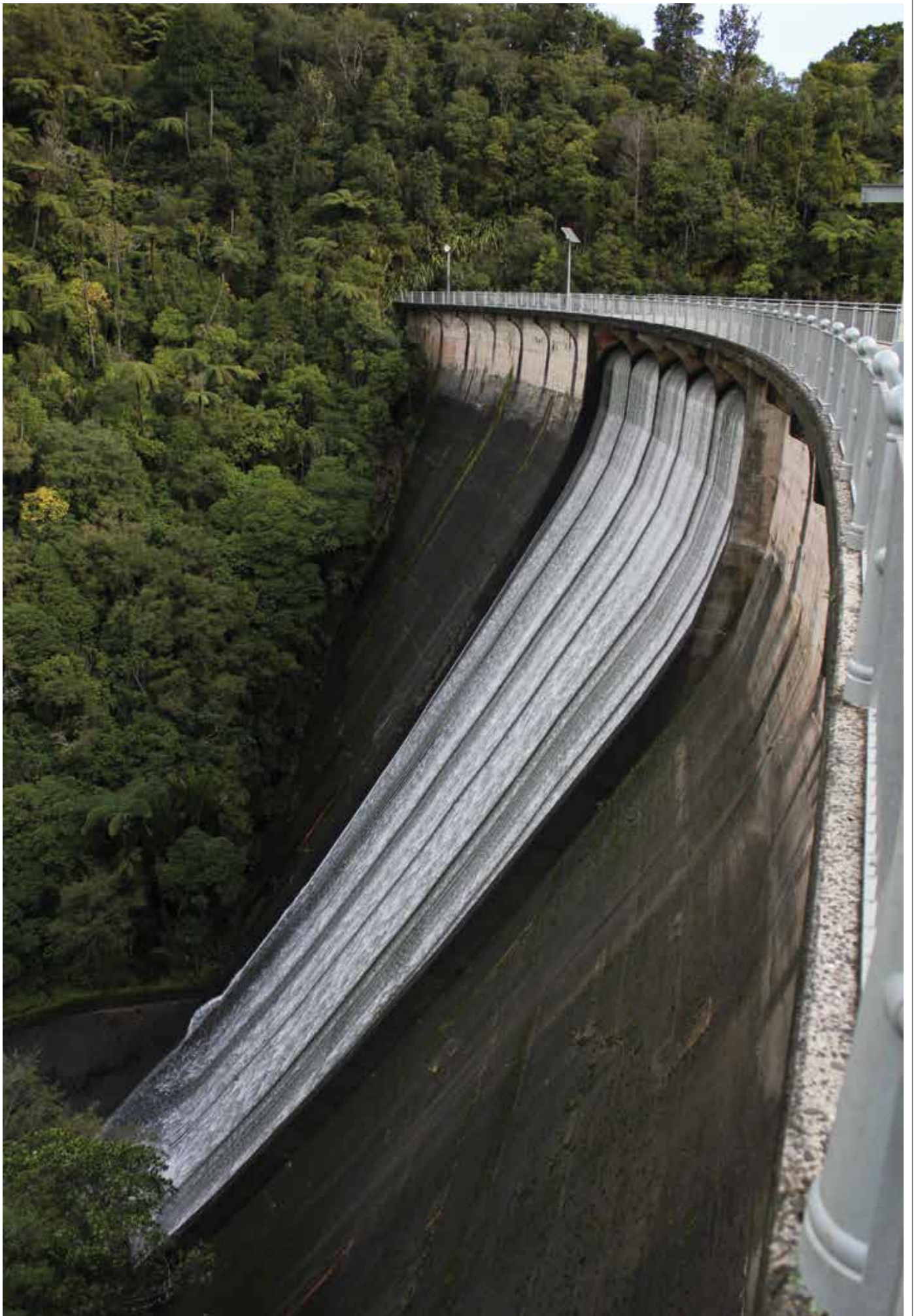




ANNUAL  
WATER  
QUALITY  
REPORT  

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2013



9 December 2013

## REVIEW OF WATER QUALITY MANAGEMENT SYSTEM

CRF Consulting Ltd has been retained by Watercare to undertake an independent review of its water quality management system, the review covered Watercare's:

- Annual sampling programme to ensure it meets the requirements of its contractual obligations with its customers and the requirements of the Drinking Water Standards.
- Sampling locations to ensure that they are representative of the water throughout the distribution network.
- Sampling methodologies to ensure that samples collected are representative of the water supplied at that point.
- Watercare Services Laboratory's analytical methods and procedures to ensure accuracy and reliability of results can be maintained.
- Water quality data management systems to ensure that records of analytical results are stored adequately.

The findings of this review were that Watercare makes use of appropriate controls to ensure accurate and reliable water quality sampling and analysis which provide results that are representative of the water being supplied to customers. I am also satisfied with the recording and management of test results and water quality information. Where recommendations for improvements were made, Watercare has implemented actions to ensure these are met.

I have reviewed this Water Quality Annual Report and consider that it represents an accurate reflection of the water quality testing carried out this year.



Prof. Colin Fricker Ph.D FRSPH FSB  
CRF Consulting Ltd.



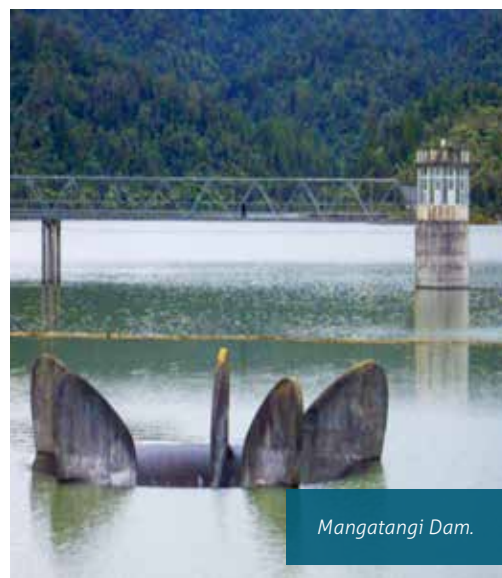
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THIS REPORT DETAILS WATER QUALITY PERFORMANCE FOR THE PERIOD 1 JULY 2012 TO 30 JUNE 2013.

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Ardmore WTP.



Mangatangi Dam.

# INTRODUCTION

## Watercare's commitment to water quality

Watercare aims to provide a safe and reliable supply of drinking water. The company achieves this by:

- Supplying water at the minimum price consistent with maintaining the long-term integrity of its assets, as required by its founding legislation
- Supplying drinking water in accordance with all national and local legislative requirements
- Meeting New Zealand's drinking water standards
- Developing and maintaining its facilities in accordance with the principles of sustainability to ensure the optimum balance of environmental, social and economic factors over the lives of its assets
- Undertaking such external and peer reviews as deemed appropriate to assess and benchmark performance against industry best practice.

## Watercare today

Watercare is committed to developing water and wastewater infrastructure to support the region's growth and prosperity in ways that maximise environmental, social and economic benefits.

Watercare has been the provider of bulk water and wastewater services to the Auckland region since 1991.

Watercare supplies bulk water to the Papakura district, where retail services are managed by a franchise agreement with Veolia Water.

On 1 November 2010, as a result of Auckland regional governance reforms, the company took over ownership and management of all the water and wastewater non-metropolitan (rural) plants' assets within the Auckland Council region and began retailing services directly to the people of Auckland.

Watercare has highlighted the quality of rural drinking water as a significant issue and is assessing a programme of work to prioritise and increase security of supply and water quality to non-metropolitan areas since then.

## INTRODUCTION (continued)

Watercare's main services include:

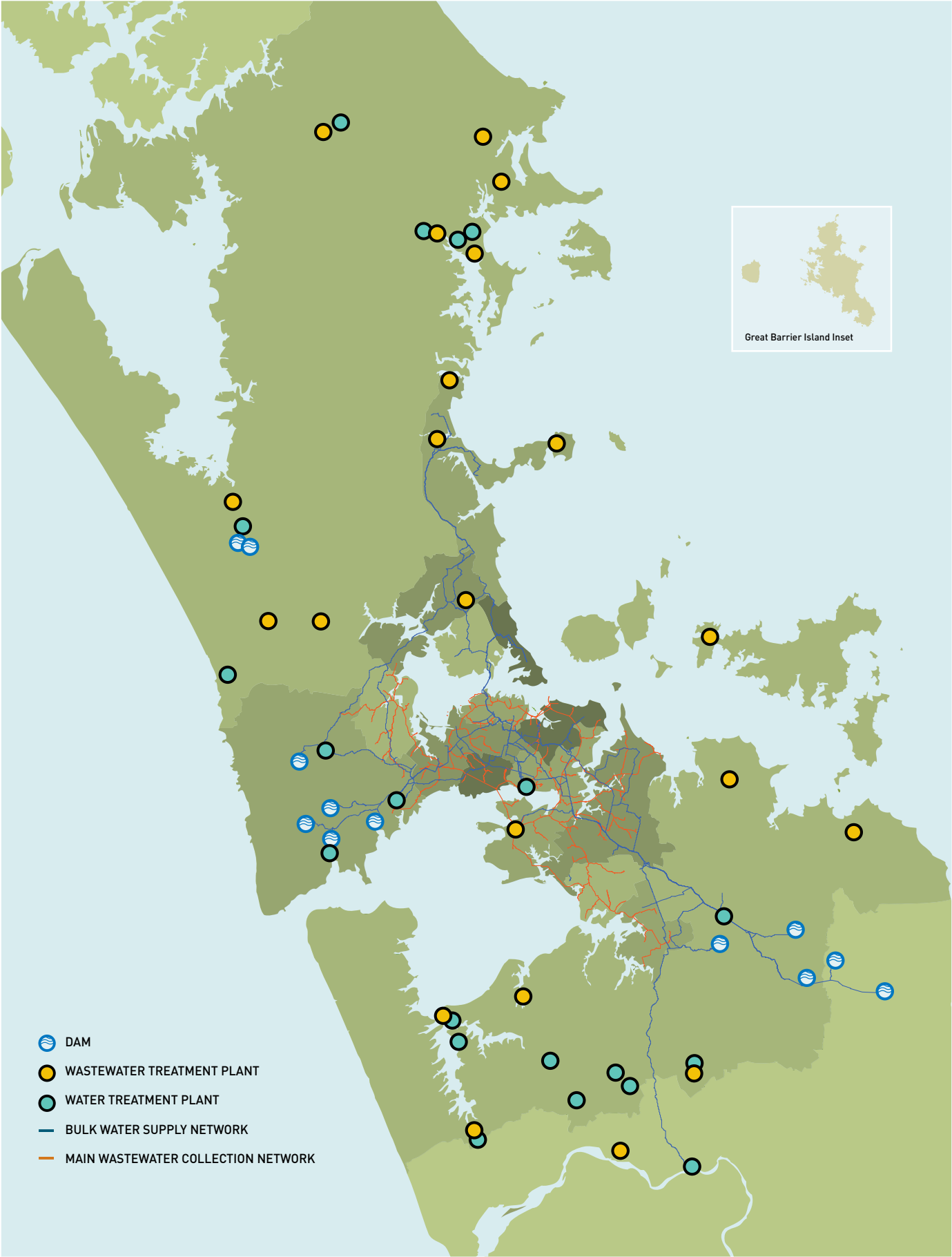
- The collection, treatment and distribution of drinking water from 11 dams, 26 bores and springs, and four rivers. A total of 140 billion litres of water is treated annually at 20 plants and distributed over 9,000 kilometres of water pipes through 149 reservoirs and 108 pump stations to 450,000 households.
- The collection, treatment and disposal of wastewater at 19 treatment plants. The two main wastewater plants servicing the majority of the region are located at Mangere on the Manukau Harbour, and Rosedale on the North Shore.
- The transfer, treatment and disposal of trade waste. Watercare works with approximately 1,700 customers administering the trade waste by-law to protect the wastewater network and assist in ensuring the wastewater treatment plant discharges meet consent requirements.
- The provision of commercial laboratory services in support of the business. The independently accredited laboratory provides a full range of testing and sampling services for water, wastewater, biota and air quality, and also works with a wide customer base across a variety of industries to provide first-class laboratory analysis and sampling services.

This report covers water quality from 1 July 2012 to 30 June 2013 (inclusive).



*Watercare volunteers distributing water at the Round the Bays event.*

# WATERCARE'S NETWORKS



## REGULATORY AND CONTRACTUAL REQUIREMENTS

### Local Government (Auckland Council) Act 2010

Watercare is a council controlled organisation (CCO) and a wholly owned subsidiary of Auckland Council. The company's obligations to deliver water and wastewater services for Auckland are established under Part 5 section 57(1) of the Act.

### Health (Drinking Water) Amendment Act 2007

The Health (Drinking Water) Amendment Act 2007 came into effect on 1 July 2008. The Act allows water suppliers the choice of complying with the Drinking Water Standards for New Zealand (DWSNZ) 2000 and 2005 (Revised 2008) until 1 January 2015 when the DWSNZ 2005 (Revised 2008) becomes mandatory. Watercare has opted to comply with the DWSNZ 2005 (Revised 2008) from 1 July 2009.

### Drinking Water Standards for New Zealand

The DWSNZ 2005 (Revised 2008) prescribe maximum acceptable values (MAVs) for determinands of public health significance and provide a yardstick against which drinking water quality is measured. They also specify monitoring requirements, laboratory competence and remedial measures to be taken in the event of the standards being breached.

### Agreement relating to the supply of bulk water

Veolia Water manages, maintains and operates the Papakura water network. Watercare has a signed contract with Veolia Water setting out the terms under which Watercare supplies bulk water to the district. This recognises the separate obligations under the Local Government Acts 1974 and 2002.

Terms include using reasonable endeavours to:

- Minimise risks to persons, property and the environment
- Plan for contingencies
- Plan co-operatively
- For Watercare, maintain 'A' grading for the Ardmore and Waikato water treatment plants
- For Veolia Water, to achieve and maintain 'a' grading for their reticulation networks.

Compliance with the specific requirements is outlined in Appendix 2.



## REGULATORY AND CONTRACTUAL REQUIREMENTS (continued)

### Public health grading of community supplies

As the Ministry of Health's explanatory notes say: "The grading provides an assessment of the Ministry of Health's confidence in the public health safety of each community drinking-water supply. The grading is a measure of confidence that a drinking-water supply system will not become contaminated, rather than an absolute indication of quality at a specific time."

The grading system comprises two letters. The first letter (upper case) represents the source and treatment grading, while the second letter (lower case) grades the water in the distribution zone.

Watercare's statement of corporate intent specifies the following key performance indicators with respect to grading:

| Indicator             | Measure   | 2012/13 Target | 2013/14 Target | 2014/15 Target |
|-----------------------|---|----------------|----------------|----------------|
| Potable Water Quality | Percentage of graded metropolitan water treatment plants achieving Grade 'A'        | 100%           | 100%           | 100%           |
|                       | Percentage of graded metropolitan supply reticulation achieving Grade 'a'           | 100%           | 100%           | 100%           |
|                       | Percentage of graded non-metropolitan water treatment plants achieving Grade 'A'    | 35%            | 45%            | 50%            |
|                       | Percentage of graded non-metropolitan water supply reticulation achieving Grade 'a' | 15%            | 25%            | 50%            |

## PROTECTING OUR SOURCES

The quality of water at the source is a major consideration in determining the level of treatment supplied.

Auckland's water supply is obtained from three different types of sources: dams, rivers and from under the ground. The exact proportion of each source varies daily depending on the storage levels in the dams and the time of the year.

Watercare now operates 11 dams, five in the Waitakere Ranges, four in the Hunua Ranges, one in Hays Creek near Papakura and the Mangakura Dam in Helensville. The sources in the Hunua and Waitakere ranges supply around 80 per cent of Auckland's drinking water. The Hunua and Waitakere dams are surrounded by bush or forest. These areas have been protected from development and preserved for many years to minimise any risk of contamination. Auckland Council controls activities within the water supply catchments and allows passive recreational use of the land. Watercare's lakes are not available for boating or other water sports, to protect water quality. Nevertheless, treatment is still required to make the water safe to drink.

Auckland's river water is sourced from three rivers: the Waikato River, Mahurangi River (Warkworth) and Hoteo River (Wellsford). The Waikato River provides up to 15 per cent of the region's water. While the Waikato River carries mineral compounds sourced from geothermal activity and its catchment is predominantly farmland, the advanced water treatment technologies implemented at the Waikato Water Treatment Plant ensures the treated water complies with the DWSNZ.

Watercare recognises that Tainui Maori have a special relationship with the river and acknowledges Tainui's guardianship role over the Waikato River. Watercare actively supports Tainui in its endeavours to protect and enhance river quality. Watercare makes submissions on resource consent applications that will affect the river and also sponsors Waikato RiverCare, an incorporated society working to improve river quality through shoreline planting programmes.

Watercare also sources water from 26 bores and springs, servicing local Auckland communities. The Onehunga Water Treatment Plant (WTP) sources water from bores. In Rodney, the Hamilton Road WTP (Snells/Algies) sources water from a bore and the Muriwai WTP from a spring. In Franklin, bore water is sourced for Bucklands Beach, Clarks Beach, Glenbrook Beach, Patumahoe, Waiau and three Waiuku WTPs. The Bombay WTP sources water from a spring. The Pukekohe WTP sources water from both bore and spring water.



*Cosseys Dam is one of five dams in the Hunua Ranges, originally built in 1955.*

## PRODUCING HIGH-QUALITY DRINKING WATER

Watercare operates 20 water treatment plants, which take untreated water, and removes unsafe contaminants such as suspended solids, bacteria, algae, minerals, and man-made chemical pollutants.

Watercare uses tried and trusted processes to produce safe drinking water. Commonly referred to as barriers, they are designed to meet the New Zealand drinking water standards, which are in turn based on World Health Organisation drinking water guidelines, Australian drinking water guidelines and the United States' national primary drinking water standards.

The following tables summarise the barriers used at the various treatment plants, which are appropriate to the different sources.

This table shows that the metropolitan treatment plants have at least two barriers to contamination.

| Station Process       | Ardmore   | Huia      | Huia Village | Onehunga   | Waikato | Waitakere |
|-----------------------|-----------|-----------|--------------|------------|---------|-----------|
| Coagulation           | ✓         | ✓         | ✓            | ✓          | ✓       | ✓         |
| Clarification         | ✓         | ✓         |              |            | ✓       | ✓         |
| Sand filtration       | ✓         | ✓         |              | ✓          |         | ✓         |
| Chlorine disinfection | ✓         | ✓         | ✓            | ✓          | ✓       | ✓         |
| Membrane filtration   |           |           | ✓            |            | ✓       |           |
| Activated carbon      | See note* | See note* | ✓            |            | ✓       | See note* |
| pH adjustment         | ✓         | ✓         | ✓            | ✓          | ✓       | ✓         |
| Fluoridation          | ✓         | ✓         |              | See note** | ✓       | ✓         |

\* Granular activated carbon filtration runs continuously at Huia Village and at Waikato. Powdered activated carbon can be added to Ardmore, Huia and Waitakere as required.

\*\* Water supplied from the Onehunga WTP into the main network outside of Onehunga is fluoridated.

This table summarises the Rodney non-metropolitan treatment plants' processes. Fluoride is not dosed at the Rodney water treatment plants.

| Station Process       | Muriwai | Hamiltons Rd (Snells/Algies) | Helensville | Warkworth | Wellsford |
|-----------------------|---------|------------------------------|-------------|-----------|-----------|
| Coagulation           |         |                              | ✓           | ✓         | ✓         |
| Clarification         |         |                              | ✓           | ✓         | ✓         |
| Sand filtration       |         |                              | ✓           | ✓         | ✓         |
| Cartridge filtration  | ✓       |                              |             |           |           |
| Chlorine disinfection | ✓       | ✓                            | ✓           | ✓         | ✓         |
| UV disinfection       | ✓       |                              |             | ✓         | ✓         |
| Activated carbon      |         |                              | See note*   | See note* |           |
| pH adjustment         | ✓       |                              | ✓           | ✓         | ✓         |
| Fluoridation          |         |                              |             |           |           |

\* Powdered activated carbon is added to Helensville and Warkworth WTPs as required.

## PRODUCING HIGH-QUALITY DRINKING WATER (continued)

The following tables summarise the Franklin non-metropolitan treatment plants' processes. Fluoride was only dosed at the Pukekohe Water Treatment Plant.

| Station Process       | Bombay | Bucklands Beach | Clarks Beach | Glenbrook Beach | Patumahoe |
|-----------------------|--------|-----------------|--------------|-----------------|-----------|
| Cartridge filtration  | ✓      |                 |              |                 |           |
| Chlorine disinfection | ✓      | ✓               | ✓            | ✓               | ✓         |
| UV disinfection       | ✓      | ✓               |              | ✓               | ✓         |
| pH adjustment         | ✓      |                 |              |                 |           |

| Station Process       | Pukekohe | Waiau Beach | Waiuku Rd | Waiuku | Cornwall Rd (Waiuku) |
|-----------------------|----------|-------------|-----------|--------|----------------------|
| Bag filtration        | ✓        |             | ✓         | ✓      | ✓                    |
| Membrane filtration   | ✓        |             |           |        |                      |
| Chlorine disinfection | ✓        | ✓           | ✓         | ✓      | ✓                    |
| UV disinfection       | ✓        |             |           |        |                      |
| Fluoridation          | ✓        |             |           |        |                      |

### Coagulation/Clarification

Coagulation/clarification is the primary metropolitan treatment process. Positively charged alum is added to the water as it enters clarifiers. It attracts negatively charged particles in the water, allowing them to bind together. A polyelectrolyte can be added to aid this process, forming a floc blanket which continually grows and settles out. This allows clear water at the surface to flow on to the next stage of treatment.

Coagulation and clarification can remove up to 95 per cent of the dirt in the water – most of the organic and inorganic compounds (including the coagulants), bacteria and other organisms.

### Filtration

All of the metropolitan, and some of the non-metropolitan, water treatment plants employ filters as barriers. Most have traditional sand filter beds. Bag and cartridge filters are utilised in some of the non-metropolitan WTPs. All filters are fully monitored and washed automatically to ensure they operate to their optimum level.

The Waikato and Huia Village treatment plants feature membrane filters. These filters comprise cassettes of thousands of narrow tubes covered with semi-permeable membranes. The water is drawn through the membranes and out of the tubes. The holes in the membranes are just 0.035 microns in diameter, providing higher removal rates of bacteria, protozoa and some viruses.

Membrane filters are utilised at the Pukekohe WTP to remove iron and manganese which cause discoloured water.



## PRODUCING HIGH-QUALITY DRINKING WATER (continued)

### Activated carbon

Activated carbon reduces organics and taste and odour compounds. Compounds, produced by algae, can have a disproportionate impact on taste and odour, even in minute quantities, and at high levels have an impact on public health. At the Waikato and Huia Village plants, granular activated carbon is a standard part of the process. Powdered activated carbon can be added as required at the Huia, Waitakere, Ardmore, Warkworth and Helensville WTPs.

### Disinfection

Chlorination is the most common form of disinfection used by water utilities throughout the world.

The concentration of chlorine is maintained within a tight range to ensure adequate disinfection while having minimum aesthetic effect. Chlorine is added as a final stage of the treatment process for two reasons. Firstly, it kills any remaining bacterial contaminants and it maintains that protection as the water travels through the distribution system. Secondly, it can take several days for water to travel the hundreds of kilometres of pipe to the furthest extent of the network.

Ultraviolet (UV) disinfection is also used in some of the non-metropolitan water treatment plants as an additional barrier for protozoa removal. This disinfection method uses UV light at short wavelengths to kill micro-organisms that may be resistant to chemical disinfection.

### Final treatment

At the request of its customers, Watercare adds fluoride at a concentration of less than one part per million at the metropolitan water treatment plants (excluding Onehunga and Huia Village) and the Pukekohe WTP. Fluoride is dosed in accordance with the drinking water standards.

While not required in ensuring the safety of the water, Watercare also adds small quantities of lime or caustic soda to adjust the water's pH level as required.

## PROTECTION AND MAINTENANCE OF DISTRIBUTION SYSTEMS

Water supply distribution systems can also affect water quality. Any breaks in the water mains are isolated and repaired, then the pipes are chlorinated, flushed and reconnected to the water supply system. This minimises the risk of any potential contamination entering the distribution system. New mains and reservoirs are also disinfected before use.

All service reservoirs are covered with roofs to avoid contamination from birds, animals, leaves or other airborne sources. Service reservoirs are tanks, usually located on higher ground. They help to maintain pressure in the supply lines by smoothing out the peaks and troughs in demand. While they may be supplied at a constant rate, typically they are drawn down during the day and refilled at night.



*Redoubt Road Reservoir complex.*

## MONITORING AND PROCESS CONTROL

In accordance with the drinking water standards and other legislation, Watercare has an extensive water quality monitoring programme to assess chemical, physical, radiological and aesthetic parameters as well as bacteriological parameters.

Watercare's Laboratory Services is IANZ accredited and experienced in sampling and analysis for a range of chemical and biological tests for water, wastewater, landfill, marine and environmental samples including soils and sludges. Air quality expertise includes point emission, biogas, odour and ambient sampling and testing. The laboratory works with a wide variety of external organisations including councils, environmental consultants and industries, nationwide.

The laboratory recognises that customer needs go beyond analysis to providing advice on test programmes and results, electronic methods of data transfer, provision of innovative sampling services, continual improvement of test methods, quality assurance and a high level of customer service.

All Watercare's water quality monitoring and reporting is co-ordinated through the company's Water Quality Database. This software is used to review performance against drinking water standards, contractual requirements and operational parameters. The system also enables trends to be observed and provides exception reports on test results exceeding DWSNZ guidelines.

In addition, data from monitoring equipment is collected through online monitoring systems at the company's treatment plants and within the reticulation system, allowing staff to control and respond to changing conditions remotely. The results are faster response times, more consistent water quality and more effective management and control.



*Samples being dropped off at the laboratory.*



*Water treatment plant operators analysing online monitoring data.*

## MONITORING AND PROCESS CONTROL (continued)

### Microbiological monitoring

Microbiological tests are carried out to ascertain the presence or absence of potential disease-causing organisms. It is impracticable to monitor water supplies for all potential human pathogens, so surrogates are used to indicate possible contamination. As required by the DWSNZ, Watercare uses *Escherichia coli* (*E. coli*) as the primary compliance indicator for microbiological contamination.

Heterotrophic plate counts are also used as a general indication of all organisms that may be present in a water supply, and are a useful indicator of operational performance. Each count shows mainly environmental organisms, as well as some faecal organisms. This is a useful measure of general water quality in addition to the indicator organism (*E. coli*).

### Protozoan monitoring

Protozoa such as *Cryptosporidium* and *Giardia* occur in many New Zealand water sources. They are found in the faeces of humans and wild, farm and domestic animals.

A key objective of the DWSNZ is to protect the population against such protozoa, which can have an immediate and serious impact on public health.

Watercare has significantly increased the monitoring and control capability at its plants. The aim is to ensure that control systems react appropriately when any individual process or filter system approaches the borders of the target zone.



*Microbiological samples are prepared for analysis at Watercare's Laboratory Services.*



## MONITORING AND PROCESS CONTROL (continued)

### Chemical and physical monitoring

Watercare also monitors a range of physical and chemical parameters as required by the drinking water standards to ensure that drinking water is safe over a person's lifetime.

Watercare aims for a pH level of 7.9, which is the midpoint of the customer-specified target of 7.6 to 8.2. Control of pH is important to ensure adequate disinfection of the water supply.

**Fluoride** is one of the most abundant elements in the earth's crust, and is typically found as the fluoride ion or as organic or inorganic fluorides. It is found naturally in groundwater supplies, and is present in most food and beverage products and toothpaste. At the request of the company's customers, Watercare adds fluoride to its metropolitan treated water (except the Onehunga and Huia Village treatment plants), and at Pukekohe WTP. Watercare is required to monitor fluoride on a weekly basis. The DWSNZ state a maximum acceptable value (MAV) of 1.5 milligrams per litre (mg/L). Watercare did not exceed this value in 2012/13.

Chlorine is the primary defence against disease-causing microbiological contaminants in public water supply systems. Chlorine is used in sufficient amounts to kill microbes at the treatment plants and provide a residual in the distribution system.

### Aesthetic parameters

As mentioned above, aesthetic parameters pose no threat to human health but can affect drinking water appearance, taste and odour.

Groundwater is often high in **dissolved solids** (salts) and **hardness** (calcium), which can cause calcification on hot-water systems and fixtures in the Rodney and Franklin districts. However, Watercare's metropolitan sources can all be considered surface water sources, as the Onehunga aquifer is not deep enough to acquire typical groundwater attributes. As such, it is comparatively low in salts and calcium and is considered to be 'soft' water.

It is worth noting that as water in New Zealand is generally low in minerals and metal salts it will attempt to acquire them. The Ministry of Health has warned that water sitting overnight in contact with some low-quality fittings such as taps and mixers can absorb some oxides from these metals. For that reason, they advise flushing away the first cupful of water from taps each day. Twice a year Watercare places flushing notices in local newspapers. This notice is also posted on the community section of the Watercare website.

[www.watercare.co.nz/pages/default.aspx](http://www.watercare.co.nz/pages/default.aspx)



*The Ardmore Water Treatment Plant is the largest of 20 plants.*

## FLUSHING YOUR DRINKING WATER

Some plumbing fittings have the potential to allow minute traces of metals to accumulate in water settling within the fittings for several hours.

Although the health risk is small, the Ministry of Health recommends that customers flush a large glass of water from their drinking-water tap each morning before use to remove any metals that may have dissolved from the plumbing fittings.

We recommend this simple precaution for all households, including those on public and private water supplies.

**Alum** (aluminium sulphate) is a coagulant that is added to aid the removal of colour and turbidity.

Aluminium can accumulate in pipe sediments, and be re-suspended during periods of rapid changes to flow patterns. The DWSNZ guideline value is 0.15 mg/L. Aluminium detected in treated water at the plants is typically less than this value.

**Iron** and **manganese** are naturally occurring minerals. They have no health implications and can be found in food supplements in much higher concentrations than are likely to occur in a glass of water. Unusual changes to the flow within the system can stir up deposits that have settled out of the water within the mains.

**Taste** and **odour** are sometimes related to fluctuating chlorine levels due to changing water demand.

The chlorine residual throughout the reticulation network is regularly monitored. Chlorine is added in areas remote from the treatment plants to ensure the required levels are maintained through to the consumers' taps.

**Algal blooms**, particularly in the Lower Nihotupu Dam, can also prompt taste and odour complaints. The dam is usually taken out of supply in early summer before this becomes a problem. Watercare has also commissioned Niwa to advise on monitoring and management strategies to minimise cause for further complaints.

**Colour** in water originates mainly from soil and vegetable matter such as leaves in the catchment.

Corroding metal pipes can also colour the water, with iron producing a brownish colour and copper a faint blue colour.



## VERIFICATION OF DRINKING WATER QUALITY

Compliance with the DWSNZ 2005 for the period 1 July 2012 to 30 June 2013 is outlined in the following sections.

**Appendix 1** – compliance at the water treatment plants

**Appendix 2** – compliance with the bulk water agreement with Veolia Water

**Appendix 3** – network water quality compliance by grading zone

**Note:** In the results, ND refers to non-detectable.

## APPENDIX 1 Water quality at treatment plants

### HELENSVILLE WTP TREATED

| Component Name                | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total              | mg/L            | 1                 | 39.00   | 39.00   | 39.00   |                    |                |               | ✓                            |
| Aluminium                     | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                | 0.1           | ✓                            |
| Bromate                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                       | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                |               | ✓                            |
| Calcium                       | mg/L            | 1                 | 9.50    | 9.50    | 9.50    |                    |                |               | ✓                            |
| Calcium Hardness              | mg/L            | 1                 | 24.00   | 24.00   | 24.00   |                    |                |               | ✓                            |
| Chlorate                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Chloride                      | mg/L            | 1                 | 48.00   | 48.00   | 48.00   |                    |                | 250           | ✓                            |
| Chlorine Residual             | mg/L            | 122               | 1.97    | 0.73    | 1.19    | 0.24               | 5              |               | ✓                            |
| Chlorite                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                        | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                  | mS/m            | 1                 | 31.00   | 31.00   | 31.00   |                    |                |               | ✓                            |
| Fluoride                      | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 1.5            |               | ✓                            |
| Iodide                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Iron                          | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                | 0.2           | ✓                            |
| Magnesium                     | mg/L            | 1                 | 7.60    | 7.60    | 7.60    |                    |                |               | ✓                            |
| Magnesium Hardness            | mg/L            | 1                 | 32.00   | 32.00   | 32.00   |                    |                |               | ✓                            |
| Manganese                     | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.4            | 0.04          | ✓                            |
| pH                            | pH unit         | 122               | 7.60    | 7.10    | 7.35    | 0.19               |                | 7.0-8.5       | ✓                            |
| Potassium                     | mg/L            | 1                 | 3.50    | 3.50    | 3.50    |                    |                |               | ✓                            |
| Silicon                       | mg/L            | 1                 | 18.00   | 18.00   | 18.00   |                    |                |               | ✓                            |
| Sodium                        | mg/L            | 1                 | 33.00   | 33.00   | 33.00   |                    |                | 200           | ✓                            |
| Sulphate                      | mg/L            | 1                 | 31.00   | 31.00   | 31.00   |                    |                | 250           | ✓                            |
| Suspended Solids              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Dissolved Solids        | mg/L            | 1                 | 190.00  | 190.00  | 190.00  |                    |                | 1000          | ✓                            |
| Total Hardness                | mg/L            | 1                 | 56.00   | 56.00   | 56.00   |                    |                | 200           | ✓                            |
| Total Organic Carbon          | mg/L            | 12                | 4.10    | 1.30    | 2.26    | 0.89               |                |               | ✓                            |
| Turbidity                     | NTU             | 122               | 0.35    | 0.00    | 0.19    | 0.12               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli              | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |
| <b>NUTRIENTS</b>              |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Nitrate                       | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    | 50             |               | ✓                            |
| Nitrite                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| TKN                           | mg/L            | 1                 | 0.13    | 0.13    | 0.13    |                    |                |               | ✓                            |
| Total Phosphorus              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| <b>PLASTICISERS</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate      | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate    | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |



## APPENDIX 1 Water quality at treatment plants

### HELENSVILLE WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### HELENSVILLE WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Barium                            | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 0.7            |               | ✓                            |
| Boron                             | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 1.4            |               | ✓                            |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| Copper                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | ✓                            |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc                              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | ✓                            |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 12                | 0.02    | 0.01    | 0.02    | 0.01               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 12                | 0.01    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 12                | 0.02    | 0.01    | 0.01    | 0.00               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 12                | 0.03    | 0.01    | 0.02    | 0.01               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 11                | 0.64    | 0.19    | 0.44    | 0.15               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### HUIA VILLAGE WTP TREATED

| Component Name                | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|-------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>  |                 |                   |         |         |         |                    |                |               |                              |
| abs254                        | abs unit        | 122               | 0.19    | 0.01    | 0.04    | 0.04               |                |               | ✓                            |
| Alkalinity Total              | mg/L            | 1                 | 21.00   | 21.00   | 21.00   |                    |                |               | ✓                            |
| Aluminium                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| Bromate                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                       | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | ✓                            |
| Calcium                       | mg/L            | 1                 | 4.60    | 4.60    | 4.60    |                    |                |               | ✓                            |
| Calcium Hardness              | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                |               | ✓                            |
| Chlorate                      | mg/L            | 1                 | 0.19    | 0.19    | 0.19    |                    | 0.8            |               | ✓                            |
| Chloride                      | mg/L            | 1                 | 27.00   | 27.00   | 27.00   |                    |                | 250           | ✓                            |
| Chlorine Residual             | mg/L            | 122               | 1.35    | 0.51    | 0.92    | 0.20               | 5              |               | ✓                            |
| Chlorite                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                        | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                  | mS/m            | 1                 | 14.80   | 14.80   | 14.80   |                    |                |               | ✓                            |
| Fluoride                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            |               | ✓                            |
| Iodide                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Iron                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | ✓                            |
| Magnesium                     | mg/L            | 1                 | 2.80    | 2.80    | 2.80    |                    |                |               | ✓                            |
| Magnesium Hardness            | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                |               | ✓                            |
| Manganese                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | ✓                            |
| pH                            | pH unit         | 122               | 8.20    | 7.40    | 7.80    | 0.27               |                | 7.0-8.5       | ✓                            |
| Potassium                     | mg/L            | 1                 | 1.00    | 1.00    | 1.00    |                    |                |               | ✓                            |
| Silicon                       | mg/L            | 1                 | 14.00   | 14.00   | 14.00   |                    |                |               | ✓                            |
| Sodium                        | mg/L            | 1                 | 16.00   | 16.00   | 16.00   |                    |                | 200           | ✓                            |
| Sulphate                      | mg/L            | 1                 | 4.60    | 4.60    | 4.60    |                    |                | 250           | ✓                            |
| Suspended Solids              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Dissolved Solids        | mg/L            | 1                 | 84.00   | 84.00   | 84.00   |                    |                | 1000          | ✓                            |
| Total Hardness                | mg/L            | 1                 | 23.00   | 23.00   | 23.00   |                    |                | 200           | ✓                            |
| Total Organic Carbon          | mg/L            | 13                | 3.50    | 1.20    | 1.89    | 0.69               |                |               | ✓                            |
| Turbidity                     | NTU             | 122               | 0.85    | 0.00    | 0.28    | 0.26               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli              | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |
| <b>NUTRIENTS</b>              |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Nitrate                       | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    | 50             |               | ✓                            |
| Nitrite                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| TKN                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Phosphorus              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| <b>PLASTICISERS</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate      | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate    | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### HUIA VILLAGE WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procyimdone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |



## APPENDIX 1 Water quality at treatment plants

### HUIA VILLAGE WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| Boron                             | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 1.4            |               | ✓                            |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| Copper                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | ✓                            |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.15           |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### HUIA WTP TREATED

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic acid | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 2-4-Dichlorophenoxyacetic acid    | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 4-(2-4-Dichlorophenoxy) butano    | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Bentazone                         | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Dichlorprop                       | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| MCPA                              | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | ✓                            |
| Mecoprop (MCP)                    | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Picloram                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| Triclopyr                         | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| <b>CHEMICAL AND PHYSICAL</b>      |                 |                   |         |         |         |                    |                |               |                              |
| abs254                            | abs unit        | 52                | 0.17    | 0.01    | 0.03    | 0.03               |                |               | ✓                            |
| Alkalinity Total                  | mg/L            | 52                | 22.00   | 15.00   | 18.50   | 2.45               |                |               | ✓                            |
| Aluminium                         | mg/L            | 52                | 0.04    | 0.02    | 0.03    | 0.01               |                | 0.1           | ✓                            |
| Bromate                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                           | mg/L            | 13                | 0.02    | 0.00    | 0.01    | 0.01               |                |               | ✓                            |
| Calcium                           | mg/L            | 52                | 11.00   | 8.00    | 9.27    | 0.74               |                |               | ✓                            |
| Calcium Hardness                  | mg/L            | 52                | 28.00   | 20.00   | 24.38   | 2.67               |                |               | ✓                            |
| Chlorate                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Chloride                          | mg/L            | 13                | 23.00   | 19.00   | 21.00   | 1.58               |                | 250           | ✓                            |
| Chlorine Residual                 | mg/L            | 368               | 1.02    | 0.58    | 0.81    | 0.12               | 5              |               | ✓                            |
| Chlorite                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                            | Hazen unit      | 52                | 5.00    | 0.00    | 2.50    | 3.54               |                | 10            | ✓                            |
| Conductivity                      | mS/m            | 52                | 16.20   | 13.20   | 14.85   | 0.86               |                |               | ✓                            |
| Fluoride                          | mg/L            | 52                | 1.10    | 0.00    | 0.79    | 0.19               | 1.5            |               | ✓                            |
| Iodide                            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               |                |               | ✓                            |
| Iron                              | mg/L            | 52                | 0.02    | 0.01    | 0.01    | 0.00               |                | 0.2           | ✓                            |
| Magnesium                         | mg/L            | 52                | 3.30    | 2.00    | 2.65    | 0.39               |                |               | ✓                            |
| Magnesium Hardness                | mg/L            | 52                | 13.00   | 8.20    | 10.03   | 1.35               |                |               | ✓                            |
| Manganese                         | mg/L            | 52                | 0.01    | 0.00    | 0.00    | 0.00               | 0.4            | 0.04          | ✓                            |
| pH                                | pH unit         | 368               | 8.60    | 7.30    | 7.84    | 0.40               |                | 7.0-8.5       | ✓                            |
| Potassium                         | mg/L            | 13                | 0.97    | 0.84    | 0.91    | 0.04               |                |               | ✓                            |
| Silicon                           | mg/L            | 13                | 17.00   | 12.00   | 14.20   | 1.92               |                |               | ✓                            |
| Sodium                            | mg/L            | 13                | 13.00   | 10.00   | 11.50   | 1.29               |                | 200           | ✓                            |
| Sulphate                          | mg/L            | 13                | 17.00   | 13.00   | 15.00   | 1.58               |                | 250           | ✓                            |
| Suspended Solids                  | mg/L            | 52                | 0.50    | 0.00    | 0.28    | 0.14               |                |               | ✓                            |
| Total Hardness                    | mg/L            | 52                | 41.00   | 29.00   | 33.80   | 3.61               |                | 200           | ✓                            |
| Total Organic Carbon              | mg/L            | 52                | 1.80    | 0.80    | 1.30    | 0.33               |                |               | ✓                            |
| Turbidity                         | NTU             | 368               | 0.90    | 0.00    | 0.35    | 0.29               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>               |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                  | MPN/100 mL      | 368               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### HUIA WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 13                | 0.01    | 0.00    | 0.00    | 0.00               |                |               | ✓                            |
| Nitrate  | mg/L            | 13                | 0.06    | 0.03    | 0.04    | 0.01               | 50             |               | ✓                            |
| Nitrite  | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.2            |               | ✓                            |
| TKN  | mg/L            | 13                | 0.26    | 0.00    | 0.15    | 0.12               |                |               | ✓                            |
| Total Phosphorus   | mg/L            | 13                | 0.18    | 0.00    | 0.05    | 0.08               |                |               | ✓                            |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### HUIA WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.02           |               | ✓                            |
| Arsenic                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | ✓                            |
| Barium                            | mg/L            | 13                | 0.01    | 0.00    | 0.00    | 0.00               | 0.7            |               | ✓                            |
| Boron                             | mg/L            | 13                | 0.01    | 0.01    | 0.01    | 0.00               | 1.4            |               | ✓                            |
| Cadmium                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | ✓                            |
| Copper                            | mg/L            | 13                | 0.02    | 0.00    | 0.00    | 0.00               | 2              |               | ✓                            |
| Cyanide                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead                              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | ✓                            |
| Lithium                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                |               | ✓                            |
| Mercury                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel                            | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.08           |               | ✓                            |
| Selenium                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc                              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | ✓                            |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 52                | 0.02    | 0.00    | 0.01    | 0.00               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 52                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 52                | 0.02    | 0.00    | 0.01    | 0.00               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 52                | 0.01    | 0.00    | 0.01    | 0.00               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 51                | 0.34    | 0.12    | 0.20    | 0.05               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 13                | 0.03    | 0.00    | 0.01    | 0.01               |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### MURIWAI WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 76.00   | 76.00   | 76.00   |                    |                |               | ✓                            |
| Aluminium                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | ✓                            |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                                 | mg/L            | 1                 | 0.13    | 0.13    | 0.13    |                    |                |               | ✓                            |
| Calcium                                 | mg/L            | 1                 | 7.50    | 7.50    | 7.50    |                    |                |               | ✓                            |
| Calcium Hardness                        | mg/L            | 1                 | 19.00   | 19.00   | 19.00   |                    |                |               | ✓                            |
| Chlorate                                | mg/L            | 1                 | 0.18    | 0.18    | 0.18    |                    | 0.8            |               | ✓                            |
| Chloride                                | mg/L            | 1                 | 69.00   | 69.00   | 69.00   |                    |                | 250           | ✓                            |
| Chlorine Residual                       | mg/L            | 122               | 0.98    | 0.53    | 0.77    | 0.11               | 5              |               | ✓                            |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                            | mS/m            | 1                 | 41.20   | 41.20   | 41.20   |                    |                |               | ✓                            |
| Fluoride                                | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    | 1.5            |               | ✓                            |
| Iodide                                  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | ✓                            |
| Iron                                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | ✓                            |
| Magnesium Hardness                      | mg/L            | 1                 | 27.00   | 27.00   | 27.00   |                    |                |               | ✓                            |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | ✓                            |
| pH                                      | pH unit         | 122               | 8.20    | 7.30    | 7.73    | 0.32               |                | 7.0-8.5       | ✓                            |
| Potassium                               | mg/L            | 1                 | 1.90    | 1.90    | 1.90    |                    |                |               | ✓                            |
| Silicon                                 | mg/L            | 1                 | 64.00   | 64.00   | 64.00   |                    |                |               | ✓                            |
| Sodium                                  | mg/L            | 1                 | 61.00   | 61.00   | 61.00   |                    |                | 200           | ✓                            |
| Sulphate                                | mg/L            | 1                 | 15.00   | 15.00   | 15.00   |                    |                | 250           | ✓                            |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Dissolved Solids                  | mg/L            | 1                 | 290.00  | 290.00  | 290.00  |                    |                | 1000          | ✓                            |
| Total Hardness                          | mg/L            | 1                 | 46.00   | 46.00   | 46.00   |                    |                | 200           | ✓                            |
| Turbidity                               | NTU             | 122               | 0.25    | 0.00    | 0.14    | 0.10               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | ✓                            |
| Nitrate                                 | mg/L            | 1                 | 0.67    | 0.67    | 0.67    |                    | 50             |               | ✓                            |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Phosphorus                        | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | ✓                            |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |



## APPENDIX 1 Water quality at treatment plants

### MURIWAI WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procyimdone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |
| <b>TRACE ELEMENTS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Antimony   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Arsenic  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Barium   | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 0.7            |               | ✓                            |
| Boron  | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    | 1.4            |               | ✓                            |
| Cadmium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| Copper   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Cyanide  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Mercury  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | ✓                            |
| Selenium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc   | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### MURIWAI WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 12                | 0.01    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 11                | 0.11    | 0.03    | 0.05    | 0.03               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### ONEHUNGA WTP TREATED

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic acid | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 2-4-Dichlorophenoxyacetic acid    | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 4-(2-4-Dichlorophenoxy) butano    | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Bentazone                         | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Dichlorprop                       | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| MCPA                              | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | ✓                            |
| Mecoprop (MCP)                    | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Picloram                          | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| Triclopyr                         | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| <b>CHEMICAL AND PHYSICAL</b>      |                 |                   |         |         |         |                    |                |               |                              |
| abs254                            | abs unit        | 52                | 0.02    | 0.00    | 0.01    | 0.00               |                |               | ✓                            |
| Alkalinity Total                  | mg/L            | 52                | 72.00   | 45.00   | 58.96   | 8.00               |                |               | ✓                            |
| Aluminium                         | mg/L            | 53                | 0.04    | 0.02    | 0.03    | 0.01               |                | 0.1           | ✓                            |
| Bromate                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                           | mg/L            | 13                | 0.06    | 0.01    | 0.03    | 0.01               |                |               | ✓                            |
| Calcium                           | mg/L            | 53                | 11.00   | 7.20    | 8.57    | 0.99               |                |               | ✓                            |
| Calcium Hardness                  | mg/L            | 53                | 29.00   | 18.00   | 23.36   | 3.75               |                |               | ✓                            |
| Chlorate                          | mg/L            | 13                | 0.05    | 0.02    | 0.04    | 0.01               | 0.8            |               | ✓                            |
| Chloride                          | mg/L            | 13                | 43.00   | 17.00   | 23.00   | 7.84               |                | 250           | ✓                            |
| Chlorine Residual                 | mg/L            | 367               | 1.29    | 0.63    | 0.89    | 0.14               | 5              |               | ✓                            |
| Chlorite                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                            | Hazen unit      | 52                | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                      | mS/m            | 52                | 27.80   | 10.50   | 23.85   | 3.04               |                |               | ✓                            |
| Fluoride                          | mg/L            | 53                | 0.18    | 0.04    | 0.10    | 0.04               | 1.5            |               | ✓                            |
| Iodide                            | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.00               |                |               | ✓                            |
| Iron                              | mg/L            | 53                | 0.01    | 0.00    | 0.00    | 0.00               |                | 0.2           | ✓                            |
| Magnesium                         | mg/L            | 53                | 9.80    | 6.60    | 8.16    | 0.98               |                |               | ✓                            |
| Magnesium Hardness                | mg/L            | 53                | 40.00   | 27.00   | 33.50   | 4.18               |                |               | ✓                            |
| Manganese                         | mg/L            | 53                | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | ✓                            |
| pH                                | pH unit         | 367               | 8.30    | 7.30    | 7.86    | 0.34               |                | 7.0-8.5       | ✓                            |
| Potassium                         | mg/L            | 13                | 3.60    | 2.60    | 3.14    | 0.36               |                |               | ✓                            |
| Silicon                           | mg/L            | 13                | 39.00   | 27.00   | 32.40   | 3.78               |                |               | ✓                            |
| Sodium                            | mg/L            | 13                | 25.00   | 18.00   | 21.83   | 2.64               |                | 200           | ✓                            |
| Sulphate                          | mg/L            | 13                | 20.00   | 12.00   | 15.67   | 3.01               |                | 250           | ✓                            |
| Suspended Solids                  | mg/L            | 52                | 0.30    | 0.00    | 0.19    | 0.13               |                |               | ✓                            |
| Total Hardness                    | mg/L            | 53                | 68.00   | 46.00   | 56.48   | 6.73               |                | 200           | ✓                            |
| Total Organic Carbon              | mg/L            | 52                | 1.10    | 0.30    | 0.70    | 0.27               |                |               | ✓                            |
| Turbidity                         | NTU             | 367               | 1.00    | 0.00    | 0.33    | 0.28               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>               |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                  | MPN/100 mL      | 367               | 2.00    | 0.00    | 1.00    | 1.41               | 1              |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### ONEHUNGA WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 13                | 0.07    | 0.02    | 0.04    | 0.01               |                |               | ✓                            |
| Nitrate  | mg/L            | 13                | 3.30    | 2.90    | 3.10    | 0.16               | 50             |               | ✓                            |
| Nitrite  | mg/L            | 13                | 0.01    | 0.00    | 0.01    | 0.00               | 0.2            |               | ✓                            |
| TKN  | mg/L            | 13                | 0.25    | 0.00    | 0.15    | 0.09               |                |               | ✓                            |
| Total Phosphorus   | mg/L            | 13                | 0.07    | 0.02    | 0.05    | 0.02               |                |               | ✓                            |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### ONEHUNGA WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.02           |               | ✓                            |
| Arsenic                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | ✓                            |
| Barium                            | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.7            |               | ✓                            |
| Boron                             | mg/L            | 13                | 0.07    | 0.04    | 0.06    | 0.01               | 1.4            |               | ✓                            |
| Cadmium                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | ✓                            |
| Copper                            | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 2              |               | ✓                            |
| Cyanide                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead                              | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                |               | ✓                            |
| Mercury                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.07           |               | ✓                            |
| Nickel                            | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.08           |               | ✓                            |
| Selenium                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | ✓                            |
| Zinc                              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | ✓                            |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 52                | 0.00    | 0.00    | 0.00    | 0.00               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 52                | 0.01    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 52                | 0.00    | 0.00    | 0.00    | 0.00               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 52                | 0.01    | 0.00    | 0.00    | 0.00               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 51                | 0.15    | 0.03    | 0.05    | 0.02               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | ✓                            |



## APPENDIX 1 Water quality at treatment plants

### SNELLS/ALGIES WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 200.00  | 200.00  | 200.00  |                    |                |               | ✓                            |
| Aluminium                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | ✓                            |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                                 | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    |                |               | ✓                            |
| Calcium                                 | mg/L            | 1                 | 3.60    | 3.60    | 3.60    |                    |                |               | ✓                            |
| Calcium Hardness                        | mg/L            | 1                 | 9.20    | 9.20    | 9.20    |                    |                |               | ✓                            |
| Chlorate                                | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.8            |               | ✓                            |
| Chloride                                | mg/L            | 1                 | 37.00   | 37.00   | 37.00   |                    |                | 250           | ✓                            |
| Chlorine Residual                       | mg/L            | 122               | 1.58    | 0.73    | 1.08    | 0.20               | 5              |               | ✓                            |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                            | mS/m            | 1                 | 49.20   | 49.20   | 49.20   |                    |                |               | ✓                            |
| Fluoride                                | mg/L            | 1                 | 0.13    | 0.13    | 0.13    |                    | 1.5            |               | ✓                            |
| Iodide                                  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | ✓                            |
| Iron                                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | ✓                            |
| Magnesium                               | mg/L            | 1                 | 0.31    | 0.31    | 0.31    |                    |                |               | ✓                            |
| Magnesium Hardness                      | mg/L            | 1                 | 1.30    | 1.30    | 1.30    |                    |                |               | ✓                            |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | ✓                            |
| pH                                      | pH unit         | 122               | 8.50    | 8.30    | 8.40    | 0.10               |                | 7.0-8.5       | ✓                            |
| Potassium                               | mg/L            | 1                 | 0.29    | 0.29    | 0.29    |                    |                |               | ✓                            |
| Silicon                                 | mg/L            | 1                 | 45.00   | 45.00   | 45.00   |                    |                |               | ✓                            |
| Sodium                                  | mg/L            | 1                 | 110.00  | 110.00  | 110.00  |                    |                | 200           | ✓                            |
| Sulphate                                | mg/L            | 1                 | 4.40    | 4.40    | 4.40    |                    |                | 250           | ✓                            |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Dissolved Solids                  | mg/L            | 1                 | 340.00  | 340.00  | 340.00  |                    |                | 1000          | ✓                            |
| Total Hardness                          | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                | 200           | ✓                            |
| Turbidity                               | NTU             | 122               | 0.25    | 0.00    | 0.14    | 0.10               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.08    | 0.08    | 0.08    |                    |                |               | ✓                            |
| Nitrate                                 | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 50             |               | ✓                            |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Phosphorus                        | mg/L            | 1                 | 0.09    | 0.09    | 0.09    |                    |                |               | ✓                            |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### SNELLS/ALGIES WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procyimdone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |
| <b>TRACE ELEMENTS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Antimony   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Arsenic  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Barium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| Boron  | mg/L            | 1                 | 0.16    | 0.16    | 0.16    |                    | 1.4            |               | ✓                            |
| Cadmium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| Copper   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Cyanide  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium  | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | ✓                            |
| Mercury  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | ✓                            |
| Selenium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### SNELLS/ALGIES WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.15           |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WAITAKERE WTP TREATED

| Component Name                 | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>         |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic   | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 2-4-Dichlorophenoxyacetic acid | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 4-(2-4-Dichlorophenoxy) butano | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Bentazone                      | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Dichlorprop                    | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| MCPA                           | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | ✓                            |
| Mecoprop (MCP)                 | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Picloram                       | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| Triclopyr                      | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | ✓                            |
| <b>CHEMICAL AND PHYSICAL</b>   |                 |                   |         |         |         |                    |                |               |                              |
| abs254                         | abs unit        | 51                | 0.06    | 0.01    | 0.02    | 0.01               |                |               | ✓                            |
| Alkalinity Total               | mg/L            | 51                | 24.00   | 13.00   | 18.09   | 3.48               |                |               | ✓                            |
| Aluminium                      | mg/L            | 52                | 0.05    | 0.02    | 0.03    | 0.01               |                | 0.1           | ✓                            |
| Bromate                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                        | mg/L            | 13                | 0.02    | 0.00    | 0.01    | 0.01               |                |               | ✓                            |
| Calcium                        | mg/L            | 52                | 13.00   | 8.60    | 10.15   | 1.33               |                |               | ✓                            |
| Calcium Hardness               | mg/L            | 52                | 31.00   | 21.00   | 26.00   | 3.32               |                |               | ✓                            |
| Chlorate                       | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Chloride                       | mg/L            | 13                | 27.00   | 19.00   | 23.14   | 2.79               |                | 250           | ✓                            |
| Chlorine Residual              | mg/L            | 354               | 1.30    | 0.52    | 0.84    | 0.19               | 5              |               | ✓                            |
| Chlorite                       | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                         | Hazen unit      | 51                | 5.00    | 0.00    | 2.50    | 3.54               |                | 10            | ✓                            |
| Conductivity                   | mS/m            | 51                | 17.60   | 9.90    | 15.42   | 1.48               |                |               | ✓                            |
| Fluoride                       | mg/L            | 52                | 1.10    | 0.03    | 0.80    | 0.19               | 1.5            |               | ✓                            |
| Iodide                         | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.00               |                |               | ✓                            |
| Iron                           | mg/L            | 52                | 0.03    | 0.01    | 0.02    | 0.01               |                | 0.2           | ✓                            |
| Magnesium                      | mg/L            | 52                | 3.00    | 1.80    | 2.40    | 0.39               |                |               | ✓                            |
| Magnesium Hardness             | mg/L            | 52                | 12.00   | 7.40    | 9.00    | 1.12               |                |               | ✓                            |
| Manganese                      | mg/L            | 52                | 0.03    | 0.00    | 0.01    | 0.01               | 0.4            | 0.04          | ✓                            |
| pH                             | pH unit         | 354               | 8.50    | 6.80    | 7.85    | 0.46               |                | 7.0-8.5       | ✓                            |
| Potassium                      | mg/L            | 13                | 1.20    | 0.85    | 0.98    | 0.11               |                |               | ✓                            |
| Silicon                        | mg/L            | 13                | 19.00   | 8.80    | 13.10   | 3.39               |                |               | ✓                            |
| Sodium                         | mg/L            | 13                | 15.00   | 9.70    | 12.45   | 1.95               |                | 200           | ✓                            |
| Sulphate                       | mg/L            | 13                | 18.00   | 13.00   | 15.60   | 2.07               |                | 250           | ✓                            |
| Suspended Solids               | mg/L            | 51                | 0.85    | 0.00    | 0.34    | 0.23               |                |               | ✓                            |
| Total Hardness                 | mg/L            | 52                | 43.00   | 34.00   | 37.88   | 3.04               |                | 200           | ✓                            |
| Total Organic Carbon           | mg/L            | 51                | 9.30    | 1.20    | 2.59    | 1.94               |                |               | ✓                            |
| Turbidity                      | NTU             | 354               | 0.70    | 0.10    | 0.35    | 0.19               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli               | MPN/100 mL      | 354               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WAITAKERE WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 14                | 0.01    | 0.00    | 0.00    | 0.00               |                |               | ✓                            |
| Nitrate  | mg/L            | 13                | 0.08    | 0.01    | 0.03    | 0.02               | 50             |               | ✓                            |
| Nitrite  | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.2            |               | ✓                            |
| TKN  | mg/L            | 14                | 0.31    | 0.00    | 0.15    | 0.09               |                |               | ✓                            |
| Total Phosphorus   | mg/L            | 14                | 0.01    | 0.00    | 0.01    | 0.01               |                |               | ✓                            |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |



## APPENDIX 1 Water quality at treatment plants

### WAITAKERE WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.02           |               | ✓                            |
| Arsenic                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | ✓                            |
| Barium                            | mg/L            | 13                | 0.01    | 0.00    | 0.01    | 0.00               | 0.7            |               | ✓                            |
| Boron                             | mg/L            | 13                | 0.02    | 0.01    | 0.01    | 0.00               | 1.4            |               | ✓                            |
| Cadmium                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | ✓                            |
| Copper                            | mg/L            | 13                | 0.01    | 0.00    | 0.00    | 0.00               | 2              |               | ✓                            |
| Cyanide                           | mg/L            | 5                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead                              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | ✓                            |
| Lithium                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                |               | ✓                            |
| Mercury                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel                            | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.08           |               | ✓                            |
| Selenium                          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc                              | mg/L            | 13                | 0.01    | 0.00    | 0.00    | 0.00               |                | 1.5           | ✓                            |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 51                | 0.03    | 0.01    | 0.02    | 0.01               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 51                | 0.01    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 51                | 0.03    | 0.00    | 0.02    | 0.01               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 51                | 0.03    | 0.00    | 0.01    | 0.01               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 50                | 0.63    | 0.17    | 0.35    | 0.10               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 14                | 0.05    | 0.00    | 0.02    | 0.03               |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WARKWORTH WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 30.00   | 30.00   | 30.00   |                    |                |               | ✓                            |
| Aluminium                               | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 0.1           | ✓                            |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                                 | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                |               | ✓                            |
| Calcium                                 | mg/L            | 1                 | 12.00   | 12.00   | 12.00   |                    |                |               | ✓                            |
| Calcium Hardness                        | mg/L            | 1                 | 29.00   | 29.00   | 29.00   |                    |                |               | ✓                            |
| Chlorate                                | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.8            |               | ✓                            |
| Chloride                                | mg/L            | 1                 | 24.00   | 24.00   | 24.00   |                    |                | 250           | ✓                            |
| Chlorine Residual                       | mg/L            | 122               | 1.83    | 0.54    | 1.04    | 0.27               | 5              |               | ✓                            |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                            | mS/m            | 1                 | 21.20   | 21.20   | 21.20   |                    |                |               | ✓                            |
| Fluoride                                | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 1.5            |               | ✓                            |
| Iodide                                  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Iron                                    | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                | 0.2           | ✓                            |
| Magnesium                               | mg/L            | 1                 | 3.50    | 3.50    | 3.50    |                    |                |               | ✓                            |
| Magnesium Hardness                      | mg/L            | 1                 | 14.00   | 14.00   | 14.00   |                    |                |               | ✓                            |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | ✓                            |
| pH                                      | pH unit         | 122               | 7.50    | 6.80    | 7.22    | 0.25               |                | 7.0-8.5       | ✓                            |
| Potassium                               | mg/L            | 1                 | 1.90    | 1.90    | 1.90    |                    |                |               | ✓                            |
| Silicon                                 | mg/L            | 1                 | 14.00   | 14.00   | 14.00   |                    |                |               | ✓                            |
| Sodium                                  | mg/L            | 1                 | 20.00   | 20.00   | 20.00   |                    |                | 200           | ✓                            |
| Sulphate                                | mg/L            | 1                 | 31.00   | 31.00   | 31.00   |                    |                | 250           | ✓                            |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Dissolved Solids                  | mg/L            | 1                 | 160.00  | 160.00  | 160.00  |                    |                | 1000          | ✓                            |
| Total Hardness                          | mg/L            | 1                 | 44.00   | 44.00   | 44.00   |                    |                | 200           | ✓                            |
| Total Organic Carbon                    | mg/L            | 12                | 3.30    | 1.00    | 1.71    | 0.71               |                |               | ✓                            |
| Turbidity                               | NTU             | 121               | 1.40    | 0.00    | 0.18    | 0.16               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Nitrate                                 | mg/L            | 1                 | 0.24    | 0.24    | 0.24    |                    | 50             |               | ✓                            |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Phosphorus                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WARKWORTH WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procyimdone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |
| <b>TRACE ELEMENTS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Antimony   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Arsenic  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Barium   | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 0.7            |               | ✓                            |
| Boron  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 1.4            |               | ✓                            |
| Cadmium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| Copper   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Cyanide  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Mercury  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | ✓                            |
| Selenium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc   | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WARKWORTH WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 12                | 0.01    | 0.00    | 0.01    | 0.00               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 12                | 0.01    | 0.00    | 0.01    | 0.00               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 12                | 0.01    | 0.00    | 0.01    | 0.00               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 11                | 0.29    | 0.06    | 0.16    | 0.07               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WELLSFORD WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 42.00   | 42.00   | 42.00   |                    |                |               | ✓                            |
| Aluminium                               | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                | 0.1           | ✓                            |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Bromide                                 | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                |               | ✓                            |
| Calcium                                 | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                |               | ✓                            |
| Calcium Hardness                        | mg/L            | 1                 | 28.00   | 28.00   | 28.00   |                    |                |               | ✓                            |
| Chlorate                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Chloride                                | mg/L            | 1                 | 26.00   | 26.00   | 26.00   |                    |                | 250           | ✓                            |
| Chlorine Residual                       | mg/L            | 122               | 2.20    | 0.47    | 1.04    | 0.32               | 5              |               | ✓                            |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | ✓                            |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | ✓                            |
| Conductivity                            | mS/m            | 1                 | 24.30   | 24.30   | 24.30   |                    |                |               | ✓                            |
| Fluoride                                | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 1.5            |               | ✓                            |
| Iodide                                  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Iron                                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | ✓                            |
| Magnesium                               | mg/L            | 1                 | 3.90    | 3.90    | 3.90    |                    |                |               | ✓                            |
| Magnesium Hardness                      | mg/L            | 1                 | 16.00   | 16.00   | 16.00   |                    |                |               | ✓                            |
| Manganese                               | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.4            | 0.04          | ✓                            |
| pH                                      | pH unit         | 122               | 7.70    | 6.90    | 7.34    | 0.27               |                | 7.0-8.5       | ✓                            |
| Potassium                               | mg/L            | 1                 | 2.10    | 2.10    | 2.10    |                    |                |               | ✓                            |
| Silicon                                 | mg/L            | 1                 | 15.00   | 15.00   | 15.00   |                    |                |               | ✓                            |
| Sodium                                  | mg/L            | 1                 | 27.00   | 27.00   | 27.00   |                    |                | 200           | ✓                            |
| Sulphate                                | mg/L            | 1                 | 30.00   | 30.00   | 30.00   |                    |                | 250           | ✓                            |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Total Dissolved Solids                  | mg/L            | 1                 | 170.00  | 170.00  | 170.00  |                    |                | 1000          | ✓                            |
| Total Hardness                          | mg/L            | 1                 | 44.00   | 44.00   | 44.00   |                    |                | 200           | ✓                            |
| Total Organic Carbon                    | mg/L            | 12                | 3.20    | 1.40    | 2.07    | 0.57               |                |               | ✓                            |
| Turbidity                               | NTU             | 122               | 0.90    | 0.00    | 0.44    | 0.28               |                | 2.5           | ✓                            |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | ✓                            |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Nitrate                                 | mg/L            | 1                 | 0.41    | 0.41    | 0.41    |                    | 50             |               | ✓                            |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | ✓                            |
| TKN                                     | mg/L            | 1                 | 0.15    | 0.15    | 0.15    |                    |                |               | ✓                            |
| Total Phosphorus                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | ✓                            |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### WELLSFORD WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | CV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | ✓                            |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | ✓                            |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | ✓                            |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | ✓                            |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | ✓                            |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | ✓                            |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | ✓                            |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | ✓                            |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | ✓                            |
| <b>TRACE ELEMENTS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Antimony   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Arsenic  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Barium   | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 0.7            |               | ✓                            |
| Boron  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 1.4            |               | ✓                            |
| Cadmium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | ✓                            |
| Chromium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| Copper   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | ✓                            |
| Cyanide  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| Lead   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Lithium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| Mercury  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | ✓                            |
| Molybdenum   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | ✓                            |
| Nickel   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | ✓                            |
| Selenium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| Zinc   | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | ✓                            |



## APPENDIX 1 Water quality at treatment plants

### WELLSFORD WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 12                | 0.02    | 0.00    | 0.01    | 0.00               | 0.06           |               | ✓                            |
| bromoform                         | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | ✓                            |
| chloroform                        | mg/L            | 12                | 0.03    | 0.01    | 0.02    | 0.01               | 0.4            |               | ✓                            |
| dibromochloromethane              | mg/L            | 12                | 0.02    | 0.00    | 0.01    | 0.01               | 0.15           |               | ✓                            |
| THM Ratio                         |                 | 11                | 0.44    | 0.13    | 0.32    | 0.08               |                |               | ✓                            |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | ✓                            |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | ✓                            |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | ✓                            |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | ✓                            |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | ✓                            |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | ✓                            |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | ✓                            |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | ✓                            |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | ✓                            |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | ✓                            |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | ✓                            |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | ✓                            |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | ✓                            |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED A

| Component Name                     | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|------------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic       | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 2-4-Dichlorophenoxyacetic acid     | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 4-(2-4-Dichlorophenoxy) butano     | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Bentazone                          | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Dichlorprop                        | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| MCPA                               | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | Yes                          |
| Mecoprop (MCP)                     | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Picloram                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| Triclopyr                          | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| <b>CHEMICAL AND PHYSICAL</b>       |                 |                   |         |         |         |                    |                |               |                              |
| abs254                             | abs unit        | 47                | 0.03    | 0.00    | 0.02    | 0.01               |                |               | Yes                          |
| Alkalinity Total                   | mg/L            | 47                | 21.00   | 0.00    | 15.86   | 7.20               |                |               | Yes                          |
| Aluminium                          | mg/L            | 47                | 0.05    | 0.02    | 0.03    | 0.01               |                | 0.1           | Yes                          |
| Bromate                            | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                            | mg/L            | 12                | 0.02    | 0.00    | 0.01    | 0.01               |                |               | Yes                          |
| Calcium                            | mg/L            | 47                | 8.10    | 6.40    | 7.21    | 0.52               |                |               | Yes                          |
| Calcium Hardness                   | mg/L            | 47                | 20.00   | 16.00   | 18.00   | 1.58               |                |               | Yes                          |
| Chlorate                           | mg/L            | 12                | 0.17    | 0.00    | 0.04    | 0.05               | 0.8            |               | Yes                          |
| Chloride                           | mg/L            | 12                | 14.00   | 12.00   | 13.00   | 1.00               |                | 250           | Yes                          |
| Chlorine Residual                  | mg/L            | 337               | 1.45    | 0.54    | 1.10    | 0.21               | 5              |               | Yes                          |
| Chlorite                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                             | Hazen unit      | 47                | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                       | mS/m            | 46                | 12.10   | 8.80    | 10.66   | 0.78               |                |               | Yes                          |
| Fluoride                           | mg/L            | 47                | 1.00    | 0.00    | 0.75    | 0.27               | 1.5            |               | Yes                          |
| Iodide                             | mg/L            | 12                | 0.01    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Iron                               | mg/L            | 47                | 0.02    | 0.01    | 0.01    | 0.00               |                | 0.2           | Yes                          |
| Magnesium                          | mg/L            | 47                | 1.80    | 1.30    | 1.55    | 0.19               |                |               | Yes                          |
| Magnesium Hardness                 | mg/L            | 47                | 7.30    | 5.30    | 6.19    | 0.60               |                |               | Yes                          |
| Manganese                          | mg/L            | 47                | 0.01    | 0.00    | 0.00    | 0.00               | 0.4            | 0.04          | Yes                          |
| pH                                 | pH unit         | 337               | 8.50    | 6.90    | 7.77    | 0.49               |                | 7.0-8.5       | Yes                          |
| Potassium                          | mg/L            | 12                | 1.10    | 0.96    | 1.01    | 0.06               |                |               | Yes                          |
| Silicon                            | mg/L            | 12                | 17.00   | 13.00   | 15.00   | 1.58               |                |               | Yes                          |
| Sodium                             | mg/L            | 12                | 9.80    | 7.30    | 8.56    | 0.70               |                | 200           | Yes                          |
| Sulphate                           | mg/L            | 12                | 8.50    | 7.20    | 7.85    | 0.44               |                | 250           | Yes                          |
| Suspended Solids                   | mg/L            | 47                | 0.30    | 0.00    | 0.19    | 0.13               |                |               | Yes                          |
| Total Hardness                     | mg/L            | 47                | 28.00   | 21.00   | 24.14   | 2.41               |                | 200           | Yes                          |
| Total Organic Carbon               | mg/L            | 47                | 1.80    | 0.70    | 1.19    | 0.36               |                |               | Yes                          |
| Turbidity                          | NTU             | 337               | 0.45    | 0.00    | 0.24    | 0.15               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                |                 |                   |         |         |         |                    |                |               |                              |
| Confirmed Cryptosporidium per 100L | /100 L          | 12                | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| Confirmed Giardia per 100L         | /100 L          | 12                | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| Escherichia coli                   | MPN/100 mL      | 359               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED A (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 12                | 0.01    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Nitrate  | mg/L            | 12                | 0.08    | 0.02    | 0.04    | 0.02               | 50             |               | Yes                          |
| Nitrite  | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.2            |               | Yes                          |
| TKN  | mg/L            | 12                | 0.18    | 0.00    | 0.10    | 0.09               |                |               | Yes                          |
| Total Phosphorus   | mg/L            | 12                | 0.02    | 0.00    | 0.01    | 0.01               |                |               | Yes                          |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED A (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 12                | 0.01    | 0.01    | 0.01    | 0.00               | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 12                | 0.01    | 0.01    | 0.01    | 0.00               | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Mercury                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 12                | 0.00    | 0.00    | 0.00    | 0.00               | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 12                | 0.01    | 0.00    | 0.00    | 0.00               |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 47                | 0.02    | 0.00    | 0.01    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 47                | 0.02    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 47                | 0.02    | 0.00    | 0.01    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 47                | 0.02    | 0.00    | 0.01    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 35                | 0.29    | 0.08    | 0.16    | 0.04               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 12                | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 12                | 0.01    | 0.00    | 0.01    | 0.01               |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B

| Component Name                 | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>         |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic   | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 2-4-Dichlorophenoxyacetic acid | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 4-(2-4-Dichlorophenoxy) butano | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Bentazone                      | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Dichlorprop                    | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| MCPA                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | Yes                          |
| Mecoprop (MCP)                 | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Picloram                       | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| Triclopyr                      | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |

### CHEMICAL AND PHYSICAL

|                      |            |     |       |       |       |      |      |         |     |
|----------------------|------------|-----|-------|-------|-------|------|------|---------|-----|
| abs254               | abs unit   | 35  | 0.02  | 0.00  | 0.01  | 0.01 |      |         | Yes |
| Alkalinity Total     | mg/L       | 35  | 21.00 | 16.00 | 18.50 | 1.87 |      |         | Yes |
| Aluminium            | mg/L       | 35  | 0.03  | 0.02  | 0.03  | 0.00 |      | 0.1     | Yes |
| Bromate              | mg/L       | 9   | 0.00  | 0.00  | 0.00  |      | 0.01 |         | Yes |
| Bromide              | mg/L       | 9   | 0.02  | 0.00  | 0.01  | 0.01 |      |         | Yes |
| Calcium              | mg/L       | 35  | 8.40  | 5.90  | 7.05  | 0.65 |      |         | Yes |
| Calcium Hardness     | mg/L       | 35  | 21.00 | 15.00 | 18.00 | 2.16 |      |         | Yes |
| Chlorate             | mg/L       | 9   | 0.04  | 0.02  | 0.03  | 0.01 | 0.8  |         | Yes |
| Chloride             | mg/L       | 9   | 14.00 | 12.00 | 13.00 | 1.00 |      | 250     | Yes |
| Chlorine Residual    | mg/L       | 264 | 1.17  | 0.49  | 0.95  | 0.17 | 5    |         | Yes |
| Chlorite             | mg/L       | 9   | 0.00  | 0.00  | 0.00  |      | 0.8  |         | Yes |
| Colour               | Hazen unit | 35  | 0.00  | 0.00  | 0.00  |      |      | 10      | Yes |
| Conductivity         | mS/m       | 35  | 12.80 | 9.60  | 10.66 | 0.82 |      |         | Yes |
| Fluoride             | mg/L       | 35  | 1.00  | 0.64  | 0.85  | 0.09 | 1.5  |         | Yes |
| Iodide               | mg/L       | 9   | 0.00  | 0.00  | 0.00  | 0.00 |      |         | Yes |
| Iron                 | mg/L       | 35  | 0.02  | 0.01  | 0.01  | 0.00 |      | 0.2     | Yes |
| Magnesium            | mg/L       | 35  | 1.80  | 1.20  | 1.50  | 0.22 |      |         | Yes |
| Magnesium Hardness   | mg/L       | 35  | 7.30  | 4.90  | 6.06  | 0.66 |      |         | Yes |
| Manganese            | mg/L       | 35  | 0.01  | 0.00  | 0.00  | 0.00 | 0.4  | 0.04    | Yes |
| pH                   | pH unit    | 264 | 8.50  | 6.90  | 7.83  | 0.44 |      | 7.0-8.5 | Yes |
| Potassium            | mg/L       | 9   | 1.10  | 0.95  | 1.00  | 0.06 |      |         | Yes |
| Silicon              | mg/L       | 9   | 16.00 | 13.00 | 14.50 | 1.29 |      |         | Yes |
| Sodium               | mg/L       | 9   | 9.10  | 7.50  | 8.41  | 0.54 |      | 200     | Yes |
| Sulphate             | mg/L       | 9   | 9.00  | 7.20  | 7.93  | 0.58 |      | 250     | Yes |
| Suspended Solids     | mg/L       | 35  | 0.30  | 0.00  | 0.19  | 0.13 |      |         | Yes |
| Total Hardness       | mg/L       | 35  | 28.00 | 20.00 | 23.63 | 2.67 |      | 200     | Yes |
| Total Organic Carbon | mg/L       | 35  | 4.10  | 0.70  | 1.45  | 1.00 |      |         | Yes |
| Turbidity            | NTU        | 264 | 0.45  | 0.00  | 0.23  | 0.15 |      | 2.5     | Yes |

### MICROBIOLOGY

|                                    |            |     |      |      |      |      |   |  |     |
|------------------------------------|------------|-----|------|------|------|------|---|--|-----|
| Confirmed Cryptosporidium per 100L | /100 L     | 7   | 0.00 | 0.00 | 0.00 |      | 1 |  | Yes |
| Confirmed Giardia per 100L         | /100 L     | 7   | 0.00 | 0.00 | 0.00 |      | 1 |  | Yes |
| Escherichia coli                   | MPN/100 mL | 264 | 0.00 | 0.00 | 0.00 | 0.71 | 1 |  | Yes |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 9                 | 0.01    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Nitrate  | mg/L            | 9                 | 0.08    | 0.02    | 0.04    | 0.02               | 50             |               | Yes                          |
| Nitrite  | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.2            |               | Yes                          |
| TKN  | mg/L            | 9                 | 0.23    | 0.00    | 0.11    | 0.12               |                |               | Yes                          |
| Total Phosphorus   | mg/L            | 9                 | 0.01    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |



## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 9                 | 0.01    | 0.01    | 0.01    | 0.00               | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 9                 | 0.01    | 0.01    | 0.01    | 0.00               | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 9                 | 0.01    | 0.00    | 0.00    | 0.00               | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Mercury                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 9                 | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 35                | 0.01    | 0.01    | 0.01    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 35                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 35                | 0.01    | 0.01    | 0.01    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 35                | 0.01    | 0.00    | 0.01    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 26                | 0.28    | 0.14    | 0.19    | 0.05               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 9                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 9                 | 0.01    | 0.00    | 0.00    | 0.00               |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B1

| Component Name                 | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>         |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic   | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 2-4-Dichlorophenoxyacetic acid | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 4-(2-4-Dichlorophenoxy) butano | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Bentazone                      | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Dichlorprop                    | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| MCPA                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | Yes                          |
| Mecoprop (MCP)                 | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Picloram                       | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| Triclopyr                      | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| <b>CHEMICAL AND PHYSICAL</b>   |                 |                   |         |         |         |                    |                |               |                              |
| abs254                         | abs unit        | 17                | 0.02    | 0.01    | 0.01    | 0.00               |                |               | Yes                          |
| Alkalinity Total               | mg/L            | 17                | 21.00   | 17.00   | 19.00   | 1.58               |                |               | Yes                          |
| Aluminium                      | mg/L            | 17                | 0.03    | 0.02    | 0.03    | 0.00               |                | 0.1           | Yes                          |
| Bromate                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Calcium                        | mg/L            | 17                | 7.70    | 7.00    | 7.36    | 0.26               |                |               | Yes                          |
| Calcium Hardness               | mg/L            | 17                | 19.00   | 17.00   | 18.00   | 1.00               |                |               | Yes                          |
| Chlorate                       | mg/L            | 4                 | 0.03    | 0.00    | 0.01    | 0.02               | 0.8            |               | Yes                          |
| Chloride                       | mg/L            | 4                 | 14.00   | 12.00   | 13.00   | 1.41               |                | 250           | Yes                          |
| Chlorine Residual              | mg/L            | 122               | 1.25    | 0.89    | 1.07    | 0.10               | 5              |               | Yes                          |
| Chlorite                       | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                         | Hazen unit      | 17                | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                   | mS/m            | 17                | 11.60   | 10.20   | 10.93   | 0.46               |                |               | Yes                          |
| Fluoride                       | mg/L            | 17                | 0.96    | 0.64    | 0.83    | 0.10               | 1.5            |               | Yes                          |
| Iodide                         | mg/L            | 4                 | 0.01    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Iron                           | mg/L            | 17                | 0.02    | 0.01    | 0.01    | 0.00               |                | 0.2           | Yes                          |
| Magnesium                      | mg/L            | 17                | 1.70    | 1.40    | 1.55    | 0.13               |                |               | Yes                          |
| Magnesium Hardness             | mg/L            | 17                | 6.80    | 5.60    | 6.18    | 0.39               |                |               | Yes                          |
| Manganese                      | mg/L            | 17                | 0.00    | 0.00    | 0.00    | 0.00               | 0.4            | 0.04          | Yes                          |
| pH                             | pH unit         | 122               | 8.40    | 7.80    | 8.10    | 0.22               |                | 7.0-8.5       | Yes                          |
| Potassium                      | mg/L            | 4                 | 1.00    | 1.00    | 1.00    |                    |                |               | Yes                          |
| Silicon                        | mg/L            | 4                 | 16.00   | 13.00   | 14.67   | 1.53               |                |               | Yes                          |
| Sodium                         | mg/L            | 4                 | 9.10    | 8.10    | 8.57    | 0.50               |                | 200           | Yes                          |
| Sulphate                       | mg/L            | 4                 | 8.30    | 7.30    | 7.67    | 0.55               |                | 250           | Yes                          |
| Suspended Solids               | mg/L            | 17                | 0.20    | 0.00    | 0.10    | 0.14               |                |               | Yes                          |
| Total Hardness                 | mg/L            | 17                | 26.00   | 23.00   | 24.50   | 1.29               |                | 200           | Yes                          |
| Total Organic Carbon           | mg/L            | 17                | 1.70    | 0.90    | 1.26    | 0.29               |                |               | Yes                          |
| Turbidity                      | NTU             | 122               | 0.70    | 0.00    | 0.24    | 0.22               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli               | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B1 (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 4                 | 0.01    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Nitrate  | mg/L            | 4                 | 0.06    | 0.03    | 0.05    | 0.01               | 50             |               | Yes                          |
| Nitrite  | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN  | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus   | mg/L            | 4                 | 0.10    | 0.00    | 0.04    | 0.06               |                |               | Yes                          |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B1 (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 4                 | 0.01    | 0.01    | 0.01    | 0.00               | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.00               | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               | 2              |               | Yes                          |
| Lead                              | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Mercury                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | Yes                          |
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 17                | 0.02    | 0.01    | 0.01    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 17                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 17                | 0.01    | 0.01    | 0.01    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 17                | 0.01    | 0.01    | 0.01    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 13                | 0.34    | 0.14    | 0.22    | 0.05               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.01               |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B2

| Component Name                 | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>         |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic   | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 2-4-Dichlorophenoxyacetic acid | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 4-(2-4-Dichlorophenoxy) butano | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Bentazone                      | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Dichlorprop                    | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| MCPA                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | Yes                          |
| Mecoprop (MCP)                 | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Picloram                       | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| Triclopyr                      | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| <b>CHEMICAL AND PHYSICAL</b>   |                 |                   |         |         |         |                    |                |               |                              |
| abs254                         | abs unit        | 17                | 0.03    | 0.01    | 0.02    | 0.00               |                |               | Yes                          |
| Alkalinity Total               | mg/L            | 17                | 21.00   | 16.00   | 18.60   | 2.07               |                |               | Yes                          |
| Aluminium                      | mg/L            | 17                | 0.03    | 0.02    | 0.02    | 0.00               |                | 0.1           | Yes                          |
| Bromate                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Calcium                        | mg/L            | 17                | 7.70    | 6.90    | 7.32    | 0.28               |                |               | Yes                          |
| Calcium Hardness               | mg/L            | 17                | 19.00   | 17.00   | 18.00   | 1.00               |                |               | Yes                          |
| Chlorate                       | mg/L            | 4                 | 0.03    | 0.00    | 0.01    | 0.02               | 0.8            |               | Yes                          |
| Chloride                       | mg/L            | 4                 | 14.00   | 12.00   | 13.00   | 1.00               |                | 250           | Yes                          |
| Chlorine Residual              | mg/L            | 122               | 1.34    | 0.76    | 1.05    | 0.12               | 5              |               | Yes                          |
| Chlorite                       | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                         | Hazen unit      | 17                | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                   | mS/m            | 17                | 11.50   | 10.20   | 10.84   | 0.44               |                |               | Yes                          |
| Fluoride                       | mg/L            | 17                | 0.96    | 0.64    | 0.82    | 0.10               | 1.5            |               | Yes                          |
| Iodide                         | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Iron                           | mg/L            | 17                | 0.02    | 0.01    | 0.02    | 0.00               |                | 0.2           | Yes                          |
| Magnesium                      | mg/L            | 17                | 1.60    | 1.40    | 1.50    | 0.10               |                |               | Yes                          |
| Magnesium Hardness             | mg/L            | 17                | 6.70    | 5.60    | 6.14    | 0.35               |                |               | Yes                          |
| Manganese                      | mg/L            | 17                | 0.01    | 0.00    | 0.00    | 0.00               | 0.4            | 0.04          | Yes                          |
| pH                             | pH unit         | 122               | 8.40    | 7.60    | 8.00    | 0.27               |                | 7.0-8.5       | Yes                          |
| Potassium                      | mg/L            | 4                 | 1.00    | 1.00    | 1.00    |                    |                |               | Yes                          |
| Silicon                        | mg/L            | 4                 | 16.00   | 13.00   | 14.67   | 1.53               |                |               | Yes                          |
| Sodium                         | mg/L            | 4                 | 9.20    | 8.00    | 8.55    | 0.50               |                | 200           | Yes                          |
| Sulphate                       | mg/L            | 4                 | 8.40    | 7.30    | 7.70    | 0.61               |                | 250           | Yes                          |
| Suspended Solids               | mg/L            | 17                | 0.30    | 0.00    | 0.19    | 0.11               |                |               | Yes                          |
| Total Hardness                 | mg/L            | 17                | 25.00   | 23.00   | 24.00   | 1.00               |                | 200           | Yes                          |
| Total Organic Carbon           | mg/L            | 17                | 1.40    | 0.80    | 1.10    | 0.22               |                |               | Yes                          |
| Turbidity                      | NTU             | 122               | 0.40    | 0.00    | 0.20    | 0.13               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli               | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B2 (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus  | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.00               |                |               | Yes                          |
| Nitrate  | mg/L            | 4                 | 0.07    | 0.03    | 0.05    | 0.01               | 50             |               | Yes                          |
| Nitrite  | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN  | mg/L            | 4                 | 0.10    | 0.00    | 0.05    | 0.07               |                |               | Yes                          |
| Total Phosphorus   | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.01               |                |               | Yes                          |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### ARDMORE WTP TREATED B2 (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 4                 | 0.01    | 0.01    | 0.01    | 0.00               | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 4                 | 0.01    | 0.00    | 0.01    | 0.00               | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               | 2              |               | Yes                          |
| Lead                              | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Mercury                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 4                 | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 17                | 0.02    | 0.01    | 0.01    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 17                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 17                | 0.02    | 0.01    | 0.01    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 17                | 0.01    | 0.01    | 0.01    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 13                | 0.34    | 0.14    | 0.23    | 0.06               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 4                 | 0.02    | 0.00    | 0.01    | 0.01               |                | 1.5           | Yes                          |



## APPENDIX 1 Water quality at treatment plants

### BOMBAY WTP TREATED

| Component Name                | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total              | mg/L            | 1                 | 43.00   | 43.00   | 43.00   |                    |                |               | Yes                          |
| Aluminium                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                       | mg/L            | 1                 | 0.08    | 0.08    | 0.08    |                    |                |               | Yes                          |
| Calcium                       | mg/L            | 1                 | 13.00   | 13.00   | 13.00   |                    |                |               | Yes                          |
| Calcium Hardness              | mg/L            | 1                 | 33.00   | 33.00   | 33.00   |                    |                |               | Yes                          |
| Chlorate                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                      | mg/L            | 1                 | 39.00   | 39.00   | 39.00   |                    |                | 250           | Yes                          |
| Chlorine Residual             | mg/L            | 123               | 1.31    | 0.31    | 0.87    | 0.23               | 5              |               | Yes                          |
| Chlorite                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                        | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                  | mS/m            | 53                | 48.70   | 29.00   | 36.98   | 4.46               |                |               | Yes                          |
| Fluoride                      | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    | 1.5            |               | Yes                          |
| Iodide                        | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                          | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                | 0.2           | Yes                          |
| Magnesium                     | mg/L            | 1                 | 13.00   | 13.00   | 13.00   |                    |                |               | Yes                          |
| Magnesium Hardness            | mg/L            | 1                 | 52.00   | 52.00   | 52.00   |                    |                |               | Yes                          |
| Manganese                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | Yes                          |
| pH                            | pH unit         | 122               | 8.10    | 7.00    | 7.55    | 0.36               |                | 7.0-8.5       | Yes                          |
| Potassium                     | mg/L            | 1                 | 1.50    | 1.50    | 1.50    |                    |                |               | Yes                          |
| Silicon                       | mg/L            | 1                 | 41.00   | 41.00   | 41.00   |                    |                |               | Yes                          |
| Sodium                        | mg/L            | 1                 | 18.00   | 18.00   | 18.00   |                    |                | 200           | Yes                          |
| Sulphate                      | mg/L            | 1                 | 2.10    | 2.10    | 2.10    |                    |                | 250           | Yes                          |
| Suspended Solids              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids        | mg/L            | 1                 | 220.00  | 220.00  | 220.00  |                    |                | 1000          | Yes                          |
| Total Hardness                | mg/L            | 1                 | 85.00   | 85.00   | 85.00   |                    |                | 200           | Yes                          |
| Total Organic Carbon          | mg/L            | 12                | 1.40    | 0.20    | 0.64    | 0.39               |                |               | Yes                          |
| Turbidity                     | NTU             | 122               | 0.30    | 0.00    | 0.17    | 0.11               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli              | MPN/100 mL      | 124               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>              |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | Yes                          |
| Nitrate                       | mg/L            | 61                | 14.00   | 1.60    | 5.91    | 2.89               | 50             |               | Yes                          |
| Nitrite                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus              | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate      | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate    | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### BOMBAY WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procyimdone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### BOMBAY WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 13                | 0.01    | 0.01    | 0.01    | 0.00               | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.10    | 0.10    | 0.10    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.14    | 0.14    | 0.14    |                    |                | 1.5           | Yes                          |
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 12                | 0.04    | 0.00    | 0.01    | 0.02               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### BUCKLAND WTP TREATED

| Component Name               | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b> |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total             | mg/L            | 1                 | 110.00  | 110.00  | 110.00  |                    |                |               | Yes                          |
| Aluminium                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                      | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | Yes                          |
| Calcium                      | mg/L            | 1                 | 21.00   | 21.00   | 21.00   |                    |                |               | Yes                          |
| Calcium Hardness             | mg/L            | 1                 | 52.00   | 52.00   | 52.00   |                    |                |               | Yes                          |
| Chlorate                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                     | mg/L            | 1                 | 25.00   | 25.00   | 25.00   |                    |                | 250           | Yes                          |
| Chlorine Residual            | mg/L            | 121               | 1.07    | 0.27    | 0.66    | 0.19               | 5              |               | Yes                          |
| Chlorite                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                       | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                 | mS/m            | 1                 | 28.50   | 28.50   | 28.50   |                    |                |               | Yes                          |
| Fluoride                     | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    | 1.5            |               | Yes                          |
| Iodide                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Iron                         | mg/L            | 1                 | 0.12    | 0.12    | 0.12    |                    |                | 0.2           | Yes                          |
| Magnesium                    | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                |               | Yes                          |
| Magnesium Hardness           | mg/L            | 1                 | 44.00   | 44.00   | 44.00   |                    |                |               | Yes                          |
| Manganese                    | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 0.4            | 0.04          | Yes                          |
| pH                           | pH unit         | 121               | 8.10    | 7.60    | 7.84    | 0.21               |                | 7.0-8.5       | Yes                          |
| Potassium                    | mg/L            | 1                 | 3.90    | 3.90    | 3.90    |                    |                |               | Yes                          |
| Silicon                      | mg/L            | 1                 | 44.00   | 44.00   | 44.00   |                    |                |               | Yes                          |
| Sodium                       | mg/L            | 1                 | 18.00   | 18.00   | 18.00   |                    |                | 200           | Yes                          |
| Sulphate                     | mg/L            | 1                 | 3.00    | 3.00    | 3.00    |                    |                | 250           | Yes                          |
| Suspended Solids             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids       | mg/L            | 1                 | 180.00  | 180.00  | 180.00  |                    |                | 1000          | Yes                          |
| Total Hardness               | mg/L            | 1                 | 96.00   | 96.00   | 96.00   |                    |                | 200           | Yes                          |
| Total Organic Carbon         | mg/L            | 12                | 2.20    | 0.20    | 0.83    | 0.66               |                |               | Yes                          |
| Turbidity                    | NTU             | 121               | 0.75    | 0.00    | 0.29    | 0.23               |                | 2.5           | Yes                          |

#### MICROBIOLOGY

|                  |            |     |      |      |      |  |   |  |     |
|------------------|------------|-----|------|------|------|--|---|--|-----|
| Escherichia coli | MPN/100 mL | 121 | 0.00 | 0.00 | 0.00 |  | 1 |  | Yes |
|------------------|------------|-----|------|------|------|--|---|--|-----|

#### NUTRIENTS

|                               |      |   |      |      |      |  |     |  |     |
|-------------------------------|------|---|------|------|------|--|-----|--|-----|
| Dissolved Reactive Phosphorus | mg/L | 1 | 0.15 | 0.15 | 0.15 |  |     |  | Yes |
| Nitrate                       | mg/L | 1 | 0.01 | 0.01 | 0.01 |  | 50  |  | Yes |
| Nitrite                       | mg/L | 1 | 0.00 | 0.00 | 0.00 |  | 0.2 |  | Yes |
| TKN                           | mg/L | 1 | 0.00 | 0.00 | 0.00 |  |     |  | Yes |
| Total Phosphorus              | mg/L | 1 | 0.17 | 0.17 | 0.17 |  |     |  | Yes |

#### PLASTICISERS

|                            |      |   |      |      |      |  |   |  |     |
|----------------------------|------|---|------|------|------|--|---|--|-----|
| Di(2-ethylhexyl) adipate   | µg/L | 1 | 0.00 | 0.00 | 0.00 |  |   |  | Yes |
| Di(2-ethylhexyl) phthalate | µg/L | 1 | 0.00 | 0.00 | 0.00 |  | 9 |  | Yes |

## APPENDIX 1 Water quality at treatment plants

### BUCKLAND WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### BUCKLAND WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 12                | 0.09    | 0.03    | 0.05    | 0.01               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### CLARKS BEACH WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 230.00  | 230.00  | 230.00  |                    |                |               | Yes                          |
| Aluminium                               | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 0.1           | Yes                          |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                                 | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                |               | Yes                          |
| Calcium                                 | mg/L            | 1                 | 2.70    | 2.70    | 2.70    |                    |                |               | Yes                          |
| Calcium Hardness                        | mg/L            | 1                 | 6.70    | 6.70    | 6.70    |                    |                |               | Yes                          |
| Chlorate                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                                | mg/L            | 1                 | 61.00   | 61.00   | 61.00   |                    |                | 250           | Yes                          |
| Chlorine Residual                       | mg/L            | 121               | 1.51    | 0.28    | 0.64    | 0.20               | 5              |               | Yes                          |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                            | mS/m            | 1                 | 61.70   | 61.70   | 61.70   |                    |                |               | Yes                          |
| Fluoride                                | mg/L            | 14                | 0.79    | 0.06    | 0.42    | 0.18               | 1.5            |               | Yes                          |
| Iodide                                  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                                    | mg/L            | 1                 | 0.21    | 0.21    | 0.21    |                    |                | 0.2           | Yes                          |
| Magnesium                               | mg/L            | 1                 | 0.97    | 0.97    | 0.97    |                    |                |               | Yes                          |
| Magnesium Hardness                      | mg/L            | 1                 | 4.00    | 4.00    | 4.00    |                    |                |               | Yes                          |
| Manganese                               | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.4            | 0.04          | Yes                          |
| pH                                      | pH unit         | 121               | 8.80    | 7.50    | 8.13    | 0.44               |                | 7.0-8.5       | Yes                          |
| Potassium                               | mg/L            | 1                 | 1.60    | 1.60    | 1.60    |                    |                |               | Yes                          |
| Silicon                                 | mg/L            | 1                 | 23.00   | 23.00   | 23.00   |                    |                |               | Yes                          |
| Sodium                                  | mg/L            | 1                 | 140.00  | 140.00  | 140.00  |                    |                | 200           | Yes                          |
| Sulphate                                | mg/L            | 1                 | 2.70    | 2.70    | 2.70    |                    |                | 250           | Yes                          |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids                  | mg/L            | 1                 | 350.00  | 350.00  | 350.00  |                    |                | 1000          | Yes                          |
| Total Hardness                          | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                | 200           | Yes                          |
| Turbidity                               | NTU             | 121               | 1.00    | 0.20    | 0.60    | 0.25               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 121               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    |                |               | Yes                          |
| Nitrate                                 | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 50             |               | Yes                          |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus                        | mg/L            | 1                 | 0.08    | 0.08    | 0.08    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### CLARKS BEACH WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |



## APPENDIX 1 Water quality at treatment plants

### CLARKS BEACH WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 13                | 1.50    | 1.20    | 1.33    | 0.15               | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.13    | 0.13    | 0.13    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    |                | 1.5           | Yes                          |
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### CORNWALL ROAD WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 130.00  | 130.00  | 130.00  |                    |                |               | Yes                          |
| Aluminium                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                                 | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    |                |               | Yes                          |
| Calcium                                 | mg/L            | 1                 | 35.00   | 35.00   | 35.00   |                    |                |               | Yes                          |
| Calcium Hardness                        | mg/L            | 1                 | 89.00   | 89.00   | 89.00   |                    |                |               | Yes                          |
| Chlorate                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                                | mg/L            | 1                 | 33.00   | 33.00   | 33.00   |                    |                | 250           | Yes                          |
| Chlorine Residual                       | mg/L            | 121               | 1.00    | 0.42    | 0.74    | 0.15               | 5              |               | Yes                          |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                            | mS/m            | 1                 | 36.20   | 36.20   | 36.20   |                    |                |               | Yes                          |
| Fluoride                                | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    | 1.5            |               | Yes                          |
| Iodide                                  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Iron                                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | Yes                          |
| Magnesium                               | mg/L            | 1                 | 11.00   | 11.00   | 11.00   |                    |                |               | Yes                          |
| Magnesium Hardness                      | mg/L            | 1                 | 44.00   | 44.00   | 44.00   |                    |                |               | Yes                          |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | Yes                          |
| pH                                      | pH unit         | 121               | 8.10    | 7.30    | 7.78    | 0.33               |                | 7.0-8.5       | Yes                          |
| Potassium                               | mg/L            | 1                 | 3.50    | 3.50    | 3.50    |                    |                |               | Yes                          |
| Silicon                                 | mg/L            | 1                 | 55.00   | 55.00   | 55.00   |                    |                |               | Yes                          |
| Sodium                                  | mg/L            | 1                 | 21.00   | 21.00   | 21.00   |                    |                | 200           | Yes                          |
| Sulphate                                | mg/L            | 1                 | 5.40    | 5.40    | 5.40    |                    |                | 250           | Yes                          |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids                  | mg/L            | 1                 | 250.00  | 250.00  | 250.00  |                    |                | 1000          | Yes                          |
| Total Hardness                          | mg/L            | 1                 | 130.00  | 130.00  | 130.00  |                    |                | 200           | Yes                          |
| Turbidity                               | NTU             | 121               | 0.30    | 0.00    | 0.17    | 0.11               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 121               | 0.00    | 0.00    | 0.00    |                    |                | 1             | Yes                          |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | Yes                          |
| Nitrate                                 | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 50             |               | Yes                          |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus                        | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### CORNWALL ROAD WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### CORNWALL ROAD WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### GLENBROOK BEACH WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 130.00  | 130.00  | 130.00  |                    |                |               | Yes                          |
| Aluminium                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                                 | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    |                |               | Yes                          |
| Calcium                                 | mg/L            | 1                 | 21.00   | 21.00   | 21.00   |                    |                |               | Yes                          |
| Calcium Hardness                        | mg/L            | 1                 | 53.00   | 53.00   | 53.00   |                    |                |               | Yes                          |
| Chlorate                                | mg/L            | 1                 | 0.50    | 0.50    | 0.50    |                    | 0.8            |               | Yes                          |
| Chloride                                | mg/L            | 1                 | 37.00   | 37.00   | 37.00   |                    |                | 250           | Yes                          |
| Chlorine Residual                       | mg/L            | 121               | 1.32    | 0.40    | 0.87    | 0.23               | 5              |               | Yes                          |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                            | mS/m            | 1                 | 37.80   | 37.80   | 37.80   |                    |                |               | Yes                          |
| Fluoride                                | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    | 1.5            |               | Yes                          |
| Iodide                                  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                                    | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                | 0.2           | Yes                          |
| Magnesium                               | mg/L            | 1                 | 7.80    | 7.80    | 7.80    |                    |                |               | Yes                          |
| Magnesium Hardness                      | mg/L            | 1                 | 32.00   | 32.00   | 32.00   |                    |                |               | Yes                          |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | Yes                          |
| pH                                      | pH unit         | 121               | 8.30    | 7.10    | 7.77    | 0.45               |                | 7.0-8.5       | Yes                          |
| Potassium                               | mg/L            | 1                 | 5.90    | 5.90    | 5.90    |                    |                |               | Yes                          |
| Silicon                                 | mg/L            | 1                 | 43.00   | 43.00   | 43.00   |                    |                |               | Yes                          |
| Sodium                                  | mg/L            | 1                 | 43.00   | 43.00   | 43.00   |                    |                | 200           | Yes                          |
| Sulphate                                | mg/L            | 1                 | 8.60    | 8.60    | 8.60    |                    |                | 250           | Yes                          |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids                  | mg/L            | 1                 | 240.00  | 240.00  | 240.00  |                    |                | 1000          | Yes                          |
| Total Hardness                          | mg/L            | 1                 | 85.00   | 85.00   | 85.00   |                    |                | 200           | Yes                          |
| Turbidity                               | NTU             | 121               | 0.60    | 0.00    | 0.24    | 0.20               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 121               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    |                |               | Yes                          |
| Nitrate                                 | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 50             |               | Yes                          |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus                        | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### GLENBROOK BEACH WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### GLENBROOK BEACH WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | Yes                          |
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### HICKEYS WTP TREATED

| Component Name               | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b> |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total             | mg/L            | 1                 | 81.00   | 81.00   | 81.00   |                    |                |               | Yes                          |
| Aluminium                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                      | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    |                |               | Yes                          |
| Calcium                      | mg/L            | 1                 | 22.00   | 22.00   | 22.00   |                    |                |               | Yes                          |
| Calcium Hardness             | mg/L            | 1                 | 56.00   | 56.00   | 56.00   |                    |                |               | Yes                          |
| Chlorate                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                     | mg/L            | 1                 | 25.00   | 25.00   | 25.00   |                    |                | 250           | Yes                          |
| Chlorine Residual            | mg/L            | 366               | 1.03    | 0.38    | 0.67    | 0.16               | 5              |               | Yes                          |
| Chlorite                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                       | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                 | mS/m            | 1                 | 31.00   | 31.00   | 31.00   |                    |                |               | Yes                          |
| Fluoride                     | mg/L            | 86                | 0.99    | 0.03    | 0.71    | 0.22               | 1.5            |               | Yes                          |
| Iodide                       | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                         | mg/L            | 13                | 0.02    | 0.00    | 0.00    | 0.01               |                | 0.2           | Yes                          |
| Magnesium                    | mg/L            | 1                 | 9.30    | 9.30    | 9.30    |                    |                |               | Yes                          |
| Magnesium Hardness           | mg/L            | 1                 | 38.00   | 38.00   | 38.00   |                    |                |               | Yes                          |
| Manganese                    | mg/L            | 13                | 0.03    | 0.00    | 0.00    | 0.01               | 0.4            | 0.04          | Yes                          |
| pH                           | pH unit         | 366               | 8.00    | 7.10    | 7.56    | 0.32               |                | 7.0-8.5       | Yes                          |
| Potassium                    | mg/L            | 1                 | 3.00    | 3.00    | 3.00    |                    |                |               | Yes                          |
| Silicon                      | mg/L            | 1                 | 33.00   | 33.00   | 33.00   |                    |                |               | Yes                          |
| Sodium                       | mg/L            | 1                 | 22.00   | 22.00   | 22.00   |                    |                | 200           | Yes                          |
| Sulphate                     | mg/L            | 1                 | 3.50    | 3.50    | 3.50    |                    |                | 250           | Yes                          |
| Suspended Solids             | mg/L            | 1                 | 0.30    | 0.30    | 0.30    |                    |                |               | Yes                          |
| Total Dissolved Solids       | mg/L            | 1                 | 200.00  | 200.00  | 200.00  |                    |                | 1000          | Yes                          |
| Total Hardness               | mg/L            | 1                 | 94.00   | 94.00   | 94.00   |                    |                | 200           | Yes                          |
| Total Organic Carbon         | mg/L            | 12                | 2.40    | 0.20    | 0.98    | 0.82               |                |               | Yes                          |
| Turbidity                    | NTU             | 366               | 0.55    | 0.00    | 0.27    | 0.18               |                | 2.5           | Yes                          |

### MICROBIOLOGY

|                  |            |     |      |      |      |  |   |  |     |
|------------------|------------|-----|------|------|------|--|---|--|-----|
| Escherichia coli | MPN/100 mL | 365 | 0.00 | 0.00 | 0.00 |  | 1 |  | Yes |
|------------------|------------|-----|------|------|------|--|---|--|-----|

### NUTRIENTS

|                               |      |    |      |      |      |      |     |  |     |
|-------------------------------|------|----|------|------|------|------|-----|--|-----|
| Dissolved Reactive Phosphorus | mg/L | 1  | 0.04 | 0.04 | 0.04 |      |     |  | Yes |
| Nitrate                       | mg/L | 26 | 8.10 | 0.01 | 5.88 | 3.00 | 50  |  | Yes |
| Nitrite                       | mg/L | 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.2 |  | Yes |
| TKN                           | mg/L | 1  | 0.00 | 0.00 | 0.00 |      |     |  | Yes |
| Total Phosphorus              | mg/L | 1  | 0.04 | 0.04 | 0.04 |      |     |  | Yes |

### PLASTICISERS

|                            |      |   |      |      |      |  |   |  |     |
|----------------------------|------|---|------|------|------|--|---|--|-----|
| Di(2-ethylhexyl) adipate   | µg/L | 1 | 0.00 | 0.00 | 0.00 |  |   |  | Yes |
| Di(2-ethylhexyl) phthalate | µg/L | 1 | 0.00 | 0.00 | 0.00 |  | 9 |  | Yes |



## APPENDIX 1 Water quality at treatment plants

### HICKEYS WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### HICKEYS WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio                         |                 | 12                | 0.05    | 0.02    | 0.03    | 0.01               |                |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### PATUMAHOE WTP TREATED

| Component Name                | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total              | mg/L            | 1                 | 110.00  | 110.00  | 110.00  |                    |                |               | Yes                          |
| Aluminium                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                       | mg/L            | 1                 | 0.02    | 0.02    | 0.02    |                    |                |               | Yes                          |
| Calcium                       | mg/L            | 1                 | 24.00   | 24.00   | 24.00   |                    |                |               | Yes                          |
| Calcium Hardness              | mg/L            | 1                 | 59.00   | 59.00   | 59.00   |                    |                |               | Yes                          |
| Chlorate                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                      | mg/L            | 1                 | 26.00   | 26.00   | 26.00   |                    |                | 250           | Yes                          |
| Chlorine Residual             | mg/L            | 121               | 1.02    | 0.15    | 0.72    | 0.18               | 5              |               | Yes                          |
| Chlorite                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                        | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                  | mS/m            | 1                 | 29.80   | 29.80   | 29.80   |                    |                |               | Yes                          |
| Fluoride                      | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    | 1.5            |               | Yes                          |
| Iodide                        | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                          | mg/L            | 1                 | 0.11    | 0.11    | 0.11    |                    |                | 0.2           | Yes                          |
| Magnesium                     | mg/L            | 1                 | 9.00    | 9.00    | 9.00    |                    |                |               | Yes                          |
| Magnesium Hardness            | mg/L            | 1                 | 37.00   | 37.00   | 37.00   |                    |                |               | Yes                          |
| Manganese                     | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 0.4            | 0.04          | Yes                          |
| pH                            | pH unit         | 121               | 8.00    | 7.60    | 7.80    | 0.16               |                | 7.0-8.5       | Yes                          |
| Potassium                     | mg/L            | 1                 | 3.30    | 3.30    | 3.30    |                    |                |               | Yes                          |
| Silicon                       | mg/L            | 1                 | 37.00   | 37.00   | 37.00   |                    |                |               | Yes                          |
| Sodium                        | mg/L            | 1                 | 22.00   | 22.00   | 22.00   |                    |                | 200           | Yes                          |
| Sulphate                      | mg/L            | 1                 | 1.60    | 1.60    | 1.60    |                    |                | 250           | Yes                          |
| Suspended Solids              | mg/L            | 1                 | 0.50    | 0.50    | 0.50    |                    |                |               | Yes                          |
| Total Dissolved Solids        | mg/L            | 1                 | 180.00  | 180.00  | 180.00  |                    |                | 1000          | Yes                          |
| Total Hardness                | mg/L            | 1                 | 96.00   | 96.00   | 96.00   |                    |                | 200           | Yes                          |
| Turbidity                     | NTU             | 121               | 0.80    | 0.15    | 0.36    | 0.22               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli              | MPN/100 mL      | 121               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>              |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus | mg/L            | 1                 | 0.08    | 0.08    | 0.08    |                    |                |               | Yes                          |
| Nitrate                       | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 50             |               | Yes                          |
| Nitrite                       | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus              | mg/L            | 1                 | 0.09    | 0.09    | 0.09    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>           |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate      | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate    | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### PATUMAHOE WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                              |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### PATUMAHOE WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |
| <b>TRIALOMETHANES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIKOU BEACH WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 180.00  | 180.00  | 180.00  |                    |                |               | Yes                          |
| Aluminium                               | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 0.1           | Yes                          |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                                 | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    |                |               | Yes                          |
| Calcium                                 | mg/L            | 1                 | 12.00   | 12.00   | 12.00   |                    |                |               | Yes                          |
| Calcium Hardness                        | mg/L            | 1                 | 31.00   | 31.00   | 31.00   |                    |                |               | Yes                          |
| Chlorate                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                                | mg/L            | 1                 | 45.00   | 45.00   | 45.00   |                    |                | 250           | Yes                          |
| Chlorine Residual                       | mg/L            | 122               | 1.35    | 0.27    | 0.84    | 0.25               | 5              |               | Yes                          |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                            | mS/m            | 1                 | 49.70   | 49.70   | 49.70   |                    |                |               | Yes                          |
| Fluoride                                | mg/L            | 1                 | 0.25    | 0.25    | 0.25    |                    | 1.5            |               | Yes                          |
| Iodide                                  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                                    | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    |                | 0.2           | Yes                          |
| Magnesium                               | mg/L            | 1                 | 4.60    | 4.60    | 4.60    |                    |                |               | Yes                          |
| Magnesium Hardness                      | mg/L            | 1                 | 19.00   | 19.00   | 19.00   |                    |                |               | Yes                          |
| Manganese                               | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    | 0.4            | 0.04          | Yes                          |
| pH                                      | pH unit         | 122               | 8.80    | 7.80    | 8.27    | 0.42               |                | 7.0-8.5       | Yes                          |
| Potassium                               | mg/L            | 1                 | 3.60    | 3.60    | 3.60    |                    |                |               | Yes                          |
| Silicon                                 | mg/L            | 1                 | 28.00   | 28.00   | 28.00   |                    |                |               | Yes                          |
| Sodium                                  | mg/L            | 1                 | 90.00   | 90.00   | 90.00   |                    |                | 200           | Yes                          |
| Sulphate                                | mg/L            | 1                 | 6.30    | 6.30    | 6.30    |                    |                | 250           | Yes                          |
| Suspended Solids                        | mg/L            | 1                 | 0.45    | 0.45    | 0.45    |                    |                |               | Yes                          |
| Total Dissolved Solids                  | mg/L            | 1                 | 290.00  | 290.00  | 290.00  |                    |                | 1000          | Yes                          |
| Total Hardness                          | mg/L            | 1                 | 50.00   | 50.00   | 50.00   |                    |                | 200           | Yes                          |
| Turbidity                               | NTU             | 122               | 2.80    | 0.20    | 0.96    | 0.64               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 122               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    |                |               | Yes                          |
| Nitrate                                 | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 50             |               | Yes                          |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus                        | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIAM BEACH WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAI AU BEACH WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRACE ELEMENTS</b>             |                 |                   |         |         |         |                    |                |               |                              |
| Antimony                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium                            | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.7            |               | Yes                          |
| Boron                             | mg/L            | 1                 | 0.65    | 0.65    | 0.65    |                    | 1.4            |               | Yes                          |
| Cadmium                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Cyanide                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead                              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium                           | mg/L            | 1                 | 0.07    | 0.07    | 0.07    |                    |                |               | Yes                          |
| Mercury                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel                            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium                          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc                              | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |



## APPENDIX 1 Water quality at treatment plants

### WAIKATO WTP TREATED

| Component Name                     | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|------------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>ACID HERBICIDES</b>             |                 |                   |         |         |         |                    |                |               |                              |
| 2-4-5-Trichlorophenoxyacetic       | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 2-4-Dichlorophenoxyacetic acid     | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 4-(2-4-Dichlorophenoxy) butano     | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Bentazone                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Dichlorprop                        | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| MCPA                               | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.002          |               | Yes                          |
| Mecoprop (MCP)                     | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Picloram                           | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| Triclopyr                          | mg/L            | 4                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| <b>CHEMICAL AND PHYSICAL</b>       |                 |                   |         |         |         |                    |                |               |                              |
| abs254                             | abs unit        | 52                | 0.05    | 0.01    | 0.02    | 0.01               |                |               | Yes                          |
| Alkalinity Total                   | mg/L            | 26                | 54.00   | 32.00   | 42.38   | 7.77               |                |               | Yes                          |
| Aluminium                          | mg/L            | 360               | 0.28    | 0.00    | 0.07    | 0.05               |                | 0.1           | Yes                          |
| Bromate                            | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                            | mg/L            | 13                | 0.01    | 0.00    | 0.01    | 0.01               |                |               | Yes                          |
| Calcium                            | mg/L            | 66                | 19.00   | 12.00   | 15.50   | 2.45               |                |               | Yes                          |
| Calcium Hardness                   | mg/L            | 66                | 48.00   | 31.00   | 39.80   | 5.03               |                |               | Yes                          |
| Chlorate                           | mg/L            | 65                | 0.23    | 0.00    | 0.13    | 0.06               | 0.8            |               | Yes                          |
| Chloride                           | mg/L            | 13                | 23.00   | 17.00   | 20.00   | 2.37               |                | 250           | Yes                          |
| Chlorine Residual                  | mg/L            | 360               | 1.38    | 0.41    | 0.97    | 0.19               | 5              |               | Yes                          |
| Chlorite                           | mg/L            | 65                | 0.01    | 0.00    | 0.00    | 0.01               | 0.8            |               | Yes                          |
| Colour                             | Hazen unit      | 52                | 5.00    | 0.00    | 2.50    | 3.54               |                | 10            | Yes                          |
| Conductivity                       | mS/m            | 13                | 23.70   | 14.20   | 21.02   | 2.77               |                |               | Yes                          |
| Fluoride                           | mg/L            | 65                | 0.96    | 0.00    | 0.73    | 0.17               | 1.5            |               | Yes                          |
| Iodide                             | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               |                |               | Yes                          |
| Iron                               | mg/L            | 66                | 0.10    | 0.02    | 0.04    | 0.02               |                | 0.2           | Yes                          |
| Magnesium                          | mg/L            | 66                | 3.40    | 2.20    | 2.80    | 0.39               |                |               | Yes                          |
| Magnesium Hardness                 | mg/L            | 66                | 14.00   | 9.00    | 10.50   | 1.65               |                |               | Yes                          |
| Manganese                          | mg/L            | 66                | 0.01    | 0.00    | 0.00    | 0.00               | 0.4            | 0.04          | Yes                          |
| pH                                 | pH unit         | 360               | 8.70    | 6.70    | 7.83    | 0.57               |                | 7.0-8.5       | Yes                          |
| Potassium                          | mg/L            | 13                | 3.50    | 2.70    | 3.14    | 0.27               |                |               | Yes                          |
| Silicon                            | mg/L            | 13                | 44.00   | 24.00   | 31.43   | 6.68               |                |               | Yes                          |
| Sodium                             | mg/L            | 14                | 22.00   | 14.00   | 17.75   | 2.82               |                | 200           | Yes                          |
| Sulphate                           | mg/L            | 13                | 30.00   | 20.00   | 24.14   | 3.89               |                | 250           | Yes                          |
| Total Hardness                     | mg/L            | 66                | 60.00   | 41.00   | 51.28   | 5.72               |                | 200           | Yes                          |
| Total Organic Carbon               | mg/L            | 52                | 5.60    | 0.50    | 1.99    | 1.33               |                |               | Yes                          |
| Turbidity                          | NTU             | 360               | 0.85    | 0.10    | 0.46    | 0.24               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                |                 |                   |         |         |         |                    |                |               |                              |
| Confirmed Cryptosporidium per 100L | /100 L          | 55                | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| Confirmed Giardia per 100L         | /100 L          | 55                | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| Escherichia coli                   | MPN/100 mL      | 362               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIKATO WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>NUTRIENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus                                      | mg/L            | 13                | 0.01    | 0.00    | 0.01    | 0.00               |                |               | Yes                          |
| Nitrate  | mg/L            | 13                | 0.99    | 0.05    | 0.50    | 0.31               | 50             |               | Yes                          |
| Nitrite  | mg/L            | 13                | 0.01    | 0.00    | 0.00    | 0.00               | 0.2            |               | Yes                          |
| TKN  | mg/L            | 13                | 0.23    | 0.00    | 0.14    | 0.08               |                |               | Yes                          |
| Total Phosphorus   | mg/L            | 13                | 0.03    | 0.00    | 0.01    | 0.01               |                |               | Yes                          |
| <b>PLASTICISERS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate   | µg/L            | 13                | 2.30    | 0.00    | 1.15    | 1.63               | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b>                            |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| cis-permethrin   | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| trans-permethrin   | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIKATO WTP TREATED (continued)

| Component Name  | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b>      |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon  | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth   | µg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Bis(2-ethylhexyl)adipate  | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor  | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo(a)pyrene  | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| <b>TRACE ELEMENTS</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Antimony  | mg/L            | 65                | 0.00    | 0.00    | 0.00    | 0.00               | 0.02           |               | Yes                          |
| Arsenic   | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Barium  | mg/L            | 14                | 0.02    | 0.02    | 0.02    | 0.00               | 0.7            |               | Yes                          |
| Boron   | mg/L            | 13                | 0.27    | 0.12    | 0.19    | 0.05               | 1.4            |               | Yes                          |
| Cadmium   | mg/L            | 14                | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium  | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 0.05           |               | Yes                          |
| Copper  | mg/L            | 13                | 0.00    | 0.00    | 0.00    | 0.00               | 2              |               | Yes                          |
| Cyanide   | mg/L            | 3                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead  | mg/L            | 65                | 0.00    | 0.00    | 0.00    | 0.00               | 0.01           |               | Yes                          |
| Lithium   | mg/L            | 13                | 0.09    | 0.04    | 0.06    | 0.02               |                |               | Yes                          |
| Mercury   | mg/L            | 65                | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum  | mg/L            | 65                | 0.00    | 0.00    | 0.00    | 0.00               | 0.07           |               | Yes                          |
| Nickel  | mg/L            | 66                | 0.00    | 0.00    | 0.00    | 0.00               | 0.08           |               | Yes                          |
| Selenium  | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc  | mg/L            | 14                | 0.00    | 0.00    | 0.00    | 0.00               |                | 1.5           | Yes                          |
| <b>TRIHALOMETHANES</b>  |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane  | mg/L            | 65                | 0.02    | 0.00    | 0.00    | 0.00               | 0.06           |               | Yes                          |
| bromoform   | mg/L            | 65                | 0.00    | 0.00    | 0.00    | 0.00               | 0.1            |               | Yes                          |
| chloroform  | mg/L            | 65                | 0.02    | 0.00    | 0.01    | 0.00               | 0.4            |               | Yes                          |
| dibromochloromethane  | mg/L            | 65                | 0.01    | 0.00    | 0.01    | 0.00               | 0.15           |               | Yes                          |
| THM Ratio   |                 | 52                | 0.19    | 0.03    | 0.11    | 0.04               |                |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIKATO WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 13                | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 13                | 0.02    | 0.00    | 0.01    | 0.01               |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIUKU RD WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 120.00  | 120.00  | 120.00  |                    |                |               | Yes                          |
| Aluminium                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                                 | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    |                |               | Yes                          |
| Calcium                                 | mg/L            | 1                 | 29.00   | 29.00   | 29.00   |                    |                |               | Yes                          |
| Calcium Hardness                        | mg/L            | 1                 | 72.00   | 72.00   | 72.00   |                    |                |               | Yes                          |
| Chlorate                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                                | mg/L            | 1                 | 32.00   | 32.00   | 32.00   |                    |                | 250           | Yes                          |
| Chlorine Residual                       | mg/L            | 121               | 1.19    | 0.41    | 0.76    | 0.19               | 5              |               | Yes                          |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                            | mS/m            | 1                 | 33.70   | 33.70   | 33.70   |                    |                |               | Yes                          |
| Fluoride                                | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    | 1.5            |               | Yes                          |
| Iodide                                  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Iron                                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | Yes                          |
| Magnesium                               | mg/L            | 1                 | 7.20    | 7.20    | 7.20    |                    |                |               | Yes                          |
| Magnesium Hardness                      | mg/L            | 1                 | 30.00   | 30.00   | 30.00   |                    |                |               | Yes                          |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | Yes                          |
| pH                                      | pH unit         | 121               | 8.70    | 7.90    | 8.18    | 0.36               |                | 7.0-8.5       | Yes                          |
| Potassium                               | mg/L            | 1                 | 4.90    | 4.90    | 4.90    |                    |                |               | Yes                          |
| Silicon                                 | mg/L            | 1                 | 35.00   | 35.00   | 35.00   |                    |                |               | Yes                          |
| Sodium                                  | mg/L            | 1                 | 27.00   | 27.00   | 27.00   |                    |                | 200           | Yes                          |
| Sulphate                                | mg/L            | 1                 | 4.90    | 4.90    | 4.90    |                    |                | 250           | Yes                          |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids                  | mg/L            | 1                 | 180.00  | 180.00  | 180.00  |                    |                | 1000          | Yes                          |
| Total Hardness                          | mg/L            | 1                 | 100.00  | 100.00  | 100.00  |                    |                | 200           | Yes                          |
| Turbidity                               | NTU             | 121               | 0.20    | 0.00    | 0.11    | 0.09               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 121               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.04    | 0.04    | 0.04    |                    |                |               | Yes                          |
| Nitrate                                 | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 50             |               | Yes                          |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus                        | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIUKU RD WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |
| <b>TRACE ELEMENTS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Antimony   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Barium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron  | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 1.4            |               | Yes                          |
| Cadmium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Cyanide  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Mercury  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIUKU RD WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIUKU WTP TREATED

| Component Name                          | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|---|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>CHEMICAL AND PHYSICAL</b>            |                 |                   |         |         |         |                    |                |               |                              |
| Alkalinity Total                        | mg/L            | 1                 | 130.00  | 130.00  | 130.00  |                    |                |               | Yes                          |
| Aluminium                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.1           | Yes                          |
| Bromate                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Bromide                                 | mg/L            | 1                 | 0.05    | 0.05    | 0.05    |                    |                |               | Yes                          |
| Calcium                                 | mg/L            | 1                 | 32.00   | 32.00   | 32.00   |                    |                |               | Yes                          |
| Calcium Hardness                        | mg/L            | 1                 | 80.00   | 80.00   | 80.00   |                    |                |               | Yes                          |
| Chlorate                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Chloride                                | mg/L            | 1                 | 34.00   | 34.00   | 34.00   |                    |                | 250           | Yes                          |
| Chlorine Residual                       | mg/L            | 121               | 1.08    | 0.38    | 0.83    | 0.17               | 5              |               | Yes                          |
| Chlorite                                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            |               | Yes                          |
| Colour                                  | Hazen unit      | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 10            | Yes                          |
| Conductivity                            | mS/m            | 1                 | 35.60   | 35.60   | 35.60   |                    |                |               | Yes                          |
| Fluoride                                | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    | 1.5            |               | Yes                          |
| Iodide                                  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Iron                                    | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 0.2           | Yes                          |
| Magnesium                               | mg/L            | 1                 | 9.90    | 9.90    | 9.90    |                    |                |               | Yes                          |
| Magnesium Hardness                      | mg/L            | 1                 | 41.00   | 41.00   | 41.00   |                    |                |               | Yes                          |
| Manganese                               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.04          | Yes                          |
| pH                                      | pH unit         | 132               | 8.30    | 7.80    | 8.02    | 0.19               |                | 7.0-8.5       | Yes                          |
| Potassium                               | mg/L            | 1                 | 4.20    | 4.20    | 4.20    |                    |                |               | Yes                          |
| Silicon                                 | mg/L            | 1                 | 54.00   | 54.00   | 54.00   |                    |                |               | Yes                          |
| Sodium                                  | mg/L            | 1                 | 25.00   | 25.00   | 25.00   |                    |                | 200           | Yes                          |
| Sulphate                                | mg/L            | 1                 | 5.20    | 5.20    | 5.20    |                    |                | 250           | Yes                          |
| Suspended Solids                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Dissolved Solids                  | mg/L            | 1                 | 240.00  | 240.00  | 240.00  |                    |                | 1000          | Yes                          |
| Total Hardness                          | mg/L            | 1                 | 120.00  | 120.00  | 120.00  |                    |                | 200           | Yes                          |
| Turbidity                               | NTU             | 132               | 0.35    | 0.00    | 0.19    | 0.12               |                | 2.5           | Yes                          |
| <b>MICROBIOLOGY</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Escherichia coli                        | MPN/100 mL      | 121               | 0.00    | 0.00    | 0.00    |                    | 1              |               | Yes                          |
| <b>NUTRIENTS</b>                        |                 |                   |         |         |         |                    |                |               |                              |
| Dissolved Reactive Phosphorus           | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    |                |               | Yes                          |
| Nitrate                                 | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 50             |               | Yes                          |
| Nitrite                                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.2            |               | Yes                          |
| TKN                                     | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Total Phosphorus                        | mg/L            | 1                 | 0.06    | 0.06    | 0.06    |                    |                |               | Yes                          |
| <b>PLASTICISERS</b>                     |                 |                   |         |         |         |                    |                |               |                              |
| Di(2-ethylhexyl) adipate                | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Di(2-ethylhexyl) phthalate              | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 9              |               | Yes                          |
| <b>POLYCYCLIC AROMATIC HYDROCARBONS</b> |                 |                   |         |         |         |                    |                |               |                              |
| Benzo[a]pyrene                          | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |



## APPENDIX 1 Water quality at treatment plants

### WAIUKU WTP TREATED (continued)

| Component Name   | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|--|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOCHLORINE PESTICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Aldrin   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.00004        |               | Yes                          |
| alpha-Chlordan   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.0002         |               | Yes                          |
| gamma-BHC (lindane)  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Heptachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Heptachlor epoxide   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Hexachlorobenzene  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Methoxychlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Permethrin (cis + trans)   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| pp-DDT   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.001          |               | Yes                          |
| Procymidone  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 700            |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Atrazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Metolachlor  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 10             |               | Yes                          |
| Molinate   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 7              |               | Yes                          |
| Pendimethalin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| Propanil   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Simazine   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Terbutylazine  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 8              |               | Yes                          |
| Trifluralin  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 30             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANONITROGEN HERBICIDES</b>   |                 |                   |         |         |         |                    |                |               |                              |
| Alachlor   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 20             |               | Yes                          |
| <b>SEMI-VOLATILE ORGANIC COMPOUNDS – ORGANOPHOSPHORUS PESTICIDES</b> |                 |                   |         |         |         |                    |                |               |                              |
| Chlorpyrifos   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 40             |               | Yes                          |
| Diazinon   | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| Pirimiphos-meth  | µg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 100            |               | Yes                          |
| <b>TRACE ELEMENTS</b>  |                 |                   |         |         |         |                    |                |               |                              |
| Antimony   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Arsenic  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    | 0.01           |               | Yes                          |
| Barium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.7            |               | Yes                          |
| Boron  | mg/L            | 1                 | 0.03    | 0.03    | 0.03    |                    | 1.4            |               | Yes                          |
| Cadmium  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          |               | Yes                          |
| Chromium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| Copper   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 2              |               | Yes                          |
| Cyanide  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| Lead   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Lithium  | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                |               | Yes                          |
| Mercury  | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.007          |               | Yes                          |
| Molybdenum   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.07           |               | Yes                          |
| Nickel   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.08           |               | Yes                          |
| Selenium   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| Zinc   | mg/L            | 1                 | 0.01    | 0.01    | 0.01    |                    |                | 1.5           | Yes                          |

## APPENDIX 1 Water quality at treatment plants

### WAIUKU WTP TREATED (continued)

| Component Name                    | Component Units | Number of Samples | Maximum | Minimum | Average | Standard Deviation | MAV DWSNZ 2008 | GV DWSNZ 2008 | Component Annual Report Flag |
|-----------------------------------|-----------------|-------------------|---------|---------|---------|--------------------|----------------|---------------|------------------------------|
| <b>TRIHALOMETHANES</b>            |                 |                   |         |         |         |                    |                |               |                              |
| bromodichloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| bromoform                         | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.1            |               | Yes                          |
| chloroform                        | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            |               | Yes                          |
| dibromochloromethane              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.15           |               | Yes                          |
| <b>VOLATILE ORGANIC COMPOUNDS</b> |                 |                   |         |         |         |                    |                |               |                              |
| 1-1-1-trichloroethane             | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-3-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-4-trichlorobenzene            | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| 1-2-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 1.5            | 0.001         | Yes                          |
| 1-2-dichloroethane                | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.03           |               | Yes                          |
| 1-4-dichlorobenzene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.4            | 0.0003        | Yes                          |
| benzene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.01           |               | Yes                          |
| carbon tetrachloride              | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                |               | Yes                          |
| ethylbenzene                      | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.3            | 0.002         | Yes                          |
| m- and p-xylene                   | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.6            |               | Yes                          |
| styrene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.004          | 0.004         | Yes                          |
| tetrachloroethylene               | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.05           |               | Yes                          |
| toluene                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.8            | 0.03          | Yes                          |
| trans-1-2-dichloroethene          | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.06           |               | Yes                          |
| trichloroethylene                 | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    | 0.02           |               | Yes                          |
| Ammonia                           | mg/L            | 1                 | 0.00    | 0.00    | 0.00    |                    |                | 1.5           | Yes                          |

## APPENDIX 2 Compliance with bulk water agreement

### PAPAKURA BULK WATER AGREEMENT COMPLIANCE 2012/13

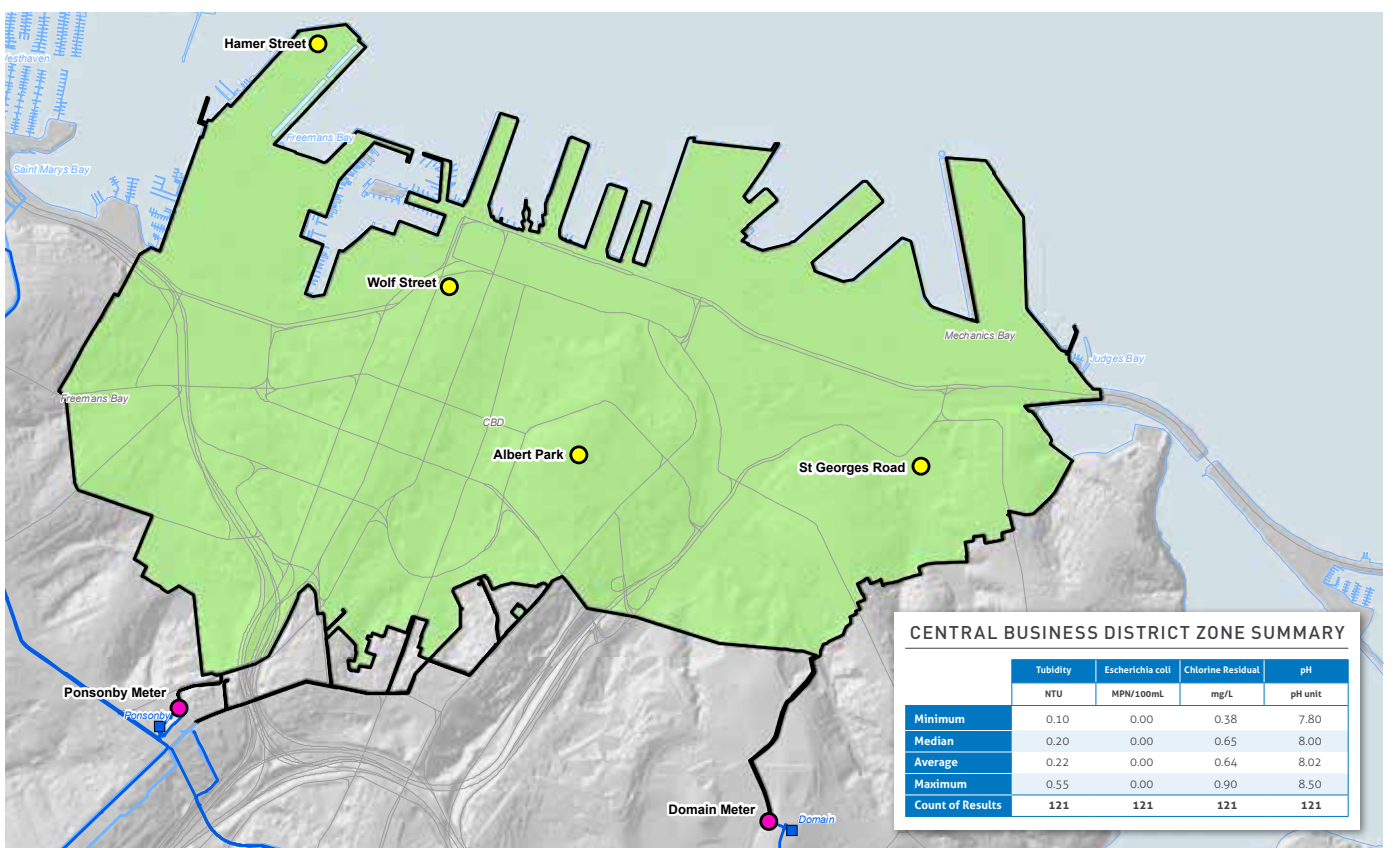
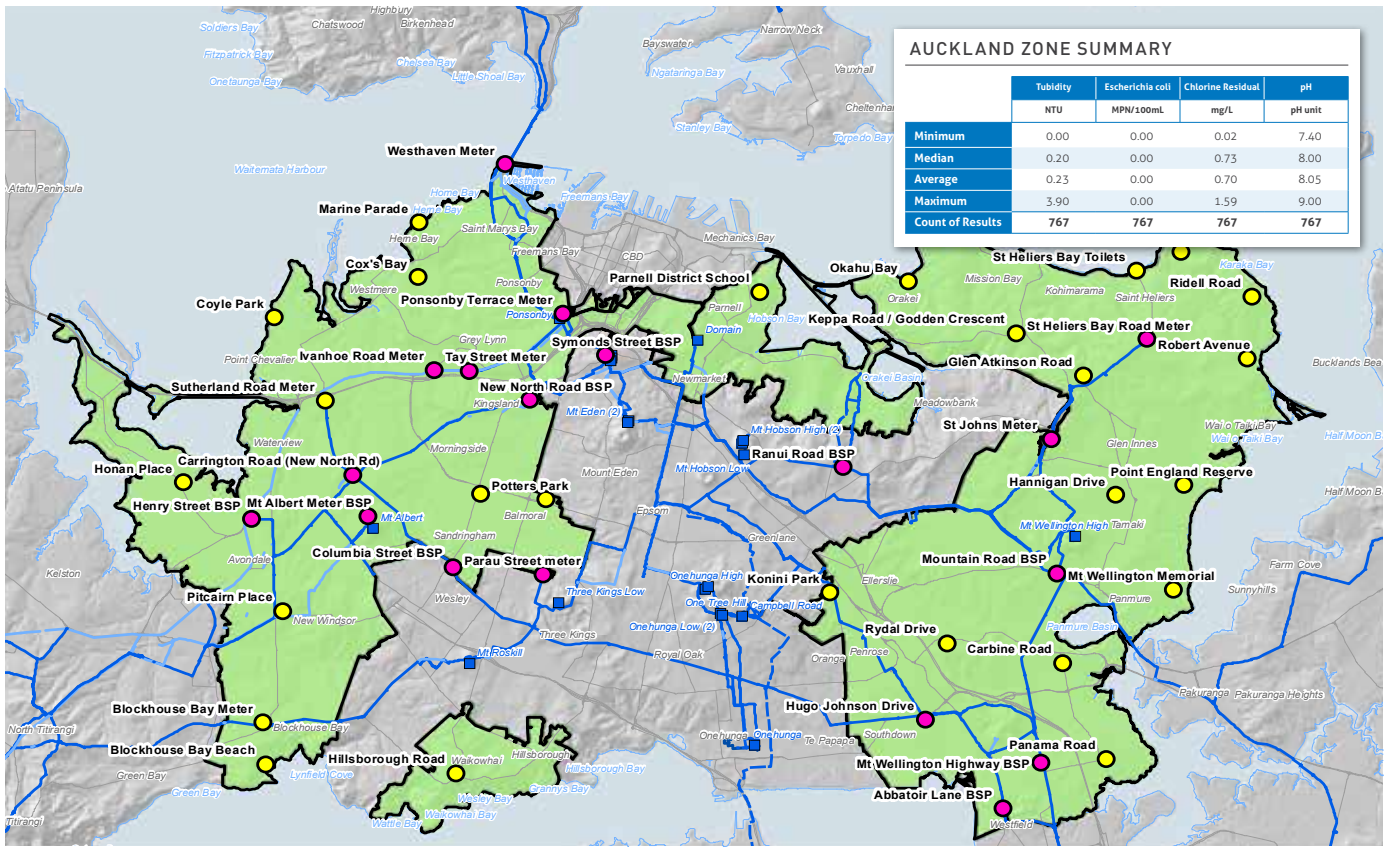
| Grading Zone       | FAC (0.3 to 1.5mg/l FAC) |              | pH (7.5 to 8.5)     |              | Turbidity (<1.0 NTU) |              | HPC (<50 cfu/ml)    |              | E.coli (<1 in 100ml) |              |
|--------------------|--------------------------|--------------|---------------------|--------------|----------------------|--------------|---------------------|--------------|----------------------|--------------|
|                    | Required Compliance      | Year to Date | Required Compliance | Year to Date | Required Compliance  | Year to Date | Required Compliance | Year to Date | Required Compliance  | Year to Date |
| Ardmore School     | 95                       | 100          | 95                  | 100          | 98                   | 100          | 98                  | 100          | 100                  | 100          |
| Papakura           | 95                       | 100          | 95                  | 94           | 98                   | 100          | 98                  | 100          | 100                  | 100          |
| Red Hill           | 95                       | 100          | 95                  | 100          | 98                   | 100          | 98                  | 100          | 100                  | 98*          |
| Takanini           | 95                       | 100          | 95                  | 100          | 98                   | 97           | 98                  | 100          | 100                  | 100          |
| <b>Total</b>       | <b>95</b>                | <b>100</b>   | <b>95</b>           | <b>97</b>    | <b>98</b>            | <b>99</b>    | <b>98</b>           | <b>100</b>   | <b>100</b>           | <b>100</b>   |
| 2011/12 compliance | 95                       | 99           | 95                  | 94           | 98                   | 100          | 98                  | 100          | 100                  | 100          |
| 2010/11 compliance | 95                       | 100          | 95                  | 99           | 98                   | 98           | 98                  | 100          | 100                  | 100          |
| 2009/10 compliance | 95                       | 100          | 95                  | 100          | 98                   | 99           | 98                  | 100          | 100                  | 100          |
| 2008/09 compliance | 95                       | 100          | 95                  | 100          | 98                   | 100          | 98                  | 100          | 100                  | 100          |
| 2007/08 compliance | 95                       | 100          | 95                  | 99           | 98                   | 98           | 98                  | 100          | 100                  | 100          |

## APPENDIX 3 Water quality in grading zones

The Drinking Water Standards of New Zealand 2000 (Revised 2008) prescribes maximum acceptable values (MAVs) and guideline values (GVs) for determinands required to be measured in the network as outlined below:

| Determinand       | Guideline Value | Maximum Acceptance Value | Unit      |
|-------------------|-----------------|--------------------------|-----------|
| Turbidity         | 2.5             |                          | NTU       |
| Escherichia coli  |                 | <1                       | MPN/100mL |
| Chlorine Residual | 0.6-1.2         | 5                        | mg/L      |
| pH                | 7.0-8.5         |                          |           |

# APPENDIX 3 Water quality in grading zones Central Area



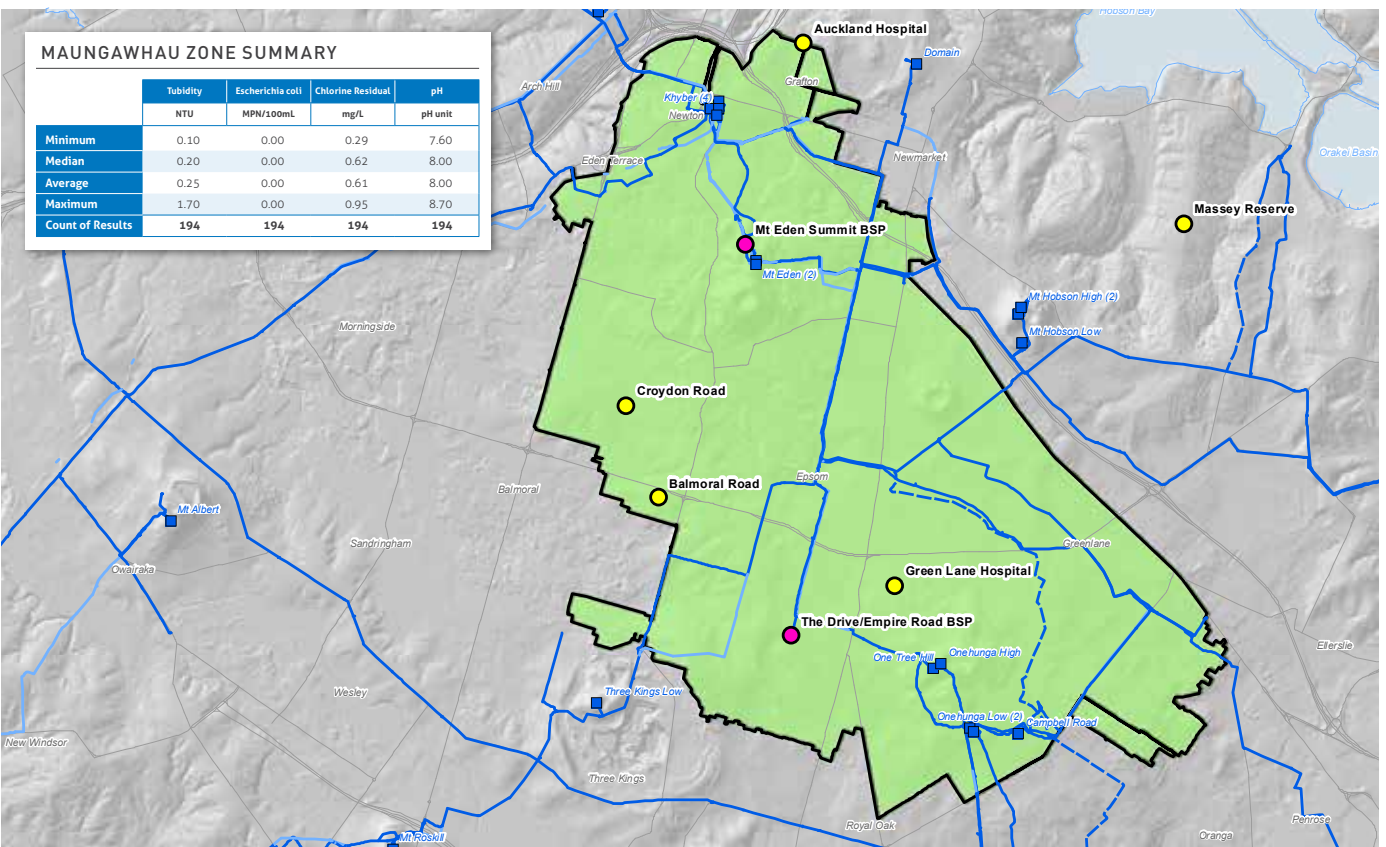
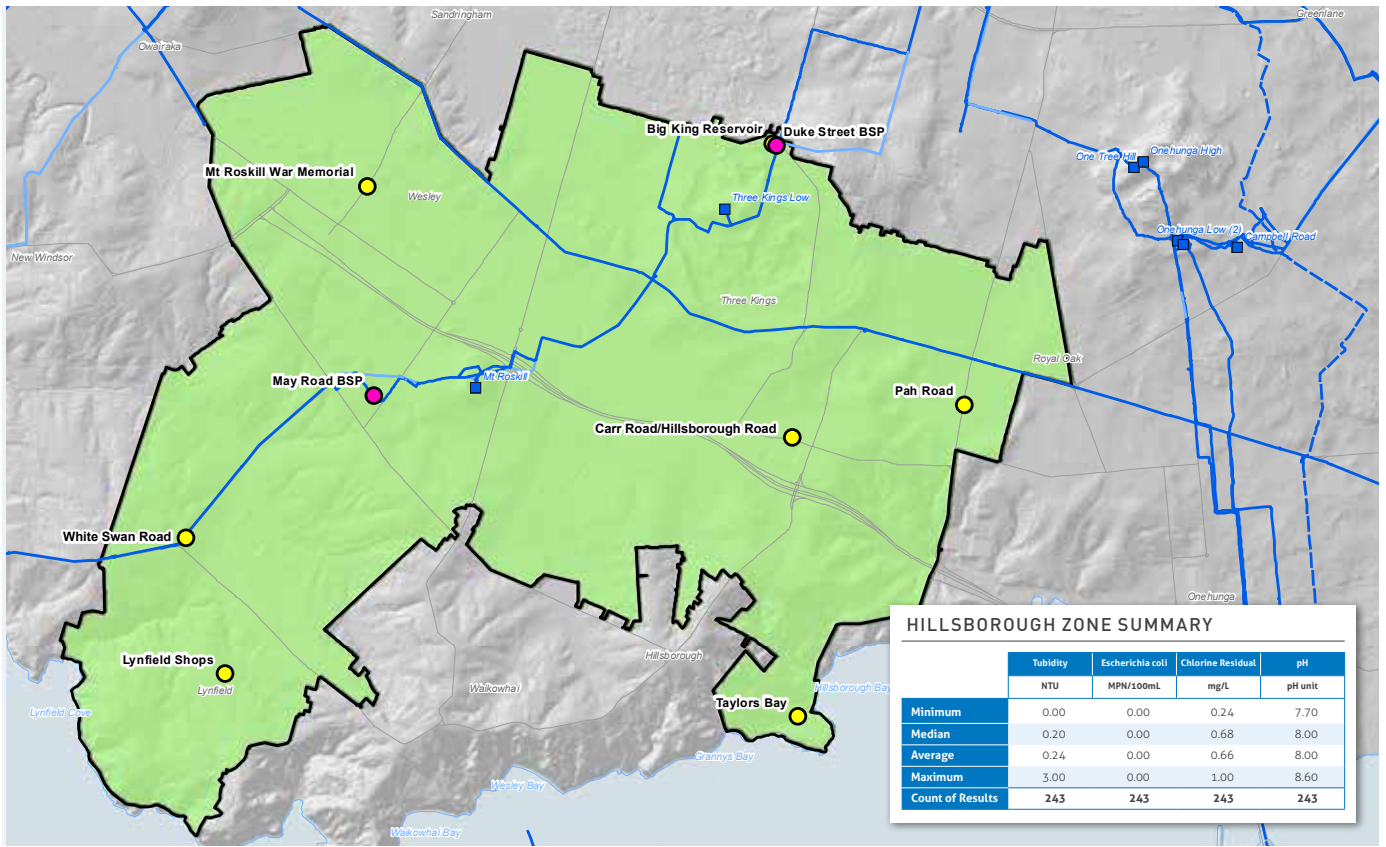
**LEGEND**

- Sample Taps ● Distribution
- Watermain — Treated Built
- Reservoir ■
- Grading Zone
- Transmission ●
- Raw Built —
- Out of Service —
- Tunnel —





# APPENDIX 3 Water quality in grading zones Central Area

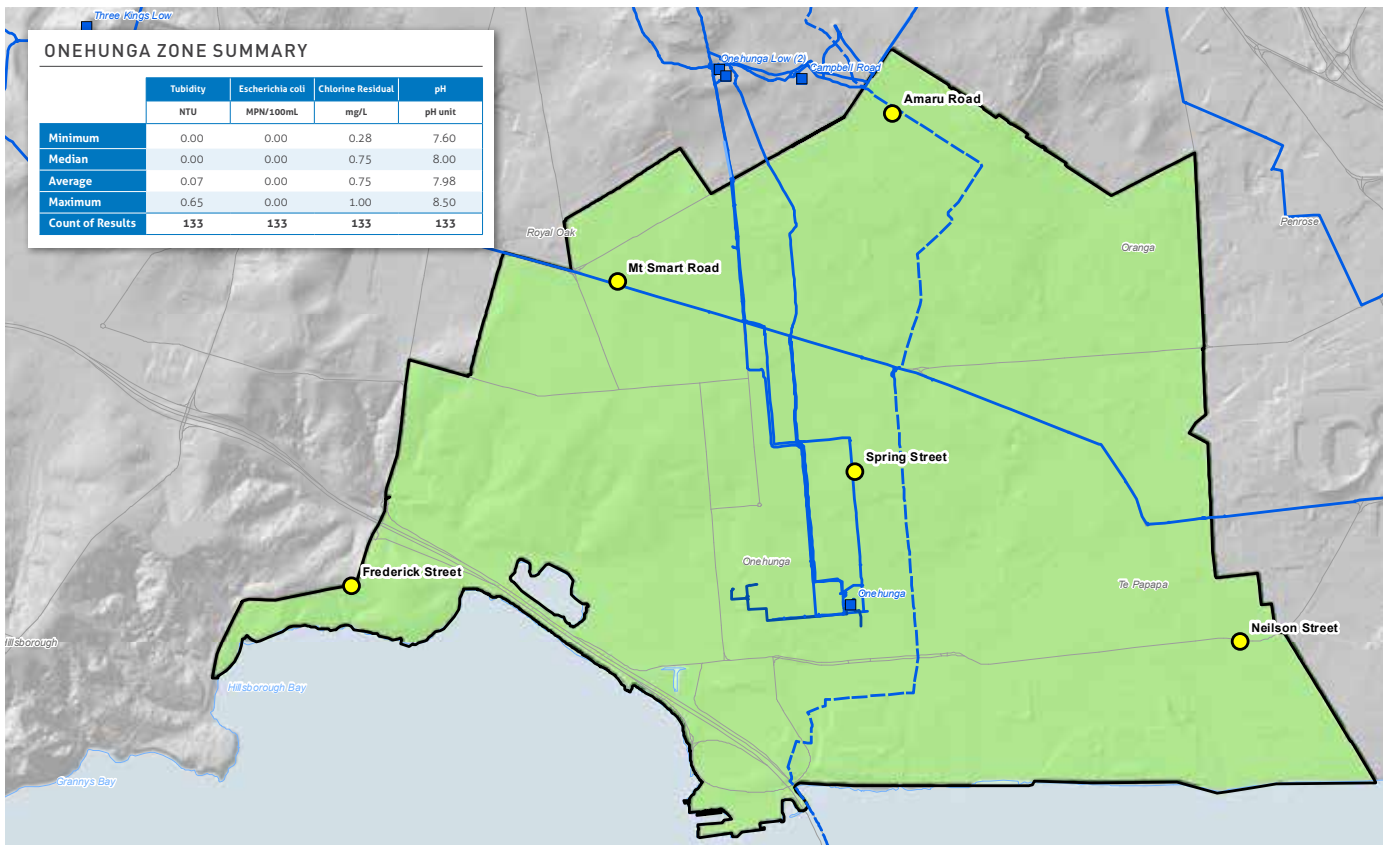
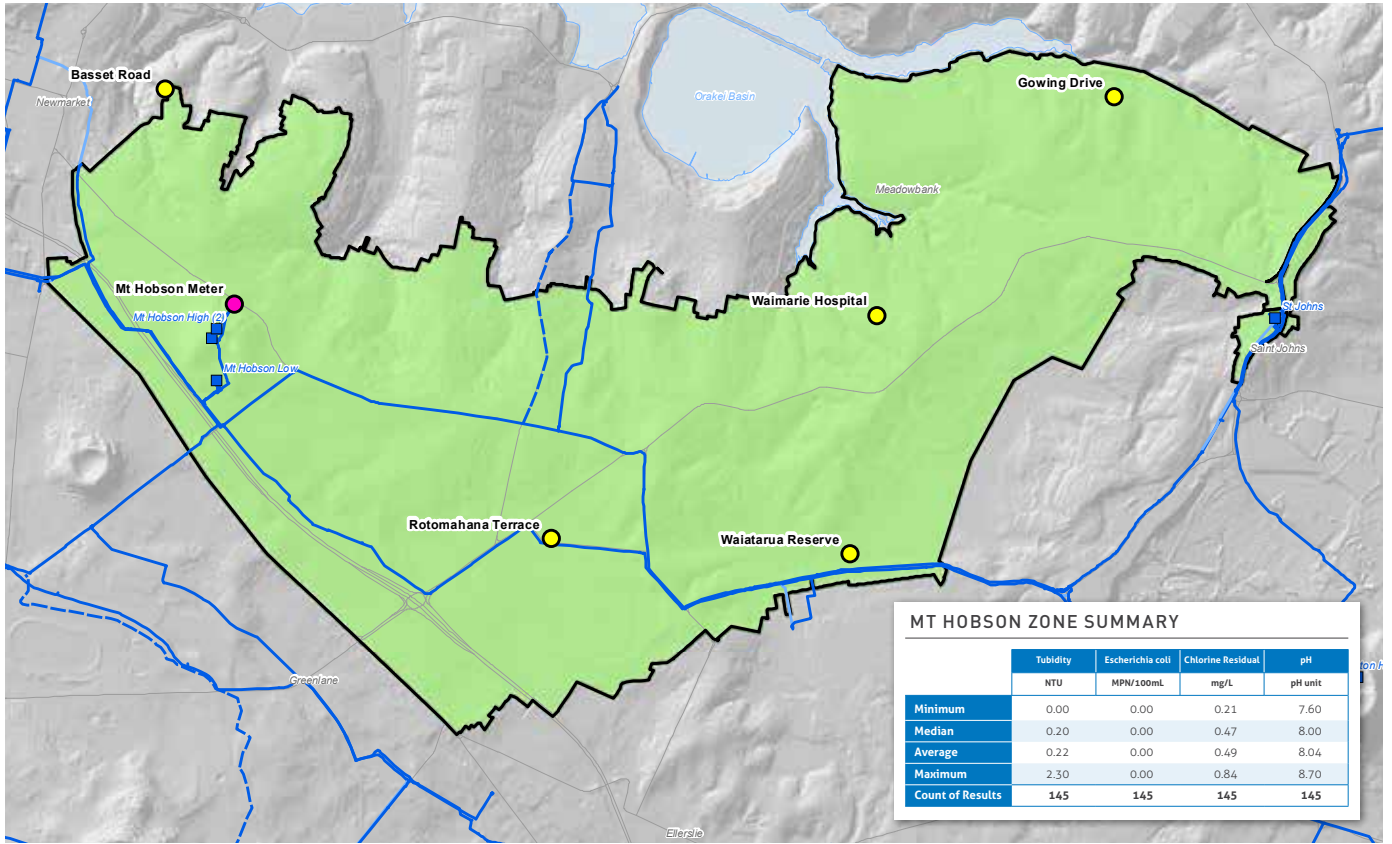


**LEGEND**

- Sample Taps
- Watermain
- Reservoir
- Grading Zone
- Distribution
- Treated Built
- Proposed
- Out of Service
- Transmission
- Raw Built
- Tunnel



# APPENDIX 3 Water quality in grading zones Central Area



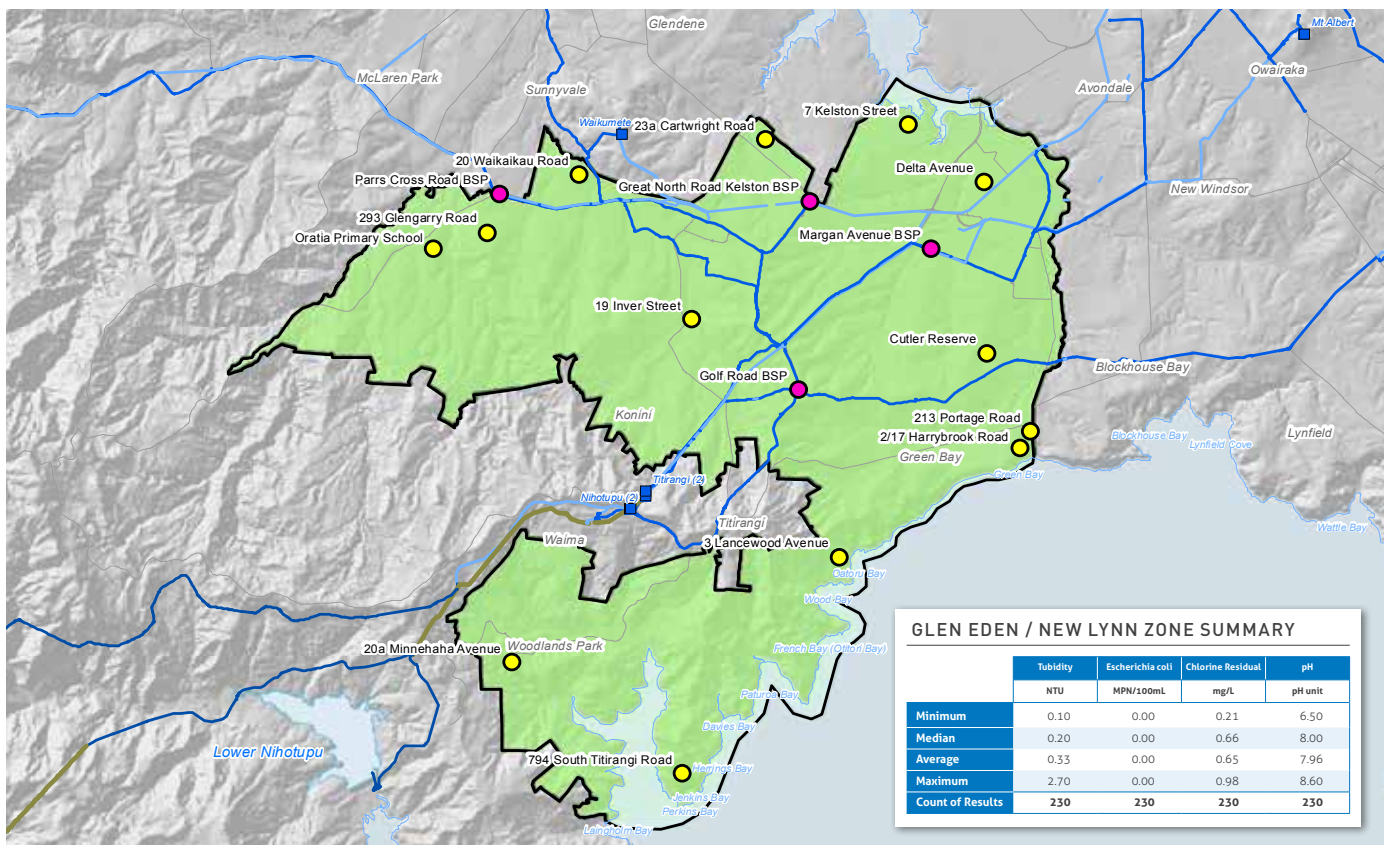
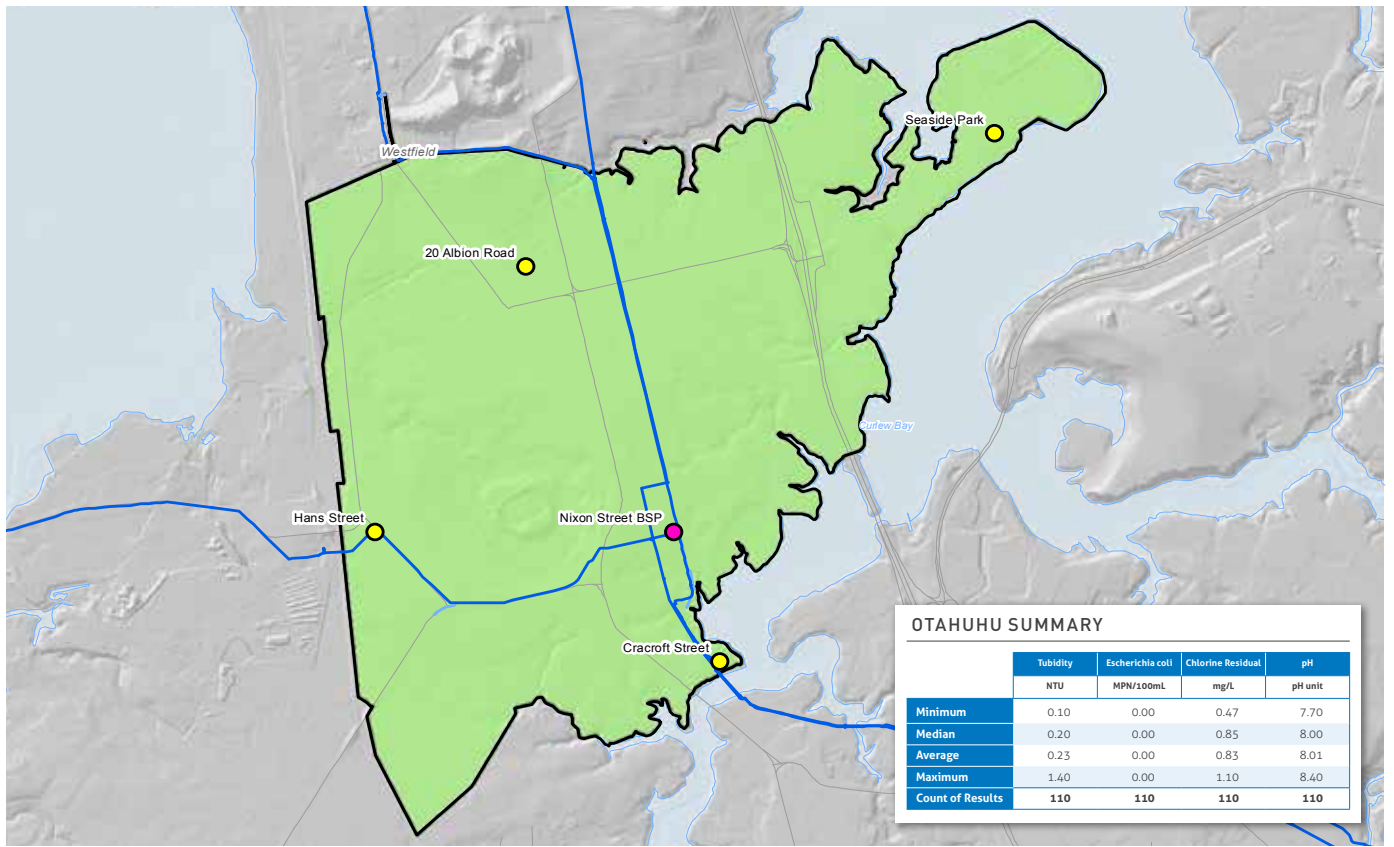
**LEGEND**

- Sample Taps
  - Distribution
  - Transmission
- Watermain
  - Treated Built
  - Raw Built
  - Proposed
  - Out of Service
  - Tunnel
- Reservoir
  - Reservoir
- Grading Zone
  - Grading Zone





# APPENDIX 3 Water quality in grading zones Central/North Western Area

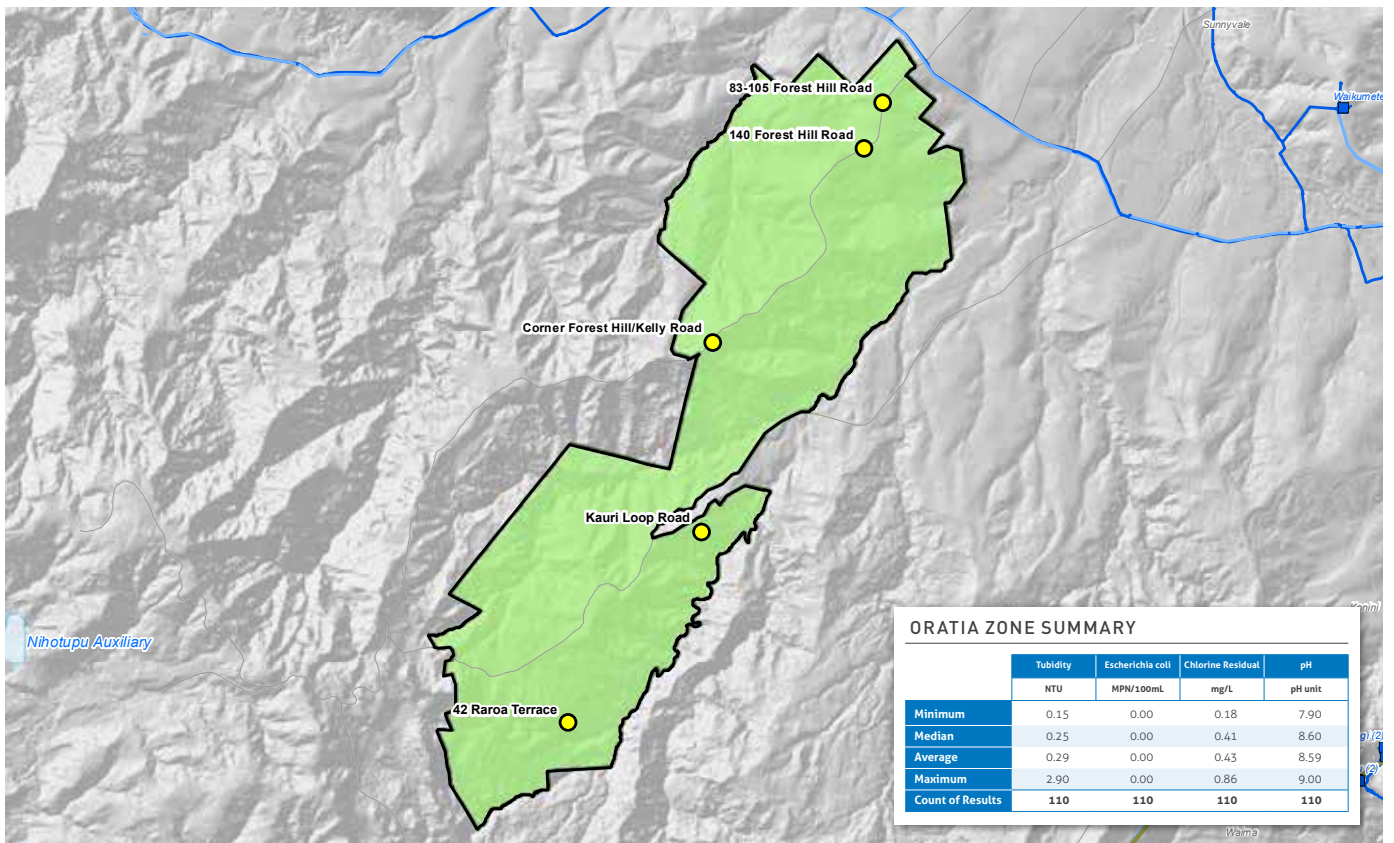
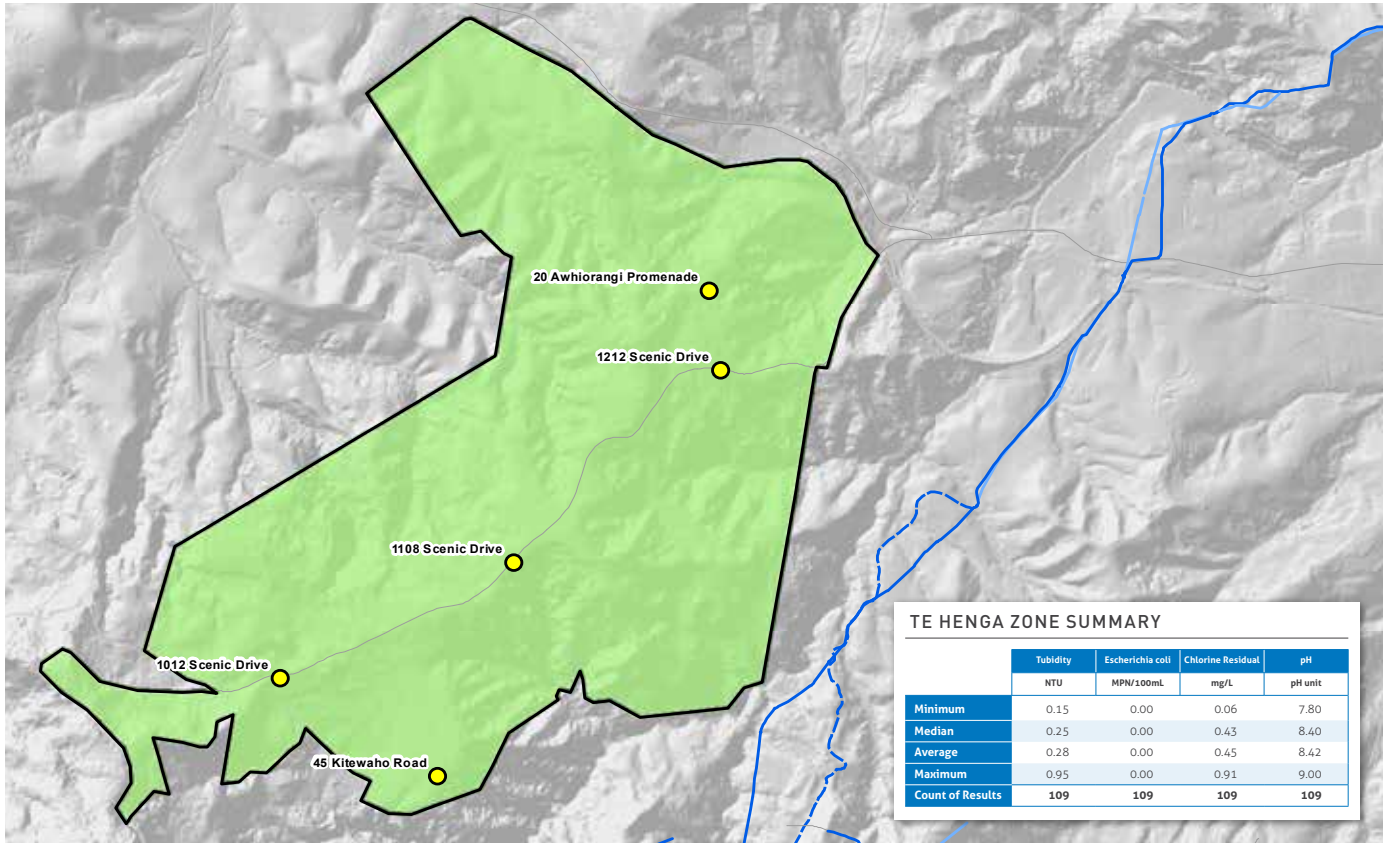


**LEGEND**

- Sample Taps ● Distribution
- Watermain — Treated Built
- Proposed
- Reservoir
- Transmission
- Raw Built
- Out of Service
- Grading Zone
- Tunnel



## APPENDIX 3 Water quality in grading zones North Western Area



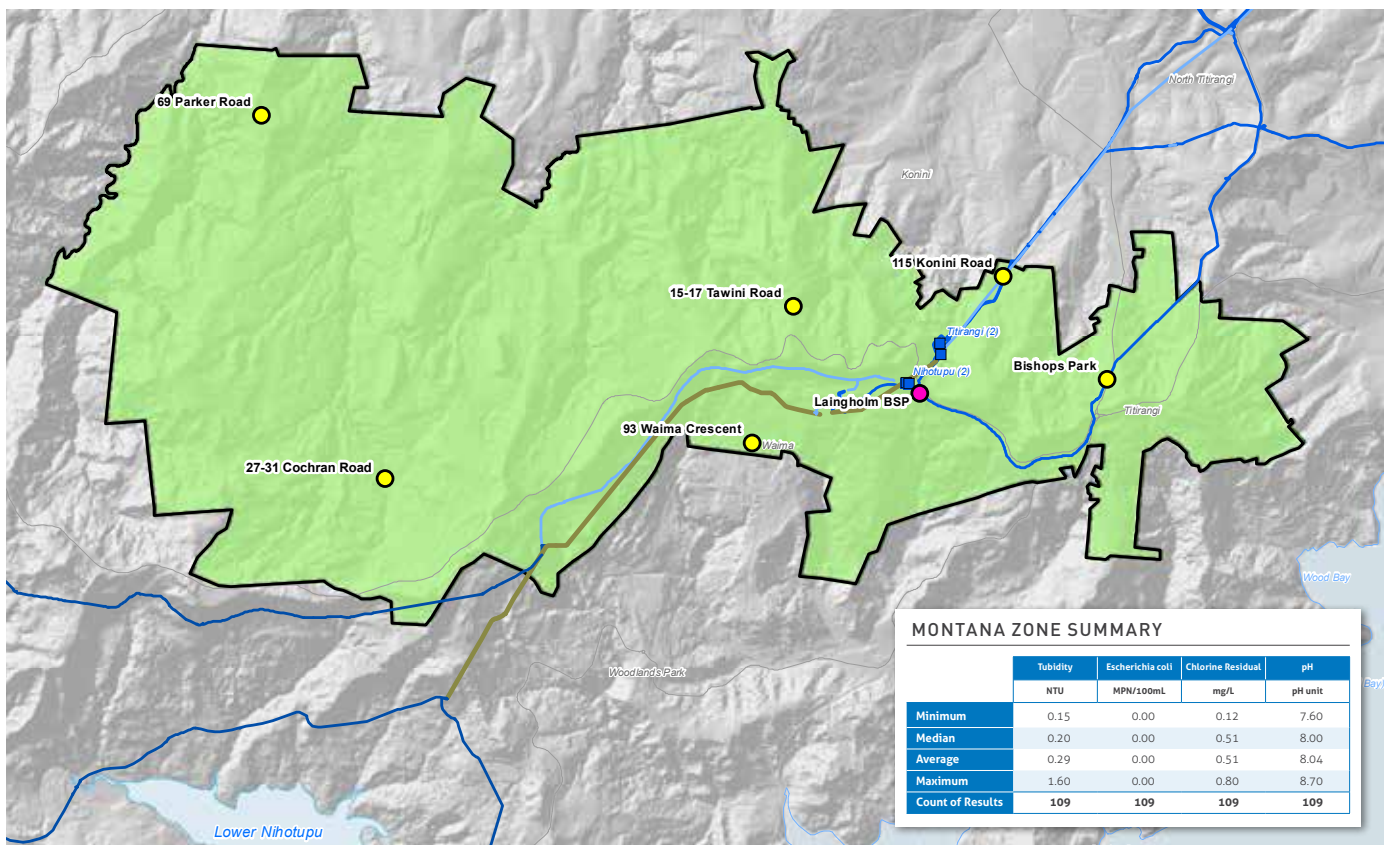
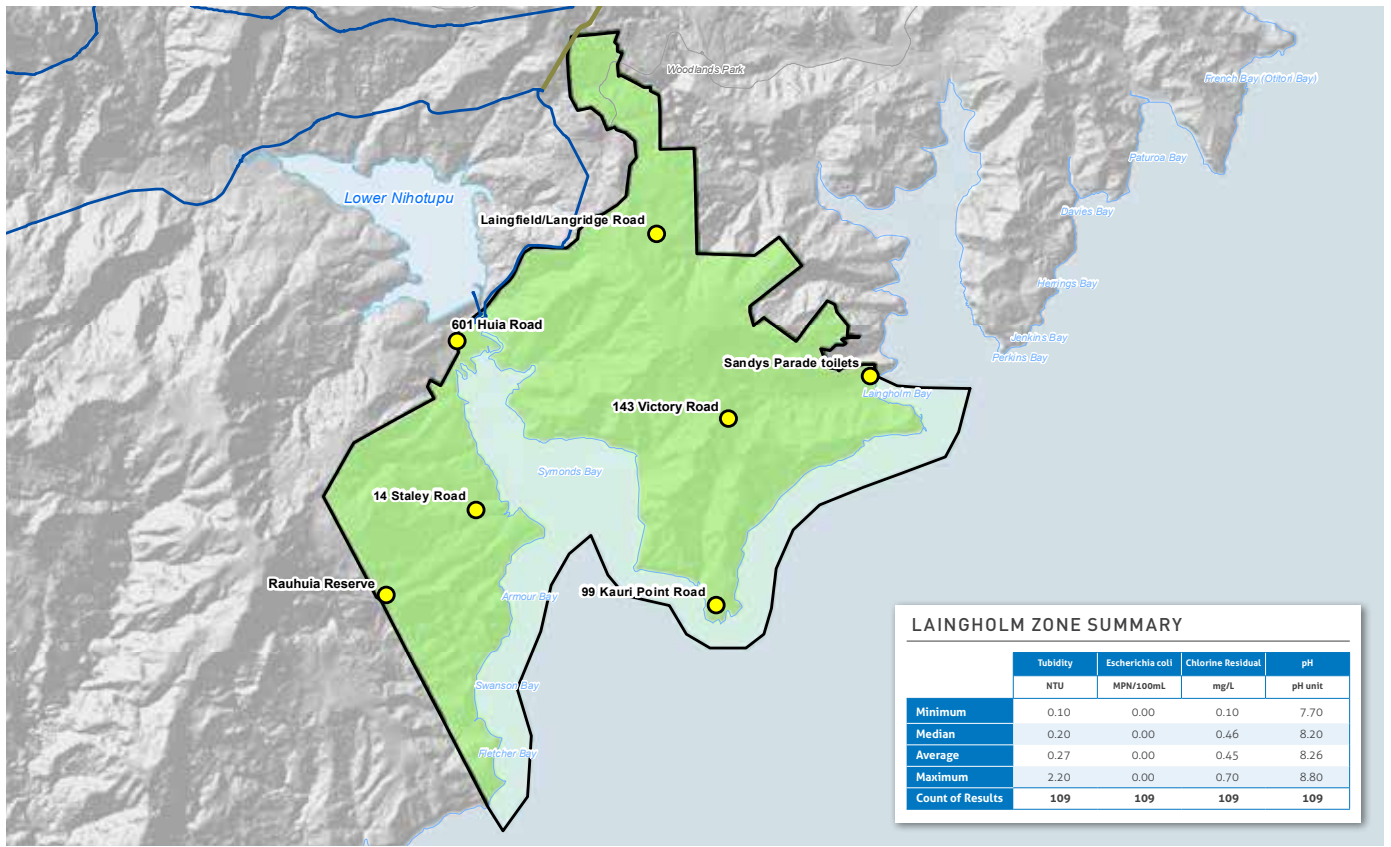
**LEGEND**

- Sample Taps
  - Distribution
  - Transmission
- Watermain
  - Treated Built
  - Raw Built
  - - - Proposed
  - - - Out of Service
  - Tunnel
- Reservoir
  - Grading Zone





# APPENDIX 3 Water quality in grading zones North Western Area

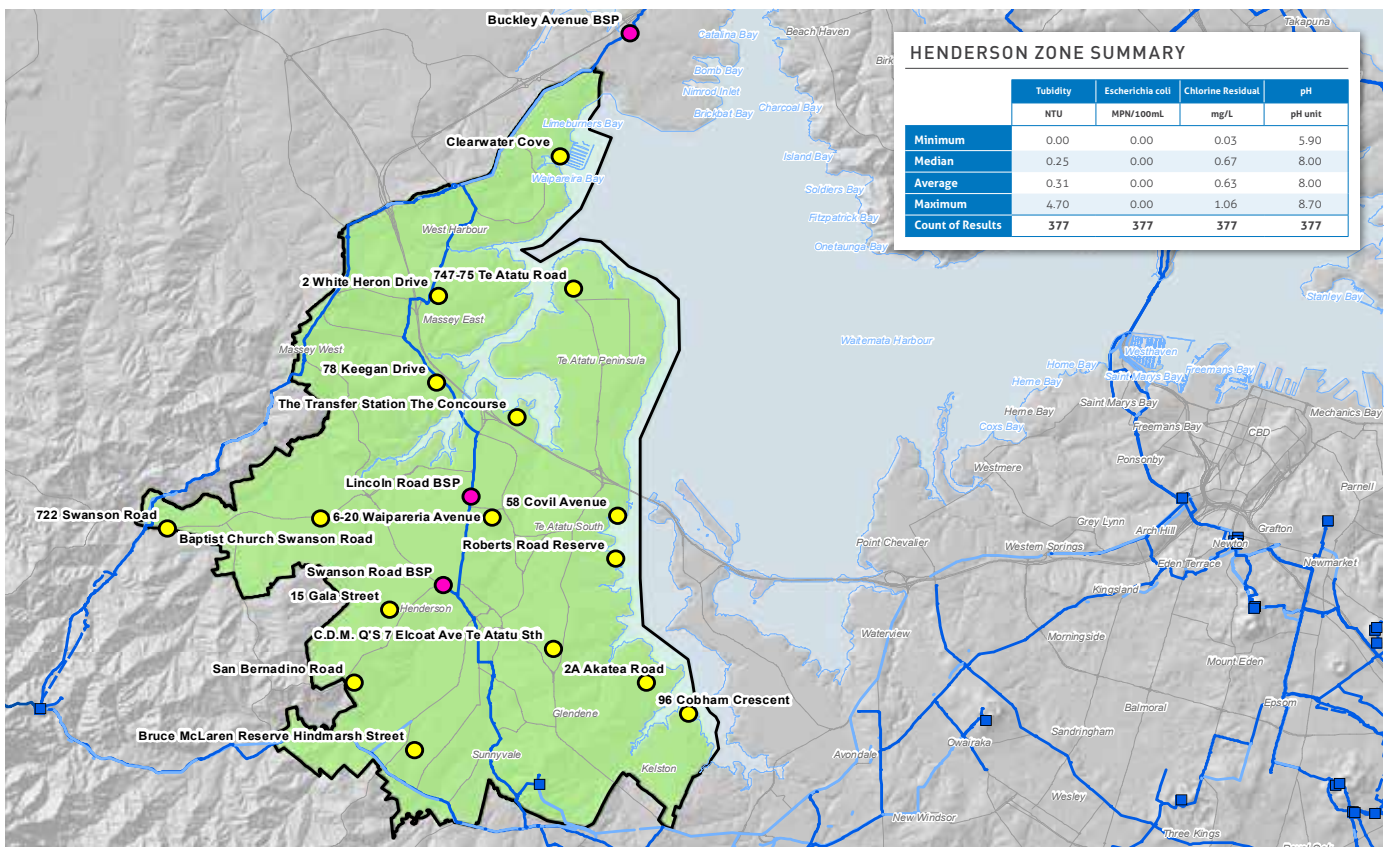
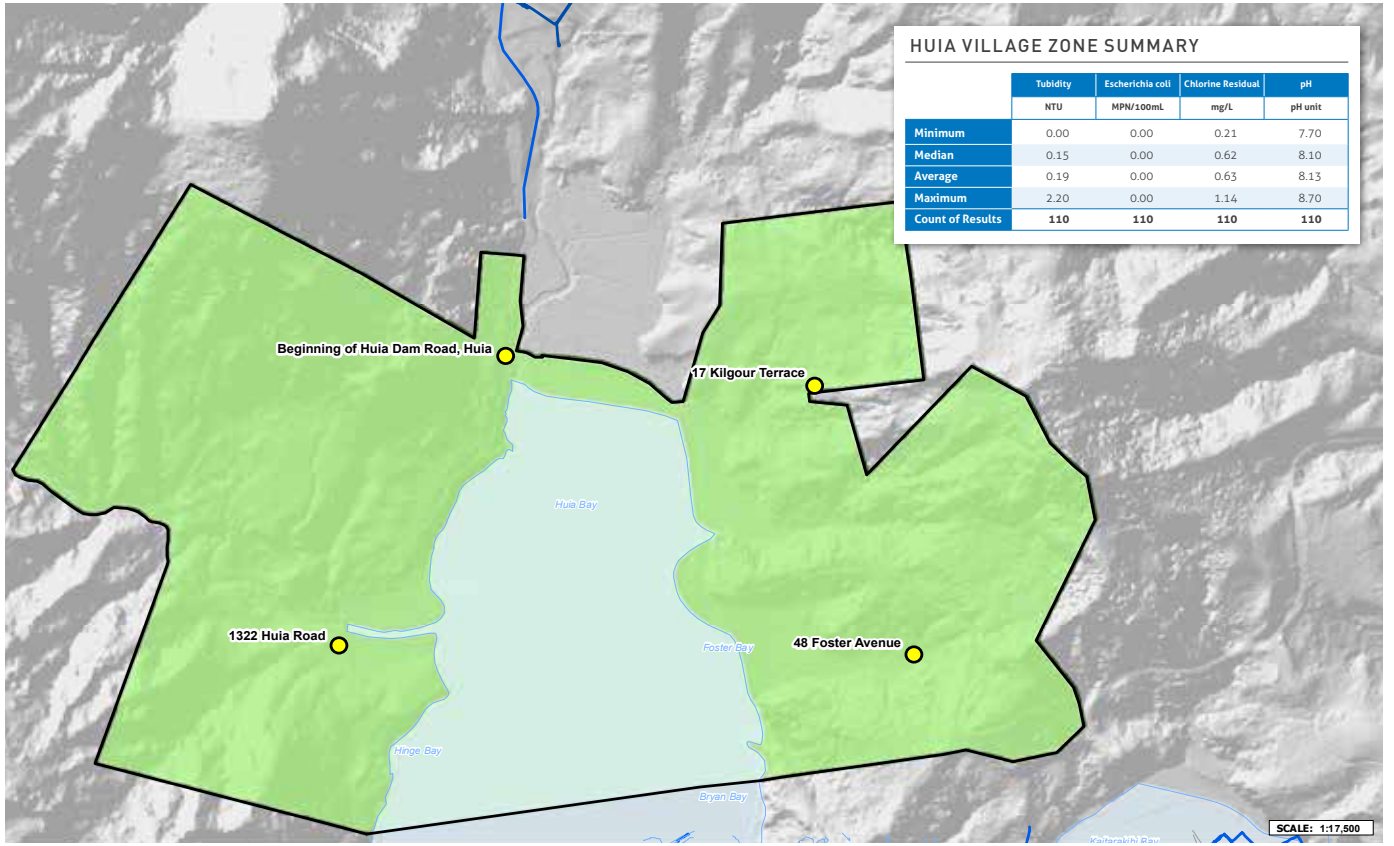


**LEGEND**

- Sample Taps
- Distribution
- Watermain
- Treated Built
- Proposed
- Reservoir
- Transmission
- Out of Service
- Raw Built
- Tunnel
- Grading Zone



# APPENDIX 3 Water quality in grading zones North Western Area



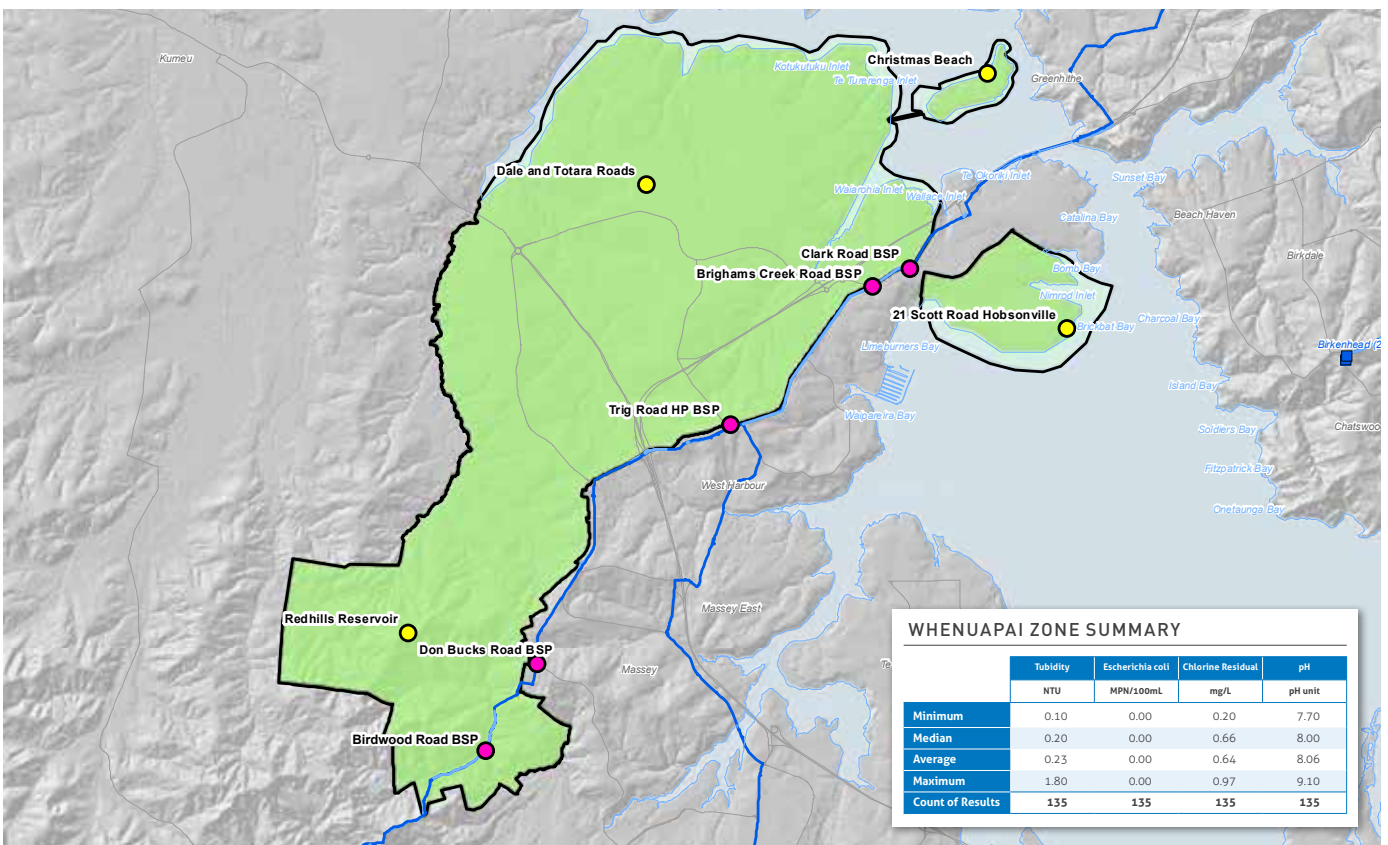
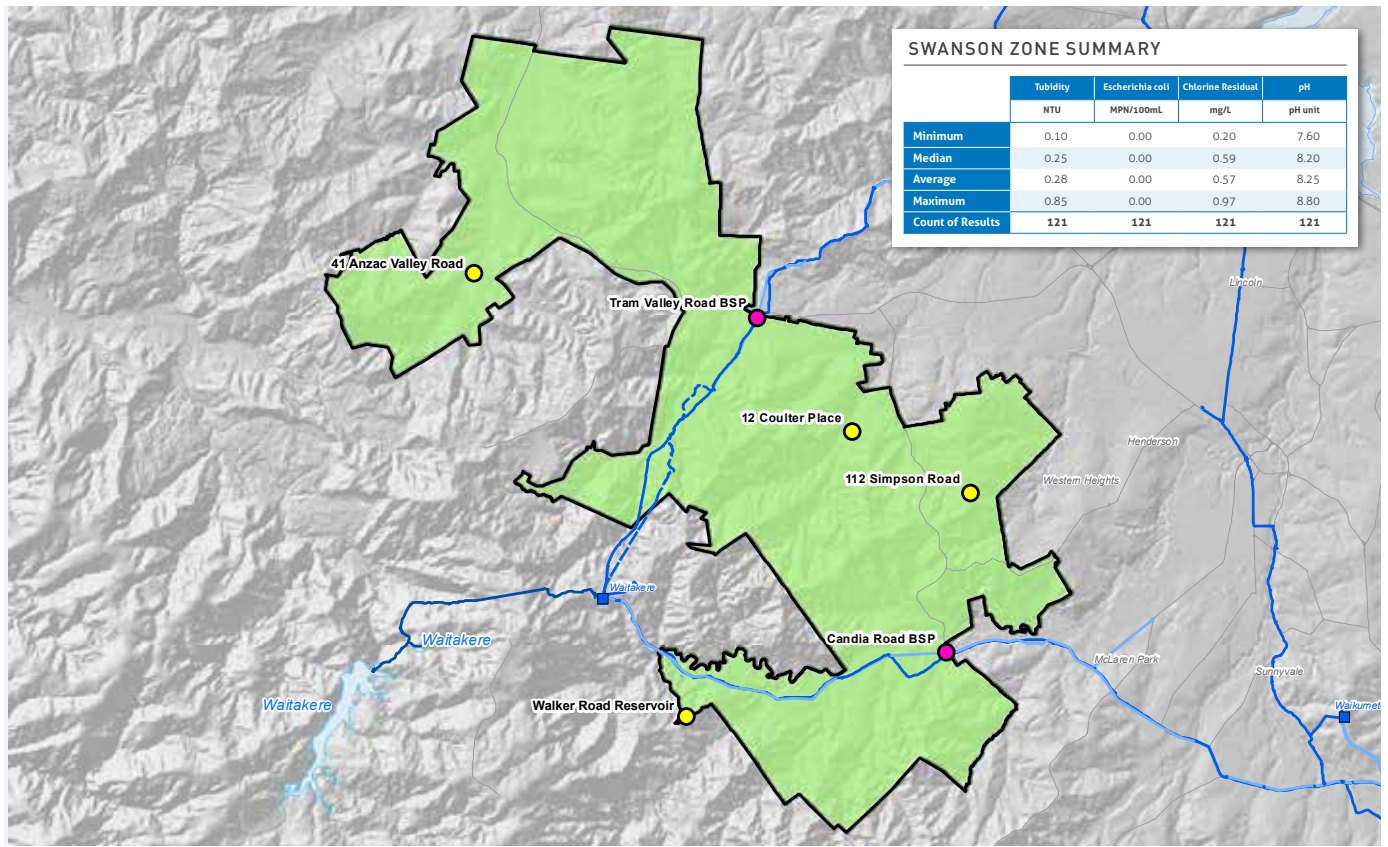
**LEGEND**

- Sample Taps
  - Distribution
  - Transmission
- Watermain
  - Treated Built
  - Raw Built
  - Proposed
  - Out of Service
  - Tunnel
- Reservoir
- Grading Zone





# APPENDIX 3 Water quality in grading zones North Western Area

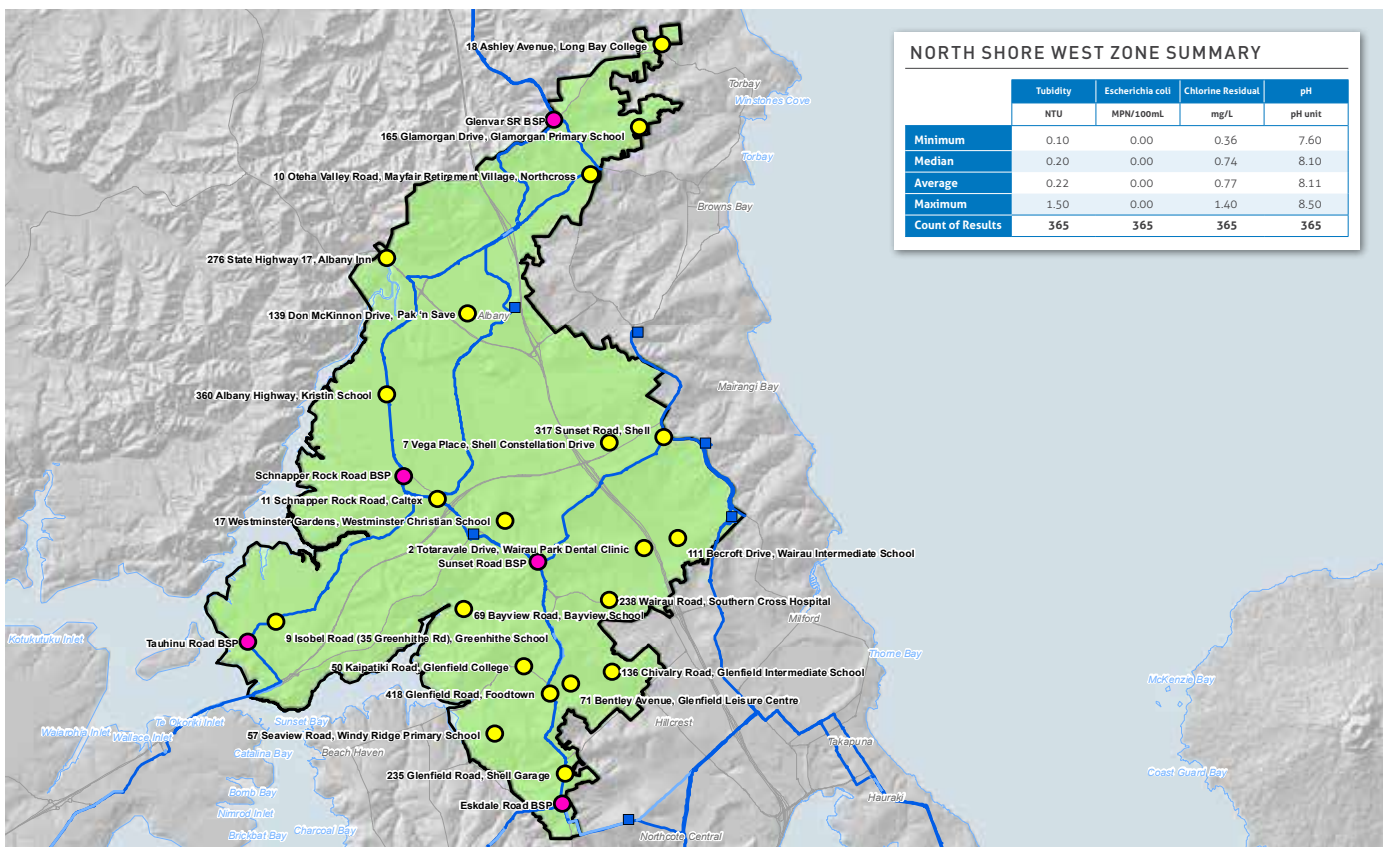
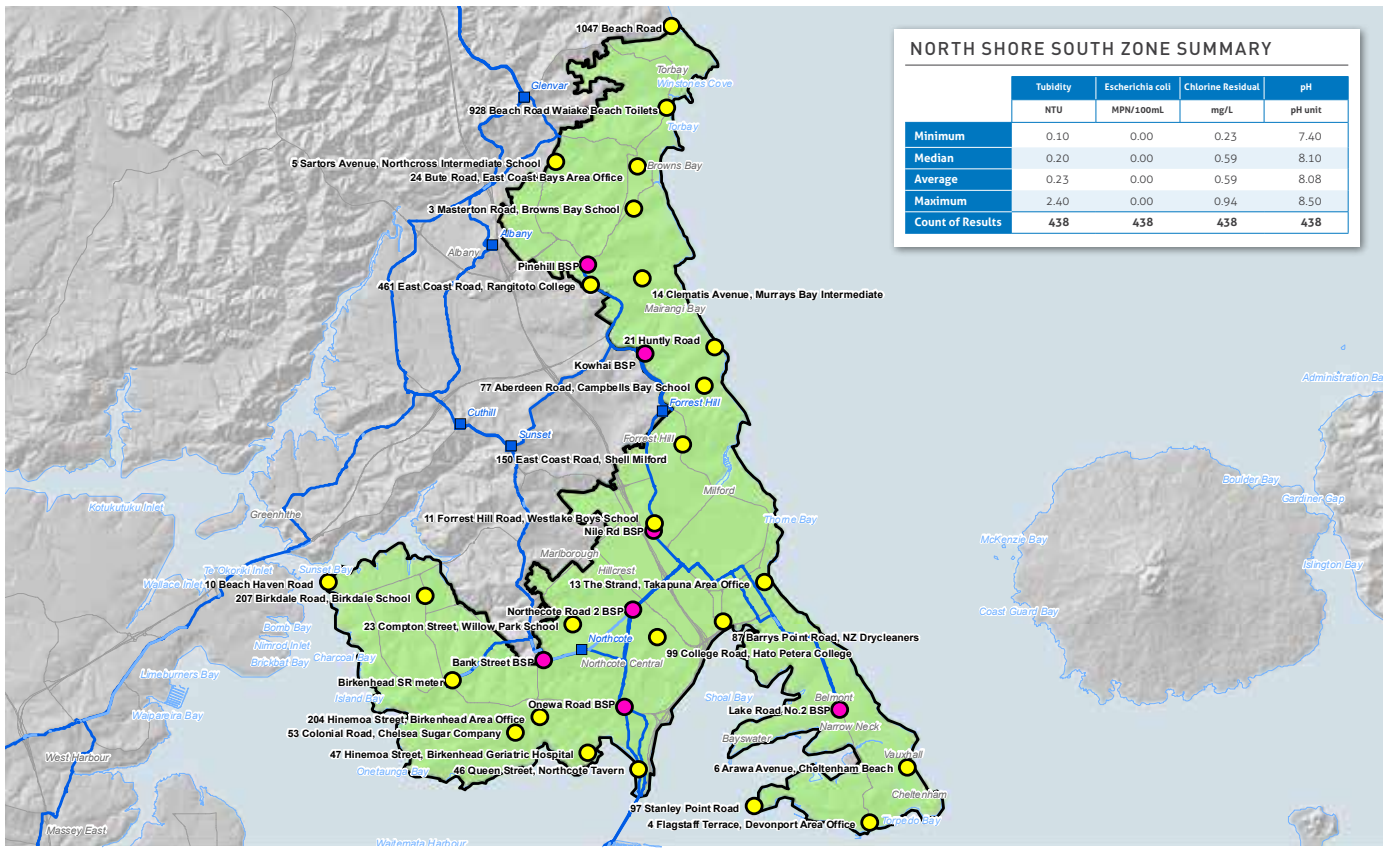


**LEGEND**

- Sample Taps ● Distribution
- Transmission
- Watermain — Treated Built
- Raw Built
- - - Proposed
- Out of Service
- Reservoir
- Grading Zone
- Tunnel



# APPENDIX 3 Water quality in grading zones North Western Area



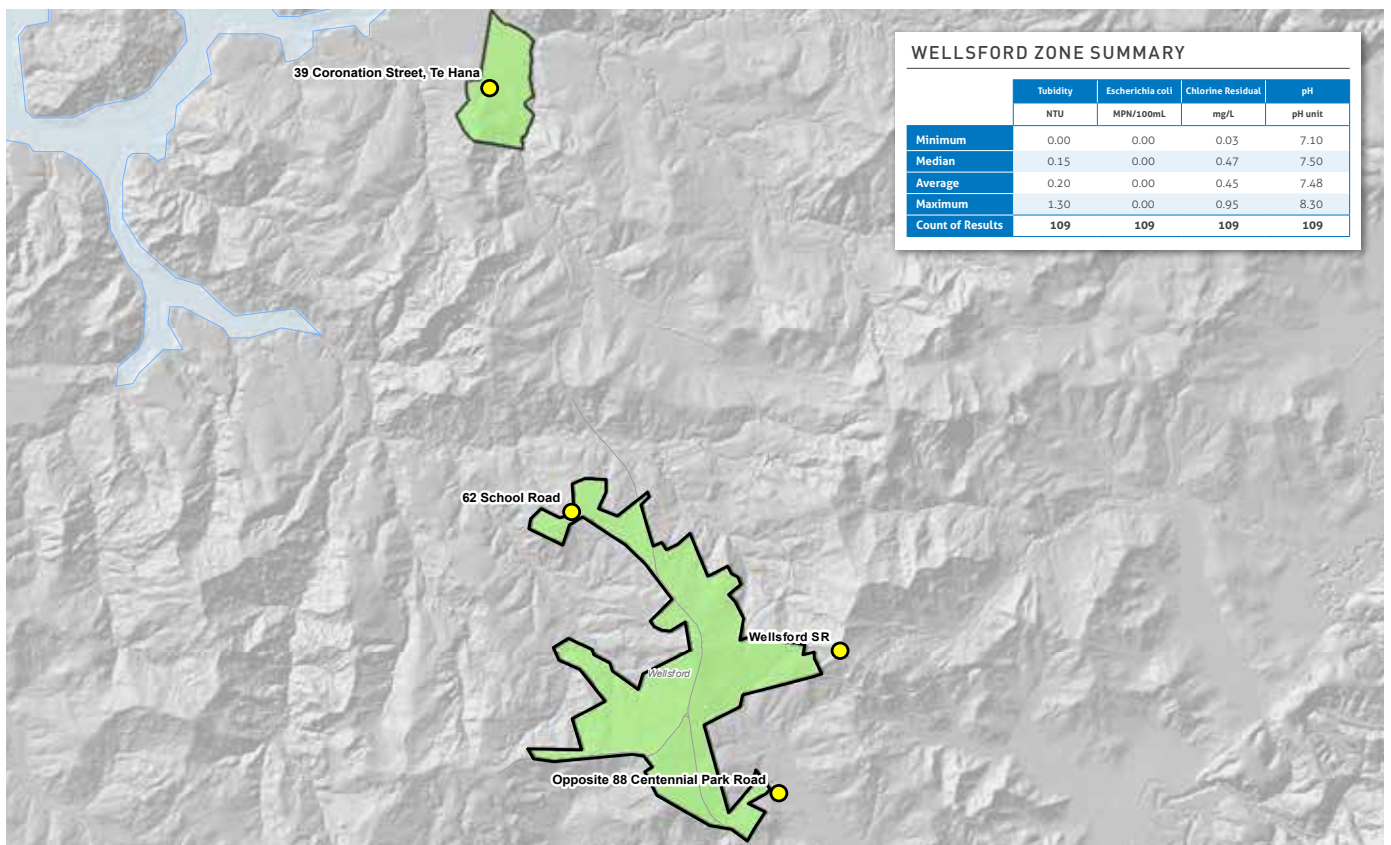
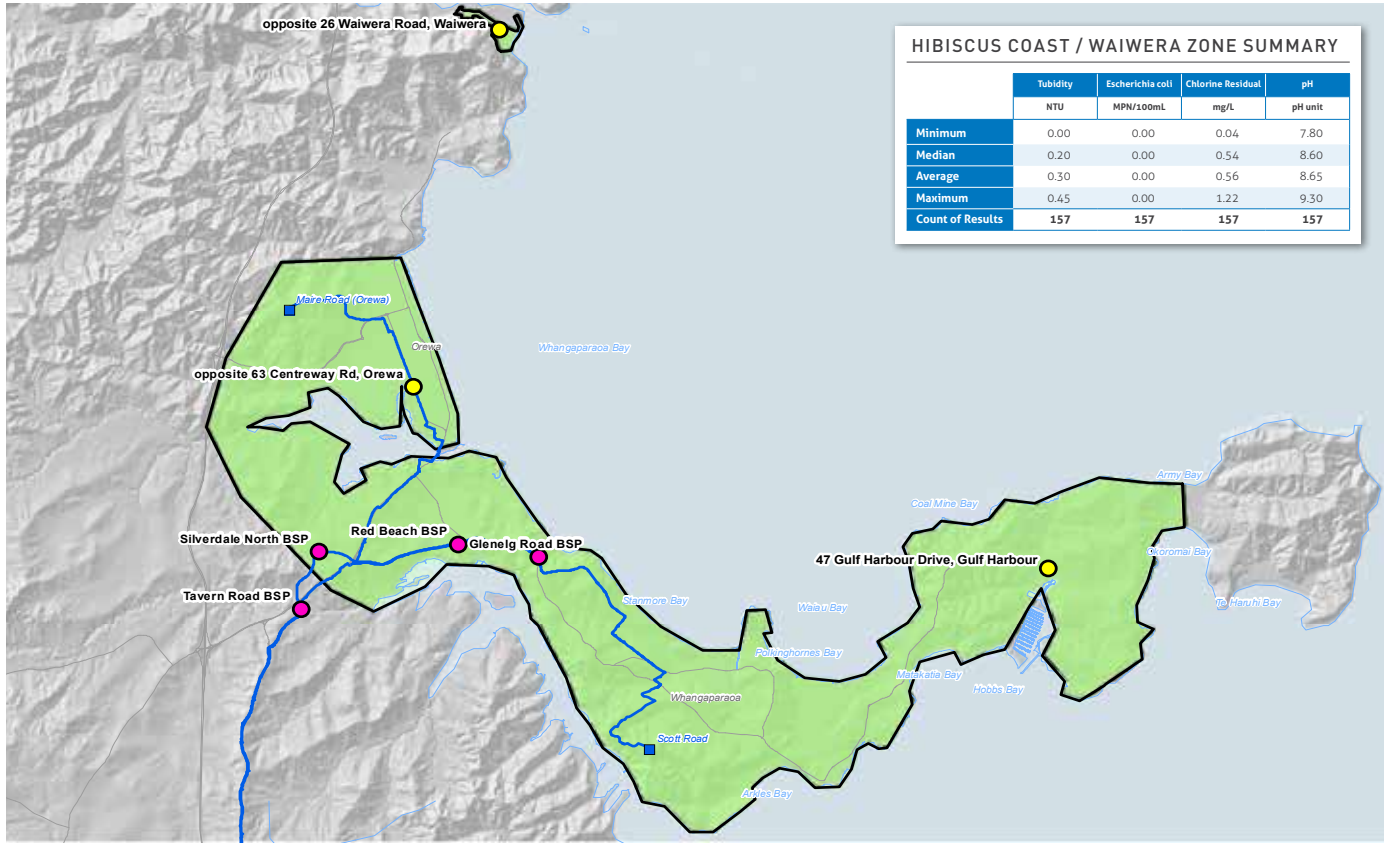
**LEGEND**

- Sample Taps ● Distribution
- Transmission
- Watermain — Treated Built
- Raw Built
- Proposed
- Out of Service
- Reservoir
- Grading Zone
- Tunnel





# APPENDIX 3 Water quality in grading zones North Western Area

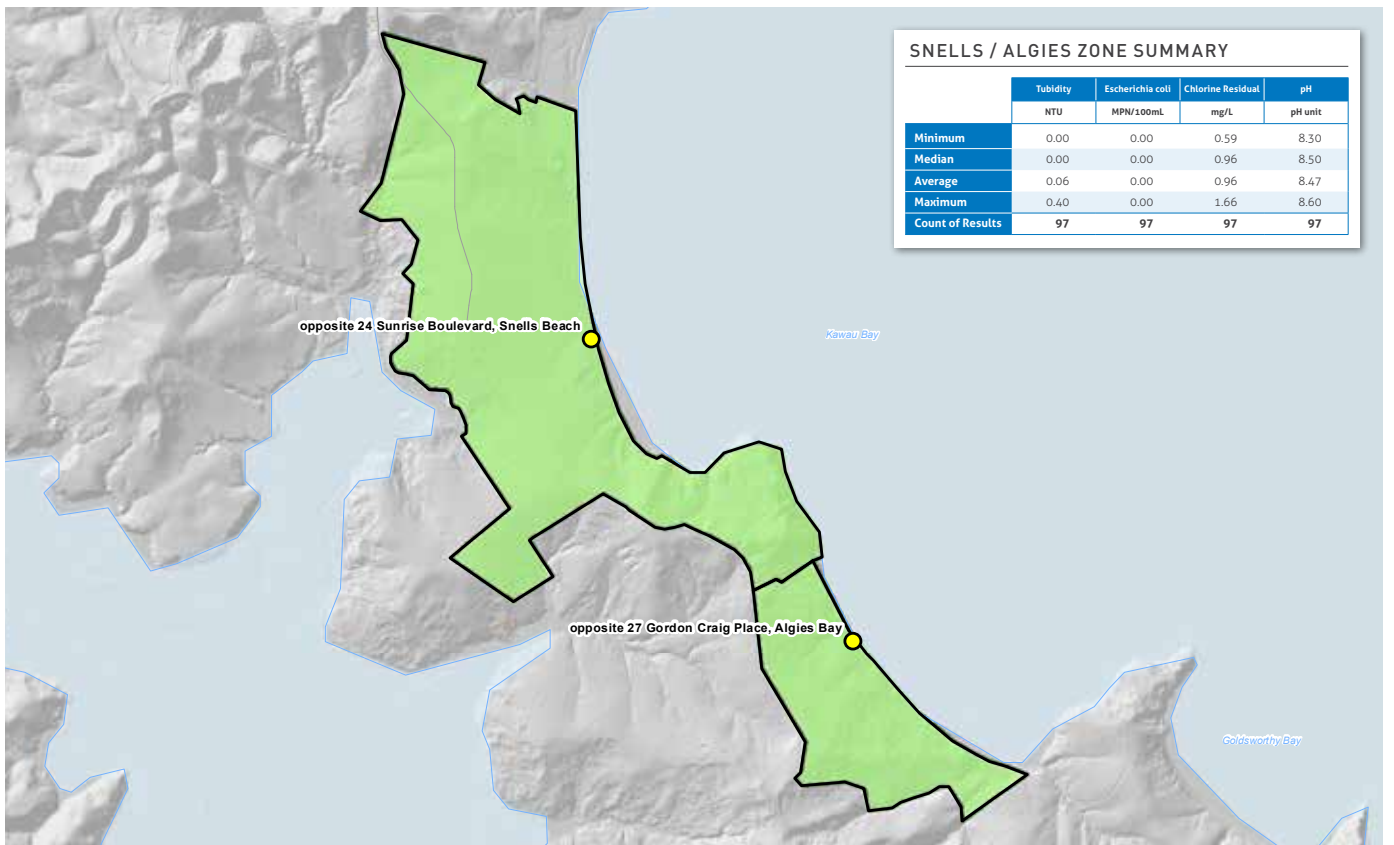
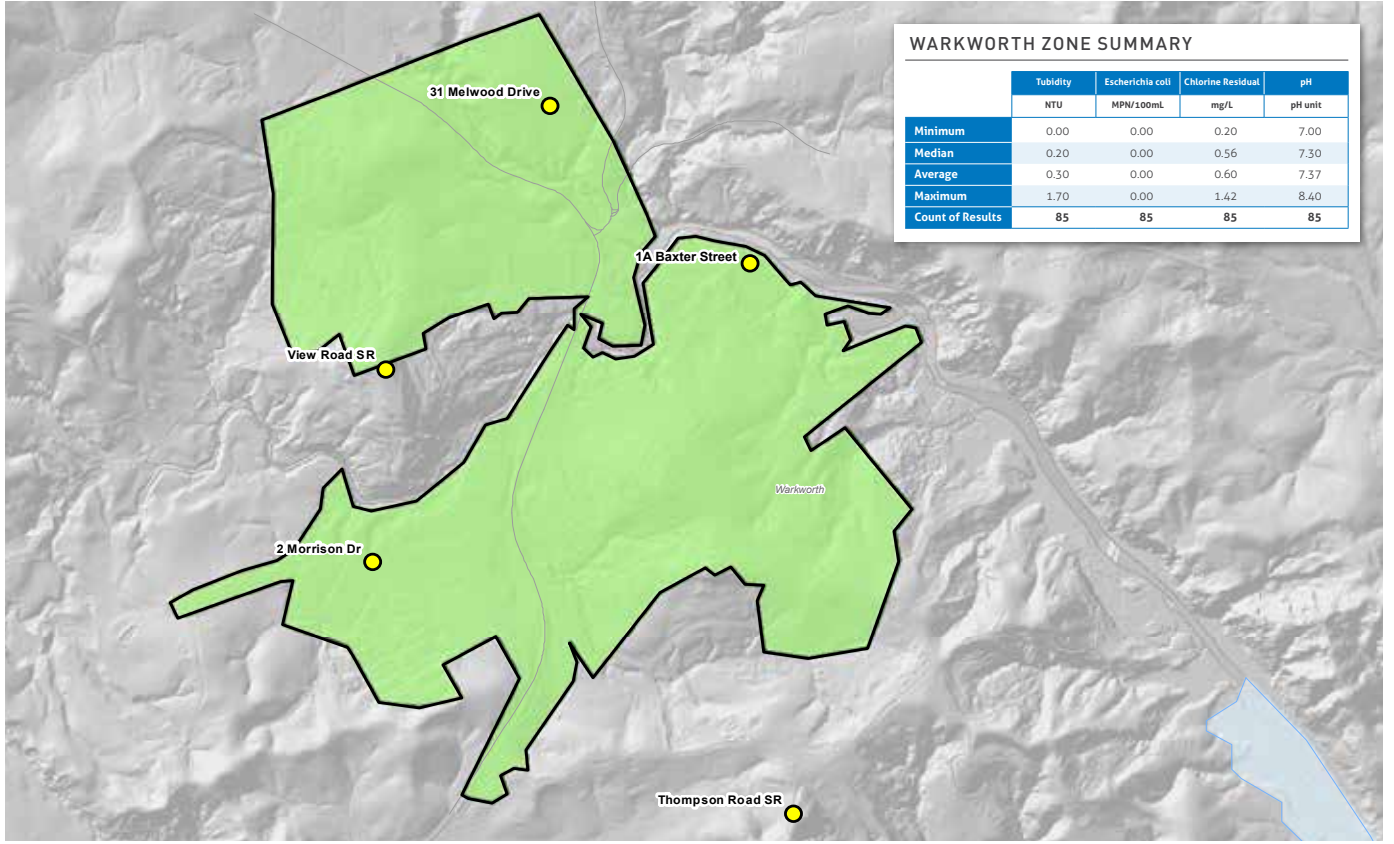


**LEGEND**

- Sample Taps
- Watermain
- Reservoir
- Grading Zone
- Distribution
- Treated Built
- Proposed
- Out of Service
- Transmission
- Raw Built
- Tunnel



# APPENDIX 3 Water quality in grading zones North Western Area



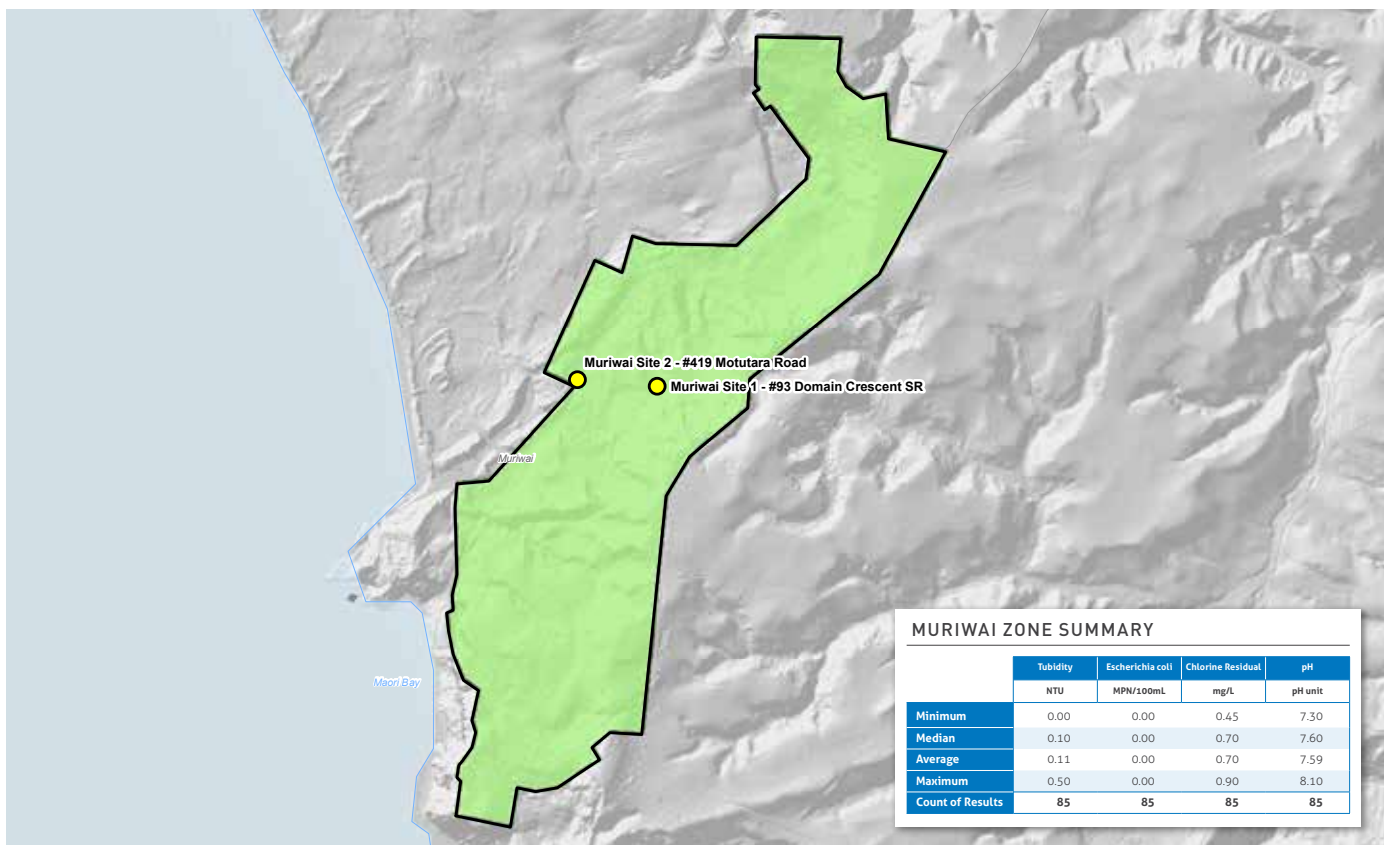
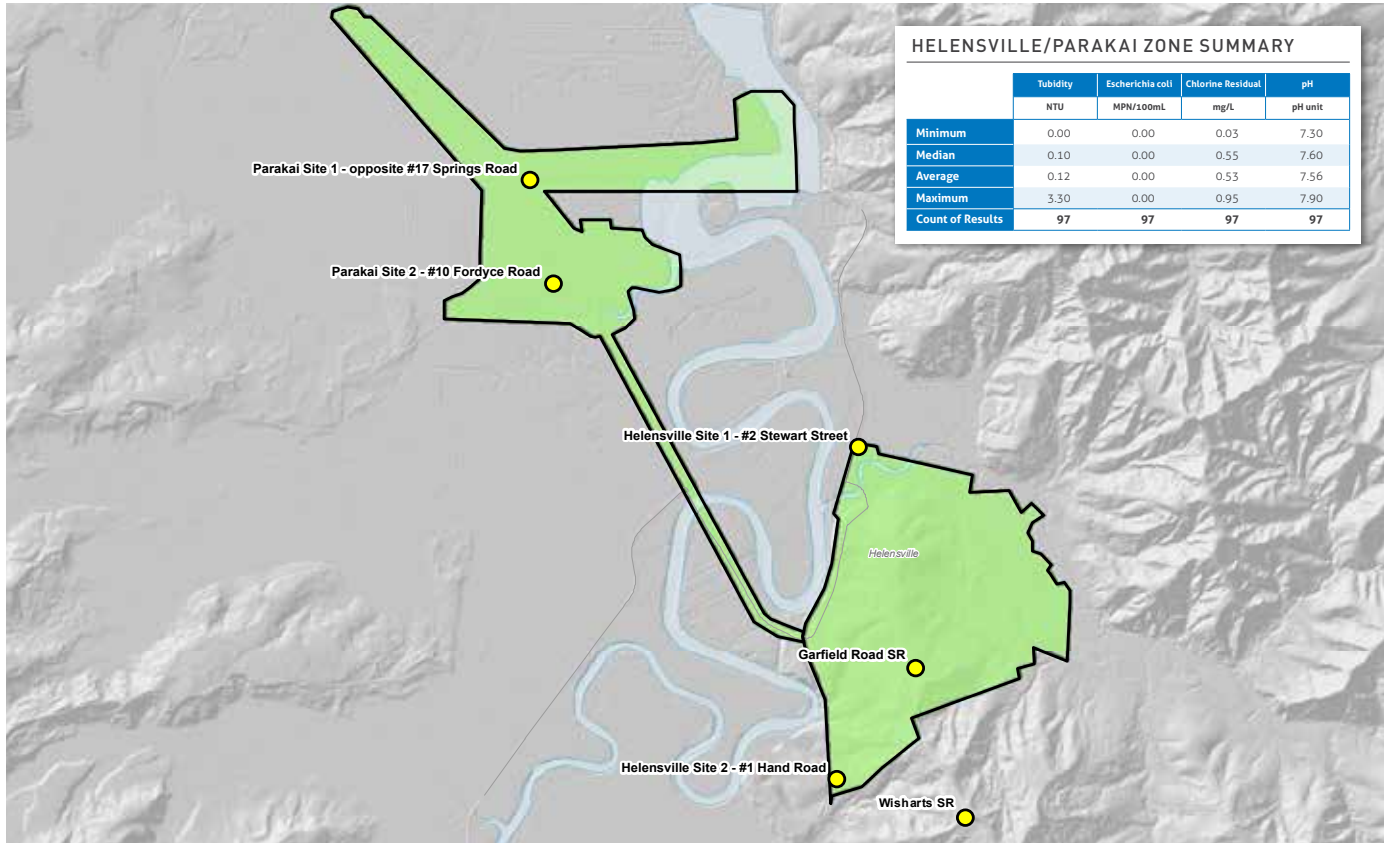
**LEGEND**

- Sample Taps ● Distribution
- Transmission
- Watermain — Treated Built
- Raw Built
- Proposed
- Out of Service
- Tunnel
- Reservoir
- Grading Zone





# APPENDIX 3 Water quality in grading zones North Western Area

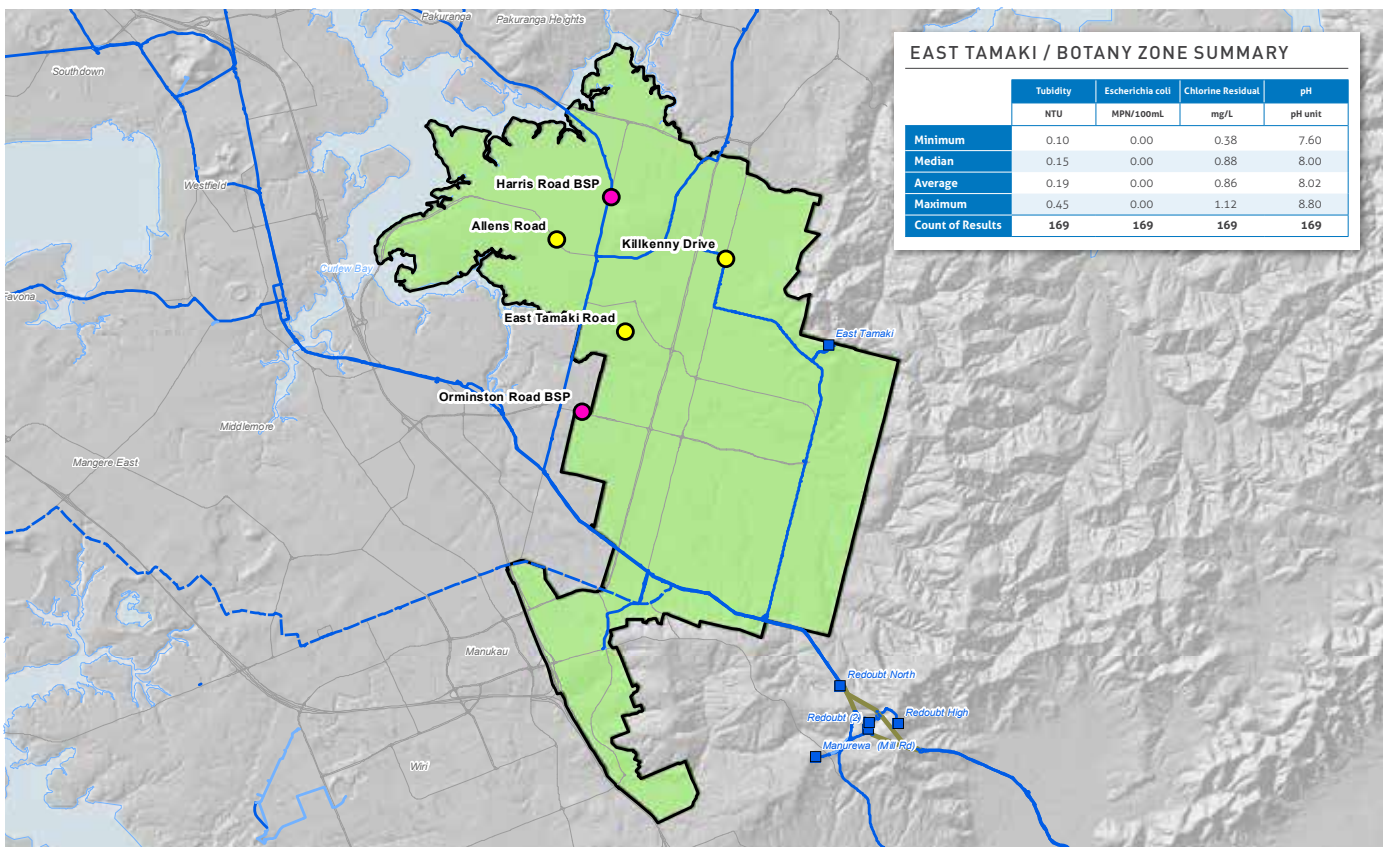
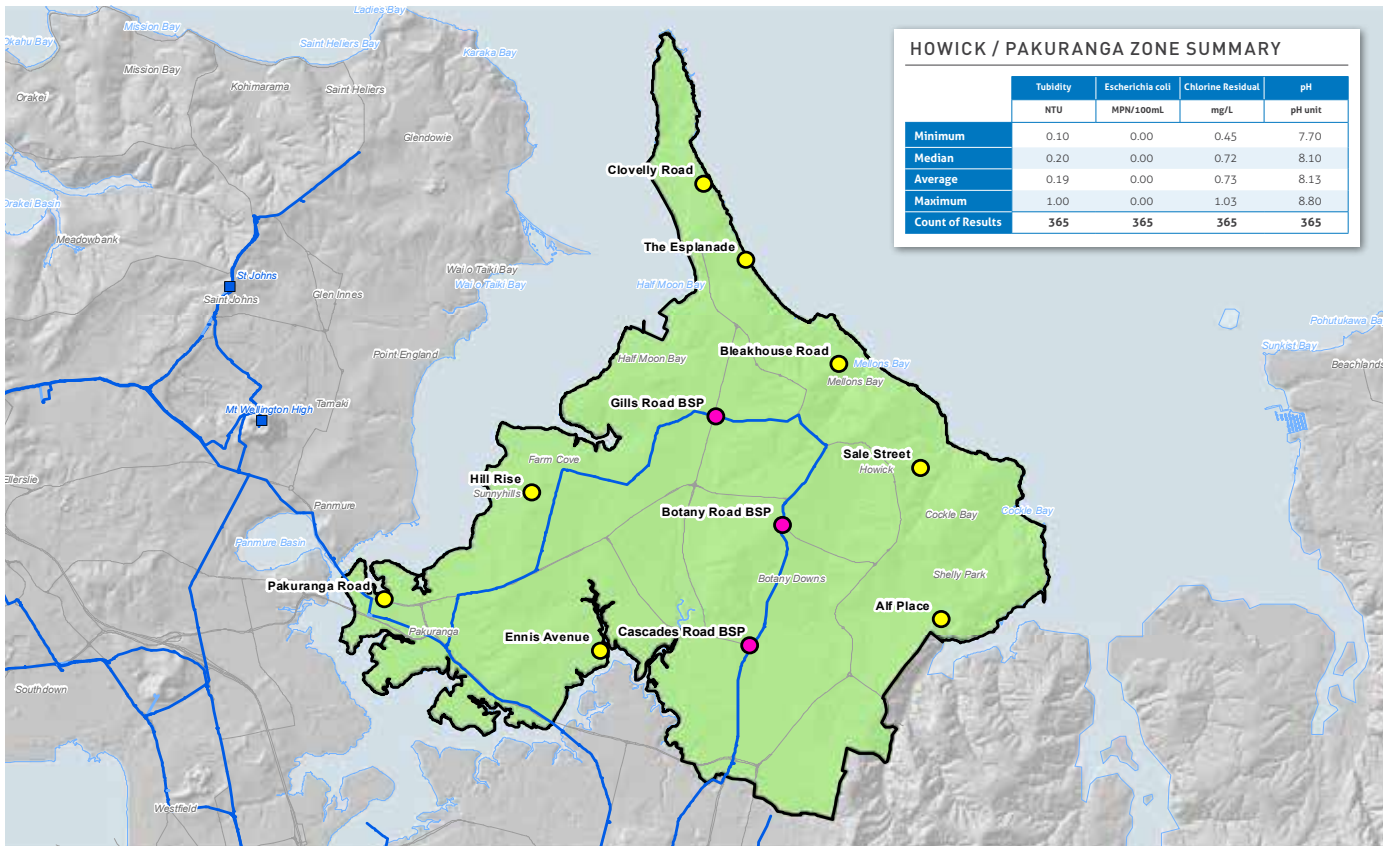


**LEGEND**

- Sample Taps ● Distribution
- Transmission
- Watermain — Treated Built
- Raw Built
- - - Proposed
- - - Out of Service
- Tunnel
- Reservoir
- Grading Zone



# APPENDIX 3 Water quality in grading zones Southern Area



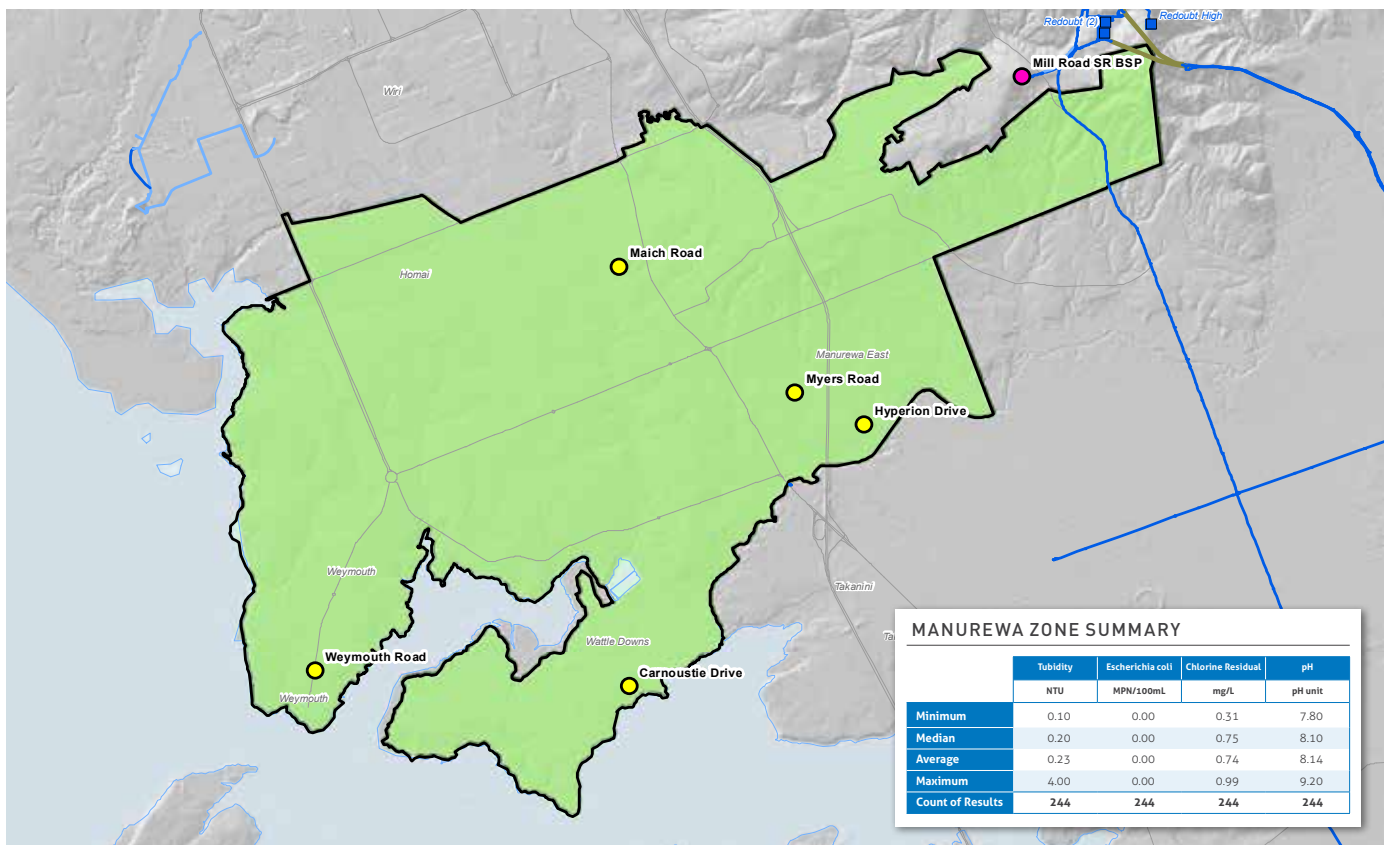
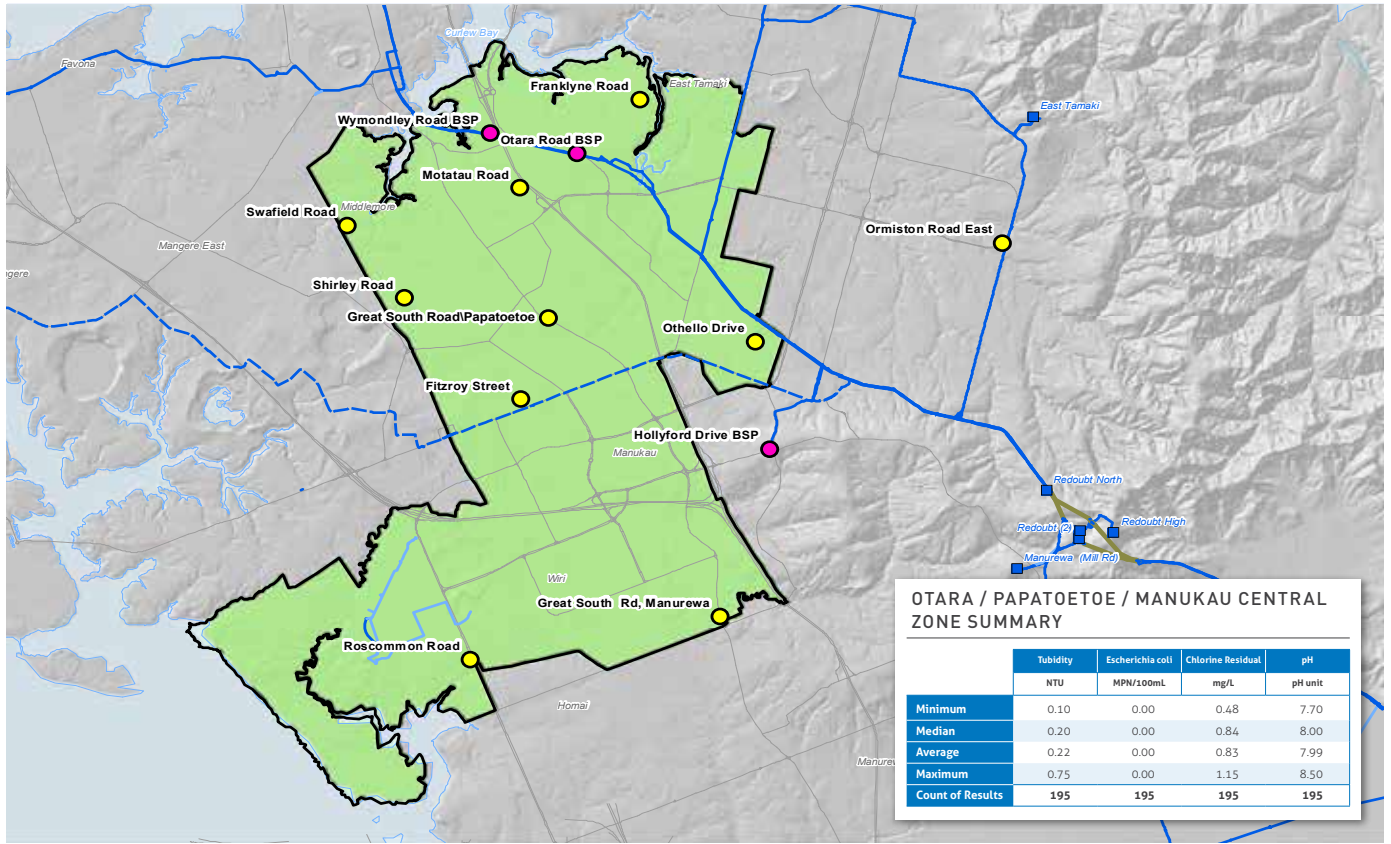
**LEGEND**

- Sample Taps ● Distribution
- Watermain — Treated Built
- Proposed
- Reservoir
- Transmission
- Raw Built
- Out of Service
- Grading Zone
- Tunnel





# APPENDIX 3 Water quality in grading zones Southern Area

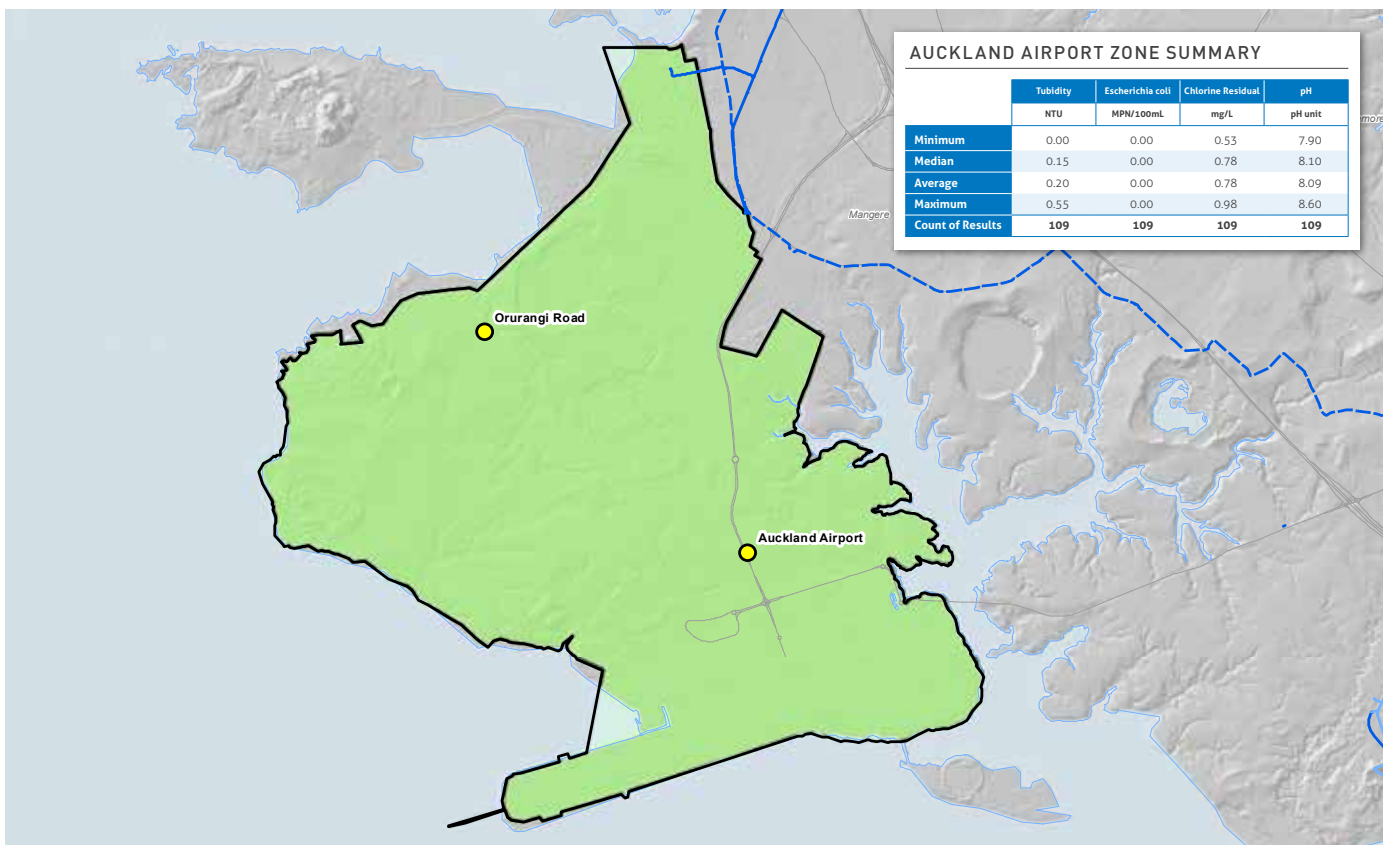
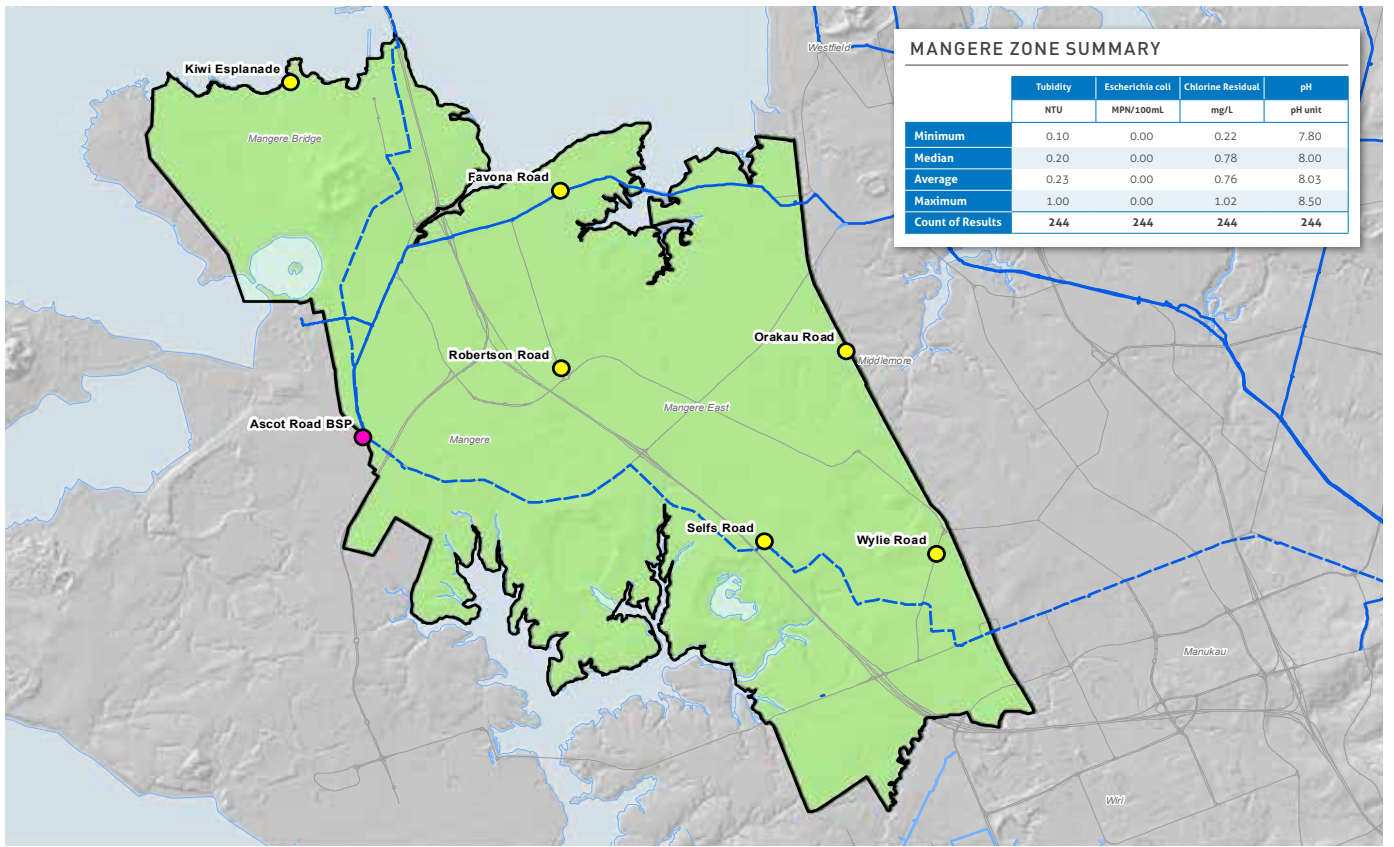


**LEGEND**

- Sample Taps ● Distribution
- Watermain — Treated Built
- - - Proposed
- Reservoir
- Transmission
- Raw Built
- - - Out of Service
- Grading Zone
- Tunnel



# APPENDIX 3 Water quality in grading zones Southern Area



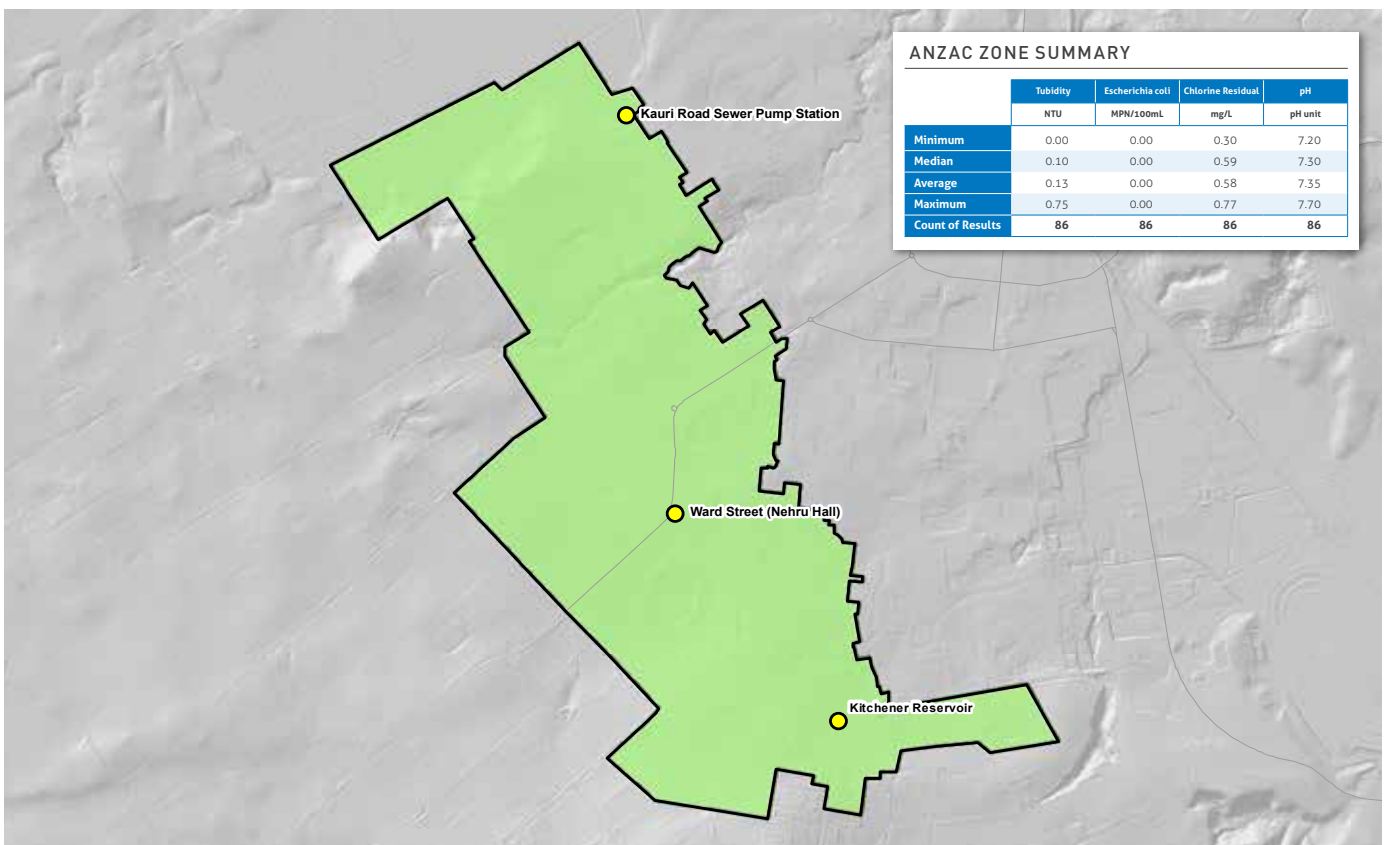
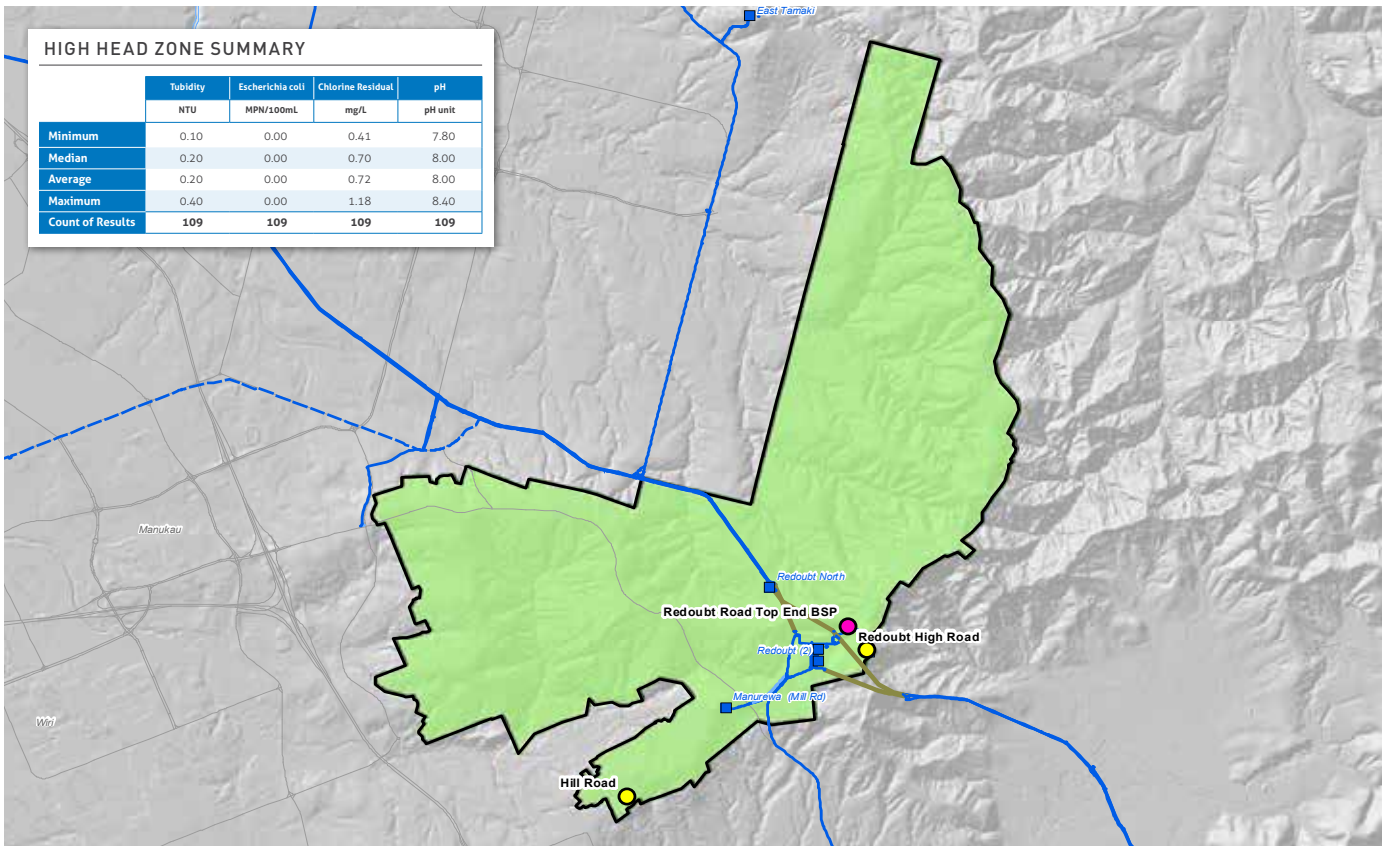
**LEGEND**

- Sample Taps
  - Distribution
  - Transmission
- Watermain
  - Treated Built
  - Raw Built
  - - - Proposed
  - - - Out of Service
  - Tunnel
- Reservoir
  - Grading Zone





# APPENDIX 3 Water quality in grading zones Southern Area

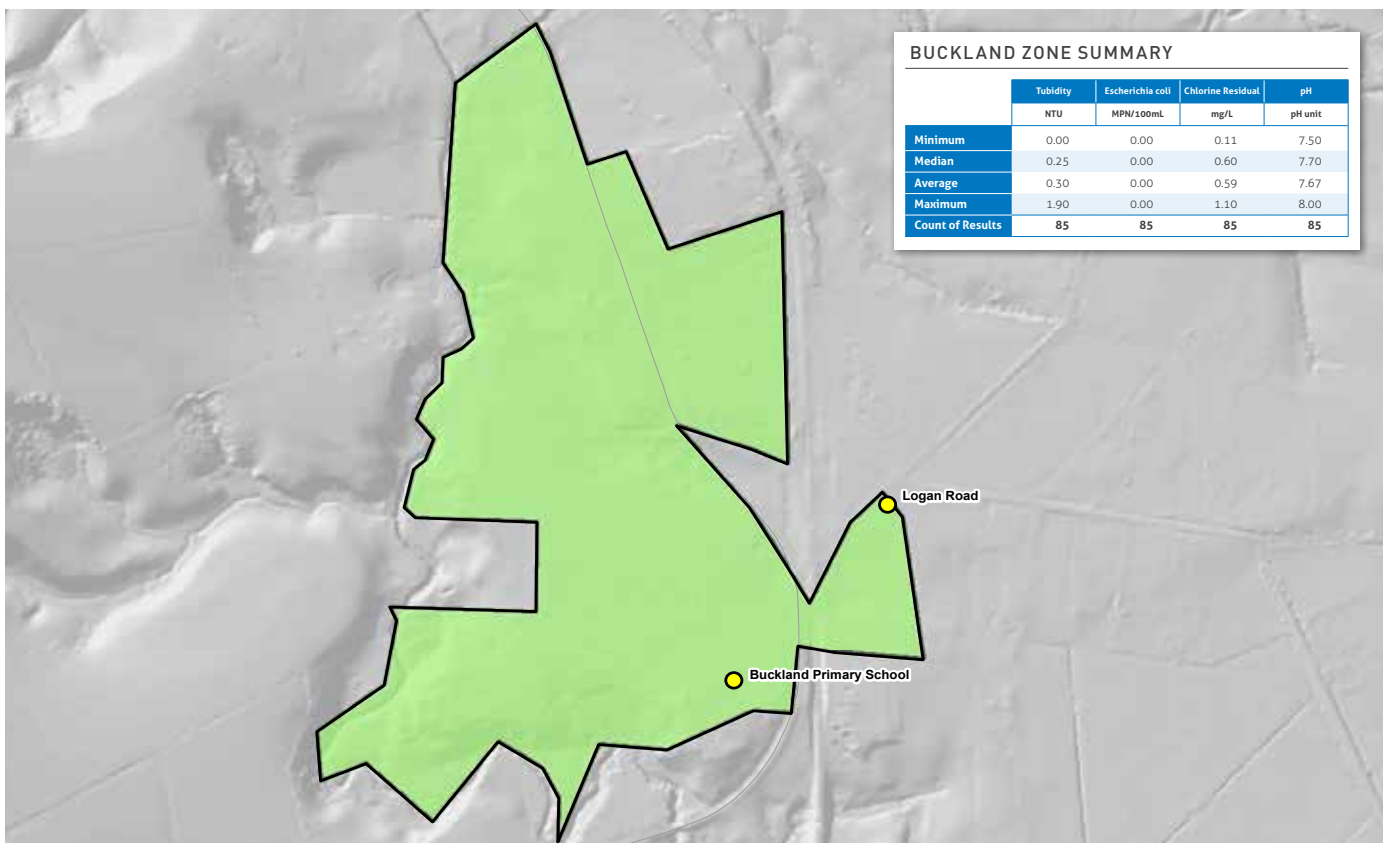
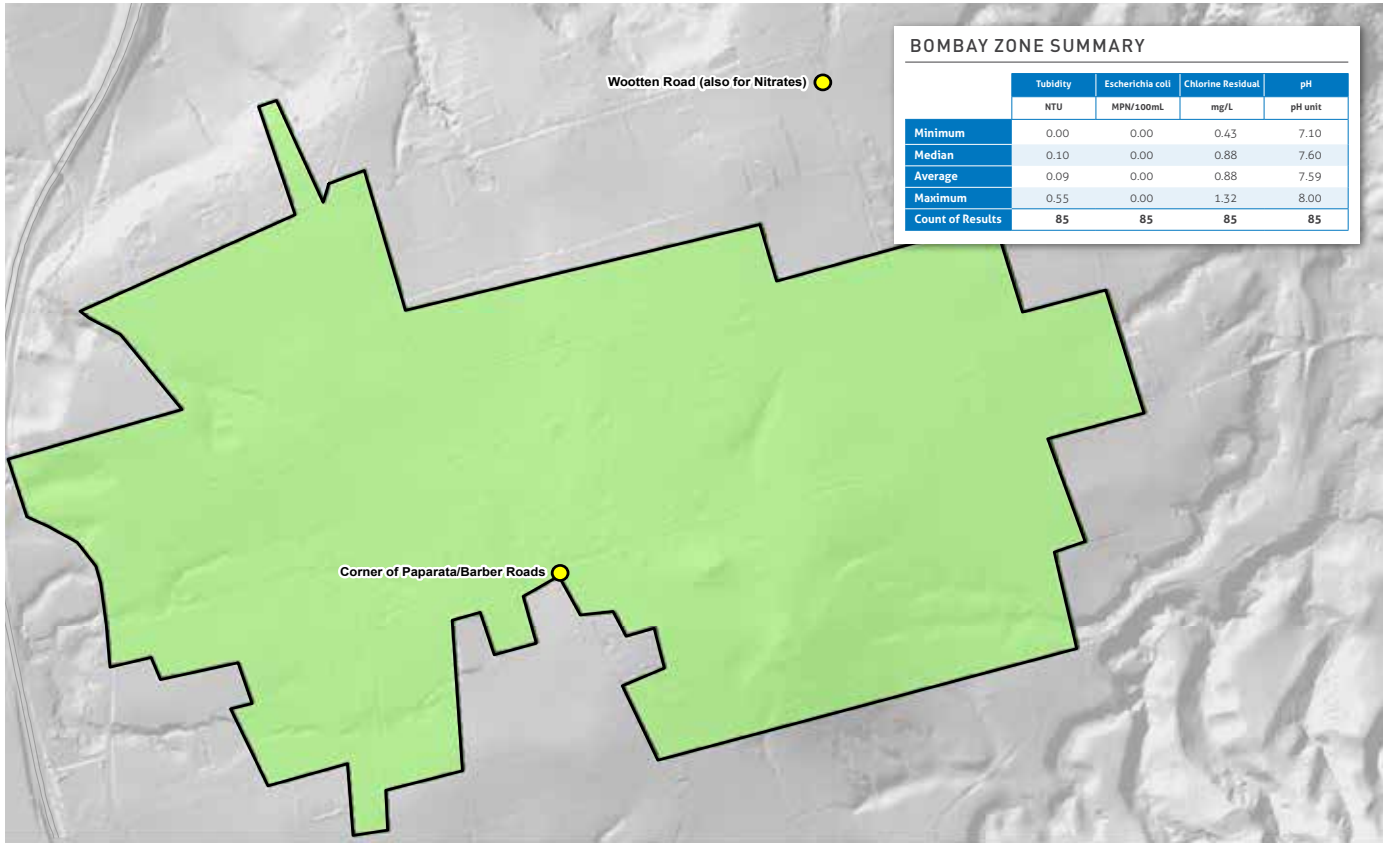


**LEGEND**

- Sample Taps ● Distribution
- Watermain — Treated Built
- Reservoir ■ Reservoir
- Grading Zone ■ Grading Zone
- Transmission
- Raw Built
- Proposed
- Out of Service
- Tunnel



## APPENDIX 3 Water quality in grading zones Southern Area

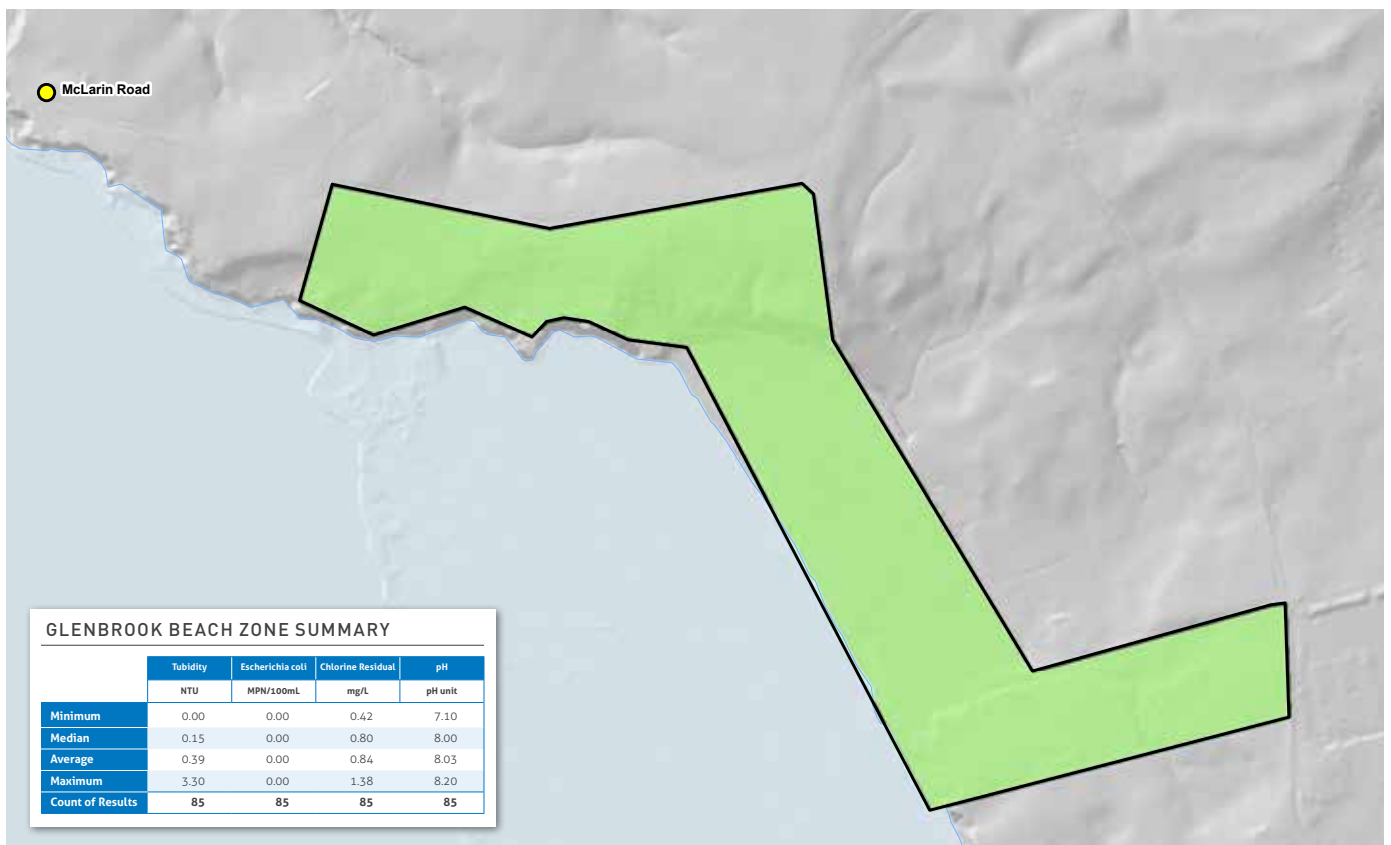
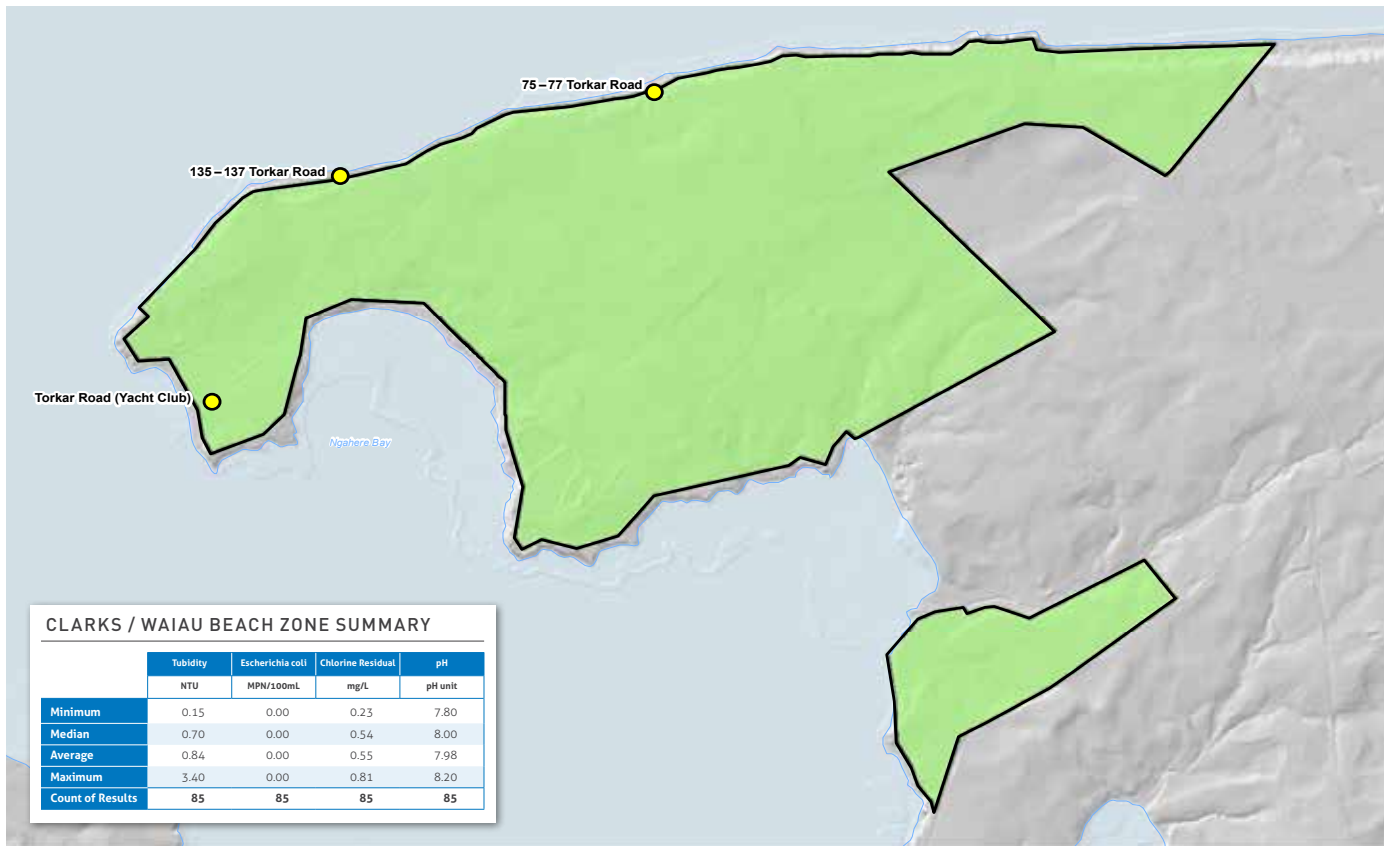


**LEGEND**

|                    |              |                  |               |                |              |
|--------------------|--------------|------------------|---------------|----------------|--------------|
| <b>Sample Taps</b> | Distribution | <b>Watermain</b> | Treated Built | Proposed       | Reservoir    |
|                    | Transmission |                  | Raw Built     | Out of Service | Grading Zone |
|                    |              |                  |               | Tunnel         |              |



## APPENDIX 3 Water quality in grading zones Southern Area



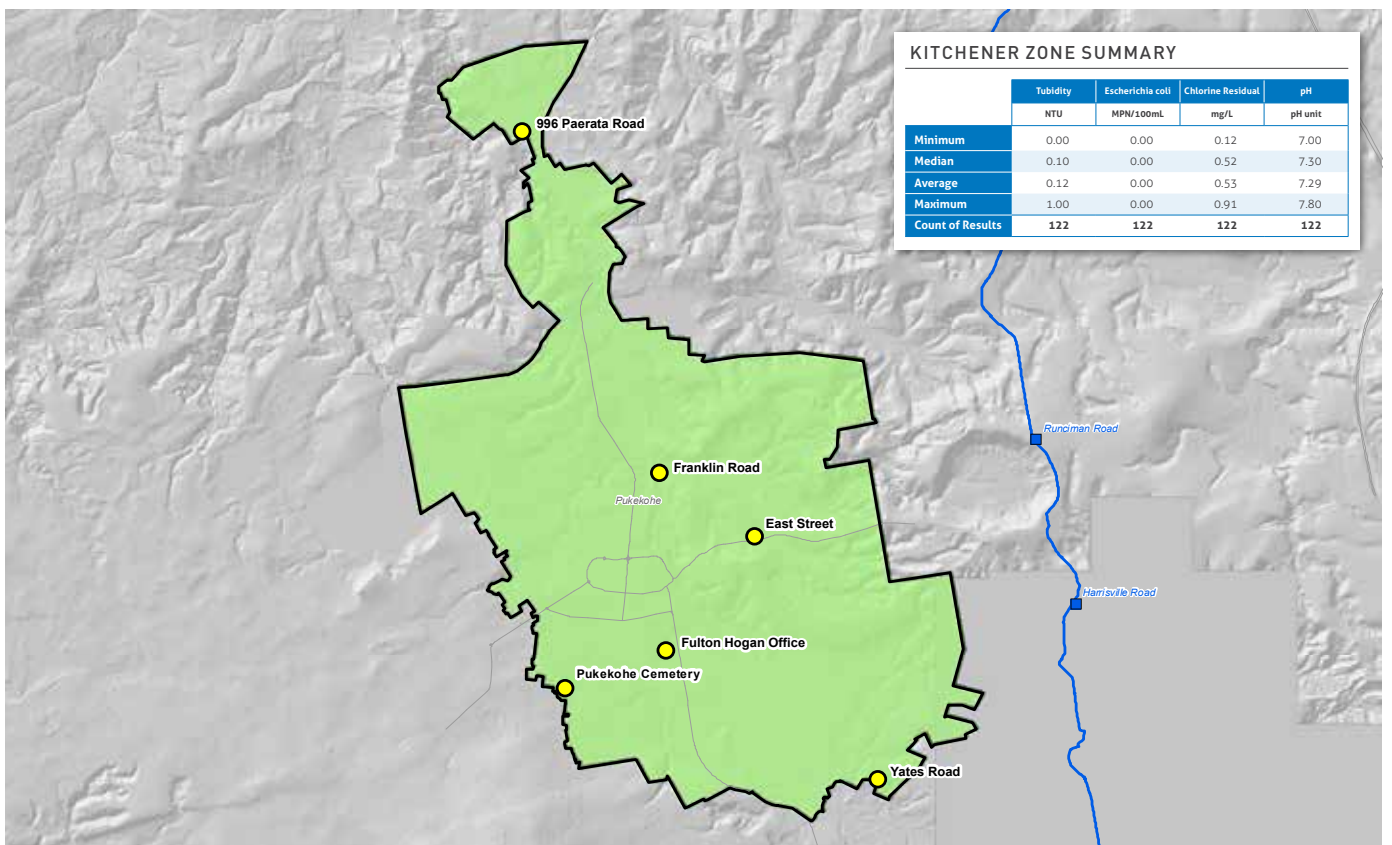
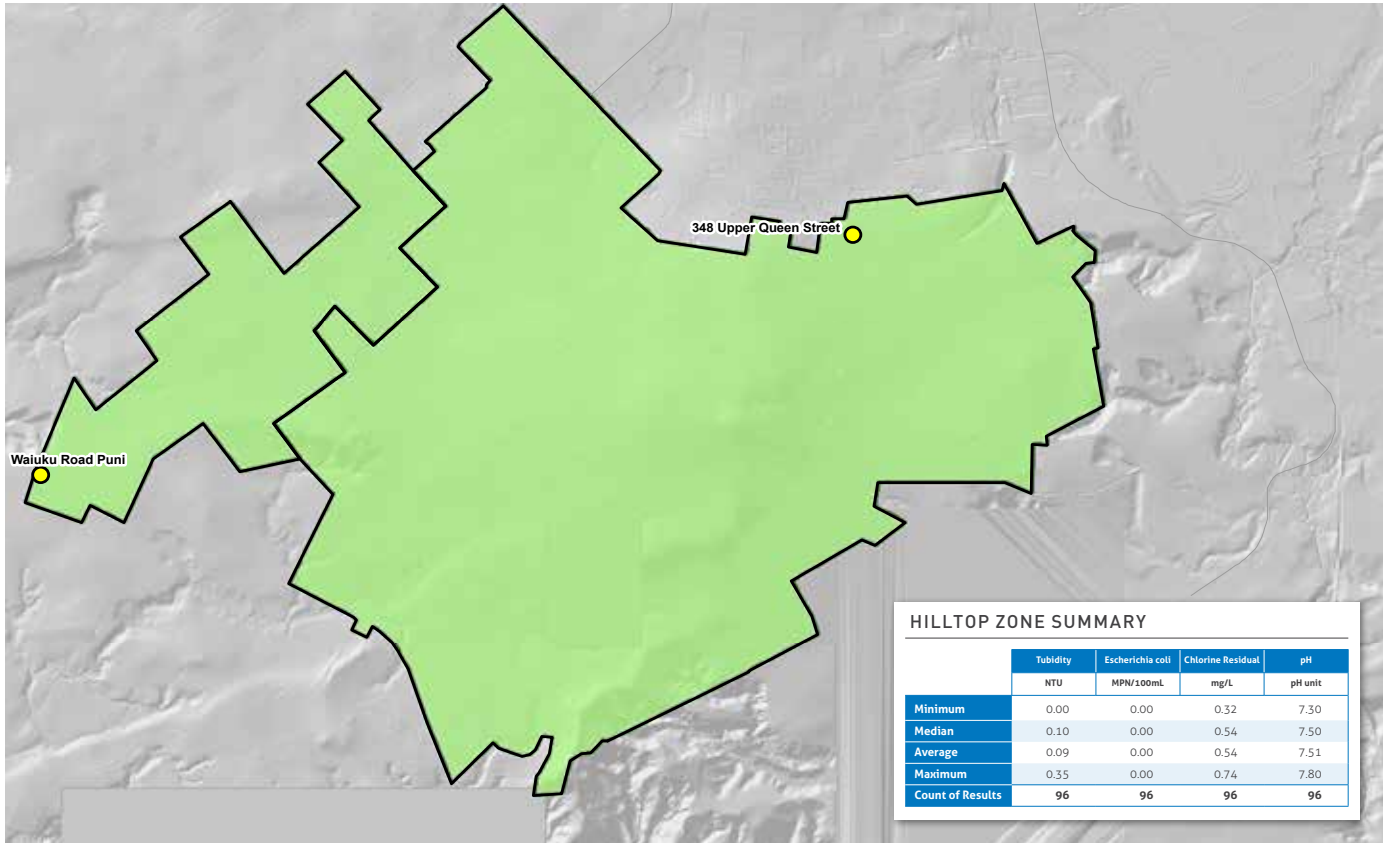
**LEGEND**

- Sample Taps
- Distribution
- Watermain
- Reservoir
- Transmission
- Out of Service
- Raw Built
- Grading Zone
- Proposed
- Tunnel





## APPENDIX 3 Water quality in grading zones Southern Area

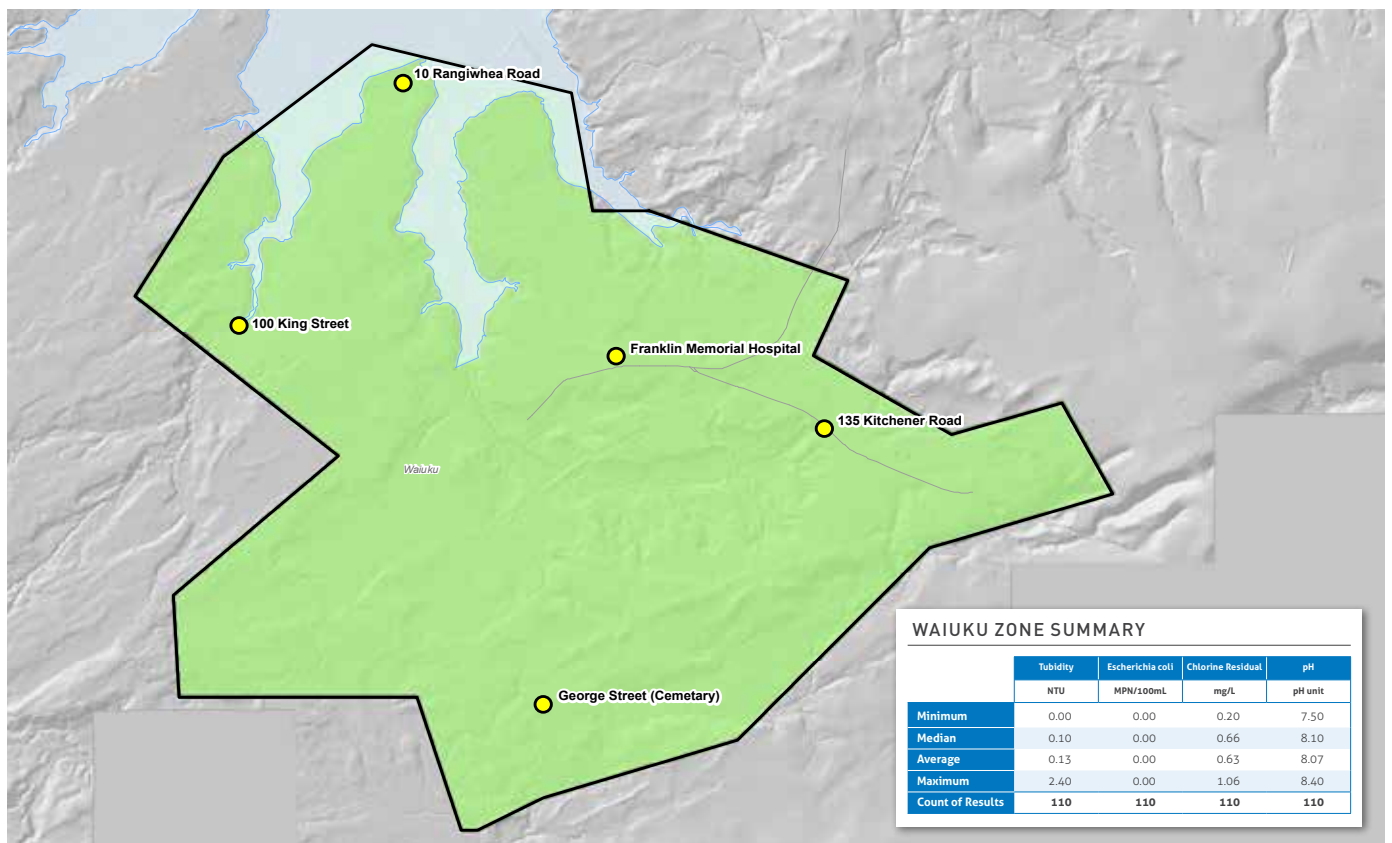
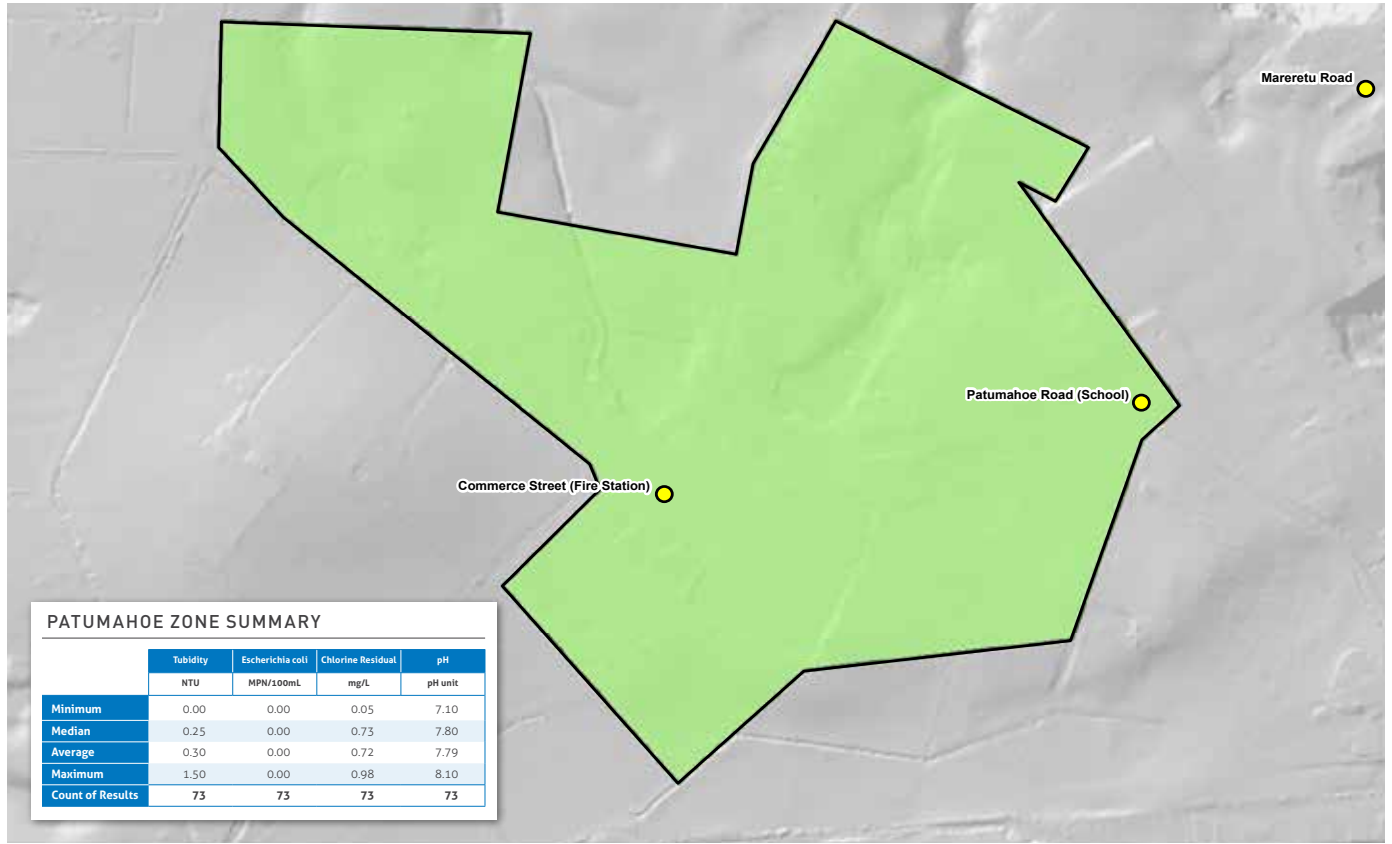


**LEGEND**

- Sample Taps ● Distribution
- Transmission
- Watermain — Treated Built
- Raw Built
- - - Proposed
- Out of Service
- Reservoir
- Grading Zone
- Tunnel



## APPENDIX 3 Water quality in grading zones Southern Area



**LEGEND**

- Sample Taps
  - Distribution
  - Transmission
- Watermain
  - Treated Built
  - Raw Built
  - Proposed
  - Out of Service
  - Tunnel
- Reservoir
  - Grading Zone





# ANNUAL WATER QUALITY REPORT --- 2013

## **Watercare Services Limited**

General enquiries: (09) 442 2222

### **Customer Postal Address:**

Private Bag 94 010  
Auckland 2241

### **Corporate Postal Address:**

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Wellesley Street  
Auckland 1141

### **Physical Address:**

73 Remuera Road  
Remuera  
Auckland 1050

Email: [info@water.co.nz](mailto:info@water.co.nz)