

**Register of  
Community  
Drinking-water  
Supplies in  
New Zealand**  
2007 Edition

Compiled by  
the ESR Water Group  
for the  
Ministry of Health

This Register lists the information available to the Ministry of Health about community drinking-water supplies in New Zealand.

Community drinking-water supplies are drinking-water supplies serving 25 or more people for at least 60 days a year. This includes many schools, permanent camp sites and marae.

For each supply, the source of water, the plants where water is treated and the distribution zones are listed, together with any public health gradings that have been given and contaminants of public health concern (Priority 2 determinands) known to be present.

The aim of the Register is to provide easily accessible information about community water supplies. If your supply is not listed here, send the name and address of the water supplier to:

Register of Community Drinking-water Supplies in New Zealand,  
Ministry of Health, PO Box 5013, Wellington.

The supply will then be included in future editions of the Register.

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This document is available on the Ministry of Health's web-page:  
[www.moh.govt.nz/water](http://www.moh.govt.nz/water)

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## FOREWORD

This edition of the *Register of Community Drinking-Water Supplies in New Zealand* supersedes the 2006 (15th) edition printed in July 2006. Like the earlier edition, it includes information on the Ministry of Health's public health grading of community drinking-water supplies and the presence of substances at concentrations that may be of public health significance.

This edition defines 2058 community drinking-water supplies, a net increase of eight (representing 53 additions and 45 deletions or deactivations) over the previous edition. For these supplies, 352 Priority 2 determinands are listed, compared with 374 previously.

The introductory section and *Register* format are designed so that the information presented can be clearly understood by those without technical knowledge of drinking-water management.

In September 2003, the Ministry of Health introduced a new public health grading process (*Grading 2003*) to replace a grading process in place since 1993. The new gradings are based upon the *Drinking-Water Standards for New Zealand 2000*, while gradings to the 1993 criteria used earlier versions of the Standards.

On 1 January 2006, any supplies that had not yet been reassessed to the *Grading 2003* criteria were reset to ungraded. Hence, this edition of the *Register* contains only *Grading 2003* gradings.



# REGISTER OF COMMUNITY DRINKING-WATER SUPPLIES IN NEW ZEALAND

2007 Edition

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## Acknowledgements

The *Register of Community Drinking-Water Supplies in New Zealand* is maintained as part of the Water Information New Zealand (WINZ) database system for drinking-water by the Water Group of ESR, a Crown Research Institute. This work is performed under contract to the Public Health Regulatory Services of the Ministry of Health.

Information for creating and amending individual supply records is gathered by health protection officers of the District Health Boards, with the close co-operation of officers of the territorial local authorities.

Any comments or suggestions regarding the *Register* are welcome and should be addressed to:

The Manager  
Public Health Policy and Regulation  
Ministry of Health  
PO Box 5013  
Wellington

or

Barry Mattingley or Alan Ferguson  
Water Group  
ESR  
PO Box 29-181  
Christchurch

## Quick Reference

### Finding a supply

- Supplies in the *Register* are grouped by health district.
- Supplies within a health district are listed in alphabetical order.
- Health districts in New Zealand are listed from north to south.
- There is a **full index of communities at the back** of the Register.
- Or try [www.drinkingwater.org.nz](http://www.drinkingwater.org.nz) to see the latest entry on the web (updated weekly).

### Understanding the tables

- Figure 3 on page 13 explains the details of a typical *Register* entry.
- Read the User's Guide section following for a fuller understanding.

### The public health grading (2003 specification)

The Ministry of Health grading provides an assessment of its confidence in the public health safety of each drinking-water supply serving a community of over 500 people. The grading has two letters. The first letter (in upper case) represents the source and treatment grading, while the second letter (in lower case) grades the water in the distribution zone itself. Gradings containing C or c indicate marginal quality, while lower gradings show that quality or risk management is unsatisfactory.

An ungraded supply is indicated by u in the *Register*.

### Source and treatment grading

Assessment based on source and treatment factors:

- A1 Completely satisfactory, negligible level of risk, demonstrably high quality
- A Completely satisfactory, extremely low level of risk
- B Satisfactory, very low level of risk when the water leaves the treatment plant
- C Marginally satisfactory, low level of microbiological risk when the water leaves the treatment plant, but may not be satisfactory chemically
- D Unsatisfactory level of risk
- E Unacceptable level of risk.

### Distribution zone grading

Assessment based on reticulation condition, management, and actual water quality:

- a1 Completely satisfactory, negligible level of risk, demonstrably high quality; meets Aesthetic Guidelines and has ISO 9001:2000 accreditation
- a Completely satisfactory, extremely low level of risk
- b Satisfactory, very low level of risk
- c Marginally satisfactory, moderate level of risk
- d Unsatisfactory level of risk
- e Unacceptable level of risk.



## User's Guide to the Register

To understand the *Register of Community Drinking-Water Supplies in New Zealand*, you need to know something about drinking-water and how it is managed. By reading this guide you will understand more clearly how water supplies are managed in New Zealand, what the main risks from water of low quality are, and the basic approaches to overcoming them. You will also learn what a grading is, how it is related not only to the quality of the water you drink, but also to how well the supply is managed to minimise risks to your health on an ongoing basis. By the time you have finished, you should also have some appreciation of the New Zealand Drinking-Water Standards, why all supplies should be tested regularly for bacteria, and why some supplies require regular testing for particular chemicals.

With that understanding, you should find the *Register* entry for your local supply to be brief but informative. If your water supply is good, you can appreciate this public notification of its quality. Otherwise, as a consumer, you can either accept the situation or make it clear locally that good quality drinking-water is important to you.

### Purpose of the Register

The *Register* provides health professionals, drinking-water professionals and the general public with an authoritative summary of the health-risk status of all community drinking-water supplies known to the Ministry of Health. "Community drinking-water supplies" means all drinking-water supplies serving more than 25 people for at least 60 days a year.

For each supply, the *Register* records:

- the name of the community
- the components of the supply, namely sources, treatment plants and distribution zones
- unique codes for each component (to aid clear identification)
- who owns and operates the supply
- how many people use the supply.

If more than 500 people are served, the *Register* also records:

- the public health grading for the supply
- the year of grading, for each treatment plant and distribution zone
- any substances of public health significance in the supply requiring monitoring.

The public health grading is an evaluation of both the actual water quality and the underlying measures taken to minimise risk. Those measures ensure the water remains safe and wholesome now and in the future.

Most supplies listed are publicly owned, but some are private. For example, country motor camps or motels serving 25 people or more are expected to be registered. Registration of smaller supplies is voluntary.

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## Finding drinking-water supplies in the *Register*

The index at the back of the *Register* lists all the supplies in New Zealand in alphabetical order.

The *Register* is arranged so that:

- supplies in the *Register* are grouped by health district
- supplies within a health district are listed in alphabetical order
- health districts are listed from north to south.

Two examples:

- Community “Aranga Beach” in Northland is on page 1 of Table 1, ie page 1.1.  
(Reason: Northland is the most northern health district in New Zealand, and communities beginning with A appear first in a table.)
- Community “Wyndham Primary School” in Southland is on page 20.13.  
(Reason: Southland is the most southern health district in New Zealand, so it is in the last or 20th table in the *Register*. Communities beginning with W appear towards the end of a table.)

## Finding the latest data on the web

Users of the *Register* are encouraged to visit the companion website [www.drinkingwater.org.nz](http://www.drinkingwater.org.nz) where the entry for any supply can be viewed and printed on-line. The website is updated weekly from the National WINZ database.

A copy of the printed *Register* can also be down-loaded in Adobe PDF format from the Ministry of Health website at [www.moh.govt.nz/water](http://www.moh.govt.nz/water)

## Who looks after your water?

Three organisations are concerned with the provision of safe and wholesome drinking-water to any particular community in New Zealand, one at the local level, one regional and one with a national perspective.

At the local level, a typical supply in this *Register* is owned by a territorial local authority (TLA) such as a district or city council. They extract the source water, run the treatment plant to remove risks or contaminants, and pipe the water to your door. Under the *Drinking-Water Standards for New Zealand 2000*, they are expected to test the water regularly to demonstrate that it is safe. If you are unhappy with your water supply, your first step should be to contact them.

The drinking-water standards were produced by the Ministry of Health, which has a national function to ensure appropriate regulations are in place. The Ministry of Health does not check on the local authorities directly, but instead works at the regional level through the district health boards (DHBs). Each DHB is expected to oversee the TLAs in its area and ensure (audit) that they maintain appropriate water quality. In a serious health risk situation, the DHB can, through the health district's medical officer of health, order a water supply to close, but generally the DHB works effectively through persuasion rather than coercion. You can discuss health aspects

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of your drinking-water with your DHB if you have concerns. DHBs also report to the ministry so that a national picture (such as this *Register*) can be maintained of the state of all community drinking-water supplies.

## What are the components of a water supply system?

The simplest water supply is just a well with a pipe from it, or a pipe from a river or lake, perhaps with a pump and storage tank. More commonly though, as a population increases, a treatment plant is required to remove actual or potential contaminants and ensure the water delivered is safe to drink. The most common water treatment is chlorination, where a chemical compound is mixed with the water to kill any bacteria from the source. This treatment will also maintain some degree of residual “resistance” to any subsequent bacterial entry to the water while it is in the pipework. Other treatment processes include coagulation (making fine particles drop out), filtration and the removal of other contaminants. Removal of cloudiness is important because chlorination is not as effective otherwise.

The water is transported to users through a network of pipes, known as the reticulation or distribution system. In larger cities, some suburbs may be supplied differently from others. Additional pumping may be required to suburbs on the hills, or the city may be subdivided, with one plant supplying to one part but not to another. For a complex situation like Dunedin City, at least eight areas can be identified as having water different to their neighbouring suburbs.

The different components of a water supply are listed in the *Register*, with lines to indicate how they are connected. The terms used are formally defined in the glossary (page 20). Here is a brief summary:

**Community:** The people served by the supply.

**Zone:** (or Distribution Zone) That part of the town or community receiving water of similar quality. For a small supply, that means “everywhere”. For larger supplies, it may be only part of a town or city. By definition, parts receiving different water will be in different zones.

**Plant:** The treatment plant supplying the water. In some situations where no treatment is given, a nominal plant is defined as where the water is pumped from or merely gathered together. In others, the treatment plant will have highly technical operations with extensive automated control and monitoring of water quality.

**Source:** The river, groundwater or other source from which the water is taken. About half of New Zealand’s drinking-water is pumped from the ground, with the remainder coming from surface sources.

In the *Register*, each of these components is on a separate line and each component has its own code, which is unique in New Zealand. The lines are ordered so that you can see which plants and sources supply each zone.

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## What are the major water quality concerns?

Chemical contamination of New Zealand supplies is always a risk, but usually it is a very small one. Most chemicals mentioned in the *Drinking-Water Standards for New Zealand 2005* specify levels likely to cause adverse effects only after prolonged periods of exposure, so, with some exceptions, chemicals are not the main area of concern unless there is a major chemical spillage.

Throughout the world (and New Zealand is no exception) by far the most common problems arise from microbiological contamination of the source waters. Animal, bird and even human effluent, introduced in one way or another upstream from a water supply, can make that water unfit for consumption. Bacteria have always been of major concern, while protozoa such as *Giardia* and *Cryptosporidium* are increasingly being highlighted as causing ill health through drinking-water.

There are two ways of minimising the risk from these microbiological contaminants:

1. Keep the source as clean as possible by protecting the catchment and minimising the possibility of contamination.
2. Treat the water to destroy any contaminants introduced.

The most successful approach is to use both of these methods, and to regularly monitor the water quality to demonstrate that any risks are being controlled. Good systematic and ongoing management is important.

## How do they know how much monitoring is necessary?

Until 31 December 2005, the amount of monitoring required was specified in the *Drinking-Water Standards for New Zealand 2000*. From 1 January 2006, the *Drinking-Water Standards for New Zealand 2005* became the definitive standard. For two years from July 2006, the Ministry of Health is allowing drinking-water suppliers to opt for compliance under either standard.

The standards speak about “determinands”, which are chemical substances, microbiological organisms, or some other characteristic of the water that can be measured, “something for which you can test”.

The standards divide all determinands of public health significance into four classes according to the priority with which they should be measured. This avoids unnecessary monitoring. Of the four classes, only determinands in the Priority 1 and 2 classes require measuring, but the others have been defined in case they are required in the future.

## What are Priority 1 determinands?

The determinands with the highest priority for monitoring, appropriately called “Priority 1 determinands”, must be measured in all drinking-water supplies. These are currently micro-organisms that are of public health significance.

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The first of these is bacteria. To gain an indication of water contamination by faecal material, a bacteria called *E. coli* is measured.

*Giardia* and *Cryptosporidium* are protozoa that are becoming increasingly of concern in drinking-waters, so these are also Priority 1 determinands. Because direct testing for these protozoa is not usually practicable, the standards offer options to stop their passage. Treatment processes such as coagulation and filtration are recognised as effective when properly managed.

The standards specify how frequently monitoring samples must be taken, such as monthly for a small supply through to at least daily for a metropolitan area. In all cases, a minimum of one year's sampling is required to demonstrate compliance with the standards.

Eventually, this measured compliance will make a difference to the supply's grading, but this is not yet in place. However, local authorities should preferably now be monitoring to the latest standards and should soon have sufficient data to demonstrate compliance or non-compliance with the *Drinking-Water Standards for New Zealand 2005*.

A new public health grading specification was completed by the Ministry of Health in September 2003. The 2007 *Register* shows only grades awarded under this specification.

## **. . . and Priority 2 determinands?**

A second level of potential contaminants, known appropriately as "Priority 2 determinands", is also defined in the standards. These are determinands known to have adverse effects on human health. Unlike Priority 1 determinands, they do not have to be measured in every supply. Monitoring is usually required if the Ministry of Health believes that levels in a particular supply exceed half the maximum allowable value (MAV) for a particular health-significant determinand.

How is a Priority 2 determinand identified? ESR, a Crown Research Institute, assesses supplies on behalf of the Ministry of Health. It uses questionnaires and targeted testing to identify those supplies where significant levels of a particular chemical are likely to be present. Through formal procedures, the Ministry of Health then confirms these chemicals as Priority 2 determinands for that particular supply.

Only supplies with populations of 100 or more have been assessed, and the population must be at least 500 before a Priority 2 determinand is officially assigned and appears in this *Register*. These limits will be lowered in the future.

Currently 352 Priority 2 determinands are assigned, consisting of 53 assigned to 52 treatment plants and 299 determinands spread over 150 distribution zones. They are included in the *Register* listings for those supplies, where they appear like this:

```

└─ ZONE:      XXX           Xname                5,000      De
      └─ Test for: Arsenic
```

The local authority is then required to test regularly for that chemical in the supply to confirm that it remains below the MAV. Weekly testing is required for fluoride, but for other chemicals testing is usually monthly. If concentrations measured remain less than half the MAV for 12

consecutive months, and the Ministry of Health is satisfied that the risk is not significant, that Priority 2 entry will be removed from the *Register*.

All Priority 2 determinands listed in this *Register* are chemicals, but micro-organisms or radiological constituents can also be defined.

## Why is fluoride a Priority 2?

If you see fluoride beside your supply, it will most likely be because it has been added at the treatment plant to help fight against tooth decay. It is not a contaminant or a health risk at the usual level of application, but since it is a health risk at higher concentrations, it is important that it be regularly monitored. While the Priority 2 general requirement is monthly monitoring, fluoridated supplies must be tested at least weekly.

In some areas of the world, fluoride naturally appears at excessive levels in groundwater. However, this is very rare in New Zealand.

## What is a plumbosolvent water?

Some supplies previously had *plumbosolvent water* (or *aggressive water*) included in their list of Priority 2 determinands. This was not a determinand as such, but indicated that the drinking-water supply has a tendency to corrode household metal pipes, taps and other plumbing. If these corrode, small amounts of metals are removed from their surface and either deposited in the pipe (such as rust), or remain dissolved in the water. It is the dissolved metals that are of concern here.

Corrosion is usually a slow process, but *plumbosolvent water* held within your plumbing overnight can end up with high dissolved metal levels. When you then turn on the tap, the first glass of water will contain these metals and should not be drunk or used for food preparation. Instead, flush the tap: run the first two glasses to waste or use it for some other purpose. After that, the tap water should be quite safe to drink.

The *Drinking-Water Standards for New Zealand 2005* take a different approach to specifying *plumbosolvent water*, and therefore previous Priority 2 determinands for this have been withdrawn. From January 2006, all waters are assumed plumbosolvent until they are proven otherwise to the satisfaction of their local Drinking-Water Assessor. This status was not available for this edition of the *Register*, but is expected to be shown in future editions.

The supplier of *plumbosolvent water* is required to publicly notify consumers that they should flush any tap before taking drinking-water if that tap has not been used for several hours or more. It is important that these consumers know this, which is why it will be listed as such in future *Registers*.

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## What is the public health grading?

In order to compare water supplies and identify those that may not be delivering quality water, the Ministry of Health grades each supply. So far, only those with populations over 500 are graded, but those with as few as 25 users will be graded in the future.

How are supplies graded? First, they are examined to find out how they function, where the water comes from, what is done to it, how often its quality is checked and what the results indicate. In all, 33 aspects of the source and treatment are examined, along with 22 factors for the distribution system and final water quality. There is a strong concern, not only about the quality of the end product, but also about whether adequate barriers to potential contamination are in place in the system. This is important, because even frequent monitoring can miss some pollution events.

For each zone (ie each area receiving similar water), a two-letter grading is designated, such as Aa, Cb, Ed, etc. The capital letter (A1, A, B, C, D or E) represents the grade of the water coming into the zone (ie source quality and treatment) while the lower-case letter (a1, a, b, c, d or e) indicates the quality of the water received at your gate. Typically, if one tends to be high (A or B), so will be the other (a or b), but any combination is possible.

As a very rough rule of thumb, for a grade of Bc, the B represents the best potential quality (regarding risks of contamination, etc), as the water leaves the treatment plant, while the c is the actual quality received by the consumer. This is a gross simplification, but is useful to gain an initial grasp of how the letters relate.

In the *Register*, each graded zone has its two-letter grade listed on the same line. Each contributing plant has its "source and treatment" upper case grade alongside it. Where only one plant serves a zone, this grade is the same as the upper case letter in the zone line, so it hardly needs repeating. However, if two or more plants serve a zone, the "worst case" plant grade is the one taken up by the zone. Having it all here lets you see if any plant is associated with more risk than the others.

---

## The source and plant grading (A to E)

The source and plant grading relates to the water as it is when leaving the treatment plant, before it enters the reticulation system. It is concerned with the barriers guarding against contamination. Possible grades are:

<b>Grade</b>	<b>Description</b>
A1	Completely satisfactory, negligible level of risk, demonstrably high quality
A	Completely satisfactory, very low level of risk
B	Satisfactory, low level of risk
C	Marginal, moderate level of risk, may be acceptable in some small communities
D	Unsatisfactory, high level of risk
E	Completely unsatisfactory, very high level of risk

Gradings are calculated using a complex algorithm involving multiple tables. Factors include the water's origin, characteristics, and compliance with standards and the degree of treatment and process supervision. Each grade can be attained by a variety of factor combinations. However, some generalisations can be made: (See Figure 1 for an alternative overview.)

- An 'A1' grade requires not only a high quality water and procedures, but also an internationally recognised audited quality assurance scheme.
- An 'A1' grade will always meet the Guideline Values for aesthetic determinands.
- An 'A1' or 'A' grade will always have residual disinfection in place to safeguard against microbiological contamination.
- A plant using a secure groundwater that is not chlorinated can at best receive a 'B' grade, because of the possibility of contamination in the reticulation system.
- A treatment plant that does not comply with the major requirements of the *Standards* cannot attain an 'A' or a 'B' grade.
- A 'C' grade for a plant means that the microbiological quality of the water delivered is satisfactory when the water leaves the plant, but the plant does not have an appropriate level of supervision and/or has one or more chemical determinands that exceed their MAV.
- A 'D' grade for a plant means that the supply is from a source with a low risk of contamination, but treatment is not adequate.
- An 'E' grade for a plant is likely to mean the water comes from a surface water source without adequate protection from animal or human contamination, and subsequent treatment, if any, is not adequate.

In conclusion, water of grade C is considered marginal. It may be acceptable to consumers in very small supplies if the alternatives are too expensive or otherwise impracticable.

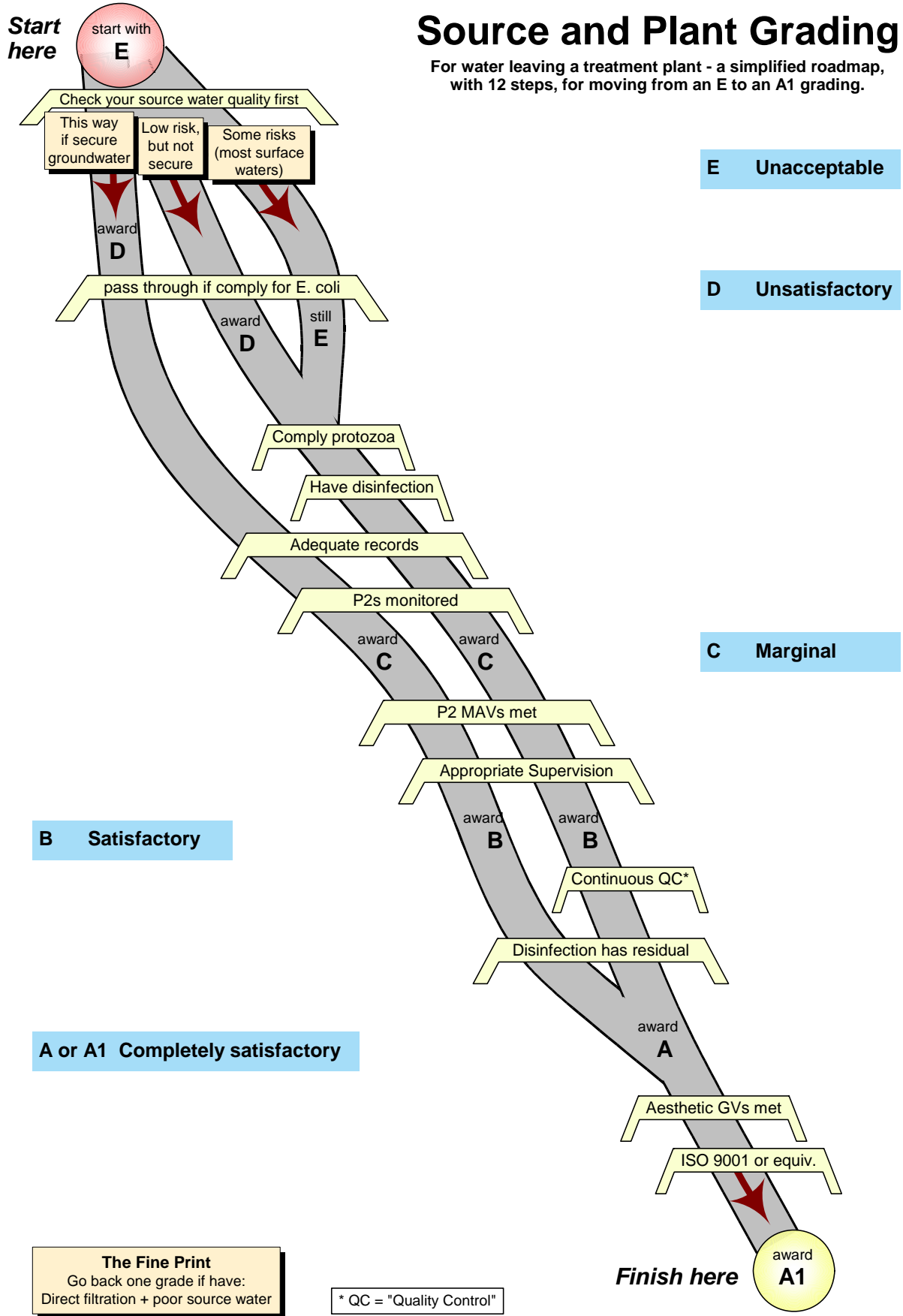
Water of grade A or B is considered as safe, while a grading of D or E indicates either the water is unsafe, or inadequate data or procedures are in place to demonstrate otherwise. This is an important proviso, since both the grading and standards emphasise that you have to show it is safe. Finding nothing wrong because you hardly looked is not acceptable.

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Figure 1

# Source and Plant Grading

For water leaving a treatment plant - a simplified roadmap, with 12 steps, for moving from an E to an A1 grading.



## The distribution grading (a to e)

Emphasis in this part of the grading is on the quality of the water and the systems in place (procedures and reticulation quality) to minimise the risk of unsafe water to the consumer. The grading is calculated using a questionnaire, with demerit marks awarded for unsatisfactory aspects. Possible grades are:

Grade	Description	Sum of Marks
a1	Completely satisfactory, negligible level of risk, demonstrably high quality; meets Aesthetic Guidelines and has ISO 9001:2000 accreditation	0 – 10
a	Completely satisfactory, extremely low level of risk	0 – 10
b	Satisfactory, very low level of risk	11 – 20
c	Marginally satisfactory, moderate level of risk	21 – 30
d	Unsatisfactory level of risk	31 – 45
e	Unacceptable level of risk.	46 or more

Demerits are given for a variety of reasons, including (most significant ones first):

23 marks:	Non-compliance for faecal coliform bacteria
12 marks:	Any combination of: No residual disinfection, median turbidity greater than 1 NTU, no regular testing programme
10 marks:	Non-compliance for chemical monitoring and/or results
7 to 10 marks:	No professional engineering supervision
9 marks:	Backflow legislative requirements not met in a supply without residual disinfection
9 marks:	Uncovered or unsecured service reservoirs
2 marks:	Each of: inadequate inspection and maintenance, low pressure, poor records of pressure, no service reservoirs.

While the combinations are obviously many, three important conclusions are:

- A zone without microbiological compliance cannot gain an 'a' or 'b' grade.
- A zone without chemical compliance cannot gain an 'a' grade, unless no demerit points are scored in all other questions.
- Inadequate management alone can have a significant effect on the grading attained.

As emphasised in the earlier discussion, while chemical risks are important, the primary risk is microbiological.

To conclude, an "a" or "b" grade is satisfactory, a "c" is marginal and "d" or "e" are unsatisfactory.

---

**Figure 2 Registering and Grading a Supply**

Schematic outline of processes

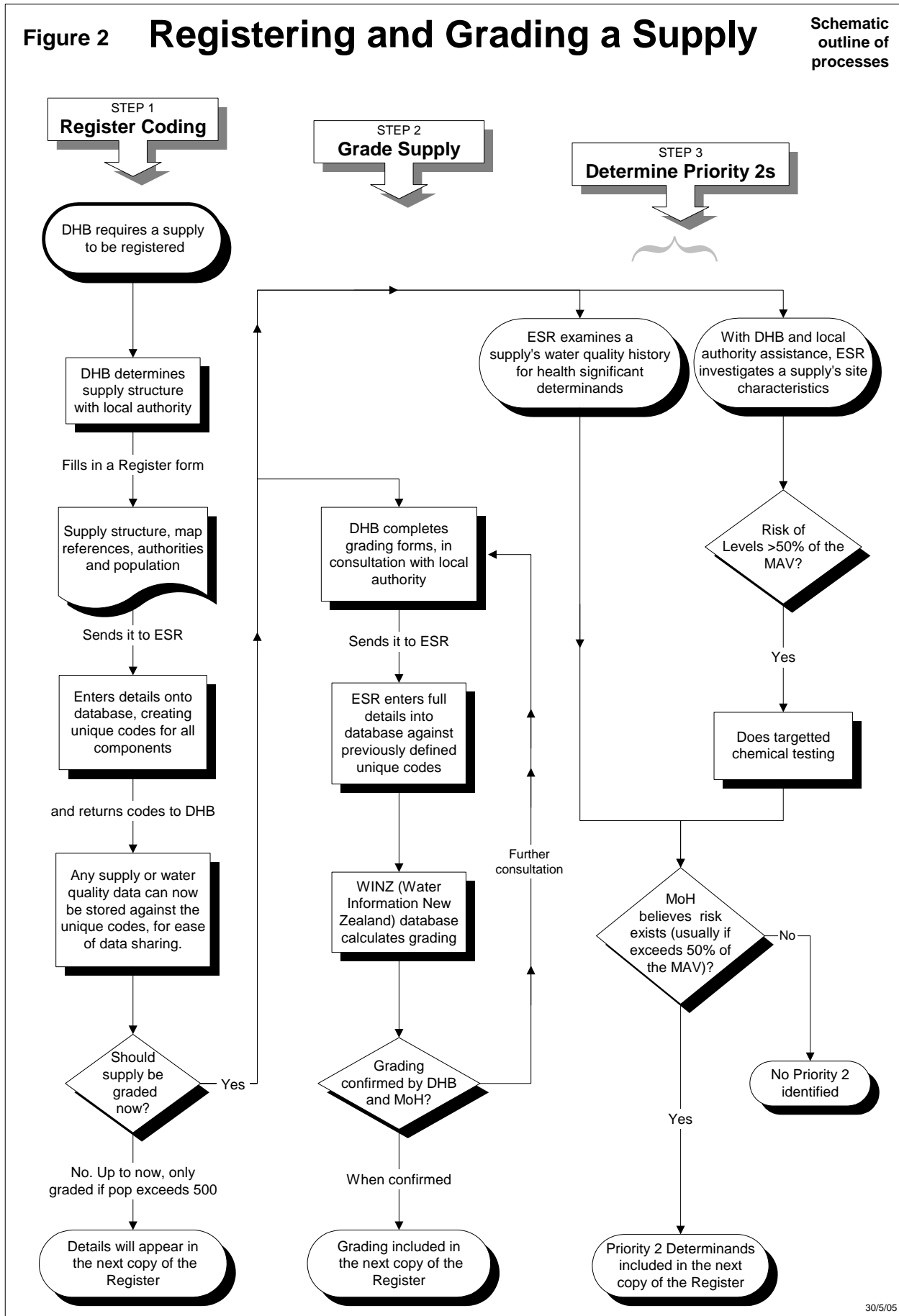
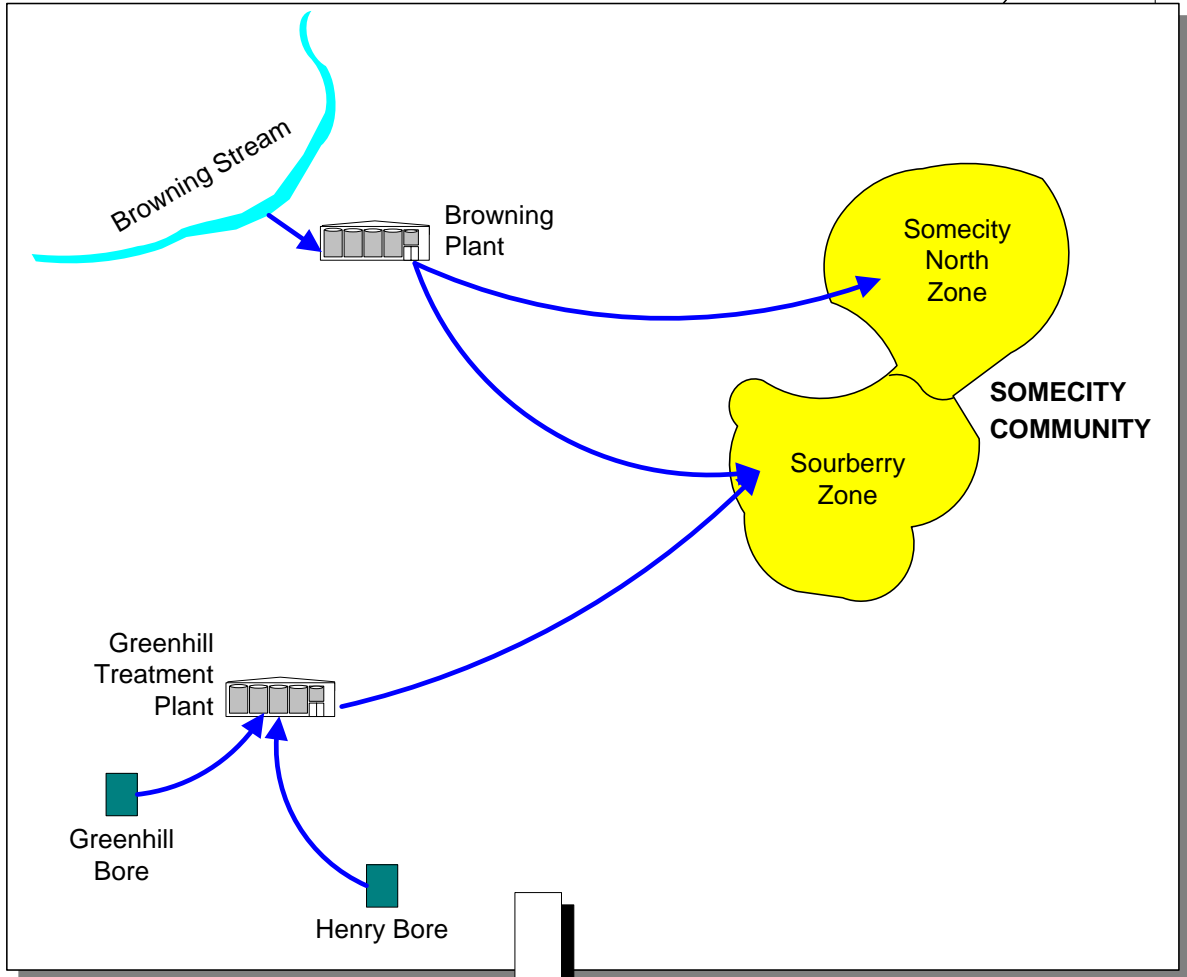


Figure 3

# Example of a Community

Note: Example is totally fictitious.


## Somecity - Physical Situation



## Somecity - Register Representation

Register				
Component	Code	Name	Population	Grade
<b>COMMUNITY</b>	<b>SOM001</b>	<b>Somecity</b> Local authority: Somelands District Council	1,226	
-- Zone	SOM001SN	Somecity North	752	Dc 2006
-- Plant:	TP00918	Browning		D 2007
-- Source:	S00651	Browning River		
-- Zone	SOM001GH	Sourberry	474	Dc 2007
-- Plant:	TP00919	Greenhill		B 2007
-- Source:	G00866	> Greenhill Bores		
-- Source:	G00871	> Henry Bore		
-- Plant:	TP00918	Browning		D 2007
-- Source:	S00651	> Browning River		

21.3



Health District 21

West H District

Xland Health

Figure 4

# Register Example Explained

**Note: Example is totally fictitious.**

*Population of the distribution zone. These should add to give the community population. A "?" indicates information not supplied yet.*

*Gradings are currently shown only if the community population is 500+*

*Health Districts are in north to south order. 1 is Northland, 20 is Southland. Name is written sideways*

*The local authority for the relevant district is shown regardless of ownership*

*Community names are alphabetical in a Health District. Zones names are alphabetical within communities, etc.*

*If the Water Authority is not the local authority, an extra line will give details here*

*Blob on map shows approx location*

*Year that this component was last graded*

Register					
Component	Code	Name	Population	Grade	
<b>COMMUNITY</b>	<b>SOM001</b>	<b>Somecity</b> Local authority: Somelands District Council	1,226		
-- Zone	SOM001SN	Somecity North	752	Dc	2006
-- Plant:	TP00918	Browning		D	2007
-- Source:	S00651	Browning River			
-- Zone	SOM001GH	Sourberry	474	Dc	2007
-- Plant:	TP00919	Test for: Arsenic, Boron		B	2007
-- Source:	G00866	Greenhill			
-- Source:	G00871	> Greenhill Bores			
-- Plant:	TP00918	> Henry Bore			
-- Source:	S00651	> Browning		D	007
-- Source:	S00651	> Browning River			

*Priority 2 determinands identified in this particular supply component, because past testing or situation evaluation indicates levels may be of health concern.*

*The Source and Treatment Grade can be:  
A1 Completely satisfactory +  
A Completely satisfactory  
B Satisfactory  
C Marginal  
D Unsatisfactory  
E Unacceptable  
u ungraded*

*The Distribution Grade can be:  
a1 completely satisfactory +  
a Completely satisfactory  
b Satisfactory  
c Marginal  
d Unsatisfactory  
e Unacceptable  
u ungraded*

*Note that the worst-case Source and Treatment Grade is written in front to give the overall grading for water to consumers.*

*Lines indicate piping connections between sources, treatment plants and distribution zones*

*Name of District Health Board (DHB) or contracted organisation responsible for Health District*

## If you are concerned by your grading . . .

The *Register* shows the gradings for supplies, but it does not go further. For a low grading, it does not say exactly why it is low, or what would make it higher.

A grading below Cc is unsatisfactory. The grading may arise for a number of reasons, including:

- The quality of the water is poor.
- The quality is unknown because monitoring is inadequate.
- Quality may be adequate most of the time, but the risk of quality deteriorating without users knowing is significant. In other words, there are inadequate barriers against contamination.

Note that in each case the solution will probably require money, although in some situations improved management of the resource may significantly affect the grading allocated.

The emphasis in the grading, and in the *Drinking-Water Standards for New Zealand 2005*, is on “demonstrable quality of water”, that is not just “it seems OK”, but “it is safe and we have taken measures so that any risks to its quality are minimal”.

If you are concerned about your supply's grading or water quality, contact those responsible for your supply, who are usually your city or district council (check your *Register* entry).

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## Summary Information

### A. Distribution of Priority 2 determinands

The two tables below show the 352 Priority 2 determinands currently assigned. 199 determinands are assigned to 150 different distribution zones, and 53 to 52 treatment plants. The highest number of Priority 2 determinands currently allocated to a single zone is seven.

The lists are sorted with the most commonly allocated determinands first.

#### Distribution Zones

Determinand	Zones	Zone population
Lead	84	371,414
Nickel	38	114,366
Trichloroacetaldehyde	32	144,062
MAV sum ratio for HAAs	30	114,508
Arsenic	20	112,768
Cadmium	18	22,089
MAV sum ratio for THMs	17	80,474
Copper	17	27,846
Dichloroacetic acid	15	30,753
Trichloroacetic acid	9	12,653
Antimony	6	135,544
Nitrate (as NO <sub>3</sub> )	4	96,400
Bromodichloromethane	4	14,491
Boron	2	2,732
Manganese	2	1,170
Fluoride	1	1,332

#### Treatment Plants

Determinand	Plants	Connected Zones	Zone population
Fluoride	47	122	2,175,658
Chlorate	4	4	3,610
Nitrate (as NO <sub>3</sub> )	1	3	19,153
Arsenic	1	1	900

## B. Major community drinking-water supplies

The following list summarises the 44 largest supplies in New Zealand, each of which serve 10,000 people or more. The full *Register* defines 2058 supplies serving 3,762,739 people. These 44 supplies serve 3,016,559 people, which is 80% of those in registered supplies or about 72% of the New Zealand population. Communities are in alphabetical order.

The list uses the following format:

<b>Community name</b>	<b>Population</b>		
└ Zone name	Population	Plant+Zone grading	

To see the full entry for each supply, refer to the main tables.

<b>Ashburton</b>	<b>15,000</b>		<b>Hamilton</b>	<b>129,400</b>	
└ Ashburton	15,000	u	└ Hamilton City	129,400	Aa
<b>Auckland City</b>	<b>395,583</b>		<b>Hastings City</b>	<b>45,715</b>	
└ Auckland	235,931	Aa	└ Flaxmere	11,324	u
└ Central Business District Auckland	17,559	Aa	└ Hastings East	13,562	u
└ Hillsborough	40,397	Aa	└ Hastings West & Central	20,829	u
└ Maungawhau	42,192	Aa	<b>Havelock North</b>	<b>11,623</b>	
└ Mt Hobson	25,685	Aa	└ Havelock North	11,623	u
└ Onehunga	20,969	Aa	<b>Hawera</b>	<b>10,720</b>	
└ Otahuhu	12,850	Aa	└ Hawera	9,500	u
<b>Auckland South, Manukau City</b>	<b>316,500</b>		└ Normanby	850	u
└ High Head	7,000	Aa	└ Ohawe Beach	270	u
└ Manukau Misc.	280,500	Aa	└ Okaiawa	100	u
└ Papatoetoe	29,000	Aa	<b>Hibiscus Coast</b>	<b>27,438</b>	
<b>Blenheim</b>	<b>21,588</b>		└ Hibiscus Coast	27,098	Au
└ Blenheim	21,588	u	└ Waiwera	340	Au
<b>Cambridge</b>	<b>13,500</b>		<b>Invercargill</b>	<b>50,456</b>	
└ Cambridge	13,368	u	└ Bluff	2,956	u
└ Karapiro Village	132	u	└ Invercargill City	47,500	u
<b>Christchurch</b>	<b>394,000</b>		<b>Levin</b>	<b>20,000</b>	
└ Central Christchurch	236,000	u	└ Levin	20,000	u
└ North-West Christchurch	83,000	u	<b>Lower Hutt</b>	<b>95,469</b>	
└ Parklands	17,000	u	└ Eastbourne	4,704	Bu
└ Riccarton	11,500	u	└ Haywards	372	A1u
└ Rocky Point	4,500	u	└ Lower Hutt	56,103	Bu
└ West Christchurch	42,000	u	└ Petone	8,034	Bu
<b>Dunedin City</b>	<b>89,181</b>		└ Stokes Valley	9,198	A1u
└ Booth Road, Dunedin	30,841	u	└ Wainuiomata	17,058	u
└ Green Island	6,409	u	<b>Masterton</b>	<b>19,000</b>	
└ Low Levels/Peninsula, Dunedin	33,728	u	└ Masterton	19,000	Aa
└ Maori Hill	12,441	u	<b>Napier</b>	<b>49,910</b>	
└ Port Chalmers	2,469	u	└ Napier City	25,800	u
└ Wingatui, Dunedin	3,293	u	└ Taradale	24,110	u
<b>Feilding</b>	<b>13,000</b>		<b>Nelson</b>	<b>43,000</b>	
└ Feilding	13,000	u	└ Nelson	43,000	Ab
<b>Gisborne City</b>	<b>30,000</b>		<b>New Plymouth</b>	<b>48,777</b>	
└ Gisborne City	30,000	u	└ Bell Block	4,437	Aa
			└ Lepperton	300	Aa

└ New Plymouth	35,700	Aa		
└ Urenui/Tikorangi	840	Aa		
└ Waitara	7,500	Aa		
<b>North Shore</b>	<b>207,714</b>			
└ North Shore Central	51,199	Aa		
└ North Shore East	44,262	Aa		
└ North Shore North	22,899	Aa		
└ North Shore South	89,354	Aa		
<b>Oamaru</b>	<b>10,487</b>			
└ North End Oamaru	5,000	u		
└ Reservoir Road, Oamaru	900	u		
└ South Hill, Oamaru	4,587	u		
<b>Palmerston North City</b>	<b>70,800</b>			
└ Aokautere	2,000	u		
└ Fitzherbert West	300	u		
└ Kelvin Grove	3,500	u		
└ Palmerston North City	65,000	u		
<b>Papakura</b>	<b>40,260</b>			
└ Papakura City	26,870	Aa		
└ Red Hill	2,520	Aa		
└ Takanini	10,870	Aa		
<b>Paraparaumu</b>	<b>22,400</b>			
└ Paraparaumu	22,400	u		
<b>Porirua</b>	<b>46,444</b>			
└ Mana/Plimmerton/Paremata	5,184	A1u		
└ Porirua High Level	15,398	A1u		
└ Porirua Low Level	16,924	A1u		
└ Pukerua Bay	1,656	A1u		
└ Whitby	7,282	A1u		
<b>Pukekohe</b>	<b>19,153</b>			
└ Anzac	3,445	u		
└ Hilltop	842	u		
└ Kitchener	14,866	u		
<b>Queenstown</b>	<b>10,500</b>			
└ Kelvin Heights	2,500	u		
└ Queenstown	8,000	u		
<b>Rangiora</b>	<b>12,000</b>			
└ Rangiora	12,000	u		
<b>Richmond</b>	<b>10,500</b>			
└ Richmond	10,500	u		
<b>Rotorua Central</b>	<b>42,500</b>			
└ Rotorua City	42,500	Ee		
<b>Rotorua East</b>	<b>10,864</b>			
└ Okareka	564	Ed		
└ Rotorua Eastern Suburbs	10,300	Ee		
<b>Tauranga</b>	<b>103,783</b>			
└ Mt Maunganui - Papamoa	52,000	Aa		
└ Tauranga - Bethlehem	51,783	Aa		
<b>Te Awamutu &amp; Pirongia</b>	<b>10,296</b>			
└ Pirongia	1,131	u		
└ Te Awamutu Township	9,165	u		
<b>Te Puke Eastern Districts</b>	<b>12,760</b>			
└ Maketu	4,500	uc		
└ Ngaupuri Scheme	60	u		
└ Te Puke	8,000	ub		
└ Te Puke (Bush)	200	ub		
<b>Timaru City</b>	<b>26,832</b>			
└ Timaru	26,832	u		
<b>Tokoroa</b>	<b>16,000</b>			
└ Tokoroa	16,000	u		
<b>Upper Hutt</b>	<b>34,650</b>			
└ Pinehaven	3,090	A1u		
└ Upper Hutt Central	31,560	A1u		
<b>Waitakere City</b>	<b>187,080</b>			
└ Glen Eden / New Lynn	56,500	Aa		
└ Henderson	106,500	Aa		
└ Huia Village	520	Aa		
└ Laingholm	2,700	Aa		
└ Montana	4,600	Aa		
└ Oratia	1,440	Aa		
└ Swanson	9,000	Aa		
└ Te Henga	720	Aa		
└ Whenuapai	5,100	Aa		
<b>Wanganui</b>	<b>39,000</b>			
└ Aramoho	5,000	Ab		
└ Wanganui City	29,000	Ab		
└ Wanganui East	5,000	Ab		
<b>Wellington City</b>	<b>165,126</b>			
└ Brooklyn	9,765	u		
└ Churton	4,446	A1u		
└ Eastern Wellington	16,815	u		
└ Johnsonville	18,357	u		
└ Karori	13,146	u		
└ Kelburn	9,924	u		
└ Onslow	11,883	u		
└ Southern Wellington	30,024	u		
└ Tawa	12,903	A1u		
└ Wadestown	6,789	u		
└ Wellington Central	31,074	u		
<b>Whakatane</b>	<b>21,020</b>			
└ Ohope	6,000	u		
└ Whakatane	15,020	u		
<b>Whangarei</b>	<b>56,530</b>			
└ Hikurangi	1,330	u		
└ Whangarei	48,000	u		
└ Whangarei Heads	7,200	u		

## C. Health Districts, District Health Boards, Territorial Authorities and Public Health Services

<b>Health District</b>	<b>District Health Board</b>	<b>Territorial Authority</b>	<b>Public Health Service</b>
Northland	Northland	Far North District Kaipara District Whangarei District	Primary and Community Health Services, Northland DHB
North West Auckland	Waitemata	North Shore City Rodney District Waitakere City	Auckland Regional Public Health, Auckland DHB
Central Auckland	Auckland	Auckland City	
South Auckland	Counties Manukau	Franklin District Manukau City Papakura District	
Waikato  Ruapehu (North)	Waikato	Hamilton City Hauraki District Matamata-Piako District Otorohanga District South Waikato District Thames-Coromandel District Waikato District Waipa District Waitomo District Ruapehu District (North)	Health Waikato, Waikato DHB
Tauranga  Eastern Bay of Plenty	Bay of Plenty	Tauranga District Western Bay of Plenty District Kawerau District Opotiki District Whakatane District	Toi Te Ora Public Health, Bay of Plenty DHB
Rotorua Taupo	Lakes	Rotorua District Taupo District	
Gisborne	Tairāwhiti	Gisborne District	
Hawke's Bay	Hawke's Bay	Wairoa District Chatham Islands County Hastings District Napier City Central Hawkes Bay District	Public Health Unit, Hawke's Bay DHB
Taranaki	Taranaki	New Plymouth District South Taranaki District Stratford District	Public Health Unit, Taranaki DHB

<b>Health District</b>	<b>District Health Board</b>	<b>Territorial Authority</b>	<b>Public Health Service</b>
Ruapehu (South) Wanganui	Whanganui	Ruapehu District (South) Rangitikei District Wanganui District	MidCentral Health, MidCentral DHB
Manawatu	MidCentral	Horowhenua District Manawatu District Palmerston North City Tararua District	
Wellington	Capital and Coast	Kapiti Coast District Porirua City Wellington City	Regional Public Health, Hutt Valley DHB
Hutt	Hutt	Lower Hutt City Upper Hutt City	
Wairarapa	Wairarapa	Carterton District Masterton District South Wairarapa District	
Nelson- Marlborough	Nelson Marlborough	Tasman District Nelson City Marlborough District	Public Health Unit, Nelson-Marlborough DHB
West Coast	West Coast	Buller District Grey District Westland District	Community and Public Health, Canterbury DHB
Canterbury	Canterbury	Banks Peninsula District Christchurch City Hurunui District Kaikoura District Selwyn District Waimakariri District	
South Canterbury	South Canterbury	Ashburton District Mackenzie District Timaru District Waimate District	
Otago	Otago	Central Otago District Clutha District Dunedin City Waitaki District	Public Health South, Otago DHB
Southland	Southland	Gore District Invercargill City Queenstown-Lakes District Southland District	

## Glossary

This glossary contains terms of interest to *Register* users. Any italicised words in the descriptions are separately defined.

**Aesthetic Determinand**

A constituent or property of the water that can adversely affect the water's taste, odour, colour, clarity or general appearance. Guideline Values for these are listed in the *Drinking-Water Standards*.

**Community**

All consumers of water, including domestic, commercial, industrial and agricultural users, within a *supply* boundary. A community may have one or more distribution zones within it.

**Community Code**

A unique six-character code defining a *community*. Consists of the first three characters of the community name followed by 001 to 999. First community registered is 001, and so on.

**Community Drinking-Water Supply**

A publicly or privately owned drinking-water *supply* which serves 25 or more people for at least 60 days per year.

**Determinand**

Sometimes called analyte, parameter, test, species, element or property, it is something determined or tested for in water samples. Some examples are pH, nitrate, copper, faecal coliforms, hardness, conductivity and chloroform.

**Disinfection**

The process used to inactivate micro-organisms in a drinking-water supply. The most common methods of disinfection are chlorination, ozonation, ultraviolet radiation and boiling.

**Disinfection residual**

The concentration of disinfectant that is still present in the water at any time after *disinfection*, to guard against post-treatment contamination. Chlorine is the most common disinfectant that can maintain a disinfection residual.

**Distribution Zone**

Part of a water supply network within which all consumers should receive drinking-water of identical quality. This water is supplied to all consumers from a similar origin or origins, with the same treatment, and through a common reticulation system. A small community will usually have a single zone. Larger towns or cities may have multiple zones because of different sources or source combinations being used, different treatment plants, separate pipe networks, different reticulation characteristics, or some other factor resulting in different or potentially different water quality being received by the consumer.

**Drinking-Water Standards for New Zealand 2000**

Previous standards, effective from 1 January 2001 to 31 December 2005, defining acceptable drinking-water quality for New Zealand supplies.

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**Drinking-Water Standards for New Zealand 2005**

Standards effective from 1 January 2006 defining acceptable drinking-water quality for New Zealand supplies.

***E. coli***

Abbreviated name for the faecal coliform bacteria *Escherichia coli*, which is a common gut bacteria living in humans and warm-blooded animals and excreted by them. While it does not usually cause illness on its own (there are some serious exceptions), its presence in drinking-water is used to indicate that the water has been subjected to faecal contamination and therefore illness-causing pathogens may be present.

**MAV**

Maximum Acceptable Value for no significant health risk as listed in the *Drinking-Water Standards for New Zealand 2000*.

**Plant**

See *treatment plant*.

**Plant Code**

A unique seven-character code defining a *treatment plant*. Code is always TP then a number from 00001 to 99999.

**Priority 2 Determinand**

A *determinand* designated for a specific *treatment plant* or *distribution zone* according to procedures outlined in the *Drinking-Water Standards for New Zealand 2000* because of a possible health risk to consumers. Generally, if a chemical *determinand* is present in a water supply at a level above 50% of the listed MAV, then it becomes a *Priority 2 determinand* for that supply. Such supply components must be monitored for the *Priority 2 determinand* at specified intervals until the risk is overcome or shown not to be present.

**Protozoa**

Single-celled aquatic micro-organisms such as *Giardia* and *Cryptosporidium*. They live and multiply in the intestine, causing fever, diarrhea, abdominal cramps and vomiting, which can last for many days. In some people, especially those with weakened immune systems, the illness can be life-threatening. In water sources they may exist for long periods as cysts, which are very resistant to water treatment processes, multiplying only after re-entering the intestine of a human or warm-blooded animal. Therefore water treatment focuses on very fine filtration to remove them, disinfection with ozone or chlorine dioxide, or the use of deep groundwater that is known to be secure from surface contamination.

**Public Health Grading**

A procedure used by the Ministry of Health to grade public supplies and their components according to the confidence which exists that the water is safe to drink and will continue to be so.

**Register of Community Drinking-Water Supplies in New Zealand**

The *Register of Community Drinking-Water Supplies in New Zealand* is a compilation of names, codes and relationships that have been allocated to the four components of water supplies, namely *communities*, *distribution zones*, *treatment plants* and *sources*. The *Register* uses information from

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local authorities checked by District Health Boards, so that each component of each supply has both a unique systematic code and a unique name. The purpose of the *Register* is to provide information on drinking-water supplies to individuals, organisations, and local, regional and national bodies in a consistent non-ambiguous manner, to encourage the use and exchange of related information.

- Secure Groundwater** Water contained beneath the land surface and that has been rigorously demonstrated to be (among other things,) free of *E. coli*, stable in chemical and physical characteristics, and not directly affected by climate, surface water or land use practices. Compared with secure groundwaters, surface waters and other groundwaters will usually represent a higher health risk to consumers in their-treatment state.
- Source** Point of origin or natural water body from which water is drawn to supply a community.
- Source Code** Unique six-character text code representing a source. The first character is G, S, M or R for ground, surface, mixed or rain water respectively. Last five are digits 00001 to 99999 for each series (ie G00001, S00001, etc).
- Supply** A drinking-water system consisting of one or more *distribution zones* and their contributing *treatment plants* and *sources*. A supply serving 25 people or more for at least 60 days per year is called a *community drinking-water supply*.
- Supply Component** *A distribution zone, treatment plant or source.*
- Treatment Plant** Facility used to treat raw water to bring it up to potable level for a community. Where an actual treatment plant does not exist (eg, an untreated groundwater supply) a nominal plant is named and coded representing the well-head or start of piping. This requirement is necessary to allow information to be stored on storage and treatment (or the lack of it) before reticulation.
- Zone** *See distribution zone.*
- Zone Code** A unique eight-character code defining a *distribution zone*. Created from the six-character *community code* followed by two letters from the zone name.
-