meeting our obligations under the Resource Management Act and taking a conservative approach to security of supply.

Chemical use efficiency. On average we used six percent less chemical to treat every litre of water we supplied last year. The make-up of supply between river and aquifer sources was virtually unchanged year-on-year, so this improvement can be attributed largely to efficiency gains.

The four main chemicals we use – both by weight and cost – are lime, caustic soda, carbon dioxide and alum. Our use of these by volume of water treated for the last three years appears in the following table.

Chemical use relative to treatment volumes

	Kilograms per million litres of water treated		
	2007/8	2006/7	2005/6
Total chemicals	50.58	53.75	70.04
Lime	17.48	17.61	22.37
Alum	10.62	11.85	13.91
CO2	8.90	9.31	15.00
Caustic	6.72	7.23	10.78

Energy use and efficiency. Our electricity use to treat and distribute water was 19.2 million kilowatt hours (kWh): 0.1 percent more than during 2006/07. This usage equates to 348 kWh per million litres of water treated; a drop in efficiency of power use year-on-year of 1.8 percent. The very dry summer and resulting increased reliance on water pumped from both the Waiwhetu Aquifer and from the lower storage lake at Te Marua during that period were the main factors behind this lower measure of efficiency.

Emissions Trading Scheme. With the New Zealand government introducing the Emissions Trading Scheme (ETS) to help meet its Kyoto obligations, the cost

of electrical power to the end user will increase significantly in the next few years. There is some uncertainty about the amount of the increase, but estimates in the range of 10-20 percent have been indicated by the Ministry for Environment. Any reduction in power use from non-renewable or fossil fuel sources will not only provide environmental benefits, but mitigate the impact of increasing financial costs too. Advancing energy minimisation and efficiency measures has therefore been a major focus of our operation, with some exciting projects in development.

Projects – resource use efficiency

- Te Marua – chloride making plant feasibility study; operating cost saving of $78,000 p.a. forecast
- Te Marua – coagulant 'feed forward' dose control introduced; chemical savings 10-15% forecast
- Waterloo lime system upgrade completed
- Energy use audit
- Hydro-generation investigations at Te Marua, Wainuiomata and five reservoir sites
- Te Marua – lake pumping power management tool installed
- Wainuiomata – variable-speed drives installed on pumps; cost saving of $22,000 p.a. forecast
- Real-time power monitoring introduced at major sites
- Pump efficiency testing; $12,000 p.a. saving identified for one pump from preliminary trial
- Tunnel Grove control valve installed; energy saving of $27,000 p.a. forecast
- Power tariff options

Chloride plant at Te Marua. We use chlorine gas for disinfection at our Te Marua and Wainuiomata treatment plants. Sodium hydroxide is also used at Te Marua for final pH correction. The price of chlorine gas has been steadily increasing over the last 10 years and the price of sodium hydroxide fluctuates widely, with large rises in the last year. Concern over increasing costs led us to consider on-site generation of both chemicals.

Consultant $h_2$ope conducted a feasibility study, which showed it would be economically viable to generate sodium hypochlorite at Te Marua, for use instead of chlorine gas. A preliminary design exercise was undertaken to test the accuracy of the initial cost estimate and develop a scope of work for installing a sodium hypochlorite generation plant. The project has been included in the 2008/09 capital works programme.

The plant is expected to reduce operating costs by around $78,000 annually, and to pay for itself in less than seven years.

Coagulant 'feed forward' dosing control. Last year we reported the substantial improvement to chemical

dosing efficiency and water quality at our Wainuiomata treatment plant from installing a 'feed forward' coagulant dosing control system (*Com::pass*).

We had anticipated having the same system fully operational at our Te Marua treatment plant by 30 June 2008. At year end the project was a few weeks behind schedule. Initial indications are that chemical savings will be between 10 and 15 percent. We will review the performance of this process change in the coming year.

Waterloo lime system upgrade. Work was completed to modify the lime dosing system so that the two treatment streams at Waterloo can operate at the same time, rather than the duty / standby configuration in place previously. This change should improve the performance of recently installed aerators and further reduce the amount of lime needed to treat the water. Sand (an impurity in treatment lime) has caused a nuisance for some years in the parts of Lower Hutt supplied directly from Waterloo. Our reduced need for lime and Hutt City Council's current work to modify its reticulation – so that all water supplied will pass through a service reservoir before reaching consumers – should greatly improve that problem. We anticipate Hutt City Council will complete the necessary changes to its reticulation by December 2008.

Energy audit progress. Last year we reported the recommendations from an Energy Efficiency and Conservation Authority (EECA) sponsored energy use audit, and a subsequent grant to assist with implementation of the recommendations. Progress with several projects arising from the audit are summarised later in this section.

A second ECCA sponsored (level 3) audit was carried out, in accordance with AS/NZS 3598:2000, to investigate further some of the level one audit recommendations. It addressed 10 topics, most of which build on the level one audit. The final level three audit report identified both low and no-cost energy saving opportunities as well as more capital intensive or long-term opportunities. Implementation of hydro generation schemes would provide the greatest gains, but need to be considered against competing goals.

Some of the 10 recommendations are already being implemented, while the rest will be carried out in the coming year.

Hydro generation from the Orongorongo supply. The change in elevation between our Orongorongo intake weir and Wainuiomata treatment plant results in surplus energy available at the plant from water pressure. This energy is dissipated through pressure reducing valves at present, but could be harnessed.

Consultant MWH has investigated this opportunity, and their draft report is due in July 2008. What has become apparent already is that in order for a generation scheme to be worthwhile, there will need to be a significant change in our operational parameters.

Maximum generation benefits are obtained when excess water (above that needed for supply) is discharged into the Wainuiomata River. This has environmental and cultural implications, which will be assessed as part of the next stage of investigation. (EMS target 4.2.4, page 39)

Orongorongo Weir: hydro generation is being considered

Kaitoke supply power generation. Last year we reported preliminary analysis that indicated we could meet up to 50 percent of the power requirement of Te Marua Pumping Station by on-site generation. In the first quarter of this year we ran a generation trial by passing raw water from Kaitoke Weir to the Stuart Macaskill Lakes via the Te Marua Pumping Station. By running one of the five 'lake to treatment plant' pumps backwards the pump motor generated up to 118 kilowatts (kW). However, this output was assessed as having been limited by the pump size, while the pump's normal function would restrict the time it could be used to generate electricity.

Consultants Better Technical Options Ltd were engaged to test whether the two 'lake to lake' pumps would be better suited for power generation. These pumps could be dedicated as turbines with little impact on normal operations, and have a higher flow capacity.

In March we received their report, which verified there is a substantial hydro generation opportunity when the lakes are being filled, and put forward four generation options: from 120kW from using one of the lake pumps, to 380kW from using a purpose-built mini hydro turbine. Payback periods for the four options ranged from two to 6.24 years. Several recommendations were also made for further tests and an investigation of contractual implications with our power suppliers. These recommendations were being implemented at our year end. (EMS target 4.2.4, page 39)

Hydro generation at service reservoirs. Site and water supply characteristics of five service reservoirs we supply to result in a marked drop in water pressure between our main and the reservoirs. This 'lost' energy could be used to generate electricity. Consultant Better Technical Options Ltd identified that energy lost at the inlets to these reservoirs could potentially generate over one million kilowatt hours of electricity per year, with an estimated market value of $60,000. We intend to seek ECCA funding for a trial hydro generation development at one of these reservoirs in the coming year. (EMS target 4.2.4, page 39)

▶ **Te Marua lakes power management tool.** The Stuart Macaskill water storage lakes at Te Marua are used to supply the treatment plant when the river water quality deteriorates, and to augment supply from the river when river flows alone cannot provide enough water.

The treatment plant is supplied predominantly from 'lake one', which is of a higher elevation and therefore requires less pumping energy to transfer water to the plant. Water from the lower lake ('lake two') can either be pumped directly to the treatment plant or transferred to the upper lake during low electricity tariff periods.

We recognised that the basis for our pumping strategy decisions could be improved and associated power costs reduced. Consultant h2ope was engaged to develop a decision tool to identify the most cost-effective pumping and demand management solutions, taking into account the full range of electricity prices.

The resulting model allows the production manager to make informed decisions about water source management for production at Te Marua. (EMS target 4.2.4, page 39)

▶ **Wainui DAF optimisation.** Our Wainuiomata treatment plant employs a dissolved air flotation (DAF) process to remove impurities from river water. One of the main operating costs of a DAF plant is for electricity to run the recycle pumps, which feed filtered water to the DAF unit. Consultant h2ope also carried out a review of the existing recycle pump operation, to evaluate costs and benefits from installing variable speed drives (VSDs) on the pumps. The study showed both performance benefits and operational cost savings would be realised by installing VSDs on the pumps. The payback period was estimated to be 4.4 years.

The new drives were commissioned in April 2008 and the DAF control system was also modified. The project was completed under budget, and projected operational cost savings of $22,200 per year give a payback forecast of 3.8 years. The modifications have operated to date without a single operator call out. (EMS target 4.2.4, page 39)

▶ **Real-time power monitoring.** In the last 12 months we have developed a system that will allow us to monitor and trend the power use at each of our major sites in near real time. The system uses cell phone technology to download data – at regular intervals or on demand – from remote power meters and store it in a database. A software application interrogates the data and provides trending of power use and power factor, notifications if specified power use or factor limits are exceeded, monthly energy and network cost schedules for invoice checking, and cost forecasting for alternative operating scenarios.

This system was newly operational at our year end. We anticipate it will help us to reduce network costs and further improve energy use efficiency. (EMS targets 4.2.1 and 4.2.4, pages 38 and 39)

Pump efficiency testing. The efficiencies of the pumps in our two major pumping stations – Waterloo and Te Marua – were tested in January and March 2008 respectively, using state-of-the-art thermodynamic testing equipment.

Follow-up testing of the worst performing of Waterloo's main supply pumps to Wellington showed reconditioning improved its efficiency by 6.8 percent, and brought it back to almost 'as new' performance. This improvement will reduce energy use by roughly 122,000 kWh annually for that pump, with an associated cost saving of about $12,000 per year.

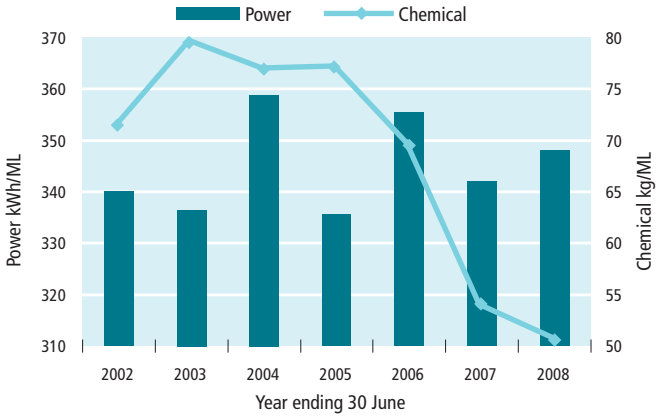
Several variations on pump refurbishment methodology were tested during this work, and the findings will be applied to current performance data for the other high energy-demand pumps at Waterloo and Te Marua, to determine in each case the most cost-effective package of improvement measures.

The worth of using this costly testing technology for lower energy-demand sites will also be assessed. During the year we participated for the first time in a pump efficiency benchmarking exercise with the Victorian Water Industry Association (Australia). In future we expect to use benchmarking to assess pump efficiency for sites where the cost of thermodynamic testing can't be justified (see also EMS targets 4.2.2 – 4.2.4, pages 38 and 39)

New control valve at Tunnel Grove. A new automated valve has been installed in the main from our Wainuiomata treatment plant, on the Gracefield side of the Wainuiomata Hill. The valve controls the flow from the Wainuiomata plant to Wellington. Moving it from the treatment plant has increased operating pressure in the main between the two points.

The purpose of this valve is to prevent pressure surges that can damage the cast-iron main. However, it has also led to a valuable reduction in power use. Increased operating pressure in the main has resulted in the two pumping stations that feed Wainuiomata's reservoirs operating more efficiently. The load at each pumping station has been reduced by about 30 kilowatts, equating to an annual saving of 306,000 kilowatt hours, or roughly 1.5 percent of our total power use. From a cost perspective, the annual energy saving will be a little over $27,000. (EMS target 4.2.4, page 39)

Power and chemical demand



Stage-two system optimiser. In 2001 we reported the results of installing a software system to optimise delivery costs of water from our Waterloo and Wainuiomata treatment plants. This software identifies whichever of the two plants has the lowest marginal cost of supply at any given time and reduces overall energy costs for pumping to meet the demand for water.

This year we upgraded the existing system operating on the Waterloo and Wainuiomata supply and installed the optimising software at the Te Marua treatment plant. Although optimisation of the Kaitoke side of our distribution system is not expected to deliver the same level of operational cost savings as was achieved from the first stage of the project, it should help us to maximise supply from Te Marua, and so assist with keeping downstream reservoirs full to target levels during periods of high demand. Our whole system is now managed with a consistent control philosophy.

At our year end there were a few minor project details to be resolved, but the new system was working well. (EMS target 4.2.4, page 39)

Electricity tariff structure options. Power charges are based on a mix of fixed and variable energy rates that we negotiate with the supply company. Since 2005 our pricing structure has all been at a fixed rate; we have had no exposure to market fluctuations and therefore little or no financial risk. This year we have analysed our historic energy use data with the aim of identifying what level of saving might be achieved by taking a slightly higher level of exposure to the spot market. We have joined an energy tendering collective and are awaiting proposals from electricity generators before deciding how to proceed. (EMS target 4.2.4, page 39)

Emissions and waste

- Full compliance with discharge consents
- Solid waste to landfill reduced
- Wainuiomata lime batching plant modified; cost savings of $10,000 p.a. forecast
- Wainuiomata – treatment waste draw-off modified; benefits include reduced discharge of water
- Reservoir overflow management reviewed

We achieved full compliance with our discharge consents. (EMS target 3.2.2, page 38)

Solid waste to landfill reduced. We sent less solid treatment waste (sludge) to landfill. Production from our Te Marua and Wainuiomata treatment plants resulted in 1,508 tonnes of de-watered sludge, or 48 kilograms for every million litres of water treated. This is a 3.3 percent reduction in total tonnage year-on-year, and a 0.6 percent decrease in terms of kilograms per million litres of river water treated. (EMS target 3.2.3, Page 38)

Wainuiomata treatment plant lime batching plant. Lime used at Wainuiomata contains about five percent of insoluble material, including sand. These particles accumulate within the system and cause wear on plant and machinery. A dump sequence was designed for the lime batching process to remove this problem. However, it resulted in a large volume of liquid waste, with an associated disposal cost of over $10,000 per year. Consultant h2ope was engaged to assess options for reusing the waste lime and minimising disposal costs.

Analysis showed that installation of a hydro-cyclone separator system would be the best solution. The system was commissioned in April 2008.

Operational cost savings of $10,000 per year were estimated as a result of reduced waste for disposal. The project cost $31,500, giving an estimated payback period of just over three years. We will assess its actual performance during 2008/09. (EMS targets 3.3.2 and 3.3.3, page 38)

▶ **Wainuiomata treatment waste draw-off.** In June, we completed the installation of tilting trays on the 'dissolved air flotation (DAF) over filter' tanks at the Wainuiomata treatment plant. The process of dirt removal at Wainui involves floating the impurities (floc) by dissolved air to the surface of the filter, then overflowing it into a pipe to the wastewater treatment plant at appropriate intervals. We identified that a significant amount of clean, partially treated, water was being sent to waste by this process, resulting in a waste of water, treatment chemicals and power. The tilting trays provide a more efficient means of moving floc from the top of the filters into the overflow channel with less water discharged to waste. The benefits will accrue from both a reduced need to discharge partially treated water, and less effort to separate the waste solid from the partially treated water; a process requiring both chemicals and power for the centrifuge. (EMS target 3.3.3, page 38)

▶ **Reservoir overflow management.** In August we caused an overflow of Naenae Reservoir during refilling of Gracefield Reservoir after maintenance. This arose in part because flow management to Naenae had been changed temporarily so it could supply the Gracefield zone while the maintenance was in progress. The overflow caused some scouring of the watercourse and discolouration of the Waiwhetu Stream, resulting in a minor breach of the 'permitted use' rules for discharges. Ownership of water typically transfers from us to the receiving city council at the inlet to their reservoirs. This overflow highlighted that while we were at fault, we have no role in the design of infrastructure to receive overflows from these reservoirs and discharge them safely.

We are now working with our customers to identify any other reservoirs where similar conditions exist, so as to minimise the likelihood any future overflow leading to a similar breach of permitted use rules.

Land use and biodiversity

▶ Possum control for the Hutt catchment deferred. Indicators show our forests in good condition

▶ Wainuiomata wetland formed

Greater Wellington actively manages 16,500 hectares of water catchment land in the Rimutaka and Tararua ranges, to ensure that it continues to yield high-quality raw water and to enhance biodiversity. We monitor various indicators of forest health, including bird densities, pest animal numbers by species and vegetation health. Professional hunters are routinely employed to keep down the numbers of large pest animals. Possum control is carried out when needed.

▶ **Pest animal control.** Possum monitoring in the Hutt Water Collection Area showed possum numbers to be below the target level of less than five percent catch rate from our traps. This result led to a possum control operation (using 1080 poison) that had been planned for this year being postponed until 2008/09.

Intensive pest animal control in the Wainuiomata-Orongorongo Water Collection Area resulted in the culling of 94 goats, 20 deer and 85 pigs, while nine goats, 10 deer and two pigs were culled professionally in the Hutt Water Collection Area.

Forest health indicator measurements show our forests remain in good condition.

▶ **Wainui lower dam wetland.** The water outlet from the historic lower dam at Wainuiomata was closed in early November 2007 to allow a wetland to form behind the dam. Closure of the dam outlet was delayed until after the trout spawning season. The wetland has now been formed. (EMS target 5.1.6, page 39)

The newly formed Wainuiomata wetland

System recovery projects

▶ Emergency connections for Upper Hutt and Wainuiomata

▶ New Karori Pumping Station fully commissioned

▶ Water main fault-line crossing upgrade at Silverstream

▶ Storage retention fittings for Pukerua Bay, Linden and Aro reservoirs

In line with the region's *Emergency Water Supply Mitigation and Preparedness Strategy and Action Plan (2003)*, we continued to develop physical mitigation and response measures, to reduce repair time for the wholesale water supply in the event of a large natural disaster, such as a movement of the Wellington Fault.

▶ **Emergency water supply connections.** We installed new emergency water supply connections near Cruicshank Reservoir in Upper Hutt, and off the Wainuiomata-to-Thorndon main near Wainuiomata shopping centre. These connections allow supply directly into city reticulation systems in the event that service reservoirs or their inlet pipes have been damaged. An emergency connection planned for the Karori zone in Wellington was delayed, as we have still to agree on a solution with Capacity: Wellington City Council's water management company.

▶ **New Karori Pumping Station commissioning.** Last year we reported a delay to the full commissioning our new Karori Pumping Station, due to the unsatisfactory condition of some of the new pumps delivered to us. Replacement

pumps for the Kelburn supply were installed and commissioned during the year, with the pump supplier meeting the associated cost.

Also during the year, the old Karori Pumping Station was decommissioned and demolished. The station had a lot of recyclable materials including two tonnes of steel in each of the pumps and lots of valuable copper in the electrical equipment. Contractor QDC salvaged most of the corrugated iron cladding from the roof and walls, timber, steel beams and other demolished materials, which went to recycling outlets. We have kept some of the material, including overhead travelling cranes and a roller door, for possible reuse.

New Karori pumping station with its green roof

We were pleased with the recycling project's success and will use it as a template for similar projects in the future.

Auto shut-off of the Kaitoke main at Silverstream. We installed an automated shut-off valve on the Kaitoke-to-Karori water main at the northern end of Silverstream Bridge. The Wellington Fault is located near the southern end of the bridge. The valve will close off automatically should a fault movement at Silverstream rupture the main.

Reservoir storage security. In 2006/07 we started to install inlet standpipes on those customer reservoirs where our inlet non-return valve is some distance from the reservoir. A standpipe will prevent most of the reservoir's contents being lost if there is a failure of the delivery pipe between the non-return valve and the reservoir. This year we installed standpipes in the Pukerua Bay, Linden and Aro reservoirs. We plan to fit standpipes to another nine reservoirs during the next three years. (QMS target 4.1.3, page 35)

Other projects

- New supply points; Grenada and Whitby
- Stuart Macaskill north lake inspection and repair
- Reduced operating flow; Wainuiomata treatment plant

Supply to new subdivisions. We have been working with Porirua and Wellington city councils in preparation to supply new service reservoirs for Grenada Village and Whitby East. The pumping station and feeder main to supply Lincolnshire Reservoir (Grenada) have been built to our specification by Wellington City Council and they will become our assets once commissioning is completed. This is expected to occur in September 2008. Similarly, the feeder main built by a developer from our Porirua branch main to the Bradey Reservoir (Whitby East) will become our asset once fully commissioned.

Stuart Macaskill lakes repair. Low water flows in our supply rivers during last summer and consequent high demand on our storage lakes resulted in 'lake one' (the north lake) of the Stuart Macaskill Lakes being all but emptied before the drought broke in April.

This is the first time that the water level in the north lake has been very low in 20 years, so we took the opportunity to drain it completely, to repair an inlet pipe and inspect the lake bed and structures.

We found the seals on the joint between the lake valve tower and its surrounding concrete apron needed replacing. The design of a new, more durable, sealing system has proved particularly challenging, and at our year end the lake remained empty. However, we have identified a suitable sealing method, and expect to have the lake repaired and refilled before January 2009.

▶ **Reduced operating flow at Wainuiomata.** Twelve months ago, the minimum operating flow at our Wainuiomata treatment plant was 12 million litres per day (ML/d). At times of low river flow the plant has had to be turned off when the raw water available to treat has dropped below this volume. A desktop study of the treatment plant's component sizing and a full-scale manual operation trial were carried out to determine the plant's low flow performance potential.

The investigation showed the plant should be able to operate at 8 or 9 ML/d with minor modifications to the control systems. The modifications were made and the plant operated successfully at a flow of 8 ML/d during March 2008.

The following table summarises our major capital expenditure projects during 2007/08.

Major capital expenditure projects 2007/08

Project (Some projects span more than one financial year)	Full year expenditure
Te Marua treatment plant control system upgrade	$571,000
System optimisation – stage 2	$361,000
Equipment replacements – Te Marua treatment plant	$256,000
Equipment replacements – Wainuiomata treatment plant	$179,000
Distribution control systems upgrades	$173,000
Natural hazard protection upgrades (Silverstream and reservoirs)	$153,000
Emergency supply points	$142,000

Community engagement

▶ Regional water supply history updated

▶ New 'mulching' publicity campaign a success

▶ Summer water conservation grabs public attention

▶ 'Live' water supply web map launched

▶ Over 800 visitors to treatment plants

▶ **Wellington's water supply history.** In September we published '*Our water history – on tap*' covering the development of public water supplies to Wellington city and its surrounds between the mid nineteenth century and today. This publication was written for us by local historian Peter Cooke, and updates an earlier history published by Wellington Regional Council in 1986. The publication can be viewed on our web site and hard copies are available by contacting us.

▶ **Spring mulch campaign.** During November, we ran a four-week promotion of the benefits of mulching, in support of our main summer water conservation campaign. Mulch is important for effective 'water-wise' gardening, but our research showed almost half of all gardeners use little or no mulch.

As part of the promotion, National Garden Industry Association garden centres and hardware shops offered low prices and specials on mulch, as a further incentive for people to buy mulch.

Retailer feedback about the mulch campaign was very positive and our follow-up research indicated that a third of

all respondents could recall the advertising and well over half of those people said it influenced their decision to mulch their gardens last summer. We intend to repeat this promotion in November 2008.

Advertising from our spring mulching promotion

▶ **Water conservation summer campaign.** Our summer water conservation promotion started in early January, with advertising of garden watering methods that people could use to help avoid a water shortage. Although peak daily demand for water did not reach extreme levels, low seasonal river levels and unfavourable long-range climate forecasts resulted in our asking our customers to introduce a sprinkler and fixed irrigation ban in late February, which we supported with further advertising. Our follow-up research found that 79 percent of respondents were aware of the watering restrictions imposed and 87 percent had taken action to reduce their watering.

▶ **Live water supply map launched.** As part of our aim to raise understanding about the region's water supply, we launched a 'live' map of our supply system on our web site in January. The map, which updates data every 15 minutes, shows the amount of water currently being supplied to each customer from our treatment plants, and allows users to look at supply trends by city or for the whole system over varying time periods, which they can determine. The map can be viewed at www.gw.govt.nz/waterlivemap.

▶ **Visitors to treatment plants.** We hosted over 800 visitors to our water treatment plants this year, as part of our aim to increase local understanding about the region's water supply. Tours of our facilities are free to educational institutions and non-profit groups. During the year we resumed development of a potable water orientated teaching guide for primary and intermediate school teachers, with clear links to the school curriculum. The guides are intended to encourage more schools to investigate water supply issues as part of their water studies, and to visit one of our treatment plants. A contractor was developing this resource at our year end.

With an increasing number of tertiary students visiting our plants over recent years, we recognised a need for more technical information to be available. During the year we published technical handouts for each of our three main treatment plants.

Health, safety and training

▶ Low injury severity rate

▶ Fewer hours in staff training

Health and safety management is a crucial component of good business practice. Our health and safety plan details our commitment – through leadership, training and the allocation of resources – to effective planning, implementation, measurement, evaluation and review. To support the principle of continual improvement, we conduct a review of procedures at least every two years.

As part of an organisation wide initiative, we have implemented a health and safety database ('Safe T Smart') to improve our monitoring and management of health and safety issues this year. Also during the year, considerable amount of time was committed to revising and preparing our health and safety system to meet the requirements of the Accident Compensation Corporation's (ACC) Workplace Safety Management Practices audit standards. Greater Wellington achieved the grade-two audit standard, which has reduced the organisation's ACC levy by approximately $50,000 per year.

▶ Trends in accident and injury rates over time provide one measure of effectiveness of safety management systems.

Seventeen incidents were recorded last year, with only two working days lost to injury (13 incidents and three lost days during 2006/07). A low severity rate for the second year running is a pleasing result.

▶ **Training.** The number of hours dedicated to staff training courses and seminars was 1,522, or 31 hours per full-time employee[11]. The equivalent figures for the last five years were 40 hours (2006/07), 48 hours (2005/06), 43 hours (2004/05), 44 hours (2003/04) and 32 hours (2002/03). The main reason for the reduced training hours relative to recent past years is that most of our production and distribution staff completed national certificates or diplomas in water supply and water reticulation respectively prior to the current year.

Direct expenditure on training and professional development for 2007/08 was 2.3 percent of total personnel costs, against a budget allowance of 3.6 percent. (EMS targets 7.1.1 and 7.2.1, page 39)

[11] Employee numbers at 30 June each year

Accident and injury rates for year to 30 June

Measure	2008	2007	2006	2005	2004
Staff numbers (year end)	49	58	55	56	58
Incidents (per 100 employees)	34.0	23.0	49.1	22.0	40.7
Frequency (Incidents per 10,000 hours worked)	2.0	1.3	2.7	1.3	2.2
Severity (Days lost per 10,000 hours worked)	0.3	0.3	2.5	3.8	1.2

Detailed water supply and financial performance

Sources of water supplied

Water abstraction (millions of litres)

For the year ended 30 June

Source	Annual					Maximum week			Maximum day		
	Total			Average day			Average day			Day	
			Percent			Date			Date		
	2008	2007	2008	2008	2007	2008	2008	2007	2008	2008	2007
River and stream abstraction											
Kaitoke/Te Marua	27,262	27,895	46.6%	74.5	76.4	31/10/07	132.4	130.0	7/6/08	143.5	137.4
Wainuiomata	3,598	5,281	6.1%	9.8	14.5	8/8/07	21.1	31.3	5/8/07	34.0	36.2
Orongorongo	1,592	1,288	2.7%	4.3	3.5	16/4/08	15.4	13.4	5/3/08	20.3	21.8
George Creek	1,110	1,458	1.9%	3.0	4.0	14/11/07	5.2	8.3	1/11/07	8.3	11.5
Big Huia Creek	825	420	1.4%	2.3	1.2	21/5/08	8.1	6.8	10/4/08	10.6	10.4
Total – Rivers	34,387	36,341	58.7%	94.0	99.6	31/10/07	163.8	169.1	26/10/07	178.5	177.2
Public artesian abstraction											
Waterloo	24,091	24,114	41.2%	65.8	66.1	27/2/08	92.9	82.1	21/2/08	100.0	94.6
Gear Island	57	100	0.1%	0.2	0.3	19/12/07	3.2	3.1	13/12/07	18.4	12.6
Total – Artesian	24,148	24,214	41.3%	66.0	66.3	27/2/08	92.9	83.7	13/12/07	104.3	101.2
Total public abstraction	**58,535**	**60,555**	**100.0%**	**159.9**	**165.9**	**31/10/07**	**219.5**	**231.1**	**3/4/08**	**236.8**	**252.8**

Totals may not add exactly due to rounding

Rainfall levels (millimetres)

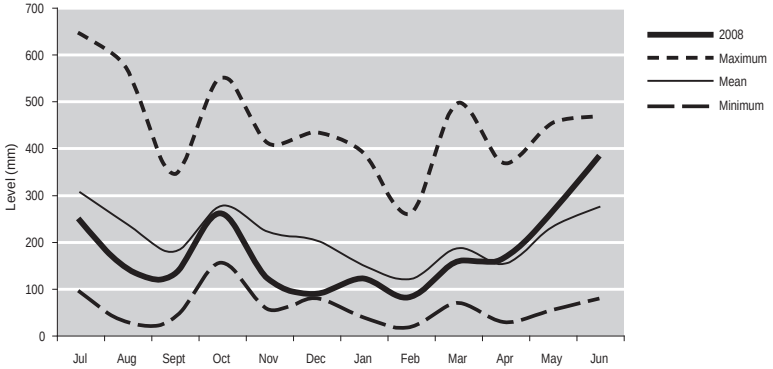
For the year ended 30 June

	Kaitoke[1]	Karori[2]	Orongorongo[3]	Wainuiomata[4]
2008	1,847	1,274	2,101	1,539
2007	2,444	1,274	2,752	2,123
Mean of data record	2,294	1,235	2,531	1,927
2008:mean	81%	103%	83%	80%

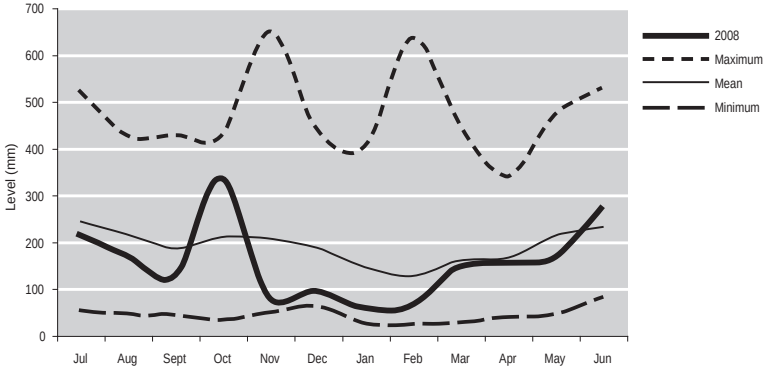
1: Kaitoke Headworks rain gauge. 2: Karori Sanctuary rain gauge. 3: Orongorongo Swamp rain gauge. 4: Wainuiomata Reservoir rain gauge.

The following graphs show average rainfall per month in our surface water catchments compared with the maximum, minimum and mean of the data record for each site.

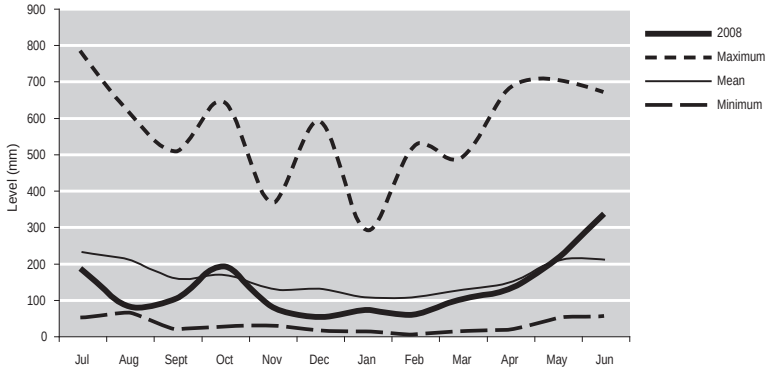
Orongorongo catchment rainfall (Orongorongo Swamp record 1980 – 2008)



Hutt catchment rainfall (Kaitoke Headworks record 1951 – 2008)



Wainuiomata catchment rainfall (Wainuiomata Reservoir record 1890 – 2008)

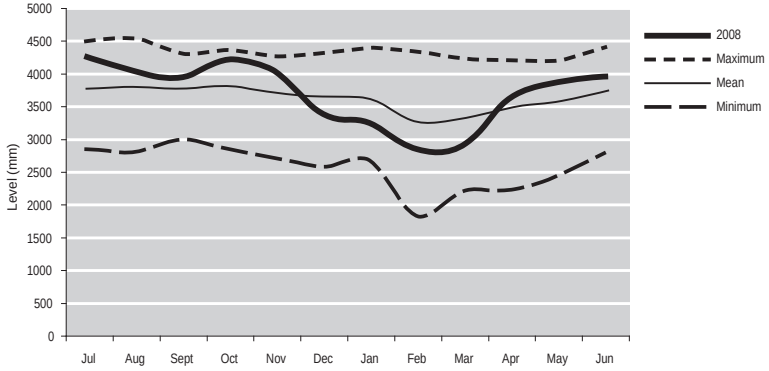


Levels and flows from water sources

The following three graphs show the historical high, low and average from the main water sources used to supply the Wellington metropolitan area, compared with data for the 12 months to 30 June 2008.

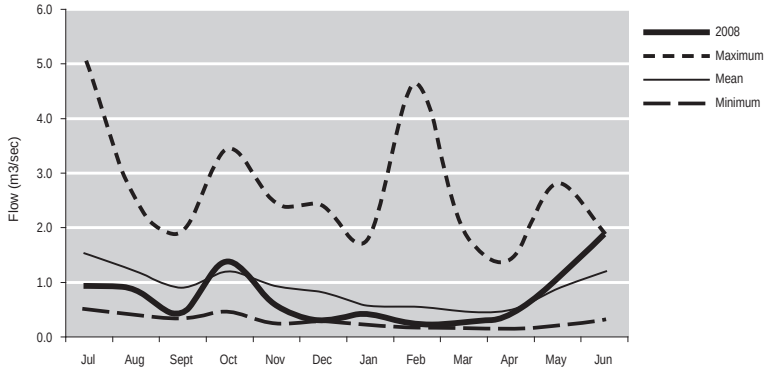
Waiwhetu Aquifer (McEwan Park record 1971-2008)

Average monthly level for the year ended 30 June



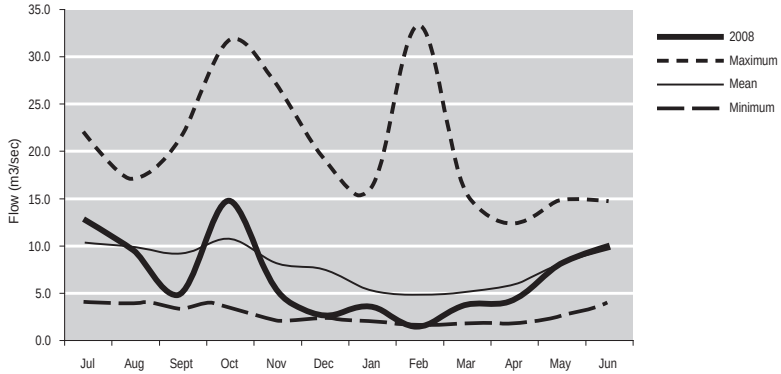
Wainuiomata River (Manuka Track record 1982-2008)

Average monthly flow rate for the year ended 30 June



Hutt River (Kaitoke record 1968-2008)

Average monthly flow rate for the year ended 30 June



Distribution shut-offs

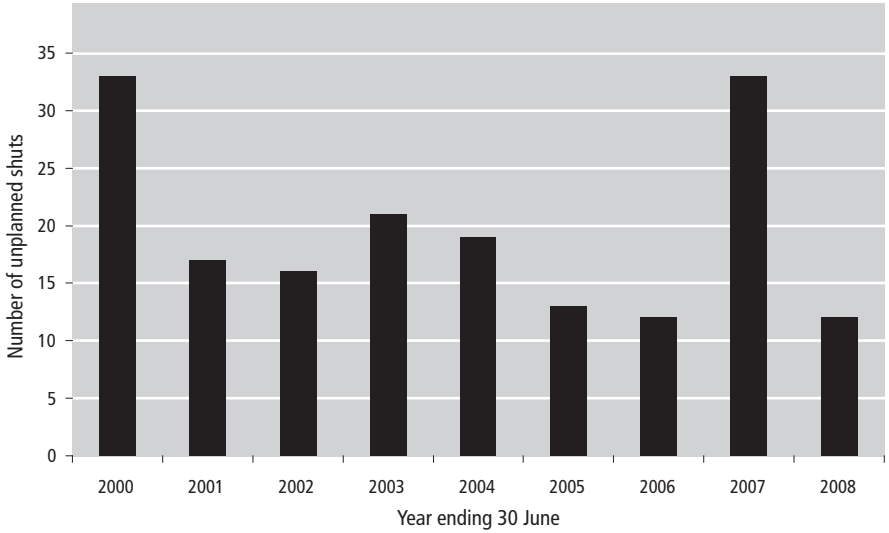
For the year ended 30 June

There were 61 shut-offs on the GW Water's bulk water supply mains (2007 = 72). All shut-offs were completed and the supply reinstated without loss of pressure or supply to our customers. Several of the shut-offs took more than eight hours to reinstate, but in these cases, alternative water supplies were available.

Twelve shut-offs were unscheduled, for the repair of leaking or burst mains, or to repack leaking valves, compared with 33 during the year to 30 June 2007 (see graph at right).

The remaining 49 shut-offs were scheduled (2006 = 39). This work was required to install new or refurbished pipes and valves (36), remove redundant distribution assets (4), to mitigate the risk to third parties working in close proximity to our high-pressure mains (1) and for planned maintenance on pipeline assets (8).

Unplanned shut-offs of bulk water mains



Resource consents

Resource consents held as at 30 June 2008

Water take	Land use	Discharge	Total
10	53	20	83

For a report of compliance with consents for the year to 30 June 2008, see EMS targets 1.1.1 to 1.3.3, page 37.

Water supplied to customers

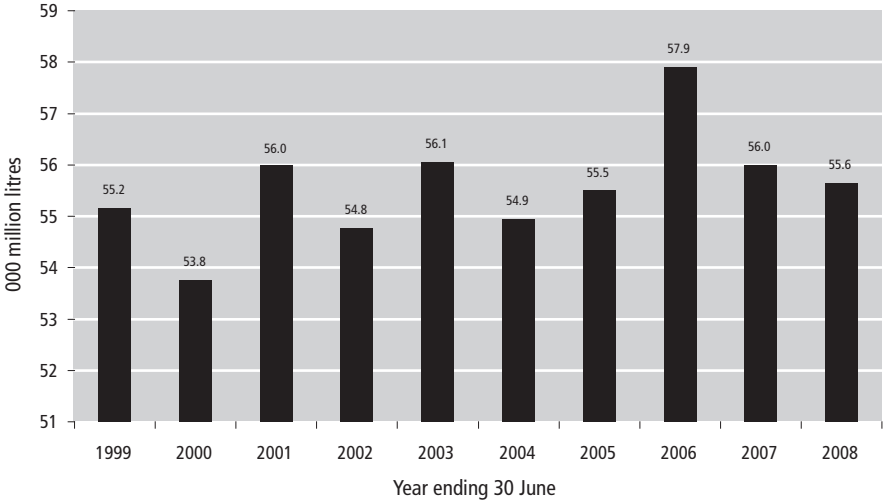
Historically, we have recorded water supply figures weekly by manual reading of revenue meters at the supply points to our customers. However, since December 2005, we have had remote access to these meters and have collected readings daily. The annual supply totals prior to the year ended 30 June 2006 presented below have been calculated to represent 365/366 day years, so as to make the historic data more directly comparable between years and consistent with abstraction and production figures, which are recorded daily. The years ended 30 June 2000, 2004 and 2008 are 366 days.

Annual water supply (millions of litres)

For the year ended 30 June

	Hutt City		Porirua City		Upper Hutt City		Wellington City		Total supply	
	Total	Avg. day	Total	Avg. day	Total	Avg. day	Total	Avg. day	Total	Avg. day
2008	14,133	38.6	6,439	17.6	5,159	14.1	29,912	81.7	55,642	152.0
2007	14,076	38.6	6,317	17.3	5,113	14.0	30,542	83.7	56,048	153.6
% change	+0.4%		+1.9%		+0.9%		-2.1%		-0.3%	
2006	14,236	39.0	6,475	17.7	5,533	15.2	31,667	86.8	57,913	158.7
2005	13,938	38.2	6,022	16.5	5,319	14.6	30,244	82.9	55,522	152.1
2004	13,956	38.1	5,907	16.1	5,296	14.5	29,776	81.4	54,935	150.1
2003	14,714	40.3	6,135	16.8	5,303	14.5	29,899	81.9	56,050	153.6
2002	14,177	38.8	5,908	16.2	5,774	15.8	28,902	79.2	54,760	150.0
2001	14,441	39.6	5,987	16.4	5,807	15.9	29,729	81.4	55,962	153.3
2000	13,989	38.2	5,536	15.1	5,496	15.1	28,729	78.5	53,750	146.9
1999	14,986	41.1	5,777	15.8	5,741	15.7	28,661	78.5	55,165	151.1

10-year supply trend



Average per capita daily supply (litres)

For the year ended 30 June 2008

	Hutt City	Porirua City	Upper Hutt City	Wellington City	Total
Population[1]	101,150	50,700	38,050	190,950	380,850
Households[2]	35,727	15,564	14,253	68,901	134,445
Gross litres/head/day	382	347	370	428	399
Gross litres/household/day	1,081	1,130	989	1,186	1,131

[1] Usually-resident population, urban areas – extrapolated from Statistics NZ estimates. The populations presented are based on the estimates for 30 June 2007, plus half the difference between the 30 June 2006 and 30 June 2007 estimates, to approximate a 2007/08 mid-year population

[2] Occupied dwellings, local authority areas – Statistics NZ 2006 Census (final)

Maximum week supply (millions of litres)

For the year ended 30 June

	Hutt City	Porirua City	Upper Hutt City	Wellington City	Total
Maximum week 2008	30/1/08	30/1/08	30/1/08	30/1/08	30/1/08
Total of max. week					
2008	336.8	156.2	124.3	668.0	1,285.3
2007	316.9	143.9	122.1	669.0	1,246.8
% change	+6.3%	+8.5%	+1.8%	-0.1%	+3.1%
Avg. day of max. week					
2008	48.1	22.3	17.8	95.4	183.6
2007	45.3	20.6	17.4	95.6	178.1

'Base' winter (June – August) supply (millions of litres)

For the year ended 30 June

	Hutt City		Porirua City		Upper Hutt City		Wellington City		Total 'base' supply	
	Total	Avg. day	Total	Avg. day	Total	Avg. day	Total	Avg. day	Total	Avg. day
2008	3,321	36.1	1,491	16.2	1,192	13.0	7,165	77.9	13,168	143.1
2007	3,387	36.8	1,515	16.5	1,240	13.5	7,813	84.9	13,955	151.7
% change	-1.9%		-1.6%		-3.9%		-8.3%		-5.6%	
2006	3,377	36.7	1,503	16.3	1,276	13.9	7,560	82.2	13,716	149.1
2005	3,356	36.5	1,443	15.7	1,245	13.5	7,271	79.0	13,314	144.7
2004	3,414	37.1	1,415	15.4	1,226	13.3	7,230	78.6	13,285	144.4
2003	3,498	38.0	1,402	15.2	1,283	13.9	7,137	77.6	13,319	144.8
2002	3,445	37.4	1,365	14.8	1,374	14.9	6,996	76.0	13,180	143.3
2001	3,361	36.5	1,335	14.5	1,335	14.5	6,974	75.8	13,005	141.4
2000	3,394	36.9	1,284	14.0	1,305	14.2	7,016	76.3	12,999	141.3
1999	3,452	37.5	1,315	14.3	1,284	14.0	6,810	74.0	12,861	139.8

N.B. figures are July and August from one calendar year and June from the next. E.g. 2008 represents July and August 2007 and June 2008

Water supply to Wellington during June 2006 (shown as part of the 2006 June year total), and July and August 2006 (shown as part of the 2007 June year total), was substantially more than expected, due to a large leak in the city's reticulation, which was repaired in September 2006. Water supply to Wellington in June 2006 was 11.7 percent more than during June 2007, while supply during July and August 2006 was 12.1 percent more and 10.7 percent more respectively than for the same months in 2005. Our analysis suggests this leak accounts for most of the increase seen in total base supply during those two financial years.

Water quality

Chemical monitoring of the bulk water supply

The health risk due to toxic chemicals in drinking water differs to that caused by microbiological contaminants. It is unlikely that any one substance could result in an acute health problem except under exceptional circumstances, such as significant contamination of the supply. Moreover, experience has shown that the water usually becomes undesirable after such incidents for obvious reasons, such as taste, odour and appearance. The problems associated with chemical constituents arise primarily from their ability to cause adverse effects after prolonged periods of exposure. Standards for chemical compliance are set out in the Drinking-water Standards for New Zealand (DWSNZ) 2005.

The second column of the following table shows the maximum allowable value (MAV) or guideline value (GV) from the Drinking-water Standards for New Zealand 2005 for a range of chemical constituents. MAVs are shown in bold type, while GVs are in standard type.

The drinking water standards state that the MAV of a determinand in drinking water represents the concentration in the water that, on the basis of present knowledge, is not considered to cause any significant risk to the health of the consumer over their lifetime of consumption of that water. GVs apply to aesthetic determinands, which are not considered of health significance. However, if a GV is exceeded the water may be rendered unappealing to consumers. For more information on MAVs and GVs, see the Drinking-water Standards for New Zealand 2005.

Mean values of chemical analysis at treatment plants

For the year ended 30 June 2008

	DWS NZ 2005	Te Marua		Wainuiomata		Waterloo		Gear Island	
Parameter	GV or MAV(A)	No. of samples	Value	No. of samples	Value	No. of samples	Value	No. of samples	Value
Alkalinity (total), mg/L CaCO3	-	13	30.6	12	34.8	13	57.7	-	-
Aluminium (acid soluble), mg/L	0.10	25	0.01	23	0.02	-	-	-	-
Arsenic (total), mg/L	**0.01**	2	<0.002	2	<0.002	2	<0.002	2	<0.002
Boron, mg/L	**1.4**	2	<0.05	2	<0.05	2	<0.05	-	-
Cadmium (total), mg/L	**0.004**	2	<0.001	2	<0.001	2	<0.001	2	<0.001
Calcium hardness, mg/L CaCO3	200	13	22.15	12	35.08	13	46.38	12	24.66
Chloride, mg/L	250	1	8.6	1	20.5	2	15.7	2	16.6
Chromium (total), mg/L	**0.05**	2	<0.001	2	<0.001	2	<0.001	2	<0.001
Colour (true), PtCo units	10	-	-	-	-	-	-	-	-
Conductivity, µS/cm @ 25°C	-	14	10.97	13	15.54	15	17.74	1	21.40
Copper (total), mg/L	**2**	14	0.065	12	0.065	13	0.065	13	0.065
Cyanide (total), mg/L	**0.08**	2	<0.0075	2	<0.0075	2	<0.0075	2	<0.0075
Fluoride, mg/L	**1.5(B)**	51	0.85	46	0.77	98	0.77	98	0.85
Hardness, mg/L	200	1	52	-	-	-	-	1	43
Iron (total), mg/L	0.2	14	0.013	12	0.042	13	0.072	13	0.120
Langelier saturation index	-	13	-1.43	12	-1.37	13	-0.90	12	-1.01
Lead (total), mg/L	**0.01**	2	<0.001	2	<0.001	4	<0.001	4	<0.001
Manganese (total), mg/L	**0.4**	14	<0.013	12	<0.013	13	<0.013	13	<0.013
Mercury (total), mg/L	**0.002**	2	<0.001	2	<0.001	2	<0.001	2	<0.001
Nickel (total), mg/L	**0.02**	2	<0.0015	2	<0.001?	2	<0.001?	2	<0.0015
Nitrate, mg/L –N	**50**	2	0.03	2	0.06	2	0.65	2	1.32
pH	7.0-8.5	14	7.54	13	7.36	15	7.46	-	-
Selenium (total), mg/L	**0.01**	2	<0.005	2	<0.005	2	<0.005	2	<0.005
Silica (molybdate-reactive), mg/L	-	2	8.25	2	10.56	2	14.05	2	15.40
Sodium (total), mg/L	200	1	11.0	1	12.5	2	11.3	2	27.9
Solids (total dissolved), mg/L	1000	1	55	1	76	2	87	1	108
Sulphate, mg/L	250	1	6.32	1	5.46	2	6.18	2	7.10
Turbidity, NTU	2.5	(C)	0.025	(C)	0.268	(C)	0.952	-	-
Zinc (total), mg/L	1.5	14	<0.013	12	<0.013	13	<0.013	13	<0.013

Notes: Values that are preceded by the '<' symbol indicate the detection limit for that test. The detection limits for several elements have changed from those reported last year, due to a change of testing laboratory. Laboratories have some leeway to determine the detection limit for individual tests, with reference to the drinking water standards. (A) A dash in the 'GV or MAV' column indicates that there is no applicable value. (B) The fluoride content recommended for drinking water by the Ministry of Health for oral health is 0.7 to 1.0 mg/L. (C) During the 2007/08 year we measured turbidity by continuous on-line monitoring.

Microbiological monitoring of the wholesale water supply

A public water supply that is free from microbiological contamination is an important factor in achieving high standards of public health. Microbiological contamination of a water supply has the potential to cause sickness within the community. Microbiological monitoring of potable water is carried out in order to determine the safety of the water in relation to the possibility of transmission of waterborne disease. Escherichia (E.) coli, which usually comes from faecal material, is used as an indicator of bacteriological contamination. Low numbers of protozoa (Cryptosporidium) are demonstrated by ensuring the turbidity of the water following treatment is kept very low. Direct testing of protozoa is not practical or required by the Ministry of Health.

Production

At our surface-water treatment plants (Te Marua and Wainuiomata) compliance with the microbiological criteria of the DWSNZ is demonstrated by continuously monitoring turbidity of the water leaving each filter, and free available chlorine (FAC) and pH in drinking water leaving the treatment plants. A chlorine residual in the treated water indicates that microbiological contaminants have been neutralised.

The Waiwhetu Aquifer is a secure water source and, therefore, free from microbiological contamination according to the drinking water standards. However, water leaving our aquifer-source water treatment plants (Waterloo and Gear Island) is tested to demonstrate compliance to the *E.coli* criteria of the DWSNZ. No *E.coli* was detected in daily testing of water leaving either the Waterloo or Gear Island water treatment plants.

Regional public health units assess microbiological compliance with the DWSNZ on behalf of the Ministry of Health. These assessments cover the same period as our financial year: that is, 12 months to 30 June.

We have received provisional notice of microbiological compliance for our Te Marua, Wainuiomata, Waterloo and Gear Island treatment plants for the 12 months to 30 June 2008. We expect this result will be confirmed in due course.

Distribution

An International Accreditation New Zealand registered laboratory monitors the microbiological quality of water in our distribution system after treatment. *E.coli* sampling is used, in accordance with the requirements of the drinking water standards for sampling urban reticulation systems.

Our distribution system is listed in the Register of Community Drinking Water Supplies in New Zealand. The system is split into three distinct zones, with each having its own sampling requirements based on population served. Samples must be taken on different days of the week and from sites that represent the full range of conditions that exist within a distribution zone. The three zones are (1) Central Hutt/Petone (unchlorinated supply from Waterloo Water Treatment Plant), (2) Wainuiomata/South Wellington (supply from Wainuiomata Water Treatment Plant) and (3) Upper Hutt/Porirua/North Wellington (supply from Te Marua Water Treatment Plant). Samples are drawn from 16 sampling sites within the three zones.

A summary of results for the twelve months to 30 June 2008 is given below.

E.coli results – summary of samples collected

For the year ended 30 June 2008

Distribution Zone	DWSNZ MAV(D)	No. of samples	No. of positive results
Central Hutt/Petone	<1	377	0
Wainuiomata/South Wellington	<1	288	0
Upper Hutt/Porirua/North Wellington	<1	392	0

(D) Drinking Water Standards for New Zealand 2005, Maximum Allowable Value (MAV).

We received provisional compliance with the DWSNZ, for the 12 months to 30 June 2008, from the regional public health unit of Hutt Valley District Health Board. We expect this result will be confirmed in due course.

Performance indicators

The performance indicators that applied during the 2007/08 operating year are shown in standard text. Results for 2007/08 in relation to the performance indicators are shown in italic text.

Quality, customer service and business efficiency (collect, treat and deliver water): long-term

Levels of service

1. Collect water from the Hutt, Wainuiomata and Orongorongo catchments and the Waiwhetu Aquifer for public drinking water supply
2. Manage catchments so that treatment plants receive good quality water
3. Treat water so that it meets the Ministry of Health's standards for drinking water
4. Deliver water to the cities of Lower Hutt, Porirua, Upper Hutt and Wellington

Greater Wellington collects, treats and delivers water to the cities of Lower Hutt, Porirua, Upper Hutt and Wellington. Vegetation and pest management activities are undertaken within the water supply catchments.

By 30 June 2016

The quality of water supplied will continually meet the Ministry of Health's Drinking-water Standards for New Zealand (DWSNZ). The related water supply infrastructure will be maintained and improved to meet the standards specified in the Regional Water Supply Asset Management Plan.

All water that GW Water treats currently meets the Ministry of Health's 2005 drinking water standards.

GW Water has a policy to target an 'A' grade standard for each of its water treatment plants. This means the water supplied to its customers is completely satisfactory, with minimal levels of health risk. The Te Marua and Wainuiomata water treatment plants are graded 'A1', the highest available, while our Waterloo plant is graded 'B', the highest possible given Hutt City Council's preference for an unchlorinated supply. The Gear Island treatment plant (a standby facility) is currently graded 'U' (un-graded).

GW Water holds certification to ISO 9001:2000, Quality Management Systems – Requirement, for its wholesale water supply operations. Quality management procedures ensure the high quality of all aspects of the water supply operation.

Quality, customer service and business efficiency (collect, treat and deliver water): short-term

By 30 June 2008

Water will be supplied to the four cities within a total operating spend (excluding depreciation) of $21,860,000.

Total operating expenditure of $17,693,000 was incurred, excluding depreciation.

The collection, treatment and delivery of water will be managed to ensure the quality of water supplied continually complies with the Ministry of Health's relevant Drinking-water Standards for New Zealand 2005. Expenditure on compliance monitoring activities will not exceed the budget of $734,000.

We received provisional advice from the drinking water assessor employed by Hutt Valley District Health Board that, for the year to 30 June 2008, we achieved full compliance with the Standards for water leaving our treatment plants and in the bulk distribution system. Changes to compliance monitoring requirements and disestablishment of our laboratory at 30 June 2007 resulted in costs being lower than expected: at $280,000.

Water testing will be conducted by a laboratory with International Accreditation New Zealand (IANZ) registration, at sampling points defined by the Quality Assurance Section of GW Water, not less than five days out of every seven.

A comprehensive monitoring and testing programme, complying with the requirements of the DWSNZ, has been undertaken. The quality of the water leaving the treatment plants has been continuously monitored, with results recorded every minute. The quality of the water in the bulk distribution system has been sampled and tested by an IANZ-accredited laboratory, at representative locations, in accordance with a testing regime that we agreed with the Regional Public Health unit of the Hutt Valley District Health Board.

We will maintain the grading for each water treatment plant at 1 July 2007, except for the plants that will be graded during the year.

There have been no changes to our treatment plant gradings since 1 July 2007. We have identified minor technical issues that we believe would prevent an 'A1' grading for our Gear Island plant, and are considering how best to overcome them.

Vegetation management and pest control measures will be carried out in Greater Wellington Regional Council's water supply catchments, in accordance with its Forestry Management Plan and within a

budget of $306,000, so that the treatment plants receive good quality water.

Vegetation management and pest control measures were carried out in the catchments as required. Sampling of untreated source water did not detect unusual levels of cryptosporidium. A planned pest control operation was not required. The final full year cost of this activity was $115,000.

A ranger service for the Wainuiomata–Orongorongo Water Collection Area will be obtained from the Parks Department of the Water Supply, Parks and Forests Division, at a cost not exceeding $101,000.

The Parks Department of GWRC provided a ranger service as required. This work incurred expenditure of $94,000.

Customers will be provided with a business report by 30 November 2007, which will include the following information:

- Financial results for the preceding financial year ended 30 June
- Actual water quality compared with targeted performance
- A list of incidents where supply has been interrupted, together with the time taken to respond and repair
- A report on compliance with resource consent requirements
- Status of ongoing service level agreements.

A business report was published by 30 November 2007 and provided to our customers. Information as per the bullet points above was included.

Plan to meet current and future demand for water: long-term

Levels of service

1. Assess the demand for water – now and in the future – and plan how such demands will be met, including developing new sources
2. Encourage people to use water wisely

By 30 June 2016

Water supply will be adequate to meet present and future demands in accordance with current supply policy (currently a 1-in-50-year return-period drought standard).

Water consumption will be reduced by the amount agreed with our four city customers and specified in the Wellington Water Management Plan.

Because of greater than expected population growth, we are currently operating to a 1-in-35-year drought standard or a 2.9% probability of shortfall in any year.

We completed the Wellington Water Management Plan technical document (with assistance from the region's four city councils) and provided it to our customers in May 2008. The water demand management options discussed in the technical report will be considered alongside the bulk water supply development strategy for the region's cities. A Regional Water Strategy is being developed, which will build on the water management plan technical report for the entire region.

Plan to meet current and future demand for water: short-term

By 30 June 2008

System enhancements will start to enable the bulk supply to meet the requirements of a population of 390,000 (currently able to meet the requirements of 368,000).

Physical works are still to start on system enhancements to meet this target. We are consulting with the four city council customers about a number of short-term water supply options and expect their responses in the first half of the 20008/09 year. Preliminary design-work has started on increasing the maximum water storage capacity in the Stuart Macaskill Lakes.

We will prepare a report for Council on the preferred new water source option by 28 February 2008.

On 8 May 2008, a report on this matter was presented to the Water Supply, Parks and Forests Committee of Council.

A water conservation programme will be implemented within a budget of $185,000. (LTCCP budget was $74,000. However, it was increased to provide for research into water usage.)

The water conservation programme was implemented at a total cost of $232,000. This included the research project and unbudgeted expenditure to publicise a ban on the use of sprinklers and fixed irrigation systems during summer.

Plan for emergencies: long-term

Levels of service

1. Maintain our pipes and plants and build resilience in the system so water can continue to be supplied after an emergency – or restored as quickly as possible

By 30 June 2016

Water will be available on a daily basis to meet the 1-in-50-year return-period drought standard. The related water supply infrastructure will be maintained and improved to meet the standards specified in the Regional Water Supply Asset Management Plan.

Plans will be in place to enable water to be supplied to the community following a major natural disaster.

Because of greater than expected population growth, we are currently operating to a 1-in-35-year drought standard or a 2.9% probability of shortfall in any year. We expect to have restored the 1-in-50-year security of supply standard by 2012.

GW Water manages water supply assets in accordance with a planned programme of maintenance. Our policy is that there is no deferred maintenance. The Asset Management Plan was prepared in accordance with the National Asset Management Steering Group guidelines.

GW Water has an 'n-1' policy for security of water supply. This means that either Te Marua or Waterloo water treatment plants could be out of commission and there would still be enough water available to meet the basic needs of the community under most circumstances. New cross connections between customer reticulation systems and the bulk water mains are being installed over time. We are working with Wellington City Council to develop a major new reservoir near Wellington Hospital.

Plan for emergencies: short-term

By 30 June 2008

We will install at least one customer emergency connection, at a cost not exceeding $100,000. (LTCCP budget was $54,000. It was increased to provide for an unforeseen need for an emergency connection to the Pukerua Bay Reservoir.

We installed emergency water supply connections at Fergusson Drive in Upper Hutt (below Cruickshank Reservoir), in Wainuiomata and at Pukerua Bay, at a cost of $142,000.

We will undertake hazard protection work at a cost not exceeding $200,000.

The design of a bypass parallel to the Kaitoke-to-Karori pipeline, across the Wellington Fault at Te Marua, was completed at a cost of $153,000. The bypass will help to restore some water supply following a break to the main pipeline caused by a movement along the fault line.

Environmental management: long-term

All water supply activities will be undertaken in an environmentally sympathetic manner according to the principles of the Resource Management Act 1991.

GW Water acquires and seeks to comply with all appropriate resource consents. Abstraction consents govern the quantity of water that can be drawn from each source and how much must remain. Consents are also sought for any discharges from the treatment plants. Most by-products from the plants are processed through wastewater recovery plants and removed off-site.

GW Water holds certification to ISO 14001:2004 (the International Standards Organisation's environmental management benchmark) for its bulk water supply activities.

Environmental management: short-term

By 30 June 2008

All appropriate resource consent conditions will be complied with, within a monitoring budget of $65,000.

We achieved full compliance for all consents except that authorising abstraction from the Orongorongo River and its tributaries. We did not meet the requirement to retain a minimum residual flow downstream of these abstractions for a short time on three occasions; two due to operator error and the third due to a lightning strike. We have programmed corrective actions for all three events. Annual consent monitoring costs were $63,000.

We will demonstrate our actual resource consent compliance to an auditable standard and a report on compliance for 2006/07 will be prepared by 30 November 2007.

We published a report covering these matters by 30 November 2007.

We will start installing inland monitoring wells in the Waiwhetu Aquifer at a cost not exceeding $30,000.

The actual cost incurred to the end of the 2007/08 financial year was $9,400.

Health and safety: long-term

The manner in which we carry out our operations will comply with the Health and Safety in Employment Act 1992, as amended in 2002, Health and Safety Regulations 1995, relevant codes of practice and current legislation.

A hazard identification programme will be undertaken at all work locations in order to eliminate, isolate or minimise the effect of risk to all GW Water staff and contractors working at those locations. These hazards will be entered on hazard registers, which will be continually updated.

A hazard identification programme has been undertaken for all operational sites and hazard registers have been updated and are maintained on an ongoing basis.

Health and safety: short-term

By 30 June 2008

Hazard registers will be reviewed on a six-monthly basis. The effectiveness of the measures taken to eliminate, isolate or minimise risk to all GW Water employees and contractors will be continually assessed.

The hazard registers have been recently reviewed and no issues relating to their effectiveness have been identified.

The health and safety plans of all contractors employed by GW Water will be reviewed prior to their employment. Their activities should comply with the Health and Safety in Employment Act 1992, as amended in 2002, the Health and Safety Regulations 1995, relevant codes of practice and current legislation, and meet or exceed the methods of operation as determined within the Utility Services Health and Safety Plan. Their activities will be monitored on a regular basis, to ensure that any risk to their employees, employees of subcontractors, Greater Wellington Regional Council staff or the general public is eliminated, isolated or minimised.

Contractor Health and Safety plans continue to be reviewed prior to engagement.

A near miss and two accidents occurred during the first quarter of the year. The near miss resulted from a technical short-circuit that had not previously been identified. The accidents resulted in a bruised leg from slipping between floor grates and a shoulder injury resulting from a fall after a step on a stairway gave way.

Quality management system

Quality management system objectives, targets, and performance

Text in the two columns to the right of each target gives (1) a summary of performance against the target for the 2007/08 financial year, and (2) additional background information where needed.

	Targets	Achievement 2007/08	Comment
Objective 1.1	Provide sufficient water to meet the unrestricted (other than routine hosing restrictions) demand in all but a drought situation that has a severity equal to or greater than a 1-in-50-year drought		
Target 1.1.1	Develop new sources, as required, to ensure that sufficient water is available to meet the unrestricted (other than by routine hosing restrictions) demand in all but a drought situation that has a severity equal to or greater than a 1-in-50-year drought. (Annual performance indicator)	Not achieved	GW Water uses a complex supply and demand model (Sustainable Yield Model) to assist with strategic planning. This SYM indicates that the current annual shortfall risk is approximately 2.9% (target < 2.0%). A sprinkler and fixed irrigation system ban was in place between 26 February and 9 April, so enough water would be available in the event of the summer drought extending into autumn. We have investigated in detail four short-term options to increase available water for supply (see pages 4-8), and have requested feedback on these and a preferred dam site (for when that option is eventually needed) from our customers. No new water sources were introduced during the year.
Target 1.1.2	Develop and extend the water supply infrastructure as required to ensure that sufficient water is available to meet the unrestricted (other than by routine hosing restrictions) demand in all but a drought situation that has a severity to or greater than a 1-in-50-year drought. (Annual performance indicator) [Note: In a drought situation, it may be necessary to impose restrictions as a precautionary measure, even though the drought may, at its conclusion, turn out to be of lesser severity than 1 in 50 years.]	Partially achieved	We have developed new water infrastructure option proposals in relation to the water-source development options reported on pages 4-8. No physical construction works have occurred. We consult customers annually about their requirement for new supply points to meet population movement within their boundaries. We are working with Porirua and Wellington city councils to provide water to new subdivisions in Whitby and Grenada respectively. We are also working with Wellington and Capital & Coast Health on a joint storage proposal for southern Wellington. We progressed or completed various seismic strength improvement projects, including fitting water retention standpipes in Pukerua Bay, Linden and Aro reservoirs.
Objective 1.2	Maintain the customers' service reservoirs above agreed minimum levels.		
Target 1.2.1	Meet the following criteria for each customer service reservoir supplied directly by GW Water: • Maintain at least 70% full for 90% of the time • Maintain at least 60% full for 98% of the time Compliance is measured each month for each supply point. 2007/08 comprises of 480 reservoir-months. (Annual performance indicator) [Note: Compliance with this target will be assessed by interrogating reservoir level data recorded at 15-minute intervals.]	Partially achieved 60% full target met for 460 of 480 reservoir- months (95.8%) 70% full target met for 465 of 480 reservoir- months (96.9%)	The 60% target was not achieved for 22 reservoir-months in total. Of these, two events were to allow customer maintenance while a further seven were needed to fit inlet standpipes to customer reservoirs. The remaining 13 events were unplanned and resulted from high demand, equipment failure or avoidance of peak 'time of use' power tariffs. The 70% target was not achieved for 17 reservoir-months in total. Of these, two events were to allow customer maintenance while a further seven were needed to fit inlet standpipes to customer reservoirs. The remaining eight events were unplanned and resulted from high demand or equipment failure. Target performance has been aggregated for each of the five storage sites that have more than one reservoir (Johnsonville, Onslow, Maldives, Porirua Low and Trentham). This is a change from previous years.
Objective 1.3	Maintain system pressure above agreed minimum levels		
Target 1.3.1	Maintain the wholesale supply pressure into the Thorndon Zone above 85m for 90% of the time and above 80m and below 100m for 98% of the time. (Annual performance indicator) [Note: Compliance with this target will be assessed by interrogating pressure data recorded at 15-minute intervals.]	Fully achieved	Thorndon Zone pressure above 80m and below 100m for at least 98.7% of the time for each month (range = 98.7% to 100.0%). Thorndon Zone pressure was above 85m for at least 98.1% of each month (range = 98.1% to 99.9%).
Objective 2.1	Meet the following criteria for each customer service reservoir supplied directly by GW Water:		
Target 2.1.1	Comply with the microbiological requirements of the DWSNZ 2005 for water leaving the treatment plants 100% of the time. (Annual performance indicator)	Achieved provisionally	The Regional Public Health unit of Hutt Valley District Health Board (HVDHB) has advised provisional microbiological compliance to the DWSNZ 2005 for our four water treatment plants.
Target 2.1.2	Comply with the chemical [P2] requirements of the DWSNZ 2005 for water leaving the treatment plants 100% of the time. (Annual performance indicator)	Achieved provisionally	The Regional Public Health unit of HVDHB has advised provisional chemical compliance to the DWSNZ 2005 for our four water treatment plants.

	Targets	Achievement 2007/08	Comment
Target 2.1.3	Comply with the aesthetic requirements of the DWSNZ 2005 for water leaving the treatment plants. (Annual performance indicator)	Not achieved HVDHB does not assess aesthetic compliance on an annual basis at present	We monitor for aesthetics and believe our records show all our treatment plants meet the compliance criteria, consistent with the DWSNZ 2005 and the Public Health Grading of Community Drinking-Water Supplies 2003. However, there is no provision for annual aesthetic compliance reporting in WINZ at present and HVDHB does not yet assess compliance on an annual basis. To date, the health authorities have only assessed aesthetic compliance when conducting grading assessments of our Te Marua and Wainuiomata treatment plants. Te Marua and Wainuiomata complied when last re-graded (2006/07 and 2004/05 respectively). Both plants are graded 'A1'.
Target 2.1.3.1	Construct a powdered activated-carbon plant at Te Marua to eliminate unacceptable taste originating from algal blooms, by 30 September 2007.	Achieved	Construction of a semi-portable powdered activated-carbon treatment plant was completed and available for use from the beginning of summer.
Target 2.1.4	Develop monthly compliance reports that source data directly from the control systems of the water treatment plants, by 31 December 2007.	Partially achieved	Theses reports are available for Te Marua, Wainuiomata and Waterloo treatment plants, but not yet for Gear Island.
Objective 2.2	Comply with the microbiological, chemical and aesthetic requirements of the DWSNZ 2005 for water in the distribution system		
Target 2.2.1	Comply with the microbiological requirements of the DWSNZ 2005 for water in the distribution system 100% of the time. (Annual performance indicator)	Achieved provisionally	The Regional Public Health unit of HVDHB has advised provisional microbiological compliance to the DWSNZ 2005 for our three bulk distribution zones.
Target 2.2.3	Comply with the aesthetic requirements of the DWSNZ 2005 for water in the distribution system. (Annual performance indicator)	Achieved provisionally	We monitor for aesthetics and believe that our records for the year show our distribution system fully met the compliance criteria, consistent with the DWSNZ 2005 and the Public Health Grading of Community Drinking-Water Supplies 2003. However, there is no provision for annual aesthetic compliance reporting in WINZ at present and HVDHB does not yet assess compliance on an annual basis. HVDHB assessed aesthetic compliance as part of the grading process for our 3 bulk distribution zones in the last quarter of 2006/07. All zones were graded 'a1' in the first quarter of this year.

	Targets	Achievement 2007/08	Comment
Target 2.2.4	Develop monthly compliance reports that source data directly from the control systems for the distribution network, by 31 March 2008.	Not achieved	We experienced difficulties handling the volume of data required for compliance with DWSNZ 2005. However a draft revision of DWSNZ 2005 indicates a significant relaxation of the standards requirements. This change has not been made official yet.
Objective 3.1	Add fluoride to treated water in accordance with Ministry of Health recommendations in the DWSNZ 2005, unless our customers specifically request that unfluoridated water be supplied and it is practicable to do so		
Target 3.1.1	In fluoridated supplies, comply with Ministry of Health recommendations for the addition of fluoride 85% of the time. (Annual performance indicator)	Achieved	Compliance by treatment plant: Te Marua 92%, Wainuiomata 87%, Waterloo (Naenae) 85%, Waterloo (Gracefield) 93%, Gear Island 89%.
Objective 4.1	Manage assets wisely		
Target 4.1.1	Keep asset information up to date, by adding information about newly created or refurbished assets by 31 August following the end of the financial year.	Achieved	All new and refurbished asset data was entered on GW Water's asset management system by 6 August 2008.
Target 4.1.2	Carry out a condition assessment of assets that have reached 90% of their economic life within one year of that event – that is, the life recorded in the Hansen asset management system primarily for the purpose of calculating loss of service potential (by 30 September each year).	Not achieved	Staff time was re-assigned to work of higher priority.
Target 4.1.3	Replace or refurbish assets before failure reduces levels of service (refer to objectives 1.2, 1.3, 2.1 and 2.2). (Annual performance indicator)	Partially achieved	Minor equipment failures contributed to our narrowly missing self-imposed reservoir level targets for a handful of reservoir-months. (see QMS target 1.2.1)
Objective 4.2	Practice prudent financial management		
Target 4.2.1	Net debt to levy ratio does not exceed target level of 220%. (Annual performance indicator)	Achieved	Debt to levy ratio 182% at 30 June 2008.
Target 4.2.2	Ensure that the asset value recorded in the financial statements is materially correct by capitalising completed capital projects each financial year and conducting regular revaluations as set out in New Zealand Infrastructure Asset Valuation and Depreciation Guide. (Annual performance indicator)	Achieved	Our assets were last re-valued at 30 June 2004, as per the requirements of New Zealand Infrastructure Asset Valuation and Depreciation Guide. We have made an index-based adjustment to the asset value as at 30 June 2008, and have commissioned an asset revaluation, which we expect to be finished by 30 November 2008.

	Targets	Achievement 2007/08	Comment
Target 4.2.3	Ensure that the annual actual direct operating costs do not exceed the budgeted value. (Annual performance indicator)	Achieved	Annual direct operating costs were $14.1 million (m), compared with a budget of $15.5m.
Target 4.2.4	Consult with the customer territorial authorities regarding the content of each annual capital works programme by 30 June each year. (Annual performance indicator)	Achieved	Proposed capital works programme for 2008/09 presented to customers for feedback on 28 April 2008.
Target 4.2.5	Ensure that the annual capital works programme is completed within budget. (Annual performance indicator)	Achieved	Expenditure on the annual Capital Works Programme was $3,784,000 against a budget of $4,837,000. $407,000 of the balance was re-budgeted into 2008/09 to fund completion of projects. These savings are mainly due to a less than anticipated need to replace equipment and slower than anticipated progress on investigating new sources. (see Financial overview, page 41)
Target 4.2.6	Ensure that 90% of the major capital works projects nominated in the annual Operating Plan do not exceed the approved funding plus 20%. (Annual performance indicator)	Not achieved	Of the 38 capital works projects in the Operating Plan for 2007/08, 29 (76%) were completed within the criteria.
Target 4.2.7	Maintain and actively manage insurance policies or reserve funds, so that the financial impact of any natural disaster is minimised. (Annual performance indicator)	Achieved	GW Water has an asset contingency reserve fund in relation to the Stuart Macaskill Lakes (Te Marua) and its distribution network. This insurance investment reserve fund stood at $12.7m at 30 June 2008, and bank credit lines are held to cover any additional funding requirement. All other significant assets are covered by insurance policies that cover the replacement costs, which are updated annually.
Target 4.2.8	Consult with the customer territorial authorities regarding the content of each proposed annual plan and on Long-term Council Community Plans (LTCCP) by 30 June each year. (Annual performance indicator)	Achieved	We offered all customer councils a presentation of the proposed Annual Plan for 2008/09. Presentations were made to Wellington City Council, on 22 April, and Upper Hutt City Council, on 30 April. Their views have been noted.
Target 4.2.9	Achieve unit costs (both total and operating) per million litres of water produced that are comparable with other bulk suppliers operating under similar conditions. This is to be reported annually and subject to comparable organisations providing suitable information. (Annual performance indicator)	Achieved	Costs benchmarked with Watercare Services (Auckland) see page 48.

	Targets	Achievement 2007/08	Comment
Objective 5.2	The Te Marua and Wainuiomata water treatment plants will each obtain an 'A1' grading		
Target 5.2.1	The Te Marua and Wainuiomata water treatment plants will maintain all requirements for an 'A1' grading.	Achieved	
Objective 5.3	The Waterloo Water Treatment Plant will retain its 'B' grading, unless Hutt City Council changes its policy of supplying unchlorinated water to Central Lower Hutt, Petone and Eastbourne		
Target 5.3.1	The Waterloo Water Treatment Plant will maintain all requirements for a 'B' grading.	Achieved	Hutt City Council prefers to receive an un-chlorinated supply for Central Lower Hutt, Petone and Eastbourne. This requirement means 'B' is the highest grading achievable.
Objective 5.4	The Gear Island Water Treatment Plant will obtain an 'A' grading		
Target 5.4.5	Collect 12 months of compliant FAC data by 31 December 2007.	Not achieved	While the Gear Island treatment plant complies with the drinking water standards by virtue of its secure groundwater status, achievement of an 'A' grading requires chlorination. The water is chlorinated before it leaves the plant, but full compliance with all aspects of the chlorination rules has not yet been achieved over the required 12 month period.
Objective 6.1	The Upper Hutt/North Wellington and Central Hutt/Petone Zones will receive an 'a' grading		
Target 6.1.1	Assemble and collate data, and forward to the Drinking Water Assessor.	Achieved	An 'a1' grading has been awarded by the Regional Public Health unit of HVDHB for all three bulk water distribution zones.
Objective 6.2	The Wainuiomata/South Wellington Zone will receive an 'a' grading, provided that the cost of doing so is acceptable to Greater Wellington Water and its customers		
Target 6.2.1	Assemble and collate data, and forward to the Drinking Water Assessor.	Achieved	An 'a1' grading has been awarded by the Regional Public Health unit of HVDHB for all three bulk water distribution zones.
Objective 7.1	An Environmental Management System certified under the terms of ISO 14001:2004 – Environmental Management Systems – Specification with guidance for use will be maintained		
Target 7.1.1	Maintain certification to ISO 14001:2004. (Annual performance indicator)	Achieved	Certification was maintained following an audit by BVQI in January 2008.

Environmental management system

Environmental management system objectives, targets, and performance

Text in the two columns to the right of each target gives (1) a summary of performance against the target for the 2007/08 financial year, and (2) additional background information where needed.

	Targets	Achievement 2007/08	Comment
Objective 1.1	Be aware of all legislation, regulations, bylaws and standards that are relevant to the environmental performance of GW Water		
Target 1.1.1	Maintain a file of all resource consents issued to GW Water and regularly update it by 30 June each year. (Annual performance indicator)	Achieved	
Objective 1.2	Comply with all legislation, regulations, bylaws and standards that are relevant to the environmental performance of GW Water		
Target 1.2.1	Obtain all necessary resource consents and building permits for new work or changes to the operation of the system. (Annual performance indicator)	Achieved	Records held by the Management Systems Coordinator. During the year, GWRC Environment Division, the resource consent manager, made a ruling that dewatering trenches at a flow rate greater than 2.5 litres per second constituted the "taking" of groundwater, and required consent. An application for a global consent to cover trenching operations over the whole region is in preparation.
Target 1.2.2	Obtain and keep up-to-date all necessary trade waste permits by their respective expiry dates. (Annual performance indicator)	Achieved	Trade waste permits are held for Te Marua and Waterloo water treatment plants.
Target 1.2.3	Obtain and keep up to date all necessary location test certificates by their respective expiry dates. (Annual performance indicator)	Achieved	
Target 1.2.4	Keep all building warrants of fitness up to date by their respective expiry dates. (Annual performance indicator)	Achieved	
Target 1.2.5	Review and implement the new hazardous substance component of the Hazardous Substance and New Organism Act by the dates required by regulation.	Achieved	
Objective 1.3	Report compliance with all legislation, regulations, bylaws and standards that are relevant to the environmental performance of GW Water		
Target 1.3.1	Demonstrate compliance with all resource consents. (Annual performance indicator)	Partially achieved	We achieved full compliance for all consents except that authorising abstraction from the Orongorongo River and its tributaries. We did not meet the requirement to retain a minimum residual flow downstream of these abstractions for a short time on three occasions; two due to operator error and the third due to a lightning strike. We have programmed corrective actions for all three events.
Target 1.3.2	Carry out and report all monitoring required by resource consents annually or to timeframes required by consent conditions. (Annual performance indicator)	Achieved	
Target 1.3.3	Determine and report annually all monitoring required by hazardous substance legislation, where matters are not covered by resource consents. (Annual performance indicator)	Achieved	See targets 1.2.3 and 1.2.5.
Objective 2.1	Identify all activities with environmental impacts and assess the significance of these impacts		
Target 2.1.1	Maintain a written procedure for identifying aspects and impacts, and evaluating their significance. (Annual performance indicator)	Achieved	We review this target on an annual basis as part of our management systems review.
Objective 2.2	For new projects or activities, consider environmental aspects when choosing between alternatives		
Target 2.2.1	Options reports, feasibility reports and design reports for all capital projects initiated shall include consideration of environmental effects, including their avoidance or mitigation. (Annual performance indicator)	Achieved	While the environmental impacts for most capital works are minor, proposed new source development projects potentially have significant environmental impacts. We have arranged several environmental studies as part of the investigation of these projects. These studies formed an important part of information used to inform the multi-criteria analysis conducted to establish a preferred dam site. The potential impacts on the Hutt River of reducing the residual flow at Kaitoke have been studied in detail.
Objective 3.1	Adopt all practicable means to prevent pollution of the environment		
Target 3.1.1	Monitor and report on accidental discharges of substances with the potential of harming the environment at all treatment plants annually. (Annual performance indicator)	Achieved	Comprehensive spillage control measures, including bunding and managed sumps, are in place at all GW Water's treatment plants.

	Targets	Achievement 2007/08	Comment
Target 3.1.2	Construct bunds at all water treatment plants to contain spills from chemical dosing lines by 31 December 2007.	Achieved	Additional bunding of chemical lines was completed by 30 June 2007.
Target 3.1.3	Reduce chemical use by introducing a split-stream process at Te Marua, by 31 December 2007.	Achieved	Chemical use per litre of water treated was reduced 7.3% between 2006/07 and 2007/08.
Objective 3.2	Treat and dispose of wastes in an environmentally safe manner		
Target 3.2.1	Comply with trade waste permit conditions for the tenure of each permit and report annually. (Annual performance indicator)	Achieved	We hold trade waste licences for Te Marua and Waterloo water treatment plants. Hutt City Council's Trade Waste section carries out an annual compliance audit.
Target 3.2.2	Comply with the requirements of all discharge consents. (Annual performance indicator)	Achieved provisionally	GWRC Environment Division provided preliminary advice that we complied with all discharge consent conditions.
Target 3.2.3	Dispose of sludge and other solid waste to a properly consented landfill or in some other environmentally safe manner. (Annual performance indicator)	Achieved	Sludge and solid waste are sent to a consented landfill at Silverstream.
Target 3.2.4	Install a centrate sewer main from Wainuiomata Water Treatment Plant by 31 March 2008.	Achieved	This project was completed and is operational.
Target 3.2.5	Dispose of liquid waste in an environmentally safe manner. (Annual performance indicator)	Achieved	Trade waste contractors manage the treatment and disposal of our liquid waste in accordance with the conditions of their trade waste licences, issued by their local territorial authority.
Objective 3.3	Adopt policies, procedures and practices that will reduce waste		
Target 3.3.1	Review operation of the waste water plant at Wainuiomata treatment plant to optimise performance, by 30 June 2008.	Achieved	We have received recommendations for changes to the operation of the waste water plant at Wainuiomata treatment plant. We have not yet made the changes.
Target 3.3.2	Investigate reuse or volume reduction for waste lime at Wainuiomata treatment plant, by 30 June 2008.	Achieved	Operational cost savings of $10,000 per year were estimated as a result of reduced waste for disposal. The project cost $31,500, giving an estimated payback period of just over three years. We will assess its actual performance during 2008/09.
Target 3.3.3	Investigate options for increasing the solids content of sludge by 30 June 2008.	Achieved	See comment for target 3.3.1.

	Targets	Achievement 2007/08	Comment
Objective 4.1	Recognise the natural limits of regional water resources		
Target 4.1.1	Accurately monitor and investigate adverse trends in losses between abstraction, production and supply. Any losses are to be reported annually.	Achieved	No adverse trends evident from production efficiency performance (see page 9) or distribution efficiency performance. (see page 5)
Target 4.1.2	Further investigations of losses between Kaitoke and Te Marua to be undertaken by 31 December 2007.	Achieved	We investigated apparent losses between Kaitoke Weir and Te Marua treatment plant. (see page 10)
Target 4.1.3	Complete draft water management plan, subject to timely responses from territorial authorities, by 30 June 2008.	Not achieved	We completed the technical ('toolkit') report of the proposed Wellington Water Management Plan in May, and distributed it to our city council customers. The plan itself cannot be completed until a water conservation target and approach to achieving that are agreed between GW Water and its customers. (see also page 8)
Target 4.1.4	In conjunction with the Resource Investigations Section, install additional sentinel wells on Petone foreshore to reduce the risk of saltwater intrusion into the Waiwhetu Aquifer by 31 December 2007.	Achieved by 30 June 2007	
Objective 4.2	Minimise energy use		
Target 4.2.1	Each month monitor the power usage at those sites with half hour power meters to check for discrepancies. (Annual performance indicator)	Achieved	
Target 4.2.2	Every two years review the efficiency of the boost and treatment pumps at: • Colin Grove • Hautana Street • Mahoe Street • Penrose Street No. 1 • Penrose Street No. 2 • Willoughby Street No. 1 • Willoughby Street No. 2 • Kaiwharawhara Pumping Station • Te Marua Pumping Station • Waterloo Water Treatment Plant (Annual performance indicator)	Partially achieved	We tested the efficiency of the pumps in our two major pumping stations, at Waterloo and Te Marua, using state-of-the-art thermodynamic testing equipment. 'Before and after' testing of the worst performing Wellington pump at Waterloo showed that reconditioning improved the pump efficiency by 6.8%, and brought it up to almost 'as new' performance. We are evaluating the results to determine if we can achieve worthwhile efficiency gains at any of our other pump stations. We took part in a pump benchmarking study in association with the Victorian Water Industry Association in Australia. The Wellington and Naenae pumps were included in the study, and found to have an 'above-average' overall efficiency when compared with other similar pump stations.

	Targets	Achievement 2007/08	Comment
Target 4.2.3	Every five years review the efficiency of the boost and treatment pumps at: • Johnsonville Pumping Station • Karori Pumping Station • Point Howard Pumping Station • Moores Valley Pumping Station • Ngauranga Pumping Station • Warwick Street Pumping Station • Te Marua Water Treatment Plant • Wainuiomata Water Treatment Plant • Wainuiomata No. 1 Pumping Station (Annual performance indicator)	Achieved	Last reviews completed by 30 June 2006.
Target 4.2.4	Adopt the use of energy-efficient products and equipment, where practicable and economic. (Annual performance indicator)	No significant purchases of energy-consuming equipment	Major items of electrical equipment are assessed on a whole-life cost basis. Our electric drive motors are already close to 100% efficient and the pumps we purchase are over 80% efficient, the best currently available. A second EECA-sponsored energy audit was completed. An energy manager is implementing efficiency projects. We are considering micro-hydro plants at Te Marua, Wainuiomata and several reservoirs to provide part of our power needs. (See page 13)
Target 4.2.5	Install power factor correction at Waterloo Treatment Plant by 30 June 2008.	Not achieved	We did not install power-factor correction equipment, as technical issues made it too expensive to achieve an acceptable return on the investment required.
Objective 5.1	Prevent damage to significant habitats and ecosystems		
Target 5.1.1	Recognise the need to maintain appropriate minimum river flows and, as far as practicable, natural flow variation in watercourses below points of abstraction. (Annual performance indicator)	Achieved	Our water take resource consents and the control logic for operating software systems have minimum flow and flow-sharing arrangements written into them. We arranged for comprehensive scientific studies on the Hutt River, to establish habitat requirements and appropriate minimum flows in relation to our proposal to seek resource consent to reduce the minimum flow requirement downstream of our Kaitoke Weir. (See also page 6)
Target 5.1.2	Avoid damage to significant ecosystems by new capital works or, if this is unavoidable, mitigate the damage by establishing, if practicable, equivalent replacement ecosystems. (Annual performance indicator)	Achieved	We did not undertake new capital works that affected significant ecosystems.
Target 5.1.6	Establish a wetland behind the lower dam at Wainuiomata, subject to the cost of lowering the dam being within budget limits.	Achieved	Lowering the spillway of the Wainuiomata dam to provide for a wetland to be developed immediately upstream was completed. We delayed closure of the dam outlet until November, due to trout spawning.
Objective 6.1	All recommendations made by the Utility Services Committee involving investment or the use of natural resources shall include consideration of environmental impacts		
Target 6.1.1	All reports to the Parks, Forests & Utilities Committee (formerly the Utility Services Committee) or the Divisional Manager, Water Supply, Parks & Forests, proposing investment or use of physical resources shall address the environmental aspects of the proposal, including any practicable alternative courses of action. (Annual performance indicator)	Achieved	Consistent with Greater Wellington Regional Council policy, assessment of environmental impacts is included in all reporting.
Objective 7.1	Achieve environmental awareness in all GW Water staff		
Target 7.1.1	Provide initial training for all new GW Water staff in environmental awareness and the environmental management system within three months of starting employment. (Annual performance indicator)	Achieved	
Objective 7.2	Ensure that all staff members whose actions have potential environmental impacts understand that potential		
Target 7.2.1	Provide specific training to staff whose actions have potential environmental impacts, to ensure they understand those potential impacts and their significance, and are equipped to eliminate or mitigate any impact. (Annual performance indicator)	Achieved	We have three levels of environmental awareness training, depending on the duties of employees. Specific training is given and the details are recorded in a training database against individual employees.

	Targets	Achievement 2007/08	Comment
Objective 8.1	Ensure that third parties engaged by GW Water are aware of environmental matters or concerns associated with their work for us		
Target 8.1.1	All formally documented works and supply contracts shall include any applicable environmental requirements. (Annual performance indicator)	Achieved	All works and sealed contracts included clauses covering environmental matters, including requirements to prevent or minimise adverse impacts.
Objective 8.2	Where practicable, the environmental performance of a contractor or supplier shall be taken into account in the assessment of tenders		
Target 8.2.1	Include environmental performance as an attribute when assessing tenders for major works or supply contracts by the weighted attribute method. (Annual performance indicator)	Achieved	We use the weighted attribute assessment method, including environmental performance, to assess all tenders for major works.
Objective 9.1	Report annually on resource consent compliance		
Target 9.1.1	Facilitate the preparation of the Environmental Regulation Department's annual compliance report. (Annual performance indicator)	Achieved	
Objective 9.2	Report annually on the environmental performance of GW Water		
Target 9.2.1	Prepare an annual report for the year ending 30 June on the environmental performance of GW Water, by 30 November. (Annual performance indicator)	Achieved	We published our report for 2006/07 in October 2007.

Financial overview

Wellington experienced an extended dry spell over summer, with drought conditions persisting through until autumn 2008. A classic La Nina weather pattern prevailed, which caused low historic flows in our surface water catchments. For the first time, since they were commissioned in 1987, the Stuart Macaskill storage lakes were used extensively. These unusual hydrologic events meant that it was a challenge to harvest and supply water for our customers. To overcome these obstacles some innovative solution were employed to stretch the resource as much as possible.

Greater Wellington Water is financially secure as these key measures demonstrate:

- Operating surplus higher than budget at $1.2 million
- Total operating costs held at previous levels – $23.9 million (budget $26.9M)
- Interest costs contained at $3.5 million (budget $4.0M)
- Debt was reduced to $42.7 million (budget $45.6M).

Operating costs

Total operating expenses, at $23.9 million, were 3.6 percent less than the corresponding period last year ($24.8M). During the year, we realised some major efficiency gains in the use of chemicals and energy. Chemical costs were some $196,000 lower, while energy costs were reduced by $30,000 from the previous year. The reduced costs were driven by initiatives in chemical dosing regimes and process changes. Similarly, energy costs have been reduced with pumps' power-factors corrected and a reduced network charge of around 15 percent.

Financial costs

Interest charges were lower because the opening debt position and capital spending were less than expected. Some capital projects have been slightly delayed. Finance costs came in at $552,000 below budget.

With higher interest rates ruling, the self-insurance funds attracted additional investment income of around $210,000.

Depreciation charge

The depreciation charge, at $6,241,000, was less than budget by $1,066,000, because the water supply assets were not re-valued at 30 June 2007 as planned. Consequently, with a lower asset base, a reduced depreciation charge applies. In addition, the reduced capital spend had a contributing effect.

Capital expenditure

Capital expenditure was lower than expected, at $3.7 million, because some budgeted projects were not as advanced as anticipated, or not required:

- The proposed new Wellington reservoir was delayed due to funding issues, principally with Capital & Coast District Health Board, saving $100,000
- Detailed investigation of a new water source was deferred until the community has been consulted, saving $101,000
- Our contingency fund for replacement of equipment at water treatment plants was not fully needed. This fund covers replacement of failed equipment, or equipment needing urgent replacement to avoid failure. The failure rate was less than anticipated, saving $138,000
- Delays and cost reductions on the Stage 2 Optimiser project resulted in an under-spend of $339,000.

Cash flow

Cash flow from operating activities for the year came in at $7.6 million, compared with $6.0 million previously.

Financial position

Greater Wellington Water's financial position is sound, with assets of $305 million (previously $305M) and liabilities of $47 million (previously $49M). Total debt is at $43 million (previously $45M).

The table below summarises financial performance since 2004.

Financial summary

	June 2008	June 2007	June 2006	June 2005	June 2004
	Actual $000	Actual $000	Actual $000	Actual $000	Actual $000
Operating revenue	25,157	24,395	24,130	24,274	23,844
Depreciation	6,241	6,175	6,331	6,563	5,352
Financial costs	3,491	3,268	3,176	3,295	3,674
All other operating expenditure	14,204	15,315	14,682	13,543	13,785
Operating surplus	**1,221**	**(363)**	**(59)**	**873**	**1,033**

Financial statements

Income statement

For the year ended 30 June

	Notes	2008 Actual $000	2008 Budget $000	2007 Actual $000
Operating revenue				
Water supply levies		23,460	23,460	22,776
Internal revenue		252	304	268
Other revenue (interest & external)		1,445	1,191	1,351
Total operating revenue		**25,157**	**24,955**	**24,395**
Operating expenditure				
Personnel costs		3,670	4,082	4,291
Contractor & consultant costs		1,875	1,910	2,457
Internal consultant costs	2	961	899	633
Interest costs		3,491	4,043	3,220
Depreciation		6,241	7,307	6,175
Loss / (gain) on sale		128	(8)	141
Movement in doubtful debt provision		(21)	-	21
GWRC overhead charge		853	853	804
Operating expenditure	3	6,738	7,801	7,016
Total operating expenditure		**23,936**	**26,887**	**24,758**
Net surplus/(deficit) for the year		**1,221**	**(1,932)**	**(363)**

Statement of movements in equity

For the year ended 30 June

	2008 Actual $000	2008 Budget $000	2007 Actual $000
Equity as at 1 July	257,258	259,827	257,634
Net surplus/(deficit) for the year	1,221	(1,932)	(363)
Movement in reserves	50	-	-
Total recognised revenues and expenses for the year	**1,271**	**(1,932)**	**(363)**
Revaluation reserve movement	(69)	-	(130,092)
Other reserve and equity movements	19	-	130,079
Equity as at 30 June	**258,479**	**257,895**	**257,258**

The accompanying notes and accounting policies should be read in conjunction with these financial statements

Balance sheet

As at 30 June

	Notes	2008 Actual $000	2008 Budget $000	2007 Actual $000
Equity				
Accumulated funds, including appropriations	4	202,311	209,518	201,040
Current account	5	-	-	-
Asset revaluation reserve		56,149	48,377	56,218
Departmental reserve	4	19	-	-
Total equity		**258,479**	**257,895**	**257,258**
Represented by:				
Non-current liabilities				
Public debt	6	42,710	45,602	44,696
Total non-current liabilities		**42,710**	**45,602**	**44,696**
Current Liabilities				
Accounts payable		1,376	1,158	1,448
Employee entitlements		564	590	590
Treasury payables	5	1,966	1,936	1,936
Total current liabilities		**3,906**	**3,684**	**3,974**
Total liabilities		**46,616**	**49,286**	**48,670**
Non-current assets				
Property, plant and equipment	7	288,428	290,874	290,978
Investments	8	12,761	12,627	10,976
Total non-current assets		**301,189**	**303,501**	**301,954**
Current assets				
Accounts receivable		1,934	2,181	2,279
Stocks	9	1,657	1,453	1,591
Accrued revenue		315	46	104
Treasury receivables		-	-	-
Total current assets		**3,906**	**3,680**	**3,974**
Total assets		**305,095**	**307,181**	**305,928**
Total net assets		**258,479**	**257,895**	**257,258**

Funding statement

For the year ended 30 June

	Notes	2008 Actual $000	2008 Budget $000	2007 Actual $000
Funds from operating activities				
Funds were provided from:				
Levies received		23,460	23,460	22,776
Interest received		1,020	934	765
Other revenue		677	277	854
		25,157	24,671	24,395
Funds were applied to:				
Payments to suppliers and employees		14,094	15,260	15,222
Interest paid on public debt		3,491	4,043	3,220
		17,585	19,303	18,442
Net funds from operating activities	**10**	**7,572**	**5,368**	**5,953**
Funds from investing activities				
Funds were provided from:				
Proceeds from sale of non-current assets		30	20	95
		30	20	95
Funds were applied to:				
Purchase of non-current assets		89	179	388
Capital projects		3,743	4,837	3,868
		3,832	5,016	4,256
Net funds from investing activities		**(3,802)**	**(4,996)**	**(4,161)**

The accompanying notes and accounting policies should be read in conjunction with these financial statements

Notes to the financial statements

For the year ended 30 June

Funding statement continued

For the year ended 30 June

	Notes	2008 Actual $000	2008 Budget $000	2007 Actual $000
Funds from financing activities				
Funds were provided from:				
Appropriations / new loans		3,784	4,837	3,975
Transfer from reserves		-	-	-
		3,784	4,837	3,975
Funds were applied to:				
Repayment of public debt		5,789	3,525	4,262
Transfer to reserves		-	-	-
Investment additions		1,765	1,684	1,505
Repayment of current account		-	-	-
		7,554	5,209	5,767
Net funds from financing activities		**(3,770)**	**(372)**	**(1,792)**
Net increase in funds held		-	-	-
Add opening funds brought forward		-	-	-
Ending funds carried forward		**-**	**-**	**–**

The accompanying notes and accounting policies should be read in conjunction with these financial statements

1. Statement of accounting policies

A Reporting entity

The entity Greater Wellington (GW) Water is part of the Water Supply, Parks and Forests Division of Greater Wellington Regional Council. GW Water collects, treats and distributes potable water to four territorial authority customers.

These financial statements do not include any transactions that result from Greater Wellington's parks and forest investments.

B Measurement basis

The financial statements have been prepared on a historical cost basis, except for the revaluation of certain non-current assets.

C Particular accounting policies

The following particular accounting policies, which materially affect the measurement of results and financial position, have been applied:

Water supply levies

Levies, a statutory annual charge, represent charges to the territorial authorities for the collection, treatment and distribution of potable water. Levies are recognised in the year the charges are raised.

Property, plant and equipment

Non-current assets consist of:

Operational assets – land, buildings, improvements, plant and equipment, and motor vehicles.

Infrastructure assets – these relate to the region's water supply system. Each asset type includes all items that are required for the system to function.

Valuation

All non-current assets are valued at historical cost, except for the following:

a. Infrastructure assets have been valued using optimised depreciated replacement methodology at 30 June 2004

b. Operational land has been valued at 2004 market rates.

Work in progress

Work in progress is not depreciated. The total cost of the project is transferred to the relevant asset on completion and then depreciated.

Stocks

Chemical stocks and spares used for maintenance and construction purposes are valued at the lower of cost and net realisable value. This valuation includes allowances for slow-moving and obsolete stocks.

Depreciation

Depreciation is provided on a straight-line basis on all fixed assets other than land, at rates which will write off the cost (or valuation) of the fixed assets to their estimated residual value over their useful lives. The useful lives have been estimated as follows:

Buildings	10 to 100 years
Pipelines, reservoirs, dams	50 to 150 years
Plant, vehicles, equipment	3 to 20 years

Accounts receivable

Accounts receivable are stated at estimated net realisable value after providing against debts where collection is doubtful. Specific provisions are maintained to cover identified doubtful debts. All known losses are expensed in the period in which it becomes apparent that the receivables are not collectable.

Goods and services tax

All items in the financial statements are stated net of GST, with the exception of receivables and payables, which are stated as GST inclusive.

Employee entitlements

A provision for employee entitlements is recognised as a liability in respect of benefits earned by employees, but not yet received at balance date. Employee benefits include salaries, annual leave and long service leave. Where the benefits are expected to be paid within twelve months of balance date, the provision is the estimated amount expected to be paid. The provision for other employee benefits is stated at the present value of the future cash outflows expected to be incurred. Obligations for contributions to defined contribution superannuation schemes are recognised as an expense in the income statement as incurred.

Funding statement

The following are the definitions of the terms used in the funding statement:

a. For the purpose of the financial statements, cash is deemed to be the movement in treasury payables and receivables, being the cash equivalent for GW Water

b. Investing activities are those activities relating to the acquisition, holding and disposal of non-current assets

c. Financing activities are those activities that result in changes in the size and composition of the capital structure of GW Water

d. Operating activities include all transactions and other events that are not investing or finance activities.

Changes in accounting policies

There have been no material changes to the accounting policies, and all policies have been applied on a consistent basis, other than those required under NZ IFRS.

2. Internal consultant costs and revenue

All significant internal charges between departments of GW Water have been eliminated. The internal consultant costs and revenue lines arise from GW Water's activities with other divisions within Greater Wellington Regional Council.

3. Operating expenditure

Operating expenditure is made up of payments for transportation costs plus materials and supplies, such as chemicals and power.

4. Accumulated surplus, including appropriations

	2008	2007
	Actual $000	Actual $000
Balance at 1 July	**201,040**	**71,324**
Surplus for the year	1,221	(363)
Transfers from asset revaluation reserve	-	130,079
Departmental reserve movement	50	-
Balance at 30 June	**202,311**	**201,040**

5. Balance sheet – presentation of working capital

GW Water does not have its own bank account. All transactions are processed through the Greater Wellington Regional Council accounts. The net balance of these transactions is represented by the treasury payables figure.

6. Long-term public debt

	2008	2007
	Actual $000	Actual $000
Balance at 1 July	**44,696**	**44,983**
New loans	3,784	3,975
Operating cash surplus applied to debt repayment	(5,770)	(4,262)
Balance at 30 June	**42,710**	**44,696**

All public debt obligations are fully secured against the rateable property of Greater Wellington Regional Council. The interest rate charged on the facility at 30 June 2008 was 7.95% p.a. (7.25% p.a. at 30 June 2007). GW Water uses any operating cash surpluses to retire debt.

7. Property, plant and equipment

2008	Deemed cost $000	Revaluation reserve $000	Accumulated depreciation $000	Net book value $000
Land	2,925	4,941	-	7,866
Water supply infrastructure	250,825	51,209	24,006	278,028
Computer software	825	-	676	149
Office equipment	283	-	154	129
Plant and equipment	501	-	309	192
Motor vehicles	1,214	-	724	490
Work in progress	1,573	-	-	1,573
	258,146	**56,150**	**25,869**	**288,427**

2007	Deemed cost $000	Revaluation reserve $000	Accumulated depreciation $000	Net book value $000
Land	2,921	4,954	-	7,875
Water supply infrastructure	247,517	51,264	18,140	280,641
Computer software	785	-	630	155
Office equipment	275	-	134	141
Plant and equipment	503	-	296	207
Motor vehicles	1,313	-	698	615
Work in progress	1,344	-	-	1,344
	254,658	**56,218**	**19,898**	**290,978**

In 2004, registered valuers Knight Frank Ltd revalued the land, buildings and water supply infrastructure assets. The market values at that date (2004) were applied to land, while infrastructure assets were valued at their respective depreciated replacement costs (ODRC) as at 30 June 2004. GW Water plans further asset revaluations on a regular cyclical basis. Those assets that contribute directly to the supply and distribution of water are classified as water supply infrastructure assets and valued at component level. GW Water holds detailed valuation information on its asset information system. GW Water has accounted for property, plant and equipment in accordance with NZ IAS 16.

8. Investments

	2008	2007
	Actual $000	Actual $000
Asset rehabilitation fund	12,741	10,976
General reserve	19	-
	12,760	**10,976**

As at 30 June 2008, this investment attracted an interest rate of 8.83% (8.34% as at 30 June 2007).

9. Stocks

	2008	2007
	Actual $000	Actual $000
Chemicals	149	124
Capital spares	1,508	1,467
	1,657	**1,591**

10. Reconciliation of funds from operations to operating surplus

	2008	2007
	Actual $000	Actual $000
Reported surplus/(deficit)	1,223	(363)
Add / (less) non-cash items:		
Depreciation	6,241	6,175
Doubtful debt provision reduced	(20)	-
Loss / (gain) on sale	128	141
Total non-cash items	6,349	6,316
Net cash flow from operating activities	**7,572**	**5,953**

11. Financial instruments

Currency risk

GW Water is not exposed to foreign currency risk.

Credit risk

Financial instruments that expose GW Water to credit risk are principally bank balances, receivables and investments. A provision for doubtful receivables is maintained, and is monitored on a regular basis. Bank accounts are held with New Zealand-registered banks in accordance with GW Water's policy.

Concentration of credit risk

GW Water derives the majority of its income from the regional bulk water supply levy. Regional bulk water supply levies are collected from the region's four city councils.

Interest rate risk

Greater Wellington Regional Council's internal treasury unit manages GW Water's debt. A fixed rate of interest is charged by the unit, which minimises the exposure of GW Water to interest rate fluctuations.

Fair values

The estimated fair values of all of the financial instruments of GW Water are the book value of those investments.

12. Related parties

GW Water contracts other divisions of Greater Wellington Regional Council for some operational services. All such transactions are carried out on normal commercial terms.

13. Contingencies

GW Water had a single contingent liability of $185,000 as at 30 June 2008 ($263,988 at 30 June 2007).

14. Commitments

GW Water leases Level 4 of the Regional Council Centre from Greater Wellington Regional Council on an arms-length basis. As at 30 June 2008 GW Water did not have any capital works programme-related contractual commitments ($89,750 at 30 June 2007).

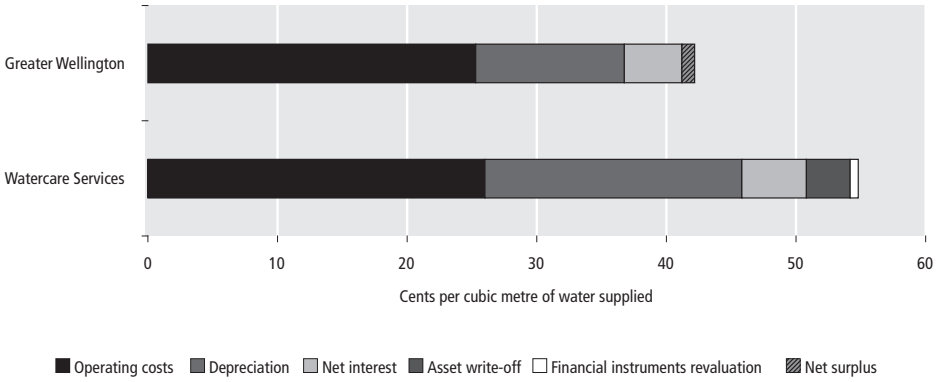
Benchmarking of costs

We have compared GW Water's performance with that of Watercare Services Limited (Auckland), the only other water supplier in New Zealand that sells water to territorial authorities or their agents for on-sale, rather than selling to consumers directly. Although the two organisations work under substantially different conditions, Watercare provides the most meaningful performance comparison currently available. We would like to acknowledge their support in providing their comparative information.

The costs shown for GW Water resulted in a surplus relative to the water levy paid by our territorial authority customers that is equivalent to 1.0 cent per cubic metre of water supplied. When other income is taken into account, the surplus is equivalent to 2.2 cents per cubic metre of supply. Watercare reported a net deficit equivalent to 4.9 cents per cubic metre of water supplied.

Potable water supply costs

For the year ended 30 June 2008



Parks, Forests and Utilities Committee members

The following councillors were members of the Parks, Forests and Utilities Committee for the year ended 30 June 2008. The committee was established following the council elections in October 2007. Prior to the elections similar functions were carried out by the Utility Services Committee.

Rex Kirton
Chair
(Upper Hutt constituency)
T/F (04) 528 4751
M 021 435 277
rex.kirton@gw.govt.nz

Sandra Greig
Deputy Chair
(Lower Hutt constituency)
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Sally Baber
(Wellington constituency)
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John Burke
(Porirua-Tawa constituency)
T (04) 233 0377
F (04) 233 0317
M 027 444 1483
john.burke@gw.govt.nz

Fran Wilde
Council Chair (ex-officio)
(Wellington constituency)
T (04) 802 0346
F (04) 384 5023
M 021 888 075
fran.wilde@gw.govt.nz

Nigel Wilson
(Kapiti Coast constituency)
T (04) 905 0583
M 027 2424 105
nigel.wilson@gw.govt.nz

Alan McKenzie
Appointee

Teri Puketapu
Iwi appointee

Greater Wellington Regional Council appointed Alan McKenzie, Regional Conservator, Department of Conservation, and Teri Puketapu (regional iwi representative) to the Parks, Forests and Utilities Committee during the year, in accordance with clause 31(3) of Schedule 7 of the Local Government Act 2002. In making the appointments the council considered that Mr McKenzie and Mr Puketapu each have the skills, attributes or knowledge to assist the work of the committee. Mr Puketapu's role is the same as the elected members on the committee – to consider the matters put before the Committee and to make decisions in the best interests of the region. Mr McKenzie has speaking, but not voting rights.

Water, air, earth and energy – elements in Greater Wellington's logo combine to create and sustain life. Greater Wellington promotes **Quality for Life** by ensuring our environment is protected while meeting the economic, cultural and social needs of the community

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