

Report on a survey of New Zealand drinking-water supplies for arsenic and nitrate

October 2018

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PREPARED FOR: Ministry of Health

CLIENT REPORT No: FW16030

REVIEWED BY: Peter Cressey

ACKNOWLEDGEMENTS

The authors gratefully acknowledge:

- public health unit staff who collected samples for this survey, or who liaised with water suppliers to obtain their help with sampling or the provision of data
- water suppliers who provided their data for inclusion in the survey
- Scott Rostron, Paul Prendergast and David Ogilvie from the Ministry of Health for their comments on the draft document
- Peter Cressey for his peer-review of the report.

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EXECUTIVE SUMMARY

Introduction

The survey reported here was undertaken to provide the Ministry of Health with an update of information on arsenic and nitrate in New Zealand networked drinking-water supplies because of changes in our understanding of risk factors leading to arsenic in water supplies, and land-use changes possibly influencing nitrate concentrations.

Method

For both the surveys of arsenic and nitrate, only water supply zones (zones) serving more than 500 people were surveyed. Zones were included in the arsenic survey if they had not been sampled for arsenic during the Ministry of Health's Priority 2 Programme (1995-2004). Zones from dairying areas, or areas where there have been many conversions to dairy farming, were included in the nitrate survey (Southland, Canterbury, Waikato), if they were sourced from groundwater. During the survey some sources and zones from Hawkes Bay were included at the request of the district health board because of nearby land-use changes.

Initially, for both determinands, one sample was to be taken from each zone and one from each source supplying the zone. However, in some instances, the water supplier had test data, produced by a Ministry-recognised laboratory, from samples already taken. To avoid duplicate sampling and to conserve resources, the survey made use of these data and no further samples were taken.

Results and discussion

Arsenic

The survey obtained arsenic concentrations for a total of 638 waters (both source and zone).

In most waters (83% of sources and 85% of zones) the arsenic concentration was below the limits of detection of the method used. In almost all cases this means the arsenic concentration was less than 0.001 mg/L (ie, less than 10% of the MAV (0.01 mg/L)).

Arsenic concentrations were found to exceed 50% of the MAV in only 5% of source waters and 2% of zone waters. When arsenic concentrations exceeded 50% of the MAV, the exceedence was frequently sufficient to also exceed the MAV.

The geographical areas in which arsenic concentrations most frequently exceeded 50% of the MAV, or the MAV itself, are those known for geothermal activity: parts of the Waikato and Bay of Plenty. In the lower half of the North Island and all of the South Island, no arsenic concentration was found to exceed 50% of the MAV.

The highest recorded concentration of arsenic in a source water was 0.027 mg/L. This was from the Waikato River (S00865) at the Mercer treatment plant intake. The

highest recorded concentration in a zone was reported in the Rangitaiki Plans Rural zone (RAN007PR) in the Bay of Plenty (0.014 mg/L).

Twenty-one source and five zone waters were found to contain arsenic at a concentration exceeding 50% of the MAV. Water suppliers are already aware of the elevated arsenic concentrations in the five zones because all have arsenic assigned as a Priority 2 determinand.

Twelve zones receive water from sources containing arsenic at a concentration more than 50% of the MAV, but the arsenic concentrations in the zones do not exceed 50% of the MAV. The Standards do not require arsenic monitoring in these zones. However, periodic sampling from the zone should be undertaken to ensure proper management of the potential public health risk.

Nitrate

The survey obtained nitrate concentrations for a total of 210 waters (both source and distribution zone).

Only 12% of waters (source and zones) surveyed contained nitrate concentrations that were below the limit of detection of the method used. This is not unexpected, partly because nitrate is a major ion in most waters, not a trace constituent, and partly because the detection limits of methods for nitrate analysis were well below the levels of nitrate typically found in water. The detection limit for nitrate was approximately 0.04 mg NO₃/L

In only 2% (3) of source waters, and in none of the zone waters, did the nitrate concentration exceed 50% of the MAV (50 mg NO₃/L). The MAV was not exceeded in any water sampled in this study.

In the five health districts included in the nitrate survey, the highest reported nitrate concentrations in source waters were found in supplies in the Waikato (27 mg NO₃/L) and Canterbury (27 mg NO₃/L) districts. The highest nitrate concentration found in a zone water was in Canterbury (25 mg NO₃/L) in the Darfield zone (DAR001DA).

None of the samples taken from the Hawkes Bay supplies showed nitrate concentrations that exceeded 25% of the MAV.

Nitrate concentrations can vary significantly in source waters. Water suppliers need to periodically sample and check on the nitrate concentration in their zone waters even if the result from this survey did not show the nitrate concentration exceeded 50% of the MAV.

Conclusions and observations

Arsenic

- a. The Priority 2 Programme has already identified all the supplies serving more than 500 people in which arsenic is present at concentrations greater than 50% of its MAV.

- b. The survey results show that, in zones serving more than 500 people at least, detectable arsenic concentrations are uncommon in areas away from geothermal activity.
- c. Waters being considered as water supply sources in the geothermal areas of the North Island, should be checked for arsenic before resources are invested in developing the source.
- d. Water suppliers with responsibility for the zones found by the survey to contain elevated arsenic levels are already aware of the potential risk to public health.

Nitrate

- a. In the surveyed health districts at the time of the survey, nitrate concentrations of potential health significance (greater than 50% of the MAV) were very infrequently detected in zones serving more than 500 people.
- b. Despite the prevalence of waters with nitrate concentrations presently less than 50% of the MAV, water suppliers should be periodically checking the nitrate concentrations in their zones because of the potential for nitrate contamination of groundwaters in the surveyed districts.
- c. Although nitrate concentrations were found to exceed 50% of the MAV in three source waters, concentrations did not exceed this level in any zones.

General observation

The monitoring of Priority 2 determinands required by the Drinking-water Standards provides information about determinands at potentially health-significant concentrations in zones. When the source water contains a determinand at concentrations in excess of 50% of its MAV, but the concentration is less than 50% of the MAV in the zone, vigilance is still needed. Monitoring of the determinand is advisable as a check that the barrier(s) reducing the concentration between the source and the zone continue to function.

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1. INTRODUCTION

Together, the Health Act 1956, water safety plans, the *Drinking-water Standards for New Zealand 2005 (rev. 2008)* (the Standards) (MoH 2008) and the *Guidelines for Drinking-water Quality Management for New Zealand 2013* (MoH 2013) form the foundation of drinking-water quality management in New Zealand. Risk management principles have a key part in ensuring the safety of drinking-water. The required monitoring of health-significant determinands provides a check on the effectiveness of a water supplier's risk management.

The determinands a water supplier is required to monitor to achieve the Standards depends, in part, on the priority classification assigned to the determinand. All water suppliers have to monitor all Priority 1 determinands and any Priority 2 determinands assigned to their supply. Monitoring of determinands classified as Priority 3 or Priority 4 is at the discretion of the water supplier, unless there is a public health reason for them to be monitored.

Priority 1 determinands are microbiological and are assigned to all supplies. As a result, to achieve the Standards all water supplies must monitor for the indicator bacterium *Escherichia coli*. Priority 2 determinands are usually chemical determinands. Not all water supplies have Priority 2 determinands assigned to them. The risk factors that may lead to the presence of a health-significant chemical determinand in a water supply vary. Only if a determinand is present in a supply at a concentration greater than 50% of the determinand's maximum acceptable value (MAV) is it assigned to the water supply and monitoring of the determinand is required for achievement of the Standards.

To assist water suppliers in making their initial identification of Priority 2 determinands the Ministry of Health funded the "Priority 2 Chemical Determinands Identification Programme" (the Priority 2 Programme). The Priority 2 Programme ran from 1995 to 2004. Now, water suppliers are expected to identify chemicals of health concern in their water supplies, as part of the implementation of their water safety plan.

The Priority 2 Programme assessed the risk factors associated with each supply to determine the likelihood of a Priority 2 determinand being present in a supply's water before deciding whether samples should be taken to test for that determinand. More than 20 years have passed since some supplies were first assessed by the Priority 2 Programme. During this period, the risk factors influencing the presence of health-significant chemical determinands in a supply, or our understanding of them, may have changed.

The presence of arsenic in a water supply is an example of a Priority 2 determinand for which our understanding of risk factors has changed. Previously, geothermal activity in an area, or possible mineral deposits, were the primary factors used to assess whether testing the supply for arsenic was required. Since then, arsenic has been found in water supplies without either of these risk factors.

Land-use changes arising from the conversion of farms to dairying operations is an example of the risk factors themselves changing. The growth in dairying in some

regions of New Zealand, and the associated increase in the nitrogen loading on the land, has increased the likelihood of water supplies in these regions containing higher concentrations of nitrate than was found in the late 1990s.

To provide the Ministry of Health with an up-dated overview of the risks to New Zealand's water supplies associated with arsenic and nitrate, ESR, with the help of public health units and water suppliers, has undertaken a survey gathering arsenic and nitrate concentration data from a selection of the country's water supplies.

This report is a record of the survey and its results. The current report:

- a. describes the selection of water supplies for inclusion in the survey (section 2.1)
- b. describes the way in which the survey was undertaken (section 2.2)
- c. identifies the data sources (section 2.3)
- d. summarises data from the survey and discusses the findings (arsenic: section 3.1; nitrate: section 3.2)
- e. discusses the implications of the findings for the risk management of water supplies (arsenic: section 3.1.1; nitrate: section 3.2.1)
- f. draws conclusions from the survey (section 4)
- g. provides listings of the minimum and maximum concentrations for each source and supply zone water included in the survey (arsenic: APPENDIX C;; nitrate: APPENDIX D:).

2. METHOD

For efficiency, the surveys for arsenic and nitrate were conducted as a single survey. They are discussed separately in this report for clarity.

2.1 SUPPLY SELECTION

2.1.1 Arsenic Survey

The Arsenic Survey was designed to include water supply distribution zones (zones) and their sources for which:

- a. the zone was not sampled for arsenic during the Priority 2 Programme in the years 1995 to 2000
- b. the zone served more than 500 people, as recorded in the Water Information New Zealand database, as at 27 July 2015.

Many zones that were sampled during the Priority 2 Programme have since undergone changes that have resulted in revised zone identification codes. The complexity of establishing links between identification codes used in 2000 and those presently in use did not allow the matching process to be automated; lists were matched manually. There is the possibility that some zones have not been properly matched. This may have resulted in a zone, or source, being included when it did not actually meet the inclusion criteria, or being excluded from the survey when it did meet the inclusion criteria.

Some zones that were not in existence during the Priority 2 Programme, but which now serve populations greater than 500 people, were included in the survey.

2.1.2 Nitrate Survey

The nitrate survey was not intended to cover all regions in New Zealand. The criteria for inclusion in the nitrate survey were:

- a. the zone was in the Southland, Canterbury or Waikato regions (a few samples from Hawkes Bay were included during the survey at the request of the Hawkes Bay District Health Board, because of land-use changes)
- b. the zone served more than 500 people, as recorded in the Water Information New Zealand database, as at 27 July 2015
- c. the zone's source was a groundwater ("G" designation in the source code).

To constrain the survey to manageable proportions, the project brief restricted the survey to three geographical regions where either dairy farming is well established or there has been substantial development in dairy farming over the past 15 or so years. Selection criterion c restricted the zones to those with groundwater sources because elevated nitrate concentrations are primarily associated with groundwaters (Davies et al 2001).

2.2 SAMPLING LOCATIONS

For both surveys, the intention, where possible, was to collect a sample from:

- a. the zone

- b. each source supplying the zone.

In many cases, where the treatment (or lack of) was unlikely to result in the determinand's concentration changing between the source and the zone, both the source and zone samples were taken to provide dual measurements of the water quality.

Occasionally the intended sampling plan (a sample from each zone and each source) could not be followed, or was considered unnecessary. There were three specific situations.

- a. Where there were no sampling points before multiple bore waters were combined, a sample of the combined waters was taken and the concentration measured in this water was assumed to be present in all bore waters.
- b. Where there was evidence that the bores in a bore field draw from the same aquifer, a sample was taken from only one bore and the test result assigned to all bores in the field. Each bore was sampled separately in the absence of evidence that all bores draw from the same aquifer and where it was physically possible to do so.
- c. Where zones in a supply received water of the same quality, such as from a bulk water supply, not all zones were sampled. Zones that were not sampled were assigned the test results from the zone that was sampled.

2.3 DATA COLLECTION

Water quality data for the survey were obtained in two ways, described in sections 2.3.1 and 2.3.2.

2.3.1 Sample collection and analysis

Arsenic and nitrate concentrations were obtained by collection of samples and having them analysed by a Ministry of Health-recognised laboratory.

The laboratory provided each public health unit with the necessary sampling containers:

- Arsenic was sampled in a nitric acid preserved 50 ml plastic tube.
- Nitrate was sampled in an unpreserved 50 ml plastic tube.

The analysis methods and their limits of detection are given in Table 1.

Table 1: Determinand methods and limits of detection for Eurofins-ELS analyses

Determinand	Method	Limit of Detection
Arsenic	ICP-MS following APHA 22nd edition method 3125 (modified)	0.001 mg/L
Nitrate	Ion Chromatography following USEPA 300.0 (modified)	0.04 mg/L ^a

^a Eurofins-ELS reported the nitrate concentration at the Limit of detection as 0.01 mg NO₃-N/L. This figure is the approximate value after conversion of the units.

ESR provided each public health unit with sampling notes (APPENDIX A:) and a sample form template (APPENDIX B:). The latter was to accompany the samples to the laboratory. The public health units returned the filled sample containers to the laboratory by courier.

To assist public health units in deciding how long samples could be retained for batching, they were advised that:

- a. the acid preserved arsenic samples could be held for up to six months before analysis without refrigeration.
- b. nitrate samples were either to be sent back to the laboratory within 24 hours or frozen, in which case they were to be returned to the laboratory within four weeks.

Some public health units came to an agreement with water suppliers for the water supplier's staff to collect samples.

The laboratory provided ESR with periodic updated spreadsheets. These contained:

- the laboratory's identification number
- the date the sample was taken
- the date the laboratory received the sample
- notes with a description of the sampling location and the drinking-water assessor's or health protection officer's sample number
- the source or zone name
- the source or zone identification code
- the grid reference (where this had been provided by the sampler)
- the arsenic concentration (where required)
- the nitrate concentration (where required)

2.3.2 Data from water suppliers

As well as arsenic and nitrate concentrations being obtained by sample collection and analysis, as described in section 2.3.1, water suppliers also provided their own test results. This saved resources, unnecessary duplication of effort and in some cases gave a much richer dataset because of regular monitoring the water supplier had undertaken over several years.

Use of these existing datasets was acceptable provided the laboratory used by the water supplier was Ministry of Health-recognised. Most of the data received from water suppliers were collected in 2014 and 2015, although some datasets extended back over a much longer period.

3. RESULTS AND DISCUSSION

Detailed results from the Arsenic and Nitrate Surveys are given in APPENDIX C: and APPENDIX D: respectively.

The tables list the minimum and maximum concentrations of the determinand collected, either through laboratory analysis or provision of existing data, by the survey.

A small amount of double counting exists in the summary statistics discussed in this section. Some sources feed more than one zone. To ensure the record for each zone is complete, data from the shared source are recorded with both zone codes. Hence, when the statistics counting the number of source results are given in the following sections, a shared source is counted more than once.

3.1 ARSENIC SURVEY RESULTS

The survey obtained arsenic concentrations for a total of 638 waters (both source and zone).

Table 2 and Table 3 contain summary statistics for the arsenic concentrations obtained by the survey for each health district, and for source and zone waters respectively. The tables provide statistics for three levels of arsenic found: concentrations below the analytical limit of detection; concentrations greater than 50% of the MAV (0.01 mg/L); and concentrations exceeding the MAV. The latter two categories are significant because they indicate the concentrations at which the Standards classify a determinand as Priority 2, so requiring its monitoring (greater than 50% MAV), and at which a water does not achieve the Standards (greater than the MAV).

The tables also list the maximum arsenic concentration reported in a water for each health district.

Table 2: Arsenic survey results for source waters

HEALTH DISTRICT	TOTAL NUMBER OF RESULTS.	RESULTS LESS THAN LIMIT OF DETECTION		RESULTS GREATER THAN 50% OF THE MAV		RESULTS GREATER THAN THE MAV		MAXIMUM CONCENTRATION (mg/L)
		Number	Proportion	Number	Proportion	Number	Proportion	
Northland	22	20	91%	1	5%	0	0%	0.006
Auckland Regional Public Health Service	24	18	75%	1	4%	1	4%	0.027
Waikato	34	16	47%	9	26%	8	24%	0.025
Toi Te Ora	20	6	30%	10	50%	6	30%	0.022
Taranaki	12	12	100%	0	0%	0	0%	0.001
Tairāwhiti	4	3	75%	0	0%	0	0%	0.001
Hawkes Bay	9	7	78%	0	0%	0	0%	0.0023
MidCentral	31	30	97%	0	0%	0	0%	0.001
Hutt Valley Health	34	30	88%	0	0%	0	0%	0.002
Nelson-Marlborough	41	41	100%	0	0%	0	0%	0.001
Community and Public Health	99	88	89%	0	0%	0	0%	0.003
Public Health South	58	50	86%	0	0%	0	0%	<0.002
Totals^a	388	321	83%	21	5%	15	4%	

The MAV for arsenic is 0.01 mg/L

^a The difference between the sum of the percentages for the three concentration categories and 100% represents the proportion of samples containing detectable concentrations that were less than 50% of the MAV.

Table 3: Arsenic survey results for distribution zones

HEALTH DISTRICT	TOTAL NUMBER OF RESULTS.	RESULTS LESS THAN LIMIT OF DETECTION		RESULTS GREATER THAN 50% OF THE MAV		RESULTS GREATER THAN THE MAV		MAXIMUM CONCENTRATION (mg/L)
		Number	Proportion	Number	Proportion	Number	Proportion	
Northland	12	12	100%	0	0%	0	0%	0.001
Auckland Regional Public Health Service	38	28	74%	0	0%	0	0%	0.004
Waikato	19	12	63%	0	0%	0	0%	0.004
Toi Te Ora	10	0	0%	5	50%	4	40%	0.014
Taranaki	8	8	100%	0	0%	0	0%	0.001
Tairāwhiti	1	1	100%	0	0%	0	0%	<0.001
Hawkes Bay	7	4	57%	0	0%	0	0%	0.003
MidCentral	17	16	94%	0	0%	0	0%	0.001
Hutt Valley Health	24	24	100%	0	0%	0	0%	0.001
Nelson-Marlborough	13	13	100%	0	0%	0	0%	0.001
Community and Public Health	59	57	97%	0	0%	0	0%	0.003
Public Health South	42	38	90%	0	0%	0	0%	0.002
Totals ^a	250	213	85%	5	2%	4	2%	

The MAV for arsenic is 0.01 mg/L

^a The difference between the sum of the percentages for the three concentration categories and 100% represents the proportion of samples containing detectable concentrations that were less than 50% of the MAV.

In the majority of source (83%) and distribution zone (85%) waters arsenic was not detected. In almost all cases this means the arsenic concentration was less than 0.001 mg/L (ie, less than 10% of the MAV), including some results received from water suppliers with a lower limit of detection. For four waters, where concentration data were received from water suppliers, the concentration was reported as less than 0.002 mg/L.

Arsenic concentrations were found to exceed 50% of the MAV in only 5% of source waters and 2% of zone waters. When arsenic concentrations exceeded 50% of the MAV, the exceedence was frequently sufficient to also exceed the MAV.

The geographical areas in which arsenic concentrations most frequently exceeded 50% of the MAV, or the MAV itself, are those known for geothermal activity: parts of the Waikato and Bay of Plenty. In Northland and Auckland only two source waters (no zone waters) were found to contain arsenic concentrations of potential health significance (greater than 50% MAV). In the lower half of the North Island and all of the South Island, no water arsenic concentration was found to exceed 50% of the MAV.

The highest recorded concentration of arsenic in a source water was 0.027 mg/L, from the Waikato River (S00865) at Watercare's Mercer treatment plant. The highest concentration in a zone was reported in the Rangitaiki Plains Rural (RAN007PR) in the Bay of Plenty (0.014 mg/L).

This geographical distribution of elevated arsenic concentrations appears self-evident. However, as explained in the section 1 of the current report, elevated arsenic concentrations have been found beyond the geothermal regions in the past. One of the aims of this survey was to determine the extent of the occurrence of arsenic outside the geothermal regions.

Although the survey results show that arsenic is not widely found in water supplies beyond the geothermal areas of the Waikato and Bay of Plenty, the survey did not gather data from all sources and zones outside the geothermal areas. It is possible that some supplies not included in the survey and not in the geothermal areas, contain elevated arsenic concentrations. As noted earlier, a small number of supplies outside geothermal areas have been found in the past to contain arsenic.

Also, in general only one arsenic concentration was obtained from each water surveyed. This raises the question of whether these results are typical. Arsenic was not detected in all sources in the southern North Island and all of the South Island. For arsenic concentrations to typically exceed 50% of the MAV, the concentration found during the survey would have had to have been atypically low by a factor of at least five. As none of the sources or zones in these two areas showed evidence of this level of variation, it is highly unlikely that elevated arsenic concentrations are typical in these sources and zones.

3.1.1 Implications for risk management

For zones in which arsenic concentrations were found to exceed 50% of the MAV in the survey, the question arises as to whether the water supplier is aware of the potential risk to consumers and if so, whether the risk is being managed.

Table 4 lists the source and zone waters in which the arsenic concentration exceeds 50% of the MAV. Twenty-one source and five zone waters were found to contain arsenic at a concentration exceeding 50% of the MAV.

As part of managing chemical risks to water supplies, the Standards require any Priority 2 determinands assigned to the supply to be monitored. Arsenic is already assigned as a Priority 2 determinand to all of the zones listed in Table 4 with arsenic concentrations exceeding 50% of the MAV (ACA001AC, MOT002MO, OMO001OM, RAN007PR, TAU001TC). Thus, the water suppliers are aware of arsenic being in their supply at potentially health-significant concentrations.

The *Annual Report on Drinking-water Quality 2014-15* (MoH 2016) recorded that all of these zones were being adequately monitored for arsenic, except Rangitaiki Plains Rural (RAN007PR). The risk to health is being managed in the Taupo Central and West zone (TAU001TC) through installation of improved treatment, but the corrective actions for the other four zones ((ACA001AC, MOT002MO, OMO001OM, RAN007PR) was classified as “inadequate” in the *Annual Report on Drinking-water Quality 2014-15*. Corrective actions to remove chemical determinands from drinking-water can be time consuming and expensive, especially if the installation of a new treatment process is required. The removal of arsenic from water is not straightforward.

As outlined in Table 4, 12 zones receive water from sources containing arsenic at concentrations more than 50% of the MAV, but the arsenic concentrations in the zones do not exceed 50% of the MAV. The Standards do not require arsenic monitoring in these zones. However, for the proper management of the public health risk associated with arsenic in these supplies, samples should be taken periodically to check that there has not been a breakdown in the barrier(s) ensuring the low arsenic concentration in the zone. This need not be at the frequency required for monitoring Priority 2b determinands (monthly).

In the sample taken from Pauanui zone (PAU001PA) during the survey, arsenic concentrations were not found to exceed 50% of the MAV. However, arsenic is assigned as a Priority 2 determinand to the Pauanui zone, indicating that previously arsenic concentrations were found to exceed 50% of the MAV in the zone¹.

¹ One of the Pauanui source waters has a relatively low arsenic content. The low arsenic concentration found in the zone sample may have resulted from the sample being taken from a location which was receiving low-arsenic water at the time of sampling.

Table 4: Source and distribution zone waters with arsenic concentrations greater than 50% of the MAV

Entries without a source code are zones

Zone Code	Zone Name	Source Code	Source Name
ACA001AC	Acacia Bay	S00001	Lake Taupo at Acacia Bay
ACA001AC	Acacia Bay		
ATH003AT	Athenree	G00577	Athenree Quarry Bore South
AUC003AA	Auckland Airport	S00865	Waikato River, Auckland
CAM001CA	Cambridge	S00008	Waikato River, Cambridge
CAM001CA	Cambridge	S00009	Lake Karapiro
DOU004EC	East Coast Bays	G01615	Taipa Bore
MOT002MO	Motuoapa	S00367	Lake Taupo Intake, Motuoapa
MOT002MO	Motuoapa		
NGA002NG	Ngaruawahia	S00070	Waikato River for Ngaruawahia
OMO001OM	Omori / Kuratau / Pukawa	S00281	Lake Taupo Intake, Omori
OMO001OM	Omori / Kuratau / Pukawa		
PAU001PA	Pauanui	G01001	Pauanui Production Well 2
PAU001PA	Pauanui	G01002	Pauanui Production Well 3
PON003PO	Pongakawa	G01693	ESZ 8
PUK001PU	Pukerimu Rural	S00029	Waikato River, Pukerimu Lane
RAN007PR	Rangitaiki Plains Rural	G00220	Braemar Springs
RAN007PR	Rangitaiki Plains Rural	G00221	Johnson Road Bore (North)
RAN007PR	Rangitaiki Plains Rural	G00548	Johnson Road Bore (South)
RAN007PR	Rangitaiki Plains Rural		
SOU009SO	Southern Districts, Waikato DC	S00041	Waikato River, Hamilton
TAU001TC	Taupo Central & West	S00006	Lake Taupo, for Lake Terrace
TAU001TC	Taupo Central & West		
TAU001TS	Taupo - Taupo South	S00006	Lake Taupo, for Lake Terrace
TAU002TA	Taupiri	S00030	Waikato River for Hopuhopu
TEK001TR	Te Kauwhata / Rangiriri	S00067	Waikato River for Te Kauwhata

The MAV for arsenic is 0.01 mg/L

3.2 NITRATE SURVEY RESULTS

The survey obtained nitrate concentrations for a total of 210 waters (both source and distribution zone).

Table 5 and Table 6 contain summary statistics for nitrate concentrations obtained by the survey, for each district health, for source and zone waters respectively.

The tables provide statistics for three categories of nitrate concentration: concentrations below the analytical limit of detection; concentrations greater than 50% of the MAV (50 mg NO₃/L); concentrations exceeding the MAV. The latter two categories are significant because they indicate the concentrations at which the Standards classify a determinand as Priority 2, so requiring its monitoring (greater than 50% MAV) and at which a water does not achieve the Standards (greater than the MAV).

The tables also list the maximum nitrate concentration reported in a water for each health district. Concentrations are expressed in units of mg NO₃/L.

Table 5: Nitrate survey results for source waters

HEALTH DISTRICT	TOTAL NUMBER OF RESULTS.	RESULTS LESS THAN LIMIT OF DETECTION		RESULTS GREATER THAN 50% OF THE MAV		RESULTS GREATER THAN THE MAV		MAXIMUM CONCENTRATION (mg NO ₃ /L)
		Number	Proportion	Number	Proportion	Number	Proportion	
Waikato	25	2	8%	1	4%	0	0%	27
Toi Te Ora	2	0	0%	0	0%	0	0%	8.5
Hawkes Bay	5	0	0%	0	0%	0	0%	9.2
Community and Public Health	88	8	9%	2	2%	0	0%	27
Public Health South	15	0	0%	0	0%	0	0%	19
Totals ^a	135	10	7%	3	2%	0	0%	

The MAV for NO₃ is 50 mg NO₃/L

^a The difference between the sum of the percentages for the three concentration categories and 100% represents the proportion of samples containing detectable concentrations that were less than 50% of the MAV

Table 6: Nitrate survey results for distribution zones

HEALTH DISTRICT	TOTAL NUMBER OF RESULTS.	RESULTS LESS THAN LIMIT OF DETECTION		RESULTS GREATER THAN 50% OF THE MAV		RESULTS GREATER THAN THE MAV		MAXIMUM CONCENTRATION (mg NO ₃ /L)
		Number	Proportion	Number	Proportion	Number	Proportion	
Waikato	11	2	18%	0	0%	0	0%	17
Toi Te Ora	2	0	0%	0	0%	0	0%	9.1
Hawkes Bay	3	0	0%	0	0%	0	0%	11
Community and Public Health	48	2	4%	0	0%	0	0%	25
Public Health South	11	0	0%	0	0%	0	0%	16
Totals ^a	75	4	5%	0	0%	0	0%	

The MAV for NO₃ is 50 mg NO₃/L

^a The difference between the sum of the percentages for the three concentration categories and 100% represents the proportion of samples containing detectable concentrations that were less than 50% of the MAV

Nitrate was not detected in only 12% of waters (source and zones) surveyed. There are two contributing factors to this: nitrate is a major ion in most waters, not a trace constituent; and the detection limits of methods for nitrate analysis are well below the levels of nitrate typically found in water. The detection limit for nitrate is reported as approximately 0.04 mg NO₃/L in all cases except one result reported in the Christchurch supply in which the nitrate concentration was reported to be less than 0.4 mg NO₃/L. This may be a transcription error in the data provided by the water supplier.

The nitrate concentration exceeded 50% of the MAV in only 2% (3) of source waters, and in none of the zone waters. The MAV for nitrate was not exceeded in any water.

In the five health districts included in the nitrate survey, the highest reported concentrations of nitrate in source waters were found in supplies in the Waikato (27 mg NO₃/L) and Canterbury (27 mg NO₃/L) districts. The highest nitrate concentration found in a zone water was in Canterbury (25 mg NO₃/L) in the Darfield supply.

None of the samples taken from the Hawkes Bay supplies showed nitrate concentrations that exceeded 25% of the MAV (12.5 mg NO₃/L).

3.2.1 Implications for risk management

For sources in which nitrate concentrations were found to exceed 50% of the MAV in the survey, this section examines what Priority 2 assignments have been made to the associated zones, as an indicator of the water supplier's awareness of the potential public health risk. Information from the *Annual Report on Drinking-water Quality 2014-15* (MoH 2016) is also reviewed to determine what is being done to manage the risk.

Table 7 lists the three source waters with nitrate concentrations exceeding 50% of the MAV. The Kihikihi zone (KIH001KI) is supplied with water from two bores: the Hall Street bore (G00032), yielding water with a nitrate concentration slightly greater than 50% of the MAV and the Church Street bore (G00031), which yields water with a very low nitrate concentration. Nitrate has not been assigned as a Priority 2 determinand to this zone. The concentration measured in the survey sample confirms that the reticulated water is very low in nitrate (0.5 mg NO₃/L), indicating that either the water is blended or the Hall Street bore is only for emergency use. There is no risk to public health due to water nitrate, even if the Hall Street bore were to be used without dilution, because the nitrate concentration is still well below the MAV.

Table 7: Source waters with nitrate concentrations greater than 50% of the MAV

Zone Code	Zone Name	Source Code	Source Name
KIH001KI	Kihikihi	G00032	Hall Street Bore
ASH003AS	Ashburton	G02002	Tinwald Bore
DAR001DA	Darfield	G01961	Darfield SH73 Bores

The MAV for NO₃ is 50 mg/L

The Ashburton zone is supplied with water from several bores with varying nitrate concentrations. The test results from the survey show that the Tinwald bore (G02002) contains the highest nitrate concentration, although nitrate levels in the bore water may fluctuate. Nitrate is already assigned to the zone as a Priority 2 determinand, but at the time and location the sample was taken from the zone, the nitrate concentration was well below 50% of the MAV.

The Darfield zone is reliant on one group of bores for its water, identified as a single source (G01961). There are no other low-nitrate sources with which to dilute the water from G01961, consequently the nitrate concentration in the Darfield zone is similar to the source concentration. The sample taken during the survey showed this. Nitrate is assigned to the Darfield zone as a Priority 2 determinand.

Nitrate concentrations can vary significantly in source waters. Water suppliers need to periodically sample and check on the nitrate concentration in their source and zone waters even if the single sample taken during this survey did not show the nitrate concentration exceeded 50% of the MAV. When more than one bore feeds a zone, and the bores contain waters with different nitrate concentrations, the location and timing of sampling within the zone can also lead to variable results.

To avoid unnecessary sampling, the nitrate concentration should be taken into account when deciding on a sampling frequency. Table 8 lists sources and zones in which the nitrate concentration was found to be 30–50% of the MAV. Seasonal checks on nitrate concentrations in these zones and zones fed by these sources, as part of risk management of the supply, would be prudent. Periodic checks for water supplies with nitrate concentrations below this range need not be as frequent as for those listed in Table 8. Nevertheless, water suppliers should be aware of changes in land use in the recharge zones of their groundwater sources, and amend the frequency of their checks accordingly.

Table 8: Source and zone waters with nitrate concentrations in the range: 30–50% of the MAV.

Entries without a source code are zones

Zone Code	Zone Name	Source Code	Source Name
Waikato District Health Board			
MAT004MA	Matamata Township	G00089	Tawari Bore 1, Matamata
MAT004MA	Matamata Township	G01910	Tawari Bore 2, Matamata
TOK001TO	Tokoroa	G00027	Elizabeth Park Bore 1
TOK001TO	Tokoroa		
Community and Public Health			
ASH003AS	Ashburton	G01683	Bridge Street No.2
CHR001CE	Central Christchurch	G00118	Central CHCH, Aquifer 1
KIR001KI	Kirwee	G00725	Kirwee Bore
ROL001RO	Rolleston	G01113	Rolleston, Overbury Crescent
ROL001RO	Rolleston	G01874	Rolleston, Westland Place
ROL001RO	Rolleston	G02009	Rolleston, Illinois Drive
SHE004SH	Sheffield/Waddington	G00820	Sheffield/Waddington Bore
SOU001SO	Southbridge	G00157	Southbridge High St Well
DAR001DA	Darfield		
KIR001KI	Kirwee		
MAN009MA	Mandeville		
SHE004SH	Sheffield/Waddington		
SOU001SO	Southbridge		
Public Health South			
EDE001ED	Edendale	G01928	Homestead Road Bore 1
EDE001ED	Edendale	G01930	Homestead Road Bore 2
GOR001GO	Gore	G00052	Coopers Wells
TUA001TU	Tuatapere	G02032	Forestry Rd Nth Bore
EDE001ED	Edendale		
EDE001WY	Wyndham		

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4. CONCLUSIONS AND OBSERVATIONS

4.1 ARSENIC

- a. Elevated arsenic concentrations have been previously found in water supply zones outside the geothermal areas of the North Island. However, the survey results show that, in zones serving more than 500 people, at least, detectable arsenic concentrations are uncommon in areas away from geothermal activity.
- b. The Priority 2 Programme has already identified all the zones serving more than 500 people in which arsenic is present at concentrations greater than 50% of its MAV.
- c. The survey confirms that waters being considered as water supply sources in the geothermal areas of the North Island, should be checked for arsenic before resources are invested in developing the source. Existing water supply sources in this area, that have not been checked for arsenic (either through previous assessment programmes or this survey), should be checked for arsenic.
- d. All the zones found by the survey to be supplying water containing arsenic at concentrations greater than 50% of the MAV have the determinand already assigned as a Priority 2 determinand. Consequently, water suppliers are already aware of the potential public health risk from arsenic in their supply. All but one zone was adequately monitored during the 2014-15 year, but in four of the zones the corrective actions being taken were assessed by the drinking water assessor as being inadequate.

4.2 NITRATE

- a. In the health districts included in the nitrate survey, existing land use or change in land use, has the potential to increase nitrate concentrations in groundwaters. However, the survey has shown that, at the time of the survey, nitrate concentrations of potential health significance (greater than 50% of the MAV) were very infrequently detected in water supply zones serving more than 500 people.
- b. Despite the prevalence of waters with nitrate concentrations less than 50% of the MAV, water suppliers should be either undertaking their own nitrate monitoring or seeking monitoring data from regional councils, because of the potential for nitrate contamination of groundwaters in the surveyed areas. Provided the nitrate concentration in a supply does not require monitoring under the Standards, the sampling frequency does not have to match that required for Priority 2 determinands. Monitoring programmes should be seeking to establish whether there are seasonally-controlled fluctuations or signs of long-term trends in nitrate concentration. Regional council data may be helpful for this purpose. Spatial and temporal fluctuations in nitrate concentrations may also be found in zones fed by more than one bore when the bores contain waters with different nitrate concentrations.

- c. Although nitrate concentrations were found to exceed 50% of the MAV in three source waters, it was not found to exceed this level in any zones.

4.3 GENERAL OBSERVATION

Managing the risk of chemical determinands in water supplies is one of the functions of a water safety plan and consequently a water supplier's responsibility. The monitoring of Priority 2 determinands undertaken to meet the requirements of the Standards provides information about determinands at potentially health-significant concentrations in zones. When the source water contains a determinand in excess of 50% of its MAV, but the concentration is less than 50% of the MAV in the zone, vigilance is still needed. Monitoring of the determinand is advisable as a check that the barrier(s) reducing the concentration between the source and the zone continue to function. The frequency of sampling need not be the same as required by the Standards for Priority 2 monitoring. Factors such as the closeness of the determinand's concentration in the source water to 50% of the MAV, and evidence of the satisfactory operation of the treatment system, should be taken into consideration when determining sampling frequency.

APPENDIX A: SAMPLING NOTES PROVIDED TO PUBLIC HEALTH UNITS

Arsenic and Nitrate Survey 2015

Sampling notes

Thank you for helping with collecting samples for the Ministry of Health's 2015 Arsenic and Nitrate Survey.

The notes below should provide you with all the information needed for collecting, storing and returning samples, and completing paperwork. Should you have a question that is not answered by these notes please call or email either:

Jacqui Ritchie 03 351 0051 jacqui.ritchie@esr.cri.nz

Or

Chris Nokes 03 351 6019 chris.nokes@esr.cri.nz

Sampling bottles

Two types of sampling container will have been provided:

1. Container for arsenic analysis: 50 ml plastic tube with a silver border labelled "Metals".
2. Container for nitrate analysis: 50 ml plastic tube with a blue border labelled "Anions"

Where to take samples

For both nitrate and arsenic we wish to have one sample taken before treatment and one sample after treatment. If there is no treatment, then a sample as close to the wellhead, (or source) as possible and a sample out in the reticulation is needed.

a. Pre-treatment samples

- Ideally, we would like these to be taken directly from the stream/river/lake or the bore/well head. However, if this is inconvenient, sampling just prior to treatment is satisfactory, subject to the conditions below.
- Where there is more than one source, we require samples to be taken from each source. You should receive enough sampling containers to do this. Again, the sample does not have to be taken at the point of abstraction, but it must be taken before mixing with water from any other sources.
- When sampling water from a bore that is not routinely used, it is important that the bore is well flushed before the sample is taken. Pump/draw at least 3 bore volumes from the bore before taking the sample.

b. Post-treatment samples

- Ideally, the sample should be taken in the reticulation. If this is inconvenient, a point at the treatment plant, but after treatment and any on-site storage, will be satisfactory.

Filling the sample bottles

- Flaming, or disinfection, of the sampling point is unnecessary for both arsenic and nitrate samples.
- When sampling from a tap, flush 1–2 L of water from the tap, or enough to ensure the sampling line is fully flushed if the sampling point is some distance from the water flow being sampled.

Arsenic samples: fill as close to the top as possible WITHOUT overflowing (as this will spill the preservative).

Nitrate samples: fill to approximately the shoulder of the bottle (which will leave a small volume of air to allow the water to expand when frozen). Overflow is not a problem, but if you do, tip water out to provide the small space above the water level in the container.

Storage of samples

Arsenic samples: these are acid-preserved and do not require refrigeration. They can be held for up to 6 months before analysis. If the samples are being stored for an extended period (several weeks) keep them at room temperature out of the sun.

Nitrate samples: these are unpreserved and must either be sent back to the laboratory or PHU within 24 hours (or soon after) or frozen, when they can be kept for three to four weeks before analysis.

Transportation

Arsenic samples: there are no special requirements for transportation.

Nitrate samples: keep the samples cool with an icepack. If this is not possible, ensure they are frozen when despatched.

Completion of the sampling form

The following notes may help in completing the form:

Field	Comment
DHB Name	The DHB name
Address	The DHB address.
Contact	DHB contact name
Name of sampler	Name of person who took the samples
Date sent	Date the sample was sent to ELS
Phone	Phone number of the person who took the samples
FAX	Fax number of the person who took the samples
Email address	Email address of the person who took the samples

Client sample ID	The identification number given to the sample by the person who took it.
Sampling location	Brief description of where the sample was taken
Grid reference	If you are able to provide spatial location information using GPS, please provide it here.
Zone/source name	Provide if you know this, but the zone code or source code is the more important identifier.
Zone/source code	This code will be of the form: ABC123DE for a zone, or G01234/S05678 for a source. If a source is unregistered and has no code, ensure a name is provided as the identifier.

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APPENDIX B: SURVEY SAMPLING FORM



ELS

Arsenic and Nitrate Survey

(Please ensure all information is entered legibly and all entries are made with waterproof, permanent ink)

Please Print Legibly

SAMPLE INFORMATION (to be completed by sender)

85 Port Rd, Lower Hutt 0800 69 5227

Eurofins ELS SAMPLE RECEIPT INFORMATION

DHB NAME		Contact		Received By:	
Address		PHONE		Date Received	
		FAX		Time Received	
NAME OF SAMPLER	DATE SENT	EMAIL ADDRESS:	ORDER NUMBER: AS&NO3SURV	Phone:	04 576 5016
				Fax:	04 576 5017

CLIENT SAMPLE ID	DATE SAMPLED	SAMPLING LOCATION	ZONE OR SOURCE NAME	ZONE OR SOURCE CODE	GRID REF (EASTING)	GRID REF (NORTHING)	ANALYSIS REQUIRED	ELS SAMPLE NUMBER

LAB COMMENTS	
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APPENDIX C: ARSENIC CONCENTRATIONS OBTAINED BY THE SURVEY

For samples taken from the source, the tables list the code and name of the zone receiving water from the source, as well as the source's code and name. The "Data Source" column records whether the concentration data provided are from sample collection and analysis (denoted as 'Laboratory Test'), or data provided by the water supplier (denoted as 'Water Supplier').

When only one measurement was available, it is logged as the 'maximum' concentration (although it may be an undetectable concentration). The results from all samples taken during the survey are recorded as maxima, because only one measurement was available.

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
Northland District Health Board							
Sources							
BRE001BR	Bream Bay	S00254	Ruakaka River	Whangarei District Council	Laboratory Test		0.001
BRE001BR	Bream Bay	S00255	Ahuroa River	Whangarei District Council	Laboratory Test	<	0.001
BRE001BR	Bream Bay	S00891	Tauroa Stream, Bream Bay	Whangarei District Council	Laboratory Test	<	0.001
BRE001BR	Bream Bay	S00892	Wilson Dam	Whangarei District Council	Laboratory Test	<	0.001
DAR002DT	Dargaville Town	S00196	Kaiha Catchment Streams V1	Kaipara District Council	Laboratory Test	<	0.001
DAR002DT	Dargaville Town	S01021	Kaihu River, Rotu Intake	Kaipara District Council	Laboratory Test	<	0.001
KAW002KA	Kawakawa	S00213	Tirohanga River	Far North District Council	Laboratory Test	<	0.001
DOU004EC	East Coast Bays	S01051	Oruru River	Far North District Council	Laboratory Test	<	0.001
DOU004EC	East Coast Bays	G00294	Bore Block 235, Wrathal Rd	Far North District Council	Laboratory Test	<	0.001
DOU004EC	East Coast Bays	G01615	Taipa Bore	Far North District Council	Laboratory Test		0.006
OKA003OK	Okaihau	G00261	Waharakeke Bore, Okaihau	Far North District Council	Laboratory Test	<	0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
OKA003OK	Okaihau	G00541	No.2 Bore, Okaihau	Far North District Council	Laboratory Test		< 0.001
OMA002OM	Omapere	S00190	Waitemarama Stream	Far North District Council	Laboratory Test		< 0.001
OMA002OM	Omapere	S01020	Waiarohia Dam	Far North District Council	Laboratory Test		< 0.001
PAI001HA	Haruru Falls	S00210	Waitangi River	Far North District Council	Laboratory Test		< 0.001
RAW001RA	Rawene	S00266	Pataka Stream, Rawene	Far North District Council	Laboratory Test		< 0.001
WHA007HE	Whangarei Heads	G00458	Maunu Springs	Whangarei District Council	Laboratory Test		< 0.001
WHA007HE	Whangarei Heads	G01222	Maunu Springs Auxillary	Whangarei District Council	Laboratory Test		< 0.001
WHA007HE	Whangarei Heads	S00258	Whau Valley Dam	Whangarei District Council	Laboratory Test		< 0.001
WHA007HE	Whangarei Heads	S00259	Hatea River	Whangarei District Council	Laboratory Test		< 0.001
WHA007HE	Whangarei Heads	S00260	Waipao Stream	Whangarei District Council	Laboratory Test		< 0.001
WHA007HI	Hikurangi	S00260	Waipao Stream	Whangarei District Council	Laboratory Test		< 0.001
Zones							
BRE001BR	Bream Bay			Whangarei District Council	Laboratory Test		< 0.001
DAR002DT	Dargaville Town			Kaipara District Council	Laboratory Test		< 0.001
KAW002KA	Kawakawa			Far North District Council	Laboratory Test		< 0.001
KAW002MO	Moerewa / Otiria			Far North District Council	Laboratory Test		< 0.001
DOU004EC	East Coast Bays			Far North District Council	Laboratory Test		< 0.001
OKA003OK	Okaihau			Far North District Council	Laboratory Test		< 0.001
OMA002OM	Omapere			Far North District Council	Laboratory Test		< 0.001
PAI001HA	Haruru Falls			Far North District Council	Laboratory Test		< 0.001
PAI001OP	Opuia			Far North District Council	Laboratory Test		< 0.001
RAW001RA	Rawene			Far North District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WHA007HE	Whangarei Heads			Whangarei District Council	Laboratory Test		< 0.001
WHA007HI	Hikurangi			Whangarei District Council	Laboratory Test		< 0.001
Auckland Regional Public Health Service							
Sources							
AUC003AA	Auckland Airport	S00733	Cosseys Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AA	Auckland Airport	S00734	Wairoa Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AA	Auckland Airport	S00735	Mangatangi Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AA	Auckland Airport	S00736	Upper Mangatawhiri Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AA	Auckland Airport	S00865	Waikato River, Auckland	Watercare Services Ltd	Water Supplier	0.0067	0.027
AUC003AU	Auckland	G00001	Onehunga Town Bores	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland	G00233	Rowe St Bores, Onehunga	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland	S00090	Upper Huia Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland	S00092	Lower Huia Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland	S00094	Upper Nihotupu Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland	S00096	Lower Nihotupu Dam	Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland	S00099	Waitakere Dam	Watercare Services Ltd	Laboratory Test		< 0.001
HUI006HV	Huia Village	S00505	Lower Huia Dam - Huia Village	Watercare Services Ltd	Laboratory Test		< 0.001
HUI006HV	Huia Village	S01017	Upper Huia Dam - Huia Village	Watercare Services Ltd	Laboratory Test		< 0.001
BOM003BO	Bombay	G00454	Bombay Spring	Watercare Services Ltd	Water Supplier	< 0.0001	< 0.0001
MUR011MU	Muriwai	G00115	Muriwai Spring	Watercare Services Ltd	Water Supplier	< 0.0001	< 0.0001
SNE002SN	Snells/Algies	G00005	Hamiltons Road TP Bore	Watercare Services Ltd	Water Supplier	< 0.0001	0.0001
TUA002TS	Tuakau South	G00087	Peter Spring Bore	Waikato District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
TUA002TS	Tuakau South	G01362	New Tuakau Bore	Waikato District Council	Laboratory Test		< 0.001
WAI214WA	Waiuku	G00080	Victoria Ave	Watercare Services Ltd	Water Supplier	0.0032	0.0036
WAI214WA	Waiuku	G00081	Cornwall Road	Watercare Services Ltd	Water Supplier	0.0043	0.0044
WAI214WA	Waiuku	G01471	Waiuku Road Bore	Watercare Services Ltd	Water Supplier	0.0028	0.0035
WAR006WA	Warkworth	S00005	Mahurangi River	Watercare Services Ltd	Water Supplier	0.0003	0.0003
WEL004WE	Wellsford/Te Hana	S00004	Hoteo River	Watercare Services Ltd	Water Supplier	0.00041	0.00041
Zones							
AUC003AA	Auckland Airport			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003AU	Auckland			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003BU	Buckland			Watercare Services Ltd	Laboratory Test		0.001
AUC003CB	Central Business Dist.Auckland			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003EB	East Tamaki/Botany			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003GN	Glen Eden/New Lynn			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003HE	Henderson			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003HH	High Head			Watercare Services Ltd	Laboratory Test		0.001
AUC003HT	Hilltop			Watercare Services Ltd	Laboratory Test		0.001
HUI006HV	Huia Village			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003KI	Kitchener			Watercare Services Ltd	Laboratory Test		0.001
AUC003LA	Laingholm			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003MA	Maungawhau			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003MG	Mangere			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003MO	Montana			Watercare Services Ltd	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
AUC003MT	Mt Hobson			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003MW	Manurewa			Watercare Services Ltd	Laboratory Test		0.001
AUC003ON	Onehunga			Watercare Services Ltd	Water Supplier	0.00023	0.00033
AUC003OP	Otara/Papatoetoe/Manukau Cent.			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003OR	Oratia			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003OT	Otahuhu			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003PT	Patumahoe			Watercare Services Ltd	Laboratory Test		0.001
AUC003SO	North Shore Sth.			Watercare Services Ltd	Water Supplier	0.00014	0.00032
AUC003SW	Swanson			Watercare Services Ltd	Water Supplier	< 0.0001	0.00017
AUC003TH	Te Henga			Watercare Services Ltd	Laboratory Test		< 0.001
AUC003WE	North Shore West			Watercare Services Ltd	Water Supplier	< 0.0001	0.00017
AUC003WH	Whenuapai			Watercare Services Ltd	Water Supplier	< 0.0001	0.00017
BOM003BO	Bombay			Watercare Services Ltd	Laboratory Test		< 0.001
BRO015BP	Broadway Park, Newmarket			Auckland Council	Water Supplier	0.00013	0.00031
MUR011MU	Muriwai			Watercare Services Ltd	Laboratory Test		< 0.001
PAP001RH	Red Hill			Watercare Services Ltd	Laboratory Test		< 0.001
PAP001TA	Takanini			Watercare Services Ltd	Laboratory Test		< 0.001
POK001PO	Pokeno			Waikato District Council	Laboratory Test		< 0.001
SNE002SN	Snells/Algies			Watercare Services Ltd	Water Supplier	< 0.0001	< 0.0001
TUA002TS	Tuakau South			Waikato District Council	Laboratory Test		< 0.001
WAI214WA	Waiuku			Watercare Services Ltd	Laboratory Test		0.004
WAR006WA	Warkworth			Watercare Services Ltd	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WEL004WE	Wellsford/Te Hana			Watercare Services Ltd	Laboratory Test		< 0.001
Waikato District Health Board							
Sources							
CAM001CA	Cambridge	G01679	Hicks Road Spring 1	Waipa District Council	Laboratory Test		< 0.001
CAM001CA	Cambridge	G01680	Hicks Road Spring 2	Waipa District Council	Laboratory Test		< 0.001
CAM001CA	Cambridge	S00008	Waikato River, Cambridge	Waipa District Council	Laboratory Test		0.025
CAM001CA	Cambridge	S00009	Lake Karapiro	Waipa District Council	Laboratory Test		0.025
KER005KE	Kerepehi	S00045	Waihou River for Kerepehi	Hauraki District Council	Laboratory Test		< 0.001
KIH001KI	Kihikihi	G00031	Church Street Bore	Waipa District Council	Laboratory Test		0.001
KIH001KI	Kihikihi	G00032	Hall Street Bore	Waipa District Council	Laboratory Test		0.001
MAT004MA	Matamata Township	G00089	Tawari Bore 1, Matamata	Matamata Piako Distr. Council	Laboratory Test		0.001
MAT004MA	Matamata Township	G01606	Matamata South Bore	Matamata Piako Distr. Council	Laboratory Test		0.002
MAT004MA	Matamata Township	G01910	Tawari Bore 2, Matamata	Matamata Piako Distr. Council	Laboratory Test		0.001
MAT004MA	Matamata Township	S00072	Waiteariki Stream	Matamata Piako Distr. Council	Laboratory Test		< 0.001
MOR001MO	Morrinsville Township	S00066	Topehaehae Stream	Matamata Piako Distr. Council	Laboratory Test		< 0.001
NGA002NG	Ngaruawahia	S00070	Waikato River for Ngaruawahia	Waikato District Council	Laboratory Test		0.025
PAE001PA	Paeroa	S00064	Waitawheta Stream	Hauraki District Council	Laboratory Test		< 0.001
PAU001PA	Pauanui	G01000	Pauanui Production Well 1	Thames Coromandel D.C.	Laboratory Test		0.003
PAU001PA	Pauanui	G01001	Pauanui Production Well 2	Thames Coromandel D.C.	Laboratory Test		0.013
PAU001PA	Pauanui	G01002	Pauanui Production Well 3	Thames Coromandel D.C.	Laboratory Test		0.008
PUK001PU	Pukerimu Rural	S00029	Waikato River, Pukerimu Lane	Waipa District Council	Laboratory Test		0.025
SOU009SO	Southern Districts, Waikato DC	S00041	Waikato River, Hamilton	Waikato District Council	Laboratory Test		0.025

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
TAU002TA	Taupiri	S00030	Waikato River for Hopuhopu	Waikato District Council	Laboratory Test		0.023
TEA001TE	Te Awamutu Township	S00003	Mangauika Stream 1, Pirongia	Waipa District Council	Laboratory Test	<	0.001
TEA001TE	Te Awamutu Township	S01013	Mangauika Stream 2, Pirongia	Waipa District Council	Laboratory Test	<	0.001
TEA003TE	Te Aroha	S00073	Waihou River for Te Aroha	Matamata Piako Distr. Council	Laboratory Test		0.001
TEA003TE	Te Aroha	S00074	Tunakohoia Stream	Matamata Piako Distr. Council	Laboratory Test	<	0.001
TEA003TE	Te Aroha	S00075	Tutumangao Stream	Matamata Piako Distr. Council	Laboratory Test	<	0.001
TEA003TE	Te Aroha	S00076	Pohimihi Impoundment Lake	Matamata Piako Distr. Council	Laboratory Test	<	0.001
TEK001TR	Te Kauwhata / Rangiriri	S00067	Waikato River for Te Kauwhata	Waikato District Council	Laboratory Test		0.021
THA001TK	Thames - Kopu	S00051	Kauaeranga River	Thames Coromandel D.C.	Laboratory Test	<	0.001
THA001TK	Thames - Kopu	S00052	Mangarehu Stream	Thames Coromandel D.C.	Laboratory Test	<	0.001
TUR007TU	Turua	S00044	Apakura Stream	Hauraki District Council	Laboratory Test	<	0.001
WAI003WA	Waihi	S00049	Walmsley Stream	Hauraki District Council	Laboratory Test	<	0.001
WAI003WA	Waihi	S01025	Ohinemuri River	Hauraki District Council	Laboratory Test	<	0.001
WAI201WA	Waitakaruru	S00046	Mangatarata Stream	Hauraki District Council	Laboratory Test		0.001
WAI201WA	Waitakaruru	S00370	Waitakaruru Stream	Hauraki District Council	Laboratory Test		0.001
Zones							
CAM001CA	Cambridge			Waipa District Council	Laboratory Test		0.002
KER005KE	Kerepehi			Hauraki District Council	Laboratory Test	<	0.001
KIH001KI	Kihikihi			Waipa District Council	Laboratory Test		0.001
MAT004MA	Matamata Township			Matamata Piako Distr. Council	Laboratory Test	<	0.001
MOR001MO	Morrinsville Township			Matamata Piako Distr. Council	Laboratory Test	<	0.001
NGA002NG	Ngaruawahia			Waikato District Council	Laboratory Test		0.003

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
PAE001PA	Paeroa			Hauraki District Council	Laboratory Test		< 0.001
PAU001PA	Pauanui			Thames Coromandel D.C.	Laboratory Test		< 0.001
PUK001PU	Pukerimu Rural			Waipa District Council	Laboratory Test		0.002
SOU009SO	Southern Districts, Waikato DC			Waikato District Council	Laboratory Test		0.003
TAU002TA	Taupiri			Waikato District Council	Laboratory Test		0.004
TEA001TE	Te Awamutu Township			Waipa District Council	Laboratory Test		< 0.001
TEA003TE	Te Aroha			Matamata Piako Distr. Council	Laboratory Test		< 0.001
TEK001TR	Te Kauwhata / Rangiriri			Waikato District Council	Laboratory Test		< 0.001
TEK001WH	Whangamarino Rural / Meremere			Waikato District Council	Laboratory Test		0.001
THA001TK	Thames - Kopu			Thames Coromandel D.C.	Laboratory Test		< 0.001
TUR007TU	Turua			Hauraki District Council	Laboratory Test		< 0.001
WAI003WA	Waihi			Hauraki District Council	Laboratory Test		< 0.001
WAI201WA	Waitakaruru			Hauraki District Council	Laboratory Test		< 0.001
Toi Te Ora - Public Health Service							
Sources							
ACA001AC	Acacia Bay	S00001	Lake Taupo at Acacia Bay	Taupo District Council	Water Supplier	0.0121	0.0121
MOT002MO	Motuoapa	S00367	Lake Taupo Intake, Motuoapa	Taupo District Council	Water Supplier	0.0111	0.0111
OMO001OM	Omori / Kuratau / Pukawa	S00281	Lake Taupo Intake, Omori	Taupo District Council	Water Supplier	0.0109	0.0109
TAU001TC	Taupo Central & West	S00006	Lake Taupo, for Lake Terrace	Taupo District Council	Water Supplier	0.0127	0.0127
TAU001TS	Taupo - Taupo South	S00006	Lake Taupo, for Lake Terrace	Taupo District Council	Water Supplier	0.0127	0.0127
ATH003AT	Athenree	G00304	Athenree Quarry Bore North	Western Bay of Plenty D.C.	Water Supplier	< 0.002	0.002
ATH003AT	Athenree	G00305	Waihi Beach, Wilson Rd Bore	Western Bay of Plenty D.C.	Water Supplier	< 0.002	0.002

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
ATH003AT	Athenree	G00577	Athenree Quarry Bore South	Western Bay of Plenty D.C.	Water Supplier	0.004	0.009
ATH003AT	Athenree	G01609	WSZ 5	Western Bay of Plenty D.C.	Water Supplier	< 0.002	< 0.002
OMO003OM	Omokoroa Minden	G01567	CSZ 1	Western Bay of Plenty D.C.	Water Supplier	0.002	0.003
OMO003OM	Omokoroa Minden	G01568	CSZ 3	Western Bay of Plenty D.C.	Water Supplier	0.002	0.003
OMO003OM	Omokoroa Minden	G01569	CSZ 4	Western Bay of Plenty D.C.	Water Supplier	0.003	0.003
OMO003OM	Omokoroa Minden	G01688	CSZ 2	Western Bay of Plenty D.C.	Water Supplier	< 0.002	< 0.002
PON003PO	Pongakawa	G01693	ESZ 8	Western Bay of Plenty D.C.	Water Supplier	0.006	0.008
KAW003KA	Kawerau	G00213	Pumphouse Spring	Kawerau District Council	Laboratory Test		0.002
KAW003KA	Kawerau	G00414	Holland Springs,Kawerau	Kawerau District Council	Laboratory Test		< 0.001
RAN007PR	Rangitaiki Plains Rural	G00208	Te Teko Spring	Whakatane District Council	Laboratory Test		< 0.001
RAN007PR	Rangitaiki Plains Rural	G00220	Braemar Springs	Whakatane District Council	Laboratory Test		0.022
RAN007PR	Rangitaiki Plains Rural	G00221	Johnson Road Bore (North)	Whakatane District Council	Laboratory Test		0.006
RAN007PR	Rangitaiki Plains Rural	G00548	Johnson Road Bore (South)	Whakatane District Council	Laboratory Test		0.007
Zones							
ATH003AT	Athenree			Western Bay of Plenty D.C.	Water Supplier	0.005	0.005
OMO003OM	Omokoroa Minden			Western Bay of Plenty D.C.	Laboratory Test		0.004
PON003PO	Pongakawa			Western Bay of Plenty D.C.	Water Supplier	0.003	0.003
KAW003KA	Kawerau			Kawerau District Council	Laboratory Test		0.001
KAW003UV	Upper Valley Road			Kawerau District Council	Laboratory Test		0.001
RAN007PR	Rangitaiki Plains Rural			Whakatane District Council	Laboratory Test		0.014
ACA001AC	Acacia Bay			Taupo District Council	Water Supplier	0.0102	0.0123
MOT002MO	Motuoapa			Taupo District Council	Water Supplier	0.0101	0.0124

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
OMO001OM	Omori / Kuratau / Pukawa			Taupo District Council	Water Supplier	0.0105	0.0127
TAU001TC	Taupo Central & West			Taupo District Council	Water Supplier	0.0012	0.0071
Taranaki District Health Board							
Sources							
HAW003NO	Normanby	S00235	Kapuni Stream	South Taranaki Distr. Council	Laboratory Test	<	0.001
ING001IN	Inglewood	S00234	Ngatoro Stream	New Plymouth District Council	Laboratory Test	<	0.001
ING001IN	Inglewood	S00752	Ngatoro Str.Infiltratn.Gallery	New Plymouth District Council	Laboratory Test	<	0.001
NEW002WA	Waitara	S00233	Waiwhakaiho River	New Plymouth District Council	Laboratory Test	<	0.001
NEW002WA	Waitara	S00406	Lake Mangamahoe	New Plymouth District Council	Laboratory Test	<	0.001
OAK001OA	Oakura	G01560	No. 1 Bore	New Plymouth District Council	Laboratory Test	<	0.001
PAT001PA	Patea	G00239	Patea Res. No.1 Upper Aquifer	South Taranaki Distr. Council	Laboratory Test	<	0.001
PAT001PA	Patea	G01988	Patea Res. No. 4 Bore	South Taranaki Distr. Council	Laboratory Test	<	0.001
PAT001PA	Patea	G02104	Patea Res. No. 5 Bore	South Taranaki Distr. Council	Laboratory Test	<	0.001
WAI018MA	Manaia	S00226	Mangawheroiti Stream	South Taranaki Distr. Council	Laboratory Test	<	0.001
WAI018MA	Manaia	S00479	Mangawhero Stream	South Taranaki Distr. Council	Laboratory Test	<	0.001
WAI018MA	Manaia	S00480	Otakeho Stream	South Taranaki Distr. Council	Laboratory Test	<	0.001
Zones							
HAW003NO	Normanby			South Taranaki Distr. Council	Laboratory Test	<	0.001
ING001IN	Inglewood			New Plymouth District Council	Laboratory Test	<	0.001
NEW002BE	Bell Block			New Plymouth District Council	Laboratory Test	<	0.001
NEW002UR	Urenui/Tikorangi			New Plymouth District Council	Laboratory Test	<	0.001
NEW002WA	Waitara			New Plymouth District Council	Laboratory Test	<	0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
OAK001OA	Oakura			New Plymouth District Council	Laboratory Test		< 0.001
PAT001PA	Patea			South Taranaki Distr. Council	Laboratory Test		< 0.001
WAI018MA	Manaia			South Taranaki Distr. Council	Laboratory Test		< 0.001
Tairawhiti District Health Board							
Sources							
GIS001RU	Gisborne Rural	S00104	Mangapoike Dam No. 1	Gisborne District Council	Laboratory Test		< 0.001
GIS001RU	Gisborne Rural	S00105	Mangapoike Dam No. 2	Gisborne District Council	Laboratory Test		< 0.001
GIS001RU	Gisborne Rural	S00106	Te Arai River	Gisborne District Council	Laboratory Test		< 0.001
GIS001RU	Gisborne Rural	S00107	Waipaoa River, at Waipaoa	Gisborne District Council	Laboratory Test		0.001
Zones							
GIS001RU	Gisborne Rural			Gisborne District Council	Water Supplier	< 0.001	< 0.001
Hawkes Bay District Health Board							
Sources							
HAU002HA	Haumoana / Te Awanga	G00072	Shrimpton Road Bores	Hastings District Council	Water Supplier	0.002	0.0023
TAK001TA	Takapau Township	G00056	Meta Street Bore	Central Hawkes Bay D.C	Laboratory Test		0.002
WAI004LO	Waipukurau Low Pressure Zone	G00057	Takapau Road Bore	Central Hawkes Bay D.C	Laboratory Test		< 0.001
WAI005OT	Otane Township	G00058	Tikokino Road Bore	Central Hawkes Bay D.C	Laboratory Test		< 0.001
HAS001EA	Hastings East	G00075	Eastbourne Street Bores	Hastings District Council	Laboratory Test		< 0.001
HAS001FL	Flaxmere	G00076	Frimley Park Bores	Hastings District Council	Laboratory Test		< 0.001
HAS001FL	Flaxmere	G00077	Flaxmere Park Bore	Hastings District Council	Laboratory Test		< 0.001
HAS001EA	Hastings East	G00078	Brookvale Road Bores	Hastings District Council	Laboratory Test		< 0.001
HAS001FL	Flaxmere	G00782	Portsmouth Road Bore	Hastings District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
Zones							
HAU002HA	Haumoana / Te Awanga			Hastings District Council	Laboratory Test		0.003
TAK001TA	Takapau Township			Central Hawkes Bay D.C	Laboratory Test		0.002
WAI004LO	Waipukurau Low Pressure Zone			Central Hawkes Bay D.C	Laboratory Test	<	0.001
WAI005OT	Otane Township			Central Hawkes Bay D.C	Laboratory Test	<	0.001
HAS001EA	Hastings East			Hastings District Council	Laboratory Test		0.001
HAS001FL	Flaxmere			Hastings District Council	Laboratory Test	<	0.001
HAS001WE	Hastings West & Central			Hastings District Council	Laboratory Test	<	0.001
MidCentral District Health Board							
Sources							
ASH001AS	Ashhurst	G00110	Ashhurst Bores	Palmerston North City Council	Laboratory Test	<	0.001
DAN001DA	Dannevirke	S00087	Tamaki River	Tararua District Council	Laboratory Test	<	0.001
LEV001LE	Levin	S00079	Ohau River, Gladstone Rd	Horowhenua District Council	Laboratory Test	<	0.001
LIN001LI	Linton	G00098	Linton Bore 3	Palmerston North City Council	Laboratory Test	<	0.001
LIN001LI	Linton	G00099	Linton Bore 11	Palmerston North City Council	Laboratory Test	<	0.001
LIN001LI	Linton	G00101	Linton Bore 13	Palmerston North City Council	Laboratory Test	<	0.001
LIN001LI	Linton	G00102	Linton Bore 14	Palmerston North City Council	Laboratory Test	<	0.001
LIN001LI	Linton	G01903	Linton Bore 15	Palmerston North City Council	Laboratory Test	<	0.001
MAS001MA	Massey University	G00107	Atawhai Bore	Palmerston North City Council	Laboratory Test	<	0.001
MAS001MA	Massey University	G00108	DRI Bore	Palmerston North City Council	Laboratory Test	<	0.001
MAS001MA	Massey University	G01207	Atawhai Bore No. 2	Palmerston North City Council	Laboratory Test	<	0.001
OHA002OH	Ohakea	G00111	Ohakea Bore	Manawatu District Council	Laboratory Test		0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
PAL001PC	Palmerston North City	G00104	Papaioea Park Bore	Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City	G00105	Takaro Bore	Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City	G00106	Roberts Line Bore	Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City	G01208	Keith Street Bore	Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City	G01412	PapaioeaPark Bore No. 2	Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City	G01736	Roberts Line Bore No. 2	Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City	S00082	Turitea Dam	Palmerston North City Council	Laboratory Test		< 0.001
TOK002TO	Tokomaru	S00080	Tokomaru River, Horseshoe Bend	Horowhenua District Council	Laboratory Test		< 0.001
WOO001WO	Woodville	S00085	Mangapapa Stream	Tararua District Council	Laboratory Test		< 0.001
WOO001WO	Woodville	S00905	Woodville Impounding Reservoir	Tararua District Council	Laboratory Test		< 0.001
MAR001MA	Marton Township	G01144	Calico Line Bore	Rangitikei District Council	Laboratory Test		< 0.001
MAR001MA	Marton Township	S00039	Tutaenui Impounding Reservoir	Rangitikei District Council	Laboratory Test		< 0.001
RAE001RA	Raetihi Township	S00034	Makotuku River	Ruapehu District Council	Laboratory Test		< 0.001
RAE001RA	Raetihi Township	S01027	Makara Stream	Ruapehu District Council	Laboratory Test		< 0.001
TAI001TA	Taihape Township	S00037	Hautapu River for Taihape	Rangitikei District Council	Laboratory Test		< 0.001
WAN001EA	Wanganui East	G00039	Wanganui Bores	Wanganui District Council	Laboratory Test		< 0.001
WAN001EA	Wanganui East	G01548	Aramoho Bore	Wanganui District Council	Laboratory Test		< 0.001
WAN001WA	Wanganui City	G00039	Wanganui Bores	Wanganui District Council	Laboratory Test		< 0.001
WAN001WA	Wanganui City	G01822	Heloise (Reservoir)	Wanganui District Council	Laboratory Test		< 0.001
Zones							
MAR001MA	Marton Township			Rangitikei District Council	Laboratory Test		< 0.001
RAE001RA	Raetihi Township			Ruapehu District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
TAI001TA	Taihape Township			Rangitikei District Council	Laboratory Test		< 0.001
WAN001AR	Aramoho			Wanganui District Council	Laboratory Test		< 0.001
WAN001EA	Wanganui East			Wanganui District Council	Laboratory Test		< 0.001
WAN001WA	Wanganui City			Wanganui District Council	Laboratory Test		0.001
ASH001AS	Ashhurst			Palmerston North City Council	Laboratory Test		< 0.001
DAN001DA	Dannevirke			Tararua District Council	Laboratory Test		< 0.001
LEV001LE	Levin			Horowhenua District Council	Laboratory Test		< 0.001
LIN001LI	Linton			Palmerston North City Council	Laboratory Test		< 0.001
MAS001MA	Massey University			Palmerston North City Council	Laboratory Test		< 0.001
OHA002OH	Ohakea			Manawatu District Council	Laboratory Test		< 0.001
PAL001AO	Aokautere			Palmerston North City Council	Laboratory Test		< 0.001
PAL001KG	Kelvin Grove			Palmerston North City Council	Laboratory Test		< 0.001
PAL001PC	Palmerston North City			Palmerston North City Council	Laboratory Test		< 0.001
TOK002TO	Tokomaru			Horowhenua District Council	Laboratory Test		< 0.001
WOO001WO	Woodville			Tararua District Council	Laboratory Test		< 0.001
Regional Public Health							
Sources							
LOW001LO	Lower Hutt	G00442	Penrose St. Well 1	The Hutt City Council	Laboratory Test		< 0.001
LOW001LO	Lower Hutt	G00443	Penrose St. Well 2	The Hutt City Council	Laboratory Test		< 0.001
LOW001LO	Lower Hutt	G00444	Colin Grove Well	The Hutt City Council	Laboratory Test		< 0.001
LOW001LO	Lower Hutt	G00445	Mahoe Street Well	The Hutt City Council	Laboratory Test		< 0.001
LOW001LO	Lower Hutt	G00446	Willoughby 2 Well 1	The Hutt City Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
LOW001LO	Lower Hutt	G00447	Willoughby 2 Well 2	The Hutt City Council	Laboratory Test		< 0.001
LOW001LO	Lower Hutt	G00448	Hautana Street Well	The Hutt City Council	Laboratory Test		< 0.001
LOW001LO	Lower Hutt	G00449	Bloomfield Terrace Well	The Hutt City Council	Laboratory Test		< 0.001
PAE002PA	Paekakariki	G01595	Paekakariki Bore	Kapiti Coast District Council	Laboratory Test		< 0.001
PAE002PA	Paekakariki	G02086	Paekakariki Bore 2	Kapiti Coast District Council	Laboratory Test		< 0.001
PAE002PA	Paekakariki	S00122	Wainui Stream for Paekakariki	Kapiti Coast District Council	Laboratory Test		< 0.001
WAI010PA	Paraparaumu/Raumati	G01563	Otaihanga Bore	Kapiti Coast District Council	Laboratory Test		0.001
WAI010PA	Paraparaumu/Raumati	G01701	K6 - Wooden Bridge	Kapiti Coast District Council	Laboratory Test		0.001
WAI010PA	Paraparaumu/Raumati	G01702	K5 - Nga Manu	Kapiti Coast District Council	Laboratory Test		0.002
WAI010PA	Paraparaumu/Raumati	G01703	K4 - Cooper 1	Kapiti Coast District Council	Laboratory Test		< 0.001
WAI010PA	Paraparaumu/Raumati	G01704	Kb4 - Landfill	Kapiti Coast District Council	Laboratory Test		< 0.001
WAI010PA	Paraparaumu/Raumati	G01705	K10 - Market Garden	Kapiti Coast District Council	Laboratory Test		0.001
WAI010PA	Paraparaumu/Raumati	S00123	Waikanae River	Kapiti Coast District Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01722	Penrose St Well 1 for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01723	Penrose St Well 2 for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01724	Colin Grove Well for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01725	Mahoe St Well for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01726	Willoughby 2/1 for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01727	Willoughby 2/2 for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01728	Hautana St Well for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	G01729	Bloomfield Tce. for Gear Is.	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	S00118	Hutt River	Wellington City Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WEL002WE	Wellington Central	S00120	Wainuiomata River	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	S00121	Orongorongo River	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	S00434	Big Huia River	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	S00435	George Creek, High Level	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	S00436	George Creek, Low Level	Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central	S00631	Te Marua Lakes	Wellington City Council	Laboratory Test		< 0.001
OPA001OP	Opaki	G01120	Opaki Well	Masterton District Council	Laboratory Test		< 0.001
Zones							
LOW001LO	Lower Hutt			The Hutt City Council	Laboratory Test		< 0.001
LOW001ST	Stokes Valley			The Hutt City Council	Laboratory Test		< 0.001
LOW001WA	Wainuiomata			The Hutt City Council	Laboratory Test		< 0.001
PAE002PA	Paekakariki			Kapiti Coast District Council	Laboratory Test		< 0.001
POR001MA	Mana/Plimmerton/Pare mata			Porirua City Council	Laboratory Test		< 0.001
POR001PH	Porirua High Level			Porirua City Council	Laboratory Test		< 0.001
POR001PL	Porirua Low Level			Porirua City Council	Laboratory Test		< 0.001
POR001PU	Pukerua Bay			Porirua City Council	Laboratory Test		< 0.001
POR001WH	Whitby			Porirua City Council	Laboratory Test		< 0.001
UPP001PI	Pinehaven			Upper Hutt City Council	Laboratory Test		< 0.001
UPP001UP	Upper Hutt Central			Upper Hutt City Council	Laboratory Test		< 0.001
WAI010PA	Paraparaumu/Raumati			Kapiti Coast District Council	Laboratory Test		< 0.001
WAI010WA	Waikanae			Kapiti Coast District Council	Laboratory Test		< 0.001
WEL002BR	Brooklyn			Wellington City Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WEL002CH	Churton			Wellington City Council	Laboratory Test		< 0.001
WEL002JO	Johnsonville			Wellington City Council	Laboratory Test		< 0.001
WEL002KA	Karori			Wellington City Council	Laboratory Test		< 0.001
WEL002KE	Kelburn			Wellington City Council	Laboratory Test		< 0.001
WEL002ON	Onslow			Wellington City Council	Laboratory Test		< 0.001
WEL002SO	Southern Wellington			Wellington City Council	Laboratory Test		< 0.001
WEL002TA	Tawa			Wellington City Council	Laboratory Test		< 0.001
WEL002WA	Wadestown			Wellington City Council	Laboratory Test		< 0.001
WEL002WE	Wellington Central			Wellington City Council	Laboratory Test		< 0.001
OPA001OP	Opaki			Masterton District Council	Laboratory Test		< 0.001
Nelson-Marlborough Public Health Service							
Sources							
BLE001BL	Blenheim	G00330	Grove Rd No. 1 Well	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G00331	Middle Renwick Rd. No.1 Well	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G00335	Grove Rd No. 2 Well	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G01092	Bomford St	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G01093	Middle Renwick Rd. No.2 Well	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G01094	Middle Renwick Rd. No.3 Well	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G01095	Grove Rd No. 3 Well	Marlborough District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim	G01964	Grove Rd No. 4 Well	Marlborough District Council	Laboratory Test		< 0.001
HAV002HA	Havelock	G00322	Kaituna Well	Marlborough District Council	Laboratory Test		< 0.001
PIC001PI	Picton/Waikawa	G00325	Picton, Speeds Road 3 Bores	Marlborough District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
PIC001PI	Picton/Waikawa	S00317	Barnes Dam, Waitahi Stream	Marlborough District Council	Laboratory Test		< 0.001
REN001RE	Renwick	G00326	Renwick Gee St No. 2 Well	Marlborough District Council	Laboratory Test		< 0.001
REN001RE	Renwick	G00327	Renwick Gee St No. 3 Well	Marlborough District Council	Laboratory Test		< 0.001
REN001RE	Renwick	G00328	Renwick Gee St No. 4 Well	Marlborough District Council	Laboratory Test		< 0.001
RIV002RI	Riverlands Industrial Estate	G00336	Riverlands Malthouse Rd Well	Marlborough District Council	Laboratory Test		< 0.001
RIV002RI	Riverlands Industrial Estate	G01675	Hardings Road North Well	Marlborough District Council	Laboratory Test		< 0.001
RIV002RI	Riverlands Industrial Estate	G01676	Hardings Road South Well	Marlborough District Council	Laboratory Test		< 0.001
SED001SE	Seddon, Awatere Valley	S00316	Black Birch Stream	Marlborough District Council	Laboratory Test		< 0.001
HOP001HO	Hope/Brightwater	G02024	Hope/Brightwater Bore 1	Tasman District Council	Laboratory Test		< 0.001
HOP001HO	Hope/Brightwater	G02025	Hope/Brightwater Bore 2	Tasman District Council	Laboratory Test		< 0.001
HOP001HO	Hope/Brightwater	G02026	Hope/Brightwater Bore 3	Tasman District Council	Laboratory Test		< 0.001
MOT001MO	Motueka	G00320	Fearons Bush Well	Tasman District Council	Laboratory Test		< 0.001
MOT001MO	Motueka	G00321	Motueka Recreation Centre Well	Tasman District Council	Laboratory Test		< 0.001
NEL001NL	Nelson	S00268	Maitai River, South Branch	Nelson City Council	Laboratory Test		< 0.001
NEL001NL	Nelson	S00269	Maitai Dam	Nelson City Council	Laboratory Test		< 0.001
NEL001NL	Nelson	S00270	Roding River	Nelson City Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G00276	Richmond Well 2	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G00277	Richmond Well 3	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G00278	Richmond Well 4	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G00279	Richmond Well 5	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G02094	Waimea Well 5 for Richmond TP	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G02095	Waimea Well 6 for Richmond TP	Tasman District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
RIC002RI	Richmond	G02096	Waimea Well 7 for Richmond TP	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G02097	Waimea Well 8 for Richmond TP	Tasman District Council	Laboratory Test		< 0.001
RIC002RI	Richmond	G02098	Waimea Well 9 for Richmond TP	Tasman District Council	Laboratory Test		< 0.001
WAI023MR	Mapua Ruby Bay	G00265	Waimea Well 5	Tasman District Council	Laboratory Test		< 0.001
WAI023MR	Mapua Ruby Bay	G00266	Waimea Well 6	Tasman District Council	Laboratory Test		< 0.001
WAI023MR	Mapua Ruby Bay	G00267	Waimea Well 7	Tasman District Council	Laboratory Test		< 0.001
WAI023MR	Mapua Ruby Bay	G00268	Waimea Well 8	Tasman District Council	Laboratory Test		< 0.001
WAI023MR	Mapua Ruby Bay	G00269	Waimea Well 9	Tasman District Council	Laboratory Test		< 0.001
WAK001WA	Wakefield	G00270	Wakefield Well	Tasman District Council	Laboratory Test		< 0.001
Zones							
HOP001HO	Hope/Brightwater			Tasman District Council	Laboratory Test		< 0.001
MOT001MO	Motueka			Tasman District Council	Laboratory Test		< 0.001
NEL001NL	Nelson			Nelson City Council	Laboratory Test		< 0.001
RIC002RI	Richmond			Tasman District Council	Laboratory Test		< 0.001
RIC002WI	Waimea Industrial			Tasman District Council	Laboratory Test		< 0.001
WAI023MR	Mapua Ruby Bay			Tasman District Council	Laboratory Test		< 0.001
WAK001WA	Wakefield			Tasman District Council	Laboratory Test		< 0.001
BLE001BL	Blenheim			Marlborough District Council	Laboratory Test		< 0.001
HAV002HA	Havelock			Marlborough District Council	Laboratory Test		< 0.001
PIC001PI	Picton/Waikawa			Marlborough District Council	Laboratory Test		< 0.001
REN001RE	Renwick			Marlborough District Council	Laboratory Test		< 0.001
RIV002RI	Riverlands Industrial Estate			Marlborough District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
SED001SE	Seddon, Awatere Valley			Marlborough District Council	Laboratory Test		< 0.001
Community and Public Health							
Sources							
AKA001AY	Aylmers	G01764	Settlers Hill Rd Well	Christchurch City Council	Laboratory Test		< 0.001
AKA001AY	Aylmers	G01805	Aylmers Well	Christchurch City Council	Laboratory Test		0.001
AKA001AY	Aylmers	S00185	Balguerei Stream	Christchurch City Council	Laboratory Test		< 0.001
AKA001AY	Aylmers	S00186	Grehan Stream	Christchurch City Council	Laboratory Test		< 0.001
AKA001AY	Aylmers	S00187	Aylmers Stream	Christchurch City Council	Laboratory Test		< 0.001
BRO012BR	Brooklands / Kainga	G00581	Brooklands Kainga Aquifer 2	Christchurch City Council	Water Supplier	< 0.0005	< 0.0005
CHE001CT	Cheviot Town	G00179	Waiiau River Gallery at Cheviot	Hurunui District Council	Laboratory Test		< 0.001
CHR001CE	Central Christchurch	G00118	Central CHCH, Aquifer 1	Christchurch City Council	Water Supplier	< 0.0005	< 0.0015
CHR001CE	Central Christchurch	G00119	Central CHCH, Aquifer 2	Christchurch City Council	Water Supplier	< 0.0015	< 0.0015
CHR001CE	Central Christchurch	G00120	Central CHCH, Aquifer 3	Christchurch City Council	Water Supplier	< 0.0015	0.0008
CHR001CE	Central Christchurch	G00121	Central CHCH, Aquifer 4	Christchurch City Council	Water Supplier	< 0.0015	0.0008
CHR001CE	Central Christchurch	G01602	Central CHCH, Aquifer 5	Christchurch City Council	Water Supplier	0.0008	0.0008
CHR001PA	Parklands	G00126	Parklands, Aquifer 2	Christchurch City Council	Water Supplier	< 0.0015	< 0.0015
CHR001PA	Parklands	G00127	Parklands, Aquifer 4	Christchurch City Council	Water Supplier	< 0.0015	0.0008
CHR001RI	Riccarton	G00131	Riccarton, Aquifer 2	Christchurch City Council	Water Supplier	< 0.0005	< 0.0005
CHR001RI	Riccarton	G01599	Riccarton, Aquifer 4	Christchurch City Council	Water Supplier	< 0.0015	< 0.0015
CHR001RP	Rocky Point	G00129	Rocky Point, Aquifer 1	Christchurch City Council	Water Supplier	0.0012	0.0012
CHR001WE	West Christchurch	G00128	West CHCH, Aquifer 2	Christchurch City Council	Water Supplier	0.0008	0.0008
CHR001WE	West Christchurch	G01601	West CHCH, Aquifer 3	Christchurch City Council	Water Supplier	0.0006	0.0006

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
DAR001DA	Darfield	G01961	Darfield SH73 Bores	Selwyn District Council	Laboratory Test		< 0.001
HAW001HW	Hawarden/Waikari	G01096	Bishells Road Bore	Hurunui District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi	G00148	Rugby Park, Kaiapoi	Waimakariri District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi	G00149	Darnley Square	Waimakariri District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi	G00150	Porter Place, Kaiapoi	Waimakariri District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi	G00151	Peraki Street, Kaiapoi	Waimakariri District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi	G01501	Sewell St	Waimakariri District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi	G01502	Ashley Place	Waimakariri District Council	Laboratory Test		< 0.001
KAI004KU	Kaikoura Urban	G01751	Mackles Bores	Kaikoura District Council	Laboratory Test		< 0.001
KIR001KI	Kirwee	G00725	Kirwee Bore	Selwyn District Council	Laboratory Test		< 0.001
LEE001LE	Leeston	G00160	Gallipoli Rd Well No.2	Selwyn District Council	Laboratory Test		< 0.001
LEE001LE	Leeston	G00162	Lake Rd Well	Selwyn District Council	Laboratory Test		< 0.001
LEE001LE	Leeston	G00501	Gallipoli Rd Well No.1	Selwyn District Council	Laboratory Test		< 0.001
LIN002LI	Lincoln	G00163	Kildare Tce Well	Selwyn District Council	Laboratory Test		< 0.001
LIN002LI	Lincoln	G00164	Cole St Well	Selwyn District Council	Laboratory Test		< 0.001
LIN002LI	Lincoln	G01341	West Belt Well	Selwyn District Council	Laboratory Test		< 0.001
LYT001LY	Lyttelton	G00135	Aquifer 4	Christchurch City Council	Water Supplier	< 0.0015	< 0.0015
MAL001MA	Malvern Hills, Hartleys Rd	S00828	Hartleys Rd Intake	Selwyn District Council	Laboratory Test		< 0.001
MAN009MA	Mandeville	G00470	Bore for Mandeville(Emergency)	Waimakariri District Council	Laboratory Test		< 0.001
MAN009MA	Mandeville	G01500	Mandeville Bore 1	Waimakariri District Council	Laboratory Test		< 0.001
MAN009MA	Mandeville	G01950	Two Chain Road Bore 2	Waimakariri District Council	Laboratory Test		< 0.001
MET001ME	Methven	S00223	Methven Gallery, Ashburton Riv	Ashburton District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
MOT016MO	Motunau, Greta, Scargill	G00143	Well, Hurunui No. 1 Rural	Hurunui District Council	Laboratory Test		< 0.001
NOR012CH	Northwest Christchurch	G00122	NW CHCH, Aquifer 1	Christchurch City Council	Water Supplier	< 0.0005	< 0.0015
NOR012CH	Northwest Christchurch	G00125	NW CHCH, Aquifer 5	Christchurch City Council	Water Supplier	< 0.0015	0.0006
OXF101OX	Oxford Rural No1	S00470	Waimakariri River Gallery 1	Waimakariri District Council	Laboratory Test		< 0.001
OXF101OX	Oxford Rural No1	S01012	Waimakariri River Gallery 2	Waimakariri District Council	Laboratory Test		< 0.001
OXF102OR	Oxford Rural No2	S00126	Coopers Creek Gallery	Waimakariri District Council	Laboratory Test		< 0.001
OXF103OX	Oxford Urban	G01893	Domain Rd Bore	Waimakariri District Council	Laboratory Test		< 0.001
OXF103OX	Oxford Urban	S00883	Gammans Well	Waimakariri District Council	Laboratory Test		< 0.001
PEG001PE	Pegasus	G01759	Pegasus PW No. 1	Waimakariri District Council	Laboratory Test		< 0.001
PEG001PE	Pegasus	G01946	Pegasus EQ No. 1	Waimakariri District Council	Laboratory Test		0.003
PEG001PE	Pegasus	G01947	Pegasus EQ No. 2	Waimakariri District Council	Laboratory Test		0.002
PEG001PE	Pegasus	G02085	Pegasus EQ No. 3 (TPPTL)	Waimakariri District Council	Laboratory Test		0.001
PRE001PR	Prebbleton	G00165	Prebbleton Wells No. 1	Selwyn District Council	Laboratory Test		< 0.001
PRE001PR	Prebbleton	G00463	Prebbleton Wells No. 2	Selwyn District Council	Laboratory Test		< 0.001
PRE001PR	Prebbleton	G01608	St Patricks Well	Selwyn District Council	Laboratory Test		< 0.001
RAK001RA	Rakaia Township	G01873	Rakaia Deep Bore 1	Ashburton District Council	Water Supplier	< 0.001	0.001
RAN001RA	Rangiora	G00147	Ayres Street Wells	Waimakariri District Council	Laboratory Test		< 0.001
RAN001RA	Rangiora	G01758	Smith St Well 1	Waimakariri District Council	Laboratory Test		< 0.001
RAN001RA	Rangiora	G01985	Smith St Well 2	Waimakariri District Council	Laboratory Test		< 0.001
RAN001RA	Rangiora	G01986	Smith St Well 3	Waimakariri District Council	Laboratory Test		< 0.001
ROL001RO	Rolleston	G00167	Rolleston Moore St Well	Selwyn District Council	Laboratory Test		< 0.001
ROL001RO	Rolleston	G01113	Rolleston, Overbury Crescent	Selwyn District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
ROL001RO	Rolleston	G01672	Izone Well	Selwyn District Council	Laboratory Test		< 0.001
ROL001RO	Rolleston	G01874	Rolleston, Westland Place	Selwyn District Council	Laboratory Test		< 0.001
ROL001RO	Rolleston	G02009	Rolleston, Illinois Drive	Selwyn District Council	Laboratory Test		< 0.001
SEL001HO	Hororata	G00822	Glentunnel Intake, Selwyn RWS	Selwyn District Council	Laboratory Test		< 0.001
SHE004SH	Sheffield/Waddington	G00820	Sheffield/Waddington Bore	Selwyn District Council	Laboratory Test		< 0.001
SOU001SO	Southbridge	G00157	Southbridge High St Well	Selwyn District Council	Laboratory Test		< 0.001
SOU001SO	Southbridge	G00158	Southbridge Taiaroa St Well	Selwyn District Council	Laboratory Test		< 0.001
SPR002SP	Springfield	G00674	Springfield Well	Selwyn District Council	Laboratory Test		< 0.001
SPR003SP	Springston	G01794	Springston Bore 2	Selwyn District Council	Laboratory Test		< 0.001
TAI009TA	Tai Tapu	G00675	Tai Tapu Bore	Selwyn District Council	Laboratory Test		< 0.001
WAI011KI	Waikuku Beach	G00155	Kings Ave Well	Waimakariri District Council	Laboratory Test		< 0.001
WAI011KI	Waikuku Beach	G01573	Campground Well	Waimakariri District Council	Laboratory Test		< 0.001
WAT006WB	Waterloo Business Pk, Stage 1	G02045	Waterloo Business Park Well 1	Christchurch City Council	Water Supplier	< 0.0011	< 0.0011
WES010WE	West Melton	G01775	Royston Common Bore	Selwyn District Council	Laboratory Test		< 0.001
WES010WE	West Melton	G01957	Eliz. Allen Dr.Bore	Selwyn District Council	Laboratory Test		< 0.001
WOO002WO	Woodend Town	G00152	Chinnerys Road Wells	Waimakariri District Council	Laboratory Test		< 0.001
WOO002WO	Woodend Town	G01166	Gladstone Park Well 1	Waimakariri District Council	Laboratory Test		0.001
WOO002WO	Woodend Town	G01916	Gladstone Park Well 2	Waimakariri District Council	Laboratory Test		0.001
GRE001GM	Greymouth	G01365	Coal Creek Infiltrat. Gallery	Grey District Council	Laboratory Test		< 0.001
HOK001HO	Hokitika	S00014	Lake Kaniere	Westland District Council	Laboratory Test		< 0.001
RUN001RU	Runanga	G00286	Grey River Flat Bore	Grey District Council	Laboratory Test		< 0.001
WES001WE	Westport	S00016	Giles Creek, South Branch	Buller District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WES001WE	Westport	S01038	Orowati River, Lower Giles Crk	Buller District Council	Laboratory Test		< 0.001
DOW001ST	Sutherlands/Taiko	S00204	Te Ngawai River	Timaru District Council	Laboratory Test		< 0.001
DOW001WT	Waitohi/Totara Valley	S00205	Waitohi	Timaru District Council	Laboratory Test		0.003
FAI002FA	Fairlie	G00249	3 Springs, Fairlie	Mackenzie District Council	Laboratory Test		< 0.001
GER001GE	Geraldine	G00204	Bores Geraldine	Timaru District Council	Laboratory Test		< 0.001
HOO001HW	Hook/Waituna	S00308	Hook River	Waimate District Council	Laboratory Test		< 0.001
LOW002LO	Lower Waihao	G00317	Lower Waihao Bore	Waimate District Council	Laboratory Test		< 0.001
PLE001PP	Pleasant Point	G00198	Pleasant Point Bore	Timaru District Council	Laboratory Test		< 0.001
TEM001TE	Temuka	G00199	Temuka Bores	Timaru District Council	Laboratory Test		< 0.001
TEM001TE	Temuka	G01332	Temuka Bore 3	Timaru District Council	Laboratory Test		< 0.001
TEM002TE	Te Moana	S00201	Hei Te Moana River Nth Br.	Timaru District Council	Laboratory Test		< 0.001
TIM001TI	Timaru	G00203	Ophi Bore	Timaru District Council	Laboratory Test		< 0.001
TIM001TI	Timaru	S00200	Pareora River	Timaru District Council	Laboratory Test		< 0.001
TWI001TW	Twizel	G00247	Twizel Wells	Mackenzie District Council	Laboratory Test		< 0.001
Zones							
GRE001CO	Cobden			Grey District Council	Laboratory Test		< 0.001
GRE001GM	Greymouth			Grey District Council	Laboratory Test		< 0.001
HOK001HO	Hokitika			Westland District Council	Laboratory Test		< 0.001
RUN001RU	Runanga			Grey District Council	Laboratory Test		< 0.001
WES001WE	Westport			Buller District Council	Laboratory Test		< 0.001
AKA001AY	Aylmers			Christchurch City Council	Water Supplier	< 0.0015	0.0012
BRO012BR	Brooklands / Kainga			Christchurch City Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
CHE001CT	Cheviot Town			Hurunui District Council	Laboratory Test		< 0.001
CHR001CE	Central Christchurch			Christchurch City Council	Water Supplier	< 0.0015	< 0.0015
CHR001PA	Parklands			Christchurch City Council	Laboratory Test		< 0.001
CHR001RI	Riccarton			Christchurch City Council	Laboratory Test		< 0.001
CHR001RP	Rocky Point			Christchurch City Council	Laboratory Test		< 0.001
CHR001WE	West Christchurch			Christchurch City Council	Laboratory Test		< 0.001
DAR001DA	Darfield			Selwyn District Council	Laboratory Test		< 0.001
HAW001HW	Hawarden/Waikari			Hurunui District Council	Laboratory Test		< 0.001
KAI003KA	Kaiapoi			Waimakariri District Council	Laboratory Test		< 0.001
KAI004KU	Kaikoura Urban			Kaikoura District Council	Laboratory Test		< 0.001
KIR001KI	Kirwee			Selwyn District Council	Laboratory Test		< 0.001
LEE001LE	Leeston			Selwyn District Council	Laboratory Test		< 0.001
LIN002LI	Lincoln			Selwyn District Council	Laboratory Test		< 0.001
LYT001DI	Diamond Harbour			Christchurch City Council	Laboratory Test		< 0.001
LYT001GO	Governors Bay			Christchurch City Council	Laboratory Test		< 0.001
LYT001LY	Lyttelton			Christchurch City Council	Laboratory Test		< 0.001
MAL001MA	Malvern Hills, Hartleys Rd			Selwyn District Council	Laboratory Test		< 0.001
MAN009MA	Mandeville			Waimakariri District Council	Laboratory Test		< 0.001
MET001ME	Methven			Ashburton District Council	Laboratory Test		< 0.001
MOT016MO	Motunau, Greta, Scargill			Hurunui District Council	Laboratory Test		< 0.001
NOR012CH	Northwest Christchurch			Christchurch City Council	Laboratory Test		< 0.001
OXF101OX	Oxford Rural No1			Waimakariri District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
OXF102OR	Oxford Rural No2			Waimakariri District Council	Laboratory Test		< 0.001
OXF103OX	Oxford Urban			Waimakariri District Council	Laboratory Test		< 0.001
PEG001PE	Pegasus			Waimakariri District Council	Laboratory Test		< 0.001
PRE001PR	Prebbleton			Selwyn District Council	Laboratory Test		< 0.001
RAK001RA	Rakaia Township			Ashburton District Council	Laboratory Test		< 0.001
RAN001RA	Rangiora			Waimakariri District Council	Laboratory Test		< 0.001
ROL001RO	Rolleston			Selwyn District Council	Laboratory Test		< 0.001
SEL001HO	Hororata			Selwyn District Council	Laboratory Test		< 0.001
SHE004SH	Sheffield/Waddington			Selwyn District Council	Laboratory Test		< 0.001
SOU001SO	Southbridge			Selwyn District Council	Laboratory Test		< 0.001
SPR002SP	Springfield			Selwyn District Council	Laboratory Test		< 0.001
SPR003SP	Springston			Selwyn District Council	Laboratory Test		< 0.001
TAI009TA	Tai Tapu			Selwyn District Council	Laboratory Test		< 0.001
WAI011KI	Waikuku Beach			Waimakariri District Council	Laboratory Test		< 0.001
WAT006WB	Waterloo Business Pk, Stage 1			Christchurch City Council	Laboratory Test		< 0.001
WES010WE	West Melton			Selwyn District Council	Laboratory Test		< 0.001
WOO002WO	Woodend Town			Waimakariri District Council	Laboratory Test		0.001
DOW001ST	Sutherlands/Taiko			Timaru District Council	Laboratory Test		< 0.001
DOW001WT	Waitohi/Totara Valley			Timaru District Council	Laboratory Test		0.003
FAI002FA	Fairlie			Mackenzie District Council	Laboratory Test		< 0.001
GER001GE	Geraldine			Timaru District Council	Laboratory Test		< 0.001
HAD001HA	Hadlow			Timaru District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
HOO001HW	Hook/Waituna			Waimate District Council	Laboratory Test		< 0.001
LOW002LO	Lower Waihao			Waimate District Council	Laboratory Test		< 0.001
PLE001PP	Pleasant Point			Timaru District Council	Laboratory Test		< 0.001
TEM001TE	Temuka			Timaru District Council	Laboratory Test		< 0.001
TEM002TE	Te Moana			Timaru District Council	Laboratory Test		< 0.001
TIM001GL	Gleniti			Timaru District Council	Laboratory Test		< 0.001
TIM001TI	Timaru			Timaru District Council	Laboratory Test		< 0.001
TWI001TW	Twizel			Mackenzie District Council	Laboratory Test		< 0.001
Public Health South							
Sources							
ALE001AL	Alexandra	G01840	Alexandra Bore 1	Central Otago District Council	Laboratory Test		< 0.001
ALE001AL	Alexandra	G01841	Alexandra Bore 2	Central Otago District Council	Water Supplier	0.00037	0.00037
ALE001AL	Alexandra	G01842	Alexandra Bore 3	Central Otago District Council	Laboratory Test		< 0.001
ALE001AL	Alexandra	G01843	Alexandra Bore 4	Central Otago District Council	Water Supplier	0.00037	0.00037
ALE001AL	Alexandra	G01844	Alexandra Bore 5	Central Otago District Council	Water Supplier	0.00037	0.00037
ALE001AL	Alexandra	G01845	Alexandra Bore 6	Central Otago District Council	Laboratory Test		< 0.001
DUN001BO	Booth Road, Dunedin	S00141	Deep Stream (M)	Dunedin City Council	Laboratory Test		< 0.001
DUN001BO	Booth Road, Dunedin	S00999	Deep Creek (M)	Dunedin City Council	Laboratory Test		< 0.001
DUN001LL	Low Levels/Peninsula, Dunedin	G00467	Taieri Bores (S)	Dunedin City Council	Laboratory Test		< 0.001
DUN001LL	Low Levels/Peninsula, Dunedin	S00143	Silverstream (S)	Dunedin City Council	Laboratory Test		< 0.001
DUN001PC	Port Chalmers	S00145	Rossville Reservoir	Dunedin City Council	Laboratory Test		< 0.001
DUN001PC	Port Chalmers	S00869	Cedar Farm Reservoir	Dunedin City Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
HER001HE	Herbert	S00330	Waianakarua River	Waitaki District Council	Laboratory Test		< 0.001
KAI005KA	Kaitangata Township	S00176	Clutha River, Matau Branch	Clutha District Council	Laboratory Test		0.001
MIL001MT	Milton	S00174	Tokomairiro River, East Branch	Clutha District Council	Laboratory Test		< 0.001
MOA001MF	Moa Flat Rural	S00183	Timber Creek, Mt. Bengier	Clutha District Council	Laboratory Test		< 0.001
MOS001QH	Quarry Hill	G01894	Severn Street Bore	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01895	Cherry Drive Bore 1	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01896	Cherry Drive Bore 2	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01897	Battleaxe Bore	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01898	Old Borough Bore	Dunedin City Council	Water Supplier	< 0.001	0.002
MOS001QH	Quarry Hill	G01899	Ayr Street Bore	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01900	Eden Street Bore	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01901	Watt Street Bore	Dunedin City Council	Water Supplier	< 0.001	< 0.001
MOS001QH	Quarry Hill	G01902	Reid Avenue Bore	Dunedin City Council	Water Supplier	< 0.001	< 0.001
NOR003NB	North Bruce Rural	S00179	Meggat Burn, Berwick Forest	Clutha District Council	Laboratory Test		< 0.001
OAM001CE	Oamaru, Central	S00162	Lower Waitaki Irrig. Co. Race	Waitaki District Council	Laboratory Test		< 0.001
OUT001OU	Outram Township	G00195	Outram Bores/Outram Bridge	Dunedin City Council	Laboratory Test		< 0.001
RAN002RA	Ranfurly	G00462	East Eweburn Spring	Central Otago District Council	Laboratory Test		< 0.001
RAN002RA	Ranfurly	S00149	Eweburn Creek	Central Otago District Council	Laboratory Test		< 0.001
RAN002RA	Ranfurly	S00980	Ranfurly Irrigation Channel	Central Otago District Council	Laboratory Test		< 0.001
ROX001RO	Roxburgh	G01849	Roxburgh Bore 1	Central Otago District Council	Water Supplier	0.00047	0.00047
ROX001RO	Roxburgh	G01850	Roxburgh Bore 2	Central Otago District Council	Laboratory Test		< 0.001
TAP001TA	Tapanui	S00178	Whiskey Gully	Clutha District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
TOK003TL	Tokarahi/Livingstone	S00169	Maerewhenua River	Waitaki District Council	Laboratory Test		< 0.001
WAI015WK	Waikouaiti/Karitane/Seacliff	S00156	Waikouaiti River	Dunedin City Council	Laboratory Test		< 0.001
ARR001AR	Arrowtown	G00055	Bush Creek Bore	Queenstown Lakes Distr Council	Laboratory Test		< 0.001
ARR001AR	Arrowtown	G01342	Arrowtown Bore	Queenstown Lakes Distr Council	Laboratory Test		< 0.001
EDE001ED	Edendale	G01928	Homestead Road Bore 1	Southland District Council	Laboratory Test		< 0.001
EDE001ED	Edendale	G01930	Homestead Road Bore 2	Southland District Council	Laboratory Test		< 0.001
GOR001GO	Gore	G00051	Jacobstown Wells	Gore District Council	Laboratory Test		< 0.001
GOR001GO	Gore	G00052	Coopers Wells	Gore District Council	Laboratory Test		< 0.001
INV001IN	Invercargill City	S00053	Oreti River	Invercargill City Council	Laboratory Test		< 0.001
LAK003LH	Lake Hayes	G00312	Spring, Slope Hill Road	Queenstown Lakes Distr Council	Laboratory Test		< 0.001
LAK003LH	Lake Hayes	G01976	Spring No. 2, Slope Hill Road	Queenstown Lakes Distr Council	Laboratory Test		< 0.001
LUG001LU	Luggate	G01343	Luggate Bore	Queenstown Lakes Distr Council	Laboratory Test		0.002
MAT002MA	Mataura	S00056	Pleura Stream	Gore District Council	Laboratory Test		< 0.001
MIL007MI	Milford Sound	S00964	Bowen River	Southland District Council	Laboratory Test		< 0.001
OTA001OT	Otautau	G00050	Leiman Street Bore	Southland District Council	Laboratory Test		< 0.001
QUE001QU	Queenstown	S00061	Lake Wakatipu, Two Mile	Queenstown Lakes Distr Council	Laboratory Test		0.001
QUE001QU	Queenstown	S00062	Lake Wakatipu, Kelvin Heights	Queenstown Lakes Distr Council	Laboratory Test		0.001
RIV001RI	Riverton	S00059	Aparima River, Riverton	Southland District Council	Laboratory Test		< 0.001
TUA001TU	Tuatapere	G01513	Forestry Rd Sth Bore	Southland District Council	Laboratory Test		< 0.001
TUA001TU	Tuatapere	G02032	Forestry Rd Nth Bore	Southland District Council	Laboratory Test		< 0.001
TUA001TU	Tuatapere	G02033	Scout Den Bore	Southland District Council	Laboratory Test		< 0.001
WAN002WA	Wanaka	S00986	Lake Wanaka, Western Intake	Queenstown Lakes Distr Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WAN002WA	Wanaka	S00987	Lake Wanaka, Beacon Pt Intake	Queenstown Lakes Distr Council	Laboratory Test		< 0.001
WIN001WI	Winton	G00053	Deegans Station Bore	Southland District Council	Laboratory Test		< 0.001
Zones							
ALE001AL	Alexandra			Central Otago District Council	Laboratory Test		< 0.001
DUN001BO	Booth Road, Dunedin			Dunedin City Council	Laboratory Test		< 0.001
DUN001LL	Low Levels/Peninsula, Dunedin			Dunedin City Council	Laboratory Test		< 0.001
DUN001MH	Maori Hill			Dunedin City Council	Laboratory Test		< 0.001
DUN001PC	Port Chalmers			Dunedin City Council	Laboratory Test		< 0.001
HER001HE	Herbert			Waitaki District Council	Laboratory Test		< 0.001
KAI005KA	Kaitangata Township			Clutha District Council	Laboratory Test		< 0.001
MIL001MT	Milton			Clutha District Council	Laboratory Test		< 0.001
MIL001OC	Otago Corrections Facility			Clutha District Council	Laboratory Test		< 0.001
MOA001MF	Moa Flat Rural			Clutha District Council	Laboratory Test		< 0.001
NOR003NB	North Bruce Rural			Clutha District Council	Laboratory Test		< 0.001
OAM001CE	Oamaru, Central			Waitaki District Council	Laboratory Test		< 0.001
OAM001KA	Oamaru, Kakanui			Waitaki District Council	Laboratory Test		< 0.001
OAM001NE	Oamaru, North End			Waitaki District Council	Laboratory Test		< 0.001
OAM001RR	Oamaru, Reservoir Road			Waitaki District Council	Laboratory Test		< 0.001
OAM001SH	Oamaru, South Hill			Waitaki District Council	Laboratory Test		< 0.001
OAM001WE	Oamaru, Weston - Enfield			Waitaki District Council	Laboratory Test		< 0.001
OUT001OU	Outram Township			Dunedin City Council	Laboratory Test		< 0.001
RAN002RA	Ranfurlly			Central Otago District Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
ROX001RO	Roxburgh			Central Otago District Council	Laboratory Test		< 0.001
TAP001TA	Tapanui			Clutha District Council	Laboratory Test		< 0.001
TOK003TL	Tokarahi/Livingstone			Waitaki District Council	Laboratory Test		< 0.001
WAI015WK	Waikouaiti/Karitane/Seac liff			Dunedin City Council	Laboratory Test		< 0.001
ARR001AR	Arrowtown			Queenstown Lakes Distr Council	Laboratory Test		< 0.001
EDE001ED	Edendale			Southland District Council	Laboratory Test		< 0.001
EDE001WY	Wyndham			Southland District Council	Laboratory Test		< 0.001
GOR001GO	Gore			Gore District Council	Laboratory Test		< 0.001
INV001BL	Bluff			Invercargill City Council	Laboratory Test		< 0.001
INV001IN	Invercargill City			Invercargill City Council	Laboratory Test		< 0.001
LAK003ES	Lake Hayes Estate and Shotover Country Club			Queenstown Lakes Distr Council	Laboratory Test		0.001
LAK003LH	Lake Hayes			Queenstown Lakes Distr Council	Laboratory Test		< 0.001
LUG001LU	Luggate			Queenstown Lakes Distr Council	Laboratory Test		0.002
MAT002MA	Mataura			Gore District Council	Laboratory Test		< 0.001
MIL007MI	Milford Sound			Southland District Council	Laboratory Test		< 0.001
OTA001OT	Otautau			Southland District Council	Laboratory Test		< 0.001
QUE001KE	Kelvin Heights			Queenstown Lakes Distr Council	Laboratory Test		0.001
QUE001QU	Queenstown			Queenstown Lakes Distr Council	Laboratory Test		0.001
RIV001RI	Riverton			Southland District Council	Laboratory Test		< 0.001
TUA001TU	Tuatapere			Southland District Council	Laboratory Test		< 0.001
WAN002AL	Albert Town			Queenstown Lakes Distr Council	Laboratory Test		< 0.001

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Arsenic Concentration (mg/L)	
						Minimum	Maximum
WAN002WA	Wanaka			Queenstown Lakes Distr Council	Laboratory Test		< 0.001
WIN001WI	Winton			Southland District Council	Laboratory Test		< 0.001

APPENDIX D: NITRATE CONCENTRATIONS OBTAINED BY THE SURVEY

For samples taken from the source, the tables list the code and name of the zone receiving water from the source, as well as the source's code and name. The "Data Source" column records whether the concentration data provided are from sample collection and analysis (denoted as 'Laboratory Test'), or data provided by the water supplier (denoted as 'Water Supplier').

When only one measurement was available, it is logged as the 'maximum' concentration (although it may be an undetectable concentration). The results from all samples taken during the survey are recorded as maxima, because only one measurement was available.

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
Waikato District Health Board							
Sources							
CAM001CA	Cambridge	G01679	Hicks Road Spring 1	Waipa District Council	Laboratory Test		1.5
CAM001CA	Cambridge	G01680	Hicks Road Spring 2	Waipa District Council	Laboratory Test		1.1
CAM001CA	Cambridge	S00008	Waikato River, Cambridge	Waipa District Council	Laboratory Test		< 0.04
CAM001CA	Cambridge	S00009	Lake Karapiro	Waipa District Council	Laboratory Test		0.1
KIH001KI	Kihikihi	G00031	Church Street Bore	Waipa District Council	Laboratory Test		0.1
KIH001KI	Kihikihi	G00032	Hall Street Bore	Waipa District Council	Laboratory Test		27
MAT004MA	Matamata Township	G00089	Tawari Bore 1, Matamata	Matamata Piako Distr. Council	Laboratory Test		21
MAT004MA	Matamata Township	G01606	Matamata South Bore	Matamata Piako Distr. Council	Laboratory Test		1.0
MAT004MA	Matamata Township	G01910	Tawari Bore 2, Matamata	Matamata Piako Distr. Council	Laboratory Test		24
MAT004MA	Matamata Township	S00072	Waiteariki Stream	Matamata Piako Distr. Council	Laboratory Test		1.3
PAU001PA	Pauanui	G01000	Pauanui Production Well 1	Thames Coromandel D.C.	Laboratory Test		1.2

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
PAU001PA	Pauanui	G01001	Pauanui Production Well 2	Thames Coromandel D.C.	Laboratory Test		0.3
PAU001PA	Pauanui	G01002	Pauanui Production Well 3	Thames Coromandel D.C.	Laboratory Test		0.5
PUT001PU	Putaruru	G00029	Waihou River Spring	South Waikato District Council	Laboratory Test		2.8
PUT001PU	Putaruru	G01657	Glenshea Bore 2	South Waikato District Council	Laboratory Test		14
PUT001PU	Putaruru	G01812	Glenshea Bore 3	South Waikato District Council	Laboratory Test		9.0
RAG001RA	Raglan	G00464	Spring, Raglan	Waikato District Council	Laboratory Test		0.2
TIR001TI	Tirau	G00030	Oraka Spring	South Waikato District Council	Laboratory Test		14
TOK001TO	Tokoroa	G00027	Elizabeth Park Bore 1	South Waikato District Council	Laboratory Test		18
TOK001TO	Tokoroa	G01752	Elizabeth Park Bore 3	South Waikato District Council	Laboratory Test		15
WAI201WA	Waitakaruru	S00046	Mangatarata Stream	Hauraki District Council	Laboratory Test		0.1
WAI201WA	Waitakaruru	S00370	Waitakaruru Stream	Hauraki District Council	Laboratory Test		< 0.04
WHA003WH	Whangamata	G00047	Beverley Hills Well 1	Thames Coromandel D.C.	Laboratory Test		0.5
WHA003WH	Whangamata	G01515	Beverley Hills Well 2 and 3	Thames Coromandel D.C.	Laboratory Test		0.6
WHA003WH	Whangamata	G01776	Wentworth Valley Bore	Thames Coromandel D.C.	Laboratory Test		5.2
Zones							
CAM001CA	Cambridge			Waipa District Council	Laboratory Test		0.5
KIH001KI	Kihikihi			Waipa District Council	Laboratory Test		0.5
MAT004MA	Matamata Township			Matamata Piako Distr. Council	Laboratory Test		1.4
MAT004WA	Waharoa			Matamata Piako Distr. Council	Laboratory Test		< 0.04
PAU001PA	Pauanui			Thames Coromandel D.C.	Laboratory Test		< 0.04
PUT001PU	Putaruru			South Waikato District Council	Laboratory Test		5.4
RAG001RA	Raglan			Waikato District Council	Laboratory Test		3.9

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
TIR001TI	Tirau			South Waikato District Council	Laboratory Test		14
TOK001TO	Tokoroa			South Waikato District Council	Laboratory Test		17
WAI201WA	Waitakaruru			Hauraki District Council	Laboratory Test		0.3
WHA003WH	Whangamata			Thames Coromandel D.C.	Laboratory Test		0.6
Toi Te Ora - Public Health Service							
Sources							
MAN002MA	Mangakino	G00088	Maraetai Spring	Taupo District Council	Laboratory Test		8.5
TUR001TU	Turangi	G00002	Turangi, Unnamed Spring	Taupo District Council	Laboratory Test		0.1
Zones							
MAN002MA	Mangakino			Taupo District Council	Laboratory Test		9.1
TUR001TU	Turangi			Taupo District Council	Laboratory Test		0.8
Hawkes Bay District Health Board							
Sources							
HAS001EA	Hastings East	G00075	Eastbourne Street Bores	Hastings District Council	Laboratory Test		9.2
HAS001FL	Flaxmere	G00076	Frimley Park Bores	Hastings District Council	Laboratory Test		0.9
HAS001FL	Flaxmere	G00077	Flaxmere Park Bore	Hastings District Council	Laboratory Test		1.2
HAS001EA	Hastings East	G00078	Brookvale Road Bores	Hastings District Council	Laboratory Test		3.8
HAS001FL	Flaxmere	G00782	Portsmouth Road Bore	Hastings District Council	Laboratory Test		1.1
Zones							
HAS001EA	Hastings East			Hastings District Council	Laboratory Test		11
HAS001FL	Flaxmere			Hastings District Council	Laboratory Test		7.8
HAS001WE	Hastings West & Central			Hastings District Council	Laboratory Test		11

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
Community and Public Health							
Sources							
AMB001AT	Amberley Town	G01997	Amberley SH1 (2012) Bore	Hurunui District Council	Laboratory Test		< 0.04
ASH002AS	Ashley/Sefton/Loburn	G00139	Ashley Rural Bores	Hurunui District Council	Laboratory Test		0.3
ASH003AS	Ashburton	G01545	Ashburton Domain No. 5 Well	Ashburton District Council	Water Supplier	11	13
ASH003AS	Ashburton	G01546	Argyle Park No. 1 Well	Ashburton District Council	Water Supplier	5.9	6.6
ASH003AS	Ashburton	G01547	Argyle Park No. 2 Well	Ashburton District Council	Water Supplier	6.2	8.0
ASH003AS	Ashburton	G01682	Bridge Street No.1	Ashburton District Council	Water Supplier	10	11
ASH003AS	Ashburton	G01683	Bridge Street No.2	Ashburton District Council	Water Supplier	11	17
ASH003AS	Ashburton	G01917	Ashburton Domain No. 6 Well	Ashburton District Council	Water Supplier	12	15
ASH003AS	Ashburton	G01963	Ashburton Domain No. 7 Well	Ashburton District Council	Water Supplier	7.9	8.5
ASH003AS	Ashburton	G02002	Tinwald Bore	Ashburton District Council	Water Supplier	24	27
BRO012BR	Brooklands / Kainga	G00581	Brooklands Kainga Aquifer 2	Christchurch City Council	Water Supplier	8.0	8.0
CHE001CT	Cheviot Town	G00179	Waiiau River Gallery at Cheviot	Hurunui District Council	Laboratory Test		0.8
CHR001CE	Central Christchurch	G00118	Central CHCH, Aquifer 1	Christchurch City Council	Water Supplier	1.7	17
CHR001CE	Central Christchurch	G00119	Central CHCH, Aquifer 2	Christchurch City Council	Water Supplier	0.9	0.9
CHR001CE	Central Christchurch	G00120	Central CHCH, Aquifer 3	Christchurch City Council	Water Supplier	1.8	6.2
CHR001CE	Central Christchurch	G00121	Central CHCH, Aquifer 4	Christchurch City Council	Water Supplier	0.8	6.2
CHR001CE	Central Christchurch	G01602	Central CHCH, Aquifer 5	Christchurch City Council	Water Supplier	5.8	5.8
CHR001PA	Parklands	G00126	Parklands, Aquifer 2	Christchurch City Council	Water Supplier	2.6	2.6
CHR001PA	Parklands	G00127	Parklands, Aquifer 4	Christchurch City Council	Water Supplier	3.2	6.2
CHR001RI	Riccarton	G00131	Riccarton, Aquifer 2	Christchurch City Council	Water Supplier	5.8	5.8

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
CHR001RI	Riccarton	G01599	Riccarton, Aquifer 4	Christchurch City Council	Water Supplier	< 0.4	< 0.4
CHR001RP	Rocky Point	G00129	Rocky Point, Aquifer 1	Christchurch City Council	Water Supplier	6.2	6.2
CHR001WE	West Christchurch	G00128	West CHCH, Aquifer 2	Christchurch City Council	Water Supplier	6.6	6.6
CHR001WE	West Christchurch	G01601	West CHCH, Aquifer 3	Christchurch City Council	Water Supplier	7.5	7.5
DAR001DA	Darfield	G01961	Darfield SH73 Bores	Selwyn District Council	Laboratory Test		25
HAW001HW	Hawarden/Waikari	G01096	Bishells Road Bore	Hurunui District Council	Laboratory Test		1.7
KAI003KA	Kaiapoi	G00148	Rugby Park, Kaiapoi	Waimakariri District Council	Laboratory Test		2.3
KAI003KA	Kaiapoi	G00149	Darnley Square	Waimakariri District Council	Laboratory Test		4.7
KAI003KA	Kaiapoi	G00150	Porter Place, Kaiapoi	Waimakariri District Council	Laboratory Test		2.5
KAI003KA	Kaiapoi	G00151	Peraki Street, Kaiapoi	Waimakariri District Council	Laboratory Test		4.4
KAI003KA	Kaiapoi	G01501	Sewell St	Waimakariri District Council	Laboratory Test		4.4
KAI003KA	Kaiapoi	G01502	Ashley Place	Waimakariri District Council	Laboratory Test		4.4
KAI004KU	Kaikoura Urban	G01751	Mackles Bores	Kaikoura District Council	Laboratory Test		2.7
KIR001KI	Kirwee	G00725	Kirwee Bore	Selwyn District Council	Laboratory Test		22
LEE001LE	Leeston	G00160	Gallipoli Rd Well No.2	Selwyn District Council	Laboratory Test		5.0
LEE001LE	Leeston	G00162	Lake Rd Well	Selwyn District Council	Laboratory Test		4.8
LEE001LE	Leeston	G00501	Gallipoli Rd Well No.1	Selwyn District Council	Laboratory Test		3.5
LIN002LI	Lincoln	G00163	Kildare Tce Well	Selwyn District Council	Laboratory Test		7.1
LIN002LI	Lincoln	G00164	Cole St Well	Selwyn District Council	Laboratory Test		5.7
LIN002LI	Lincoln	G01341	West Belt Well	Selwyn District Council	Laboratory Test		7.1
LYT001LY	Lyttelton	G00135	Aquifer 4	Christchurch City Council	Water Supplier	1.3	1.3
MAN009MA	Mandeville	G01500	Mandeville Bore 1	Waimakariri District Council	Laboratory Test		13

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
MOT016MO	Motunau, Greta, Scargill	G00143	Well, Hurunui No. 1 Rural	Hurunui District Council	Laboratory Test		1.2
NOR012CH	Northwest Christchurch	G00122	NW CHCH, Aquifer 1	Christchurch City Council	Water Supplier	2.2	8.4
NOR012CH	Northwest Christchurch	G00125	NW CHCH, Aquifer 5	Christchurch City Council	Water Supplier	5.8	6.2
OXF103OX	Oxford Urban	G01893	Domain Rd Bore	Waimakariri District Council	Laboratory Test		8.2
OXF103OX	Oxford Urban	S00883	Gammans Well	Waimakariri District Council	Laboratory Test		0.2
PEG001PE	Pegasus	G01759	Pegasus PW No. 1	Waimakariri District Council	Laboratory Test		< 0.04
PEG001PE	Pegasus	G01946	Pegasus EQ No. 1	Waimakariri District Council	Laboratory Test		< 0.04
PEG001PE	Pegasus	G01947	Pegasus EQ No. 2	Waimakariri District Council	Laboratory Test		< 0.04
PEG001PE	Pegasus	G02085	Pegasus EQ No. 3 (TPPTL)	Waimakariri District Council	Laboratory Test		< 0.04
PRE001PR	Prebbleton	G00165	Prebbleton Wells No. 1	Selwyn District Council	Laboratory Test		3.0
PRE001PR	Prebbleton	G00463	Prebbleton Wells No. 2	Selwyn District Council	Laboratory Test		3.1
PRE001PR	Prebbleton	G01608	St Patricks Well	Selwyn District Council	Laboratory Test		2.4
RAK001RA	Rakaia Township	G01873	Rakaia Deep Bore 1	Ashburton District Council	Water Supplier	0.9	1.0
RAN001RA	Rangiora	G00147	Ayres Street Wells	Waimakariri District Council	Laboratory Test		2.1
RAN001RA	Rangiora	G01758	Smith St Well 1	Waimakariri District Council	Laboratory Test		0.8
RAN001RA	Rangiora	G01985	Smith St Well 2	Waimakariri District Council	Laboratory Test		0.8
RAN001RA	Rangiora	G01986	Smith St Well 3	Waimakariri District Council	Laboratory Test		0.8
ROL001RO	Rolleston	G00167	Rolleston Moore St Well	Selwyn District Council	Laboratory Test		5.9
ROL001RO	Rolleston	G01113	Rolleston, Overbury Crescent	Selwyn District Council	Laboratory Test		17
ROL001RO	Rolleston	G01672	Izone Well	Selwyn District Council	Laboratory Test		12
ROL001RO	Rolleston	G01874	Rolleston, Westland Place	Selwyn District Council	Laboratory Test		16
ROL001RO	Rolleston	G02009	Rolleston, Illinois Drive	Selwyn District Council	Laboratory Test		18

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
SEL001HO	Hororata	G00822	Glentunnel Intake, Selwyn RWS	Selwyn District Council	Laboratory Test		0.7
SHE004SH	Sheffield/Waddington	G00820	Sheffield/Waddington Bore	Selwyn District Council	Laboratory Test		15
SOU001SO	Southbridge	G00157	Southbridge High St Well	Selwyn District Council	Laboratory Test		17
SOU001SO	Southbridge	G00158	Southbridge Taiaroa St Well	Selwyn District Council	Laboratory Test		12
SPR002SP	Springfield	G00674	Springfield Well	Selwyn District Council	Laboratory Test		3.6
SPR003SP	Springston	G01794	Springston Bore 2	Selwyn District Council	Laboratory Test		7.3
TAI009TA	Tai Tapu	G00675	Tai Tapu Bore	Selwyn District Council	Laboratory Test		1.1
WAI011KI	Waikuku Beach	G00155	Kings Ave Well	Waimakariri District Council	Laboratory Test		2.1
WAI011KI	Waikuku Beach	G01573	Campground Well	Waimakariri District Council	Laboratory Test		< 0.04
WAT006WB	Waterloo Business Pk, Stage 1	G02045	Waterloo Business Park Well 1	Christchurch City Council	Water Supplier	13	13
WES010WE	West Melton	G01775	Royston Common Bore	Selwyn District Council	Laboratory Test		9.3
WES010WE	West Melton	G01957	Eliz. Allen Dr.Bore	Selwyn District Council	Laboratory Test		7.7
FAI002FA	Fairlie	G00249	3 Springs, Fairlie	Mackenzie District Council	Laboratory Test		0.5
GER001GE	Geraldine	G00204	Bores Geraldine	Timaru District Council	Laboratory Test		1.1
LOW002LO	Lower Waihao	G00317	Lower Waihao Bore	Waimate District Council	Laboratory Test		4.7
PLE001PP	Pleasant Point	G00198	Pleasant Point Bore	Timaru District Council	Laboratory Test		4.1
SEA001SE	Seadown	G00197	Seadown Bore	Timaru District Council	Laboratory Test		8.7
TEM001TE	Temuka	G00199	Temuka Bores	Timaru District Council	Laboratory Test		3.5
TEM001TE	Temuka	G01332	Temuka Bore 3	Timaru District Council	Laboratory Test		2.2
TIM001TI	Timaru	G00203	Opihi Bore	Timaru District Council	Laboratory Test		2.9
TIM001TI	Timaru	S00200	Pareora River	Timaru District Council	Laboratory Test		0.1
TWI001TW	Twizel	G00247	Twizel Wells	Mackenzie District Council	Laboratory Test		0.4

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
WAI033WA	Waimate	G00318	Manchester Bore	Waimate District Council	Laboratory Test		1.6
WAI033WA	Waimate	G01525	Timaru Rd Bore	Waimate District Council	Laboratory Test		< 0.04
Zones							
AMB001AT	Amberley Town			Hurunui District Council	Laboratory Test		< 0.04
ASH002AS	Ashley/Sefton/Loburn			Hurunui District Council	Laboratory Test		0.8
ASH003AS	Ashburton			Ashburton District Council	Laboratory Test		6.5
BRO012BR	Brooklands / Kainga			Christchurch City Council	Laboratory Test		4.3
CHR001CE	Central Christchurch			Christchurch City Council	Water Supplier	0.19	9.3
CHR001PA	Parklands			Christchurch City Council	Laboratory Test		2.1
CHR001RI	Riccarton			Christchurch City Council	Laboratory Test		1.0
CHR001RP	Rocky Point			Christchurch City Council	Laboratory Test		4.3
CHR001WE	West Christchurch			Christchurch City Council	Laboratory Test		3.7
DAR001DA	Darfield			Selwyn District Council	Laboratory Test		25
HAW001HW	Hawarden/Waikari			Hurunui District Council	Laboratory Test		1.4
KAI003KA	Kaiapoi			Waimakariri District Council	Laboratory Test		4.2
KAI004KU	Kaikoura Urban			Kaikoura District Council	Laboratory Test		1.9
KIR001KI	Kirwee			Selwyn District Council	Laboratory Test		22
LEE001LE	Leeston			Selwyn District Council	Laboratory Test		3.5
LIN002LI	Lincoln			Selwyn District Council	Laboratory Test		7.6
LYT001DI	Diamond Harbour			Christchurch City Council	Laboratory Test		0.8
LYT001GO	Governors Bay			Christchurch City Council	Laboratory Test		1.0
LYT001LY	Lyttelton			Christchurch City Council	Laboratory Test		1.2

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
MAN009MA	Mandeville			Waimakariri District Council	Laboratory Test		16
MOT016MO	Motunau, Greta, Scargill			Hurunui District Council	Laboratory Test		1.7
NOR012CH	Northwest Christchurch			Christchurch City Council	Laboratory Test		1.2
OXF103OX	Oxford Urban			Waimakariri District Council	Laboratory Test		8.2
PEG001PE	Pegasus			Waimakariri District Council	Laboratory Test		< 0.04
PRE001PR	Prebbleton			Selwyn District Council	Laboratory Test		2.8
RAK001RA	Rakaia Township			Ashburton District Council	Laboratory Test		0.9
RAN001RA	Rangiora			Waimakariri District Council	Laboratory Test		2.3
ROL001RO	Rolleston			Selwyn District Council	Laboratory Test		6.1
SEL001HO	Hororata			Selwyn District Council	Laboratory Test		0.7
SHE004SH	Sheffield/Waddington			Selwyn District Council	Laboratory Test		15
SOU001SO	Southbridge			Selwyn District Council	Laboratory Test		16
SPR002SP	Springfield			Selwyn District Council	Laboratory Test		3.7
SPR003SP	Springston			Selwyn District Council	Laboratory Test		7.4
TAI009TA	Tai Tapu			Selwyn District Council	Laboratory Test		1.2
WAI011KI	Waikuku Beach			Waimakariri District Council	Laboratory Test		2.2
WAT006WB	Waterloo Business Pk, Stage 1			Christchurch City Council	Laboratory Test		2.5
WES010WE	West Melton			Selwyn District Council	Laboratory Test		8.2
FAI002FA	Fairlie			Mackenzie District Council	Laboratory Test		0.6
GER001GE	Geraldine			Timaru District Council	Laboratory Test		1.3
HAD001HA	Hadlow			Timaru District Council	Laboratory Test		1.6
LOW002LO	Lower Waihao			Waimate District Council	Laboratory Test		4.9

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
PLE001PP	Pleasant Point			Timaru District Council	Laboratory Test		4.2
SEA001SE	Seadown			Timaru District Council	Laboratory Test		9.2
TEM001TE	Temuka			Timaru District Council	Laboratory Test		4.3
TIM001GL	Gleniti			Timaru District Council	Laboratory Test		1.6
TIM001TI	Timaru			Timaru District Council	Laboratory Test		1.6
TWI001TW	Twizel			Mackenzie District Council	Laboratory Test		0.8
WAI033WA	Waimate			Waimate District Council	Laboratory Test		0.4
Public Health South							
Sources							
ARR001AR	Arrowtown	G00055	Bush Creek Bore	Queenstown Lakes Distr Council	Laboratory Test		2.3
ARR001AR	Arrowtown	G01342	Arrowtown Bore	Queenstown Lakes Distr Council	Laboratory Test		2.3
ART001AP	Arthurs Point	G01974	Shotover River Bore 2	Queenstown Lakes Distr Council	Laboratory Test		0.6
ART001AP	Arthurs Point	G02103	Bore 1	Queenstown Lakes Distr Council	Laboratory Test		0.6
EDE001ED	Edendale	G01928	Homestead Road Bore 1	Southland District Council	Laboratory Test		15
EDE001ED	Edendale	G01930	Homestead Road Bore 2	Southland District Council	Laboratory Test		16
GOR001GO	Gore	G00051	Jacobstown Wells	Gore District Council	Laboratory Test		8.5
GOR001GO	Gore	G00052	Coopers Wells	Gore District Council	Laboratory Test		19
LAK003LH	Lake Hayes	G00312	Spring, Slope Hill Road	Queenstown Lakes Distr Council	Laboratory Test		5.8
LAK003LH	Lake Hayes	G01976	Spring No. 2, Slope Hill Road	Queenstown Lakes Distr Council	Laboratory Test		4.4
LUG001LU	Luggate	G01343	Luggate Bore	Queenstown Lakes Distr Council	Laboratory Test		5.8
OTA001OT	Otautau	G00050	Leiman Street Bore	Southland District Council	Laboratory Test		6.2
TUA001TU	Tuatapere	G01513	Forestry Rd Sth Bore	Southland District Council	Laboratory Test		6.6

Zone Code	Zone name	Source Code	Source Name	Local Authority	Data Source	Nitrate Concentration (mg NO ₃ /L)	
						Minimum	Maximum
TUA001TU	Tuatapere	G02032	Forestry Rd Nth Bore	Southland District Council	Laboratory Test		17
TUA001TU	Tuatapere	G02033	Scout Den Bore	Southland District Council	Laboratory Test		9.4
Zones							
ARR001AR	Arrowtown			Queenstown Lakes Distr Council	Laboratory Test		2.7
ART001AP	Arthurs Point			Queenstown Lakes Distr Council	Laboratory Test		0.6
EDE001ED	Edendale			Southland District Council	Laboratory Test		16
EDE001WY	Wyndham			Southland District Council	Laboratory Test		16
GLE003GL	Glenorchy			Queenstown Lakes Distr Council	Laboratory Test		4.5
GOR001GO	Gore			Gore District Council	Laboratory Test		8.7
LAK003ES	Lake Hayes Estate and Shotover Country Club			Queenstown Lakes Distr Council	Laboratory Test		0.2
LAK003LH	Lake Hayes			Queenstown Lakes Distr Council	Laboratory Test		5.2
LUG001LU	Luggate			Queenstown Lakes Distr Council	Laboratory Test		5.8
OTA001OT	Otautau			Southland District Council	Laboratory Test		6.1
TUA001TU	Tuatapere			Southland District Council	Laboratory Test		8.4

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