

RUMORE Jennifer

Hawea Stand for Pure Water

Wanaka/Upper Clutha

Submitters Comment

The aspect of the Draft Annual Plan that most affects us is the implementation of wholesale chlorination in Hawea. The information below was submitted to Mike Theelen, presented to Ulrich Glasner, presented at the Hawea Community meeting on this matter, and has all been essentially ignored by the mayor and the council. Christchurch has implemented chlorine-free water treatment successfully and to a much greater population base, led by a mayor who was willing to do the work. FANTASTIC! They have something really special they are protecting. We require you to follow such a good example. We have attached Christchurch's plans and processes--here is your template, served to you on a platter, just implement it suited to our district.

The wishes of the overwhelming majority of the community I am sure are known to you. As a member of said community, I ask you directly to cease pursuit of Hawea chlorination immediately.

Hawea has good reason to have installed an Ultra Violet water filtration system: THE RISK OF DEVELOPING CANCER IS 93% HIGHER IN PEOPLE WHO DRINK OR ARE OTHERWISE EXPOSED TO CHLORINATED WATER. (See The Dangers of Chlorine at www.curezone.com) Additionally, the Medical College of Wisconsin reviewed a study about chlorine and cancer and concluded the following: "We are quite convinced, based on this study, that there is an association between cancer and chlorinated water."

There is much talk that chlorine is the "only" way to treat water with certainty to prevent bacterial illness arising (which is actually truly debatable); however no consideration given to long term illness brought about directly or significantly enhanced by the use of chlorinated water. THIS IS A HEALTH RISK, TOO.

I am shocked at the ignoring of this community's will. For the last three years each water quality meeting I have attended has been in the company of many other citizens that have heard the QLDC's recommendations about chlorine, and continued to maintain our position that the Ultra Violet filtration system be left to do its proven effective work instead.

These citizens, and I, were not paid, as QLDC staff members I presume were, to leave our homes in the evening to stand for our rights to pure water. Nor at this moment am I being paid to channel the considerable energy addressing this topic...again. I am writing because it is my human right to pure water, a right into which I will invest immeasurably to enforce. I feel very sad that I must make this time and energy investment--that it is not a given, and I stand in a good quality and quantity of company.

As ratepayers we supply the funding for your positions. We also find it confounding that the repeated requests to upgrade the toilets used annually by thousands of tourists at Lake Hawea go ignored...while miraculously \$500,000 has been found to poison our water WHICH WE DO NOT WANT. Please execute the will of the Hawea

community. We are intelligent people acting responsibly to self-manage our wellness decisions.

Please also refer to the copious documentation and scientifically sound evidence backing that our water supply is in zero need of tampering via chlorination... WHICH IS WHY WE HAVE SPENT MILLIONS OF DOLLARS JUST LAST YEAR ON OUR UV SYSTEM. We were assured that any occasional Escherichia Coli bacteria finding its way into our water supply via intake from Lake Hawea was mitigated with this 7-figure upgrade.

IF water had to be taken from the lake for any reason, and bacteria counts exceeded acceptable parameters THEN TEMPORARILY chlorinate until and only until the samples return to acceptable levels...AND DON'T drag it out until we as citizens get hopping mad and call a community meeting about it, then deliberate it at length, THEN finally cease the temporary practice. I would rather boil my drinking water for a few minutes that intake toxic poison, no matter how dilute.

I understand that your decision is at least in part predicated upon POSSIBLE exposure to lawsuit after a law firm reviewed the fact that the Hawke's Bay Regional Council laid charges against the Hastings District Council in connection with the contamination of Havelock North's water this past August. Those charges were laid under the Resource Management Act for a technical breach of the district council's resource consent conditions for taking water from Brookvale Bores 1 and 2. Hawea is in no way in a position of exposure similar to Havelock North.

The fear of a lawsuit has very little to do with whether our UV system is effective, so are you saying, via your decision--COMPLETELY DEVOID OF PUBLIC (YOUR EMPLOYERS') INPUT--that the upgrades painstakingly reviewed and implemented are worthless? If so then who is accountable for the mistake there?

We require UV filtration because UV is healthier than chlorination for both the citizens and the environment. For drinking water processes, using UV for primary disinfection eliminates disinfection by-product (DBP) formation and reduces the amount of chlorine required for residual maintenance by up to 90% of the amount required when chlorine is the only disinfecting agent. By eliminating chemical residuals in wastewater disinfection, UV protects receiving waters and makes reuse possible.

Further, when our water is chlorinated, ALL of it is chlorinated. If we filter it at the tap we absorb it through our skin, eyes, ears, nose and mouth when we shower or bath. A whole house filter is prohibitively expensive for many. And all the microbes chlorine kills ... our gardens need. So when we water the garden with the chlorinated water rather than our UV filtered water, we actually weaken or eliminate our soil microbial colonies.

For the past two decades, and increasingly today, ultraviolet radiation (UV) has been successfully used around the world for municipal applications including wastewater and drinking water disinfection. UV is a cost-effective and reliable technology that protects the public against pathogenic microorganisms including protozoa, bacteria and viruses.

As a growing alternative and in many cases, a direct replacement technology to chemical (chlorine) disinfection, UV does not produce harmful by-products and is non-toxic to the environment. Furthermore, UV technology is recognized as the "green" disinfection solution with a low environmental impact.

Disinfection using chlorine gas was the most common method of wastewater disinfection. Chlorine gas itself is relatively inexpensive but is a highly toxic chemical

that must be transported and handled with extreme caution. It is stored under pressure in large tanks and is released into the wastewater as a gas. Sodium hypochlorite is a diluted liquid form of chlorine that is commonly used, yet takes much longer to break down or dissipate.

Surely you must have researched all of this to have made an informed decision-- expressly excluding public opinion from your process--to chlorinate our perfectly healthy water system. In the event you did not, now you are aware of this information I again ask you to cease chlorination immediately. If you are not fully satisfied with our UV system then put heads down and bums up to implement a non-chlorination strategy. GIVE US YOUR RESEARCH OF OTHER ALTERNATIVES. COLLABORATE WITH US. Do you not find it audacious that you put this in the Draft Annual Plan, knowing our will clearly, inviting public consultation, fully anticipating ignoring us and approving it regardless of what we present? We do. We find it shocking.

We understand that the proposition of the whiff of a possibility of a lawsuit can motivate a fast blanket-approach decision. If you will not rescind this unnecessary chlorination plan based upon our clear input, please understand that we will continue to research and act upon recourse to stop this unconscionable course of action.

Instead, liaise with Christchurch City Council's mayor. Find a solution that works-- chemically free. Here is the Compliance with Drinking Water Standard Christchurch is using, and attached find Drinking water E. Coli Testing and Risk Mitigation Processes for same. Lead the way to resurrecting New Zealand's clean green status. Spend this \$500,000 doing that, and we will cheerfully back you all the way.

Council

22 September 2016

Item No.: 50

Page

895

Item 50

50

.
Compliance with Drinking Water Standards

-
Northwest Christchurch

Reference:

16/1037725

Contact:

John Mackie

john.mackie@ccc.govt.nz

941 6548

1.
Purpose and Origin of
Report

Purpose of Report

1.1

The

purpose

of this report is for the

Council

to

make a decision about the management of the

potential public health risks in the Christchurch Northwest water supply zone until the

Northwest Drinking Water Standards for New Zealand (DWSNZ) Upgrade project is completed

Origin of Report

1.2

This report is staff generated to provide Council with background information about options on how to manage the potential health risks in the Northwest Christchurch water supply zone until

the Northwest DWSNZ Upgrade project is completed.

1.3

The Council decision will also form the basis of the response to the Canterbury District Health

Board's letter of 25 August 2016, providing answers to several questions raised including 'why

Christch

urch City Council believe continued used of these non

-

secure sources does not present

an untenable risk to the residents of Northwest Christchurch'.

2.

Significance

2.1

The decision(s) in this report are of medium significance in relation to the Christchurch City

Council's Significance and Engagement Policy.

2.1.1

The level of significance was determined by completing the Significance and Engagement Policy Worksheet.

2.1.2

The community engagement and consultation outlined in this report reflect the assessment.

3.

Staff

Recommendations

That the

Council

accept Option 1 which would mean:

1.

That the drinking water supply well improvement programme for the northwest of Christchurch be brought forward for target completion in 2017, and that financial provision is made to match the accelerated delivery programme.

2.

That, the Council commence engagement and communication with the community and

vulnerable water consumers (e.g. dialysis patients), in the affected zones about the measures

that can be taken to reduce the public health risks in areas supplied from shallow groundwater

aquifers. These measures are to include;

a.

Undertaking a community education programme to raise awareness of the residual

risks
of untreated water
er supplies from shallow groundwater sources, particularly in relation to
the very old and the very young.

b.
Consideration of temporary chlorination of the affected zone until the deeper wells
are
commissioned in 2017

c.
Using water conservation measures to red
uce reliance on shallow bore water supplies
and feeding from more secure adjacent zones.

Council
22 September 2016

Item No.: 50

Page

896

Item 50

4.
Key Points

4.1
This report supports the
Council's Long Term Plan (2015

-
2025)

:
4.1.1
Activity: Water Supply (combining water conservation)

?

?

Level of Service: 12.0.2 (non
-
LTP) Ensure potable water is supplied in accordance
with the
Drinking Water Standards for New Zealand (microbiology)

4.2
The following feasible options have been considered:

?

?

Option 1

-
Fast

-

track Northwest DWSNZ Upgrade project and implement additional risk
management processes including consideration of tempora
ry chlorination (preferred option)

?

?

Option 2

-

Fast

-

track Northwest DWSNZ Upgrade project and implement additional risk
management processes excluding temporary chlorination

?

?

Option 3

–

Continue with existing Northwest DWSNZ Upgrade project timeline and implement additional risk management processes including temporary chlorination

?

?

Option 4

–

Continue with existing Northwest DWSNZ Upgrade project timeline (Do Nothing)

4.3

Option Summary

-

Advantages and Disadvantages (Preferred Option 1)

4.3.1

The advantages of this option include:

?

Most shallow wells would be decommissioned by the end of March 2017, and the remaining shallow wells that cannot be decommissioned due to operational constraints in times of peak demand would be used after careful consideration only, with chlorination.

?

Chlorination provides an additional barrier against certain microbiological contaminants such as E. coli and Campylobacter.

?

Council implements additional temporary and long

-

term risk management processes such as water conservation and demand management techniques which will be of benefit to all ratepayers in urban Christchurch and Banks Peninsula.

?

Council is well placed to provide CDHB with assurance that Council is taking all practicable steps to comply with DWSNZ.

?

Council complies with its obligation to secure groundwater provision and achieve early compliance with DWSNZ in the Northwest zone as required by the Ministry of Health.

1.1.2

The disadvantages of this option include:

?

Residents and commercial / industrial water consumers may oppose temporary water supply chlorination.

?

Chlorination is not an effective barrier against microbiological contamination by Protozoa such as Cryptosporidium and Giardia.

?

The temporary chlorination units require frequent manual adjusting and therefore likely to be expensive to operate and not always produce a consistent

stent chlorine dose.

?

Financial provisions and re

-

scheduling are required to deliver the accelerated upgrade programme.

?

Fast

-

tracking of capital works could result in increased contractor and construction rates.

Council

22 September 2016

Item No.: 50

Page

897

Item 50

5.

Context/Background

History

5.1

All

of

Council groundwater supplies

have a current risk grading

and have the highest grading

possible f

or a secure groundwater supply which is ‘

B

,

for the groundwater source

(s

atisfactory,

very low level

of risk

)

except for the Northwest Christchurch groundwater supply

where the

grading is currently ‘D’ due to the presence of shallow, unconfined wells.

5.2

The Northwest DWSNZ upgrade which involves the drilling of new deep wells to achieve secure

groundwat

er status and compliance with DWSNZ for the Northwest Christchurch Community

(listed as NORO12 in the Ministry of Health register of community drinking water supplies),

commenced in the 2012/13 financial year and is to be completed by 30 June 2018.

5.3

The

recent water contamination incident in Havelock North has raised concerns

nationwide

about public health risks and whether water suppliers in fact take all practicable steps to comply

with the DWSNZ as required by section 69V of the Health Act 1956.

5.4

C

ouncil received a letter from Dr Alistair Humphrey, Medical Officer of Health (Canterbury) dated 25 August 2016 in which Council was asked to provide details of the management of the remaining shallow, unconfined aquifer 1 wells in the Northwest zone including 'why Christchurch City Council believe continued use of these non

- secure sources does not present an untenable risk to the residents of Northwest Christchurch'.

5.5

Council staff prepared a report for the August Infrastructure Transport and Environment

t (ITE)

Committee on Council Drinking Water and E. coli Testing and Risk Mitigation Processes. This

report provided information on the city's drinking water compliance monitoring programme, the

potential public health risks in the Christchurch Northwest water supply zone while the

remaining unconfined, shallow aquifer 1 wells are being gradually replaced by deep wells, and

existing risk mitigation processes. This report is attached as Appendix A.

5.6

The most significant risk that was identified to the ITE

Committee is the minimum 24 hour delay

in identifying the presence of any contamination in the water supply as the test for E.coli

requires an incubation period of approximately 24 hours. This means that even with daily

testing, there is always a 24hr period

between the time of the test until the results are received

where a contamination event could occur that would not be immediately detected.

This risk

,although very small, can have a significant consequence particularly on the most vulnerable

members of

the community, namely the very young, the elderly, and those with existing medical conditions.

5.7

Contamination events can occur through the following means;

5.7.1

Surface water gaining access to and contaminating the groundwater well

5.7.2

Leakage or seepage

of water into water storage reservoirs through structural defects eg cracked reservoir roofs allowing bird excrement to enter the supply reservoir

5.7.3

Unauthorised backflow into the reticulation pipework from buildings or private pipe networks (eg

cattle troughs with submerged ballcock valves)

1.1.4

Accidental contamination through maintenance or construction activities.

5.8

Council staff carried out an extensive options study and has established several options as

outlined in this report.

5.9

Approval i

s sought for proceeding with the preferred Option 1 as it provides a robust risk management approach in line with best practice.

5.10

Note that the fast

-

tracking does not bring forward the overall completion date of 30 June 2018 but rather reduces the potential public health risk by decommissioning as many shallow wells as practically feasible by the end of February 2017.

Council

22 September 2016

Item No.: 50

Page

898

Item 50

6.

Option 1

-

Fast

-

track Northwest DWSNZ Upgrade project and implement additional risk management processes including consideration of

temporary

chlorination (preferred)

Option Description

6.1

The Northwest DWSNZ Upgrade project is currently scheduled to be completed by 30 June 2018.

This timeframe was approved by the Ministry of Health and CDHB on 11 June 2015.

6.2

Council staff looked at

fast options to fast

-

track the project to bring the completion date forward in order to demonstrate to CDHB that Council takes all practicable steps to comply with the DWSNZ.

6.3

Fast

-

tracking would not change the overall completion timeframe of 30 June 2018 but result in

most shallow wells being decommissioned by the end of March 2017, with the exception of the

shallow wells at Harewood pump station (dependent on the new Gardiners pump station being

fully operational) and Wrights pump station (dependent on the

long term replacement option

for the site). The shallow wells at Harewood and Wrights are currently not in service, but if they

were required to be used during times of high demand then chlorination units could be used to

provide an additional barrier to contamination.

6.4

Fast

- tracking options are site dependent and involve a specific combination of accelerated capital works items:

- drilling and developing the remaining required deep wells (drilling contractor to arrange for additional resources)

- hydraulic design to size pump station pipework (headworks) after deep wells have been drilled and developed and final well flows / yields are known

- fabrication and installation of pump station headworks

- direct negotiations for the provision of electrical works (design, supply and installation)

- site reinstatement

6.5

Fast

- tracking the capital works project requires changing existing procurement arrangements and negotiating new rates. Fast

- tracking has the potential to result in cost increases, particularly if additional resources need to be brought to the city.

6.6

Fast

- tracking also requires changes to funding arrangements by bringing back money and sourcing additional funds from less critical projects.

6.7

It is proposed to combine the fast

- tracking of the capital works programme with additional risk management processes that are over and above the processes outlined in Appendix A, Section 10 and include:

- shutting down the most vulnerable shallow wells where operationally feasible: this has already taken place at Burnside, Harewood and Wrights pump stations

- opening boundary valves between the Northwest zone and neighbouring zones to feed secure groundwater into the Northwest zone which aids the operation of the zone in times of

high
water demand (i.e. summer). Note that hydraulic modelling is required to confirm this is operationally feasible

-
chlorinating the source water at Farrington, Grampian and Avonhead pump stations, before it enters the distribution system, by utilising the existing portable chlorination units that had been used during the earthquake recovery between March and December 2011. Note that this requires communication with the public, particularly vulnerable residents such as dialysis patients who will have to take additional measures to remove the chlorine from their private water supplies.

-
carrying out additional daily E. coli and FAC sampling at Farrington, Grampian and Avonhead pump stations where the remaining shallow wells can't be shut down until the deep wells have been drilled due to water demand in the area
Council
22 September 2016
Item No.: 50
Page
899
Item 50

-
carrying out wellhead security assessments on the remaining shallow wells (Farrington, Grampian, Avonhead, Burnside and Harewood) to ensure there are no potential contamination paths in the area immediately around the wellheads
Significance
6.8
The level of significance of this option is medium and consistent with section 2 of this report

.
6.9
Engagement requirements for this level of significance require information and consultation with the community, particularly vulnerable parties such as dialysis patients, who would be affected by water chlorination.
Impact on Mana Whenua

6.10
This option does not involve a significant decision in relation to ancestral land or a body of water or other elements of intrinsic value, therefore this decision does not specifically impact Ngai Tahu, their culture and traditions.

Community Views and Preferences

6.11
The community and water supply customers in the Northwest zone are specifically

affected by
this option
due to the proposed temporary chlorination of the water supply and therefore
appropriate notification and communication with affected customers (e.g. dialysis
patients) is
required.

Alignment with Council Plans and Policies

6.12

This option is consistent
with Council's Plans and Policies.

Financial Implications

6.13

Fast

-

tracking the Northwest DWSNZ Upgrade project:

Additional funding required: \$

48

0,000

6.14

Funding source

—

bringing back money from future years

6.15

Chlorination

Set Up:

Setting up tempora

ry chlorination units (using liquid NaHCl) at the Farrington, Grampian and
Avonhead pump station sites and providing standby chlorination units at Burnside
and

Harewood sites:

\$2,000 per site = \$10,000

6.16

Chlorination

Monthly Maintenance / Ongoing:

-

ch

lorination units on standby (Burnside and Harewood): \$250/month per site =
\$500/month

-

chlorination units in operation (Farrington, Grampian and Avonhead): \$5,000 per site
=

\$15,000/month

6.17

A

dditional

water testing for

E. coli, pH and chlorine: \$3,0

00/month

6.18

Wellhead security assessments (Farrington, Grampian, Avonhead, Burnside and
Harewood):

\$1,500 per site = \$7,500

6.19

Funding source

—

operational budgets

Legal Implications

6.20

Legal implications in terms of negotiating new procurement terms and conditions would not

require Council approval as these decisions fall within the delegated authority of the General

Manager City Services.

Risks and Mitigations

6.21

There are risks associated with the fast

-

tracking of the programme and implementation of

additional risk management processes.

We appreciate your service, and hope you appreciate our resolve for pure water in Hawea. Should you choose to rescind permanent chlorination pursuits and back our community desire please know we will champion singing your praises from the highest rooftops.

Sincerely,

Jennifer Rumore

Hawea Stand for Pure Water

Communities, Housing and Economic Development Committee
01 September 2016

Christchurch
City Council 

15. Community Facilities Rebuild Update August 2016

Committee Comment

A list was distributed electronically to Committee members of community facilities to open between 1 September and 25 December 2016.

Committee Resolved CHED/2016/00070

(Staff recommendation accepted without change)

Part C

That the Communities, Housing and Economic Development Committee:

1. Receives the information in this report.

Councillor Turner/Councillor Livingstone

Carried

16. Anchor Projects and Major Facilities Report August 2016

Committee Resolved CHED/2016/00071

(Staff recommendation accepted without change)

Part C

That the Communities, Housing and Economic Development Committee:

1. Receive the information in this report.

Councillor Lonsdale/Councillor Livingstone

Carried

17 Resolution to Exclude the Public

Committee Resolved CHED/2016/00072

Part C

That at 4.03 pm the resolution to exclude the public set out on pages 364 to 365 of the agenda be adopted.

Councillor Turner/Councillor Scandrett

Carried

The public were re-admitted to the meeting at 4.13 pm.

Meeting concluded at 4.14 pm.

Communities, Housing and Economic Development Committee
01 September 2016

Christchurch
City Council 

CONFIRMED BY THE CHAIRPERSON OF THE COMMUNITIES, HOUSING AND ECONOMIC
DEVELOPMENT COMMITTEE AND THE PRINCIPAL ADVISOR PURSUANT TO STANDING ORDER
3.18.2.

CONFIRMED THIS xxx DAY OF SEPTEMBER 2016.

COUNCILLOR ANDREW TURNER
CHAIRPERSON

Report from Infrastructure, Transport and Environment Committee – 1 September 2016

29. Drinking Water E. coli Testing and Risk Mitigation Processes

Reference: 16/1048846

Contact: John Mackie john.mackie@ccc.govt.nz

941 6548

1. Infrastructure, Transport and Environment Committee Consideration

1. Christchurch City Council Officer John Mackie presented to the Committee.
2. Denise Tully, Drinking Water Assessor from the Christchurch District Health Board joined the table to speak to the Committee.
3. The Committee considered the report on Drinking Water E.coli testing and risk mitigation processes and recommended to endorse the accelerated Bore Renewal Programme and asked that staff consider the issues raised in the Medical Officer of Health's letter and report back to the Council.

2. Staff Recommendations

That the Infrastructure, Transport and Environment Committee:

1. Receive the information in this report

3. Infrastructure, Transport and Environment Committee Recommendation to Council

Part A

That the Council:

1. Receive the information in this report.
2. Endorse an accelerated Bore Renewal Programme so that the shallow bores in the North West be completed as soon as possible.
3. Request that staff consider the issues raised in the letter from the Medical Officer of Health and report directly to Council.

Attachments

No.	Report Title	Page
1	Drinking Water E. coli Testing and Risk Mitigation Processes	388

Drinking Water E. coli Testing and Risk Mitigation Processes

Reference: 16/993999

Contact: John Mackie

John.mackie@ccc.govt.nz

941 6548

1. Introduction

- 1.1 The purpose of this report is to provide Council executive and elected members background information about the city's drinking water compliance monitoring programme to understand the risk to the Community given that Christchurch operates an untreated water supply that is fed from groundwater aquifers.
- 1.2 The topic of drinking water security has received a great deal of media attention in recent weeks and it is important that the Council and the community are fully informed of the steps that are taken by Council staff, contractors and partner agencies to maintain a safe and healthy drinking water supply.

2. Executive Summary

- 2.1 Council's water supply situation and risk management processes can be summarised as follows:
 - With the exception of the Northwest Christchurch zone, all of Council's groundwater supplies have the highest grading possible for a secure groundwater supply which is 'B' for the groundwater source (satisfactory, very low level of risk). The Northwest Christchurch groundwater supply is currently graded 'D' as this zone is served from shallow aquifers. Capital works to develop deeper wells into the deeper confined aquifers are in progress to improve the water quality and the future grading. Refer to section 5.
 - Council's comprehensive water quality monitoring programme is carried out in accordance with best practice and is fully compliant with the Drinking Water Standards for New Zealand. Additional monitoring and sampling is also undertaken well in excess of the minimum DWSNZ requirements. Refer to section 6.
 - The Drinking Water Standards for New Zealand (DWSNZ) use E. coli as an indicator organism for the potential presence of faecal material (which could include a range of organisms including Campylobacter and Cryptosporidium) due to the fact that E. coli water samples don't require specialist filtering procedures, the laboratory turnaround time is short (24 hours) compared to other microbiological analyses that take longer and are more expensive.
 - Response is programmed to proactively and quickly deal with any emerging issue through isolation and/or chlorination. If the contamination was caused by a microorganism other than E. coli then Council has the ability to expedite investigatory work required in liaison with the local District Health Board to identify the offending bug. Refer to section 8.
 - Council has effective risk management and mitigation processes in place to manage risks to the water supply. Refer to section 10.
 - Various water treatment based risk mitigation options exist but have very high capital and ongoing operational costs. Refer to section 11.

3. Staff Recommendations

That the Infrastructure, Transport and Environment Committee:

1. Receive the information in this report

4. CCC Drinking Water Supplies

- 4.1 CCC owns and operates 11 water supply schemes in the urban Christchurch and Banks Peninsula areas.

Supplies & Zones	Supply Population	WINZ Community Code	Supply Type	Risk Grading
Urban Christchurch				
Christchurch Central	255,500	CHR001	Groundwater (DWSNZ secure groundwater status)	Ba
Central	185,000			Ba
Rocky Point	2,500			Ba
Parklands	16,000			Ba
Riccarton	10,000			Ba
West	42,000			Ba
Northwest Christchurch	80,000	NOR012	Groundwater	Da
Brooklands / Kainga	1,600	BRO012	Groundwater (DWSNZ secure groundwater status)	Ba
Banks Peninsula				
Lyttelton	4,450	LYT001	Groundwater (DWSNZ secure groundwater status)	Bb
Lyttelton	2,500			Bb
Diamond Harbour	1,200			Bb
Governors Bay	750			Ba
Akaroa	1,350	AKA001	Surface Water	Uu
Birdlings Flat	150	BIR001	Groundwater	Uu
Duvauchelle	250	DUV001	Surface Water	Uu
Little River	240	LIT001	Surface Water	Uu
Takamatua	150	TAK002	Surface Water	Uu
Wainui	200	WAI138	Groundwater (DWSNZ secure groundwater status)	Uu
Pigeon Bay	26	PIG001	Surface Water	Uu

5. Water Supply Public Health Risk Grading

- 5.1 The purpose of the public health grading of community drinking-water supplies is 'to provide a public statement of the extent to which a community drinking-water supply achieves and can ensure a consistently safe and wholesome product'.
- 5.2 This is determined by the extent to which a community drinking-water supply conforms to the DWSNZ and whether adequate barriers to potential contamination are in place to minimise risk to public health.

- 5.3 The grading has two letters. The first letter (capital) represents the source and treatment grading, while the second letter (lower case) grades the water in the distribution zone (reticulation system).

Source and treatment grading:

Assessment based on source and treatment factors will result in a grade:

- A1 Completely satisfactory, negligible level of risk, demonstrably high quality
- A Completely satisfactory, extremely low level of risk
- B Satisfactory, very low level of risk when the water leaves the treatment plant.
(*'B' is the highest possible grading for an untreated secure groundwater supply*)
- C Marginally satisfactory, low level of microbiological risk when the water leaves the treatment plant, but may not be satisfactory chemically.
- D Unsatisfactory level of risk
- E Unacceptable level of risk
- U This means that the supply has not been graded by the Drinking Water Assessor

Distribution zone grading:

Assessment based on reticulation condition, management and water quality will result in a grade:

- a1 Completely satisfactory, negligible level of risk, demonstrably high quality.
(*only supplies with a disinfection residual can achieve an 'a1' distribution zone grading*)
- a Completely satisfactory, extremely low level of risk
- b Satisfactory, very low level of risk
- c Marginally satisfactory, moderate level of risk
- d Unsatisfactory level of risk
- e Unacceptable level of risk
- u This means that the reticulation has not been graded by the Drinking Water Assessor

Minimum acceptable gradings are:

- Ba for water supplies serving community of greater than 10,000 residents
- Bb for water supplies serving a community between 5,001 and 10,000 residents
- Cc for water supplies serving a community of less up to 5,000 residents

- 5.4 Public health grading is currently a voluntary process which is the reason why most of CCC's Banks Peninsula water supplies are currently ungraded and expressed as Uu on the register of New Zealand community drinking water supplies on www.drinkingwater.org.nz.
- 5.5 CCC will get all water supplies graded when all capital works have been completed in a particular water supply.
- 5.6 Wainui was graded in July 2016 as having a Bb grade, however, the official grading report has not yet been released.

6. Drinking Water Compliance Monitoring Regime

- 6.1 Drinking water quality compliance monitoring is carried out in accordance with the provisions of the Drinking Water Standards for New Zealand 2005 (rev 2008) (DWSNZ).
- 6.2 E. coli is the indicator organism for microbiological compliance as it is easy to detect, does not require labour-intensive sample collection processes and has a relatively short laboratory turnaround time (24 hours incubation period).
- 6.3 The drinking water sampling schedules are approved by a Drinking Water Assessor from CDHB Community & Public Health and all water sampling and analysis is carried out by Council's laboratory which is IANZ accredited and Ministry of Health approved.
- 6.4 The water sampling regime for the water source / treatment plant is dependent on the type of water source which in general terms means that more samples are required for surface water and non-secure groundwater sources and less samples (3 samples per quarter) are required for secure groundwater sources as those are deemed to have a very low risk of contamination.
- 6.5 The sampling regime for the distribution zones is population dependent with daily sampling in the large distribution zones.
- 6.6 In addition to the sampling requirements outlined in the DWSNZ CCC has additional monitoring requirements:
 - All secure groundwater sources / well sites are tested monthly.
 - All reservoirs are tested monthly.
 - The target sample numbers for the distribution zones are 150% of the DWSNZ minimum sample requirements, and on average Council takes 200% of the number of samples required by DWSNZ
 - Approx. 15-20% of all water supply wells – approx. 20-25 wells - are tested for a comprehensive range of chemical parameters each year.

7. Sampling Results in FY 2015/16

- 7.1 In the FY 2015/16 a total of 5,487 samples had been analysed for E.coli in Christchurch City and Banks Peninsula of which 14 returned a positive result for E.coli. This equates to 0.26% of samples analysed showing presence of E.coli. No E. coli was found in secure groundwater well sites. The 14 positive results were related to 9 transgression events as outlined in the following table. 5 transgression events were related to water reservoir tank issues that occurred after rainfall and 1 transgression event was caused by a treatment plant equipment failure. 2 positive samples were from a pump station which sources water from shallow non-secure wells in the Northwest zone.

Date	Supply (Source, Distribution)	Location	No. of positive E. coli samples per event	Details and Possible Cause
03/08/2015	Little River (Distribution)	Western Valley Rd	3	Airlock in liquid chlorine dosing unit, caused by subcontractor construction work upstream. Pipework has been altered to reduce potential for air locking.

Date	Supply (Source, Distribution)	Location	No. of positive E. coli samples per event	Details and Possible Cause
04/01/2016	Central (Distribution)	Major Aitken 2 reservoir	1	Rainfall event resulted in water ingress via defects in roof. Defects identified, on repair programme
18/01/2016	Central (Distribution)	Mt Pleasant 1 reservoir	1	Rainfall event resulted in water ingress via defects in roof. Defects identified, on repair programme.
19/02/2016	Northwest (Source)	Burnside pump station	1	Presence detected at pump station outlet. No further presence nor count detected. Shallow wells on replacement programme (Northwest DWSNZ Upgrade).
17/03/2016	West (Distribution)	Burkes Track 2 reservoir	1	Rainfall related – defects in roof to be rectified (reservoir roof lining).
18/03/2016	West (Distribution)	Halswell 1 reservoir	1	Rainfall related – defects in roof to be rectified (reservoir roof lining).
26/03/2016	Northwest (Source)	Burnside pump station	1	Presence detected at pump station outlet. No further presence nor count detected. Shallow wells on replacement programme (Northwest DWSNZ Upgrade).
06/04/2016	Lyttelton (Distribution)	Buxton 2 reservoir	2	Possible contamination pathway through reservoir lid. Included on chlorine spraying round. Reservoir replacement scheduled.
01/06/2016	Northwest (Distribution)	151 Greers Rd	3	Probable source shallow wells at Burnside pump station. CCC shut down pump station. Shallow wells on replacement programme (Northwest DWSNZ Upgrade).

8. Corrective Actions Taken When Transgressions Occurred

- 8.1 All procedures were undertaken in accordance with the provisions of the DWSNZ. As soon as a water sample returned a positive test for E. coli a CCC Laboratory staff member notified all 32 members of the 'Transgression Response' email distribution list.
- 8.2 A group of representatives from CCC Network Operations, Asset Management, CCC Laboratory and the maintenance contractor City Care then used the City Services Procedures Manual procedure WS-003 Water Contamination to develop an appropriate response plan to address the issues.
- 8.3 In all 9 transgression events the immediate response plans included steps to isolate the suspected source, undertake a comprehensive sanitary survey (sampling in the nearby distribution zone and from the source), carry out an investigation of the possible causes for these transgressions and corrective action to rectify the issues such as chlorination of the

reservoir, mains flushing in the distribution zone, equipment maintenance, implementation of a reservoir roof repair programme etc.

- 8.4 The local Drinking Water Assessor was notified on every occasion, consulted and kept informed of the actions taken and the progress made. The Drinking Water Assessor was also notified when 3 consecutive clear days had been achieved at the original transgression site.

9. Transgression Events in Previous 4 Financial Years and Determination of Root Cause

	FY 2015/16	FY 2014/15	FY 2013/14	FY 2012/13
Total number of samples taken	5,487	6,163	6,827	6,395
No. samples with E. coli present	14	29	39	43
Transgression events :	9	11	23	15
Reservoir	5	5	16	5
Distribution	2	3	5	7
Water Treatment Plant	0	2	1	2
Groundwater / Well	2	1	1	1

- Sampling data from the previous 4 financial years suggest that water supply reservoir tanks are the main contributors to the Council's transgression count. Corrective actions always proved successful and over the last years Council has made significant improvements to its reservoir maintenance programme to reduce the risk.
- Equipment failure at water treatment plants has in the past resulted in E. coli being present, however, all Banks Peninsula treatment plants have had significant upgrades over the past years which reduced the risk of future transgressions greatly.
- Positive E. coli results from groundwater wells or pump stations with wells on site are rare and were related to shallow non-secure wells on site (which are currently being replaced under the Northwest DWSNZ Upgrade project) or related to the water storage / suction tanks on site.

10. Programmes and Initiatives to Reduce Public Health Risk

- 10.1 Council has several operational and capital works programmes in place to reduce public health risks.
- 10.2 **Northwest DWSNZ upgrade:** this \$16m project started in FY 2012/13 and includes the drilling of deep wells and the decommissioning of all remaining 22 unconfined aquifer 1 wells in the Northwest zone. The programme will be completed by 30 June 2018.
- 10.3 **Reservoir condition assessments:** maintenance contractor City Care has purchased an underwater camera which allows them to check the entire reservoir for structural issues even when the reservoir is filled. They have also implemented a 'roof spraying programme' where the roofs of reservoirs that are known to have structural defects are being sprayed with a chlorine solution to prevent ingress of contamination until the repairs have been completed.
- 10.4 **Increased water quality sampling:** as outlined in section 5 Council takes more than the minimum number of water samples in all water supplies, usually at least 200% of the minimum number of samples. In response to recent events in the North Island, we propose to increase this sampling even further to provide additional assurance to the community.
- 10.5 **Water Safety Plans:** CCC has Ministry of Health approved water safety plans for all water supplies. The plans contain supply specific risk assessment tables and improvement schedules that aim to reduce the most significant risks. The water safety plans are reviewed on an annual

basis and the Drinking Water Assessors carry out implementation audits onsite together with Council staff and specify improvement items as required.

- 10.6 **Liaison with Environment Canterbury:** Council maintains a close working relationship with Environment Canterbury groundwater scientists and shares water quality data which enables the preparation of long-term groundwater quality trends. Council also regularly provides comments on resource consents that have the potential to affect Council's water supplies.
- 10.7 **Backflow Prevention:** Council has a backflow policy in place that requires high risk properties to install testable double backflow devices on the point of water supply in order to reduce the risk of contaminated water entering the public water supply.
- 10.8 **Authorised Water Supply Installer Scheme:** Council operates an authorised water supply installer scheme which ensures that only suitably experienced and qualified individuals are permitted to work on Council owned water supply reticulation assets. All water supply installers are aware of the hygiene procedures they need to follow in order to reduce the risk of water supply contamination.
- 10.9 **Permit to Work System:** CCC has put the Permit to Work (PtW) system in place for works on the water supply and wastewater networks in order to ensure that Council has visibility of what is happening in the networks, can notify its principal maintenance contractor of work carried out by others, in case an after-hours response is required and can notify the applicant of any special conditions and precautions they should take in doing the work and any contingencies and remedial actions required.

11. Future Risk Management Options

- 11.1 If a decision was made at a local or national level that the public health risk of supplying untreated water to communities such as Christchurch was no longer acceptable, then Council has several options to address and mitigate those risks.
- 11.2 **Risk management based approach;** by means of more stringent water quality monitoring and proactive measures to monitor and assess risks, e.g. land use controls, inspection programmes, asset assessments, better monitoring of network activities, closer relationships with ECan, connecting with our commercial and industrial ratepayers, looking further afield (Canterbury Plains etc.)
- 11.3 **Disinfection at all Christchurch pump stations:** by installing chlorination and ultraviolet equipment at 55 sites. ROC \$100m plus ongoing operational costs.
- 11.4 (After the February 2011 earthquake Council installed portable chlorination units at 26 sites across the most vulnerable and earthquake affected parts of Christchurch. The units chlorinated the supply between March and December 2011 until key water infrastructure repairs had taken place. A comprehensive water quality monitoring programme was in place during those months and no outbreak of disease was recorded which was a very good public health outcome.)
- 11.5 **Alternative (non-groundwater) source:** In 2005 Council commissioned a report that looked at water supply options if the aquifer system became contaminated. A number of options were discussed and considered. The option of using the Waimakariri River as an alternative surface water supply and treating the water at a centralised membrane water treatment plant had a ROC of \$67m plus ongoing operational costs at 2005 construction prices.
- 11.6 **Accelerated Bore Renewal Programme:** Council staff are assessing a proposal to accelerate the shallow bore renewal programme in the Northwest zone of the city in order to reduce the contamination risk even further. This may require a re-prioritisation of our capital programme and securing additional resources to expedite the construction and commissioning.

Attachments

There are no attachments for this report.

Signatories

Author	John Mackie - Head of Three Waters and Waste
Approved By	David Adamson - General Manager City Services