



Assessments of Various Services

Christchurch City Three Year Plan
Christchurch Ōtautahi

Cemeteries and Crematoria

This assessment considers the adequacy of the provision of cemeteries and crematoria in Christchurch City to meet future demands for disposal of the dead in a controlled, hygienic and dignified manner for the period 2013 to 2023. The following report is a compilation of information provided by the former Banks Peninsula District Council and Christchurch City Council in a Sanitary Services Assessment in 2005 and updated to 2012.

Key findings are:

- Following the last sanitary services assessment it was decided to prepare a Cemeteries Master Plan. This plan is due to be finalised in 2013 and will consider use and burial practices for all the cemeteries.
- There is sufficient capacity within existing urban district cemeteries (within existing beams) to meet predicted demand for the next 3 years with further existing land to be developed through the capital programme to meet a 20 year period, however this would be reduced to 15 years following a pandemic. Location of urban cemeteries is an issue though that needs to be addressed and more land acquired.
- Rural district and small settlement cemeteries on the peninsula have sufficient existing capacity with further existing cemetery land able to be developed through the capital programme to meet long term demand.
- Because of community preference for locally accessible cemeteries, there is a requirement for a new cemetery site to service the northern urban part of the city. Additional land is required to further extend Avonhead and Belfast cemeteries.
- Limitations on the pre-purchase of cemetery plots are required to extend cemetery life spans and optimise cemetery use as there is a significant number of pre-sold plots using up land that will take many years to be utilised.
- Returned Services needs will continue to be met, and a wider range of cultural preferences to meet differing people's needs and ashes interment areas is required.
- Marketing to improve the use of less known cemeteries and ashes interment areas is required.
- Current capacity at both cemeteries and crematoria is sufficient to deal with death rates from a civil emergency or pandemic. However, during the next 10 years, it would be prudent to investigate an area that could be used for both mass burial and as a future cemetery.
- No public health issues were identified by the Medical Officer of Health. The issues of groundwater contamination from cemeteries and air discharges from crematoria which were raised by other agencies are considered in the assessment.

Asset description

There are 27 cemeteries located within the Christchurch district with 14 on the peninsular and 13 in the urban area which are managed by the Christchurch City Council (Council). Three cemeteries on the peninsula are owned by the Council but are managed by others. Fifteen of the 27 Council cemeteries are either closed or have reached capacity with the only burials being a second burial in an existing plot or burial in a reserved plot. In addition to the Council cemeteries, a number of churches (14) have their own burial grounds and there are 3 privately owned burial grounds on the peninsula.

Cemeteries and crematoria are provided for the community and the provision of this activity does not significantly alter, based on the geography or demographic profile of different parts of a community.

However, the Christchurch district differs from most others around New Zealand in that most districts have only two or three larger operational cemeteries whereas in Christchurch there are six operational in the urban area and 12 typically smaller rural cemeteries on the peninsula. The effect is that there tends to be a localised community need around each cemetery.

Following the earthquakes, it is predicted demand for cemetery space will grow disproportionately in the western side of the city.

The Christchurch City Council does not own or operate any crematoria. Cremation services within the Christchurch district are provided by three private companies. The Cremation Society of Canterbury has two facilities, one located at Linwood and the other at Harewood. The Garden City Crematory also has a cremator, and it is located at Sockburn. Mainland crematorium opened in Sydenham in 2012. No defined catchment could be determined for each of the crematoria; therefore, the assessment considers the entire district of Christchurch as a single community for cremation services.

Public health issues

Public health issues in cemeteries relate to work around graves, potential environmental effects such as contamination of ground water, and the ability of cemeteries and crematoria to cope with large numbers of dead following a natural disaster or pandemic. The few public health issues relating to cremation relate to air discharges, radiotherapy effects and devices, such as pacemakers.

Appropriate operating procedures are in place and documented for public health issues relating to both cemetery operations and cremations. The application of

the procedures is audited as part of the ISO certification process.

It is expected that there will be a substantial increase in predicted deaths for the resident population over the next 20 years owing to a combination of an aging population and the large increase in population in the district (at 2006).

Current capacity

The current capacity of cemeteries is calculated by considering both the current number of available plots both for burials and ashes and the future demand projections.

Christchurch City records information on the number of burial plots available. This excludes plots that have been pre-sold.

Cemetery	Ashes plots developed	Full burial plots developed	Future capacity ashes ²	Future capacity full burials ²
Addington	Closed			
Akaroa French	Closed			
Akaroa Anglican,	1	9	At capacity	At capacity
Akaroa Dissenters,	0	4	At capacity	At capacity
Akaroa Catholic	0	69	At capacity	At capacity
Avonhead	180	355	166	664
Barbadoes	Closed			
Belfast	0	0	7801	16541
Bromley	0	0	130 (note: this is only if the Sextons House is removed)	260 (note: this is only if the Sextons House is removed)
Diamond Harbour	0	18	648	314
Duvauchelle	104	49	756	534
Kaituna	0	50	0	56 (note: full burial plots could be used as ash plots if required)
Le Bons	0	45	300	1,800
Linwood	18	50	At capacity	At capacity
Little River	0	388	32	196 (note: full burial plots could be used as ash plots if required)
Lyttelton Anglican	10	0	At capacity	At capacity
Lyttelton Catholic	0	0	At capacity	At capacity

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Cemetery	Ashes plots developed	Full burial plots developed	Future capacity ashes ²	Future capacity full burials ²
Memorial	196	474	1322	6265
Mt Magdala	Closed			
Okains	-	180	300	1,500
Pigeon Bay	0	150	100	314
Ruru	70	100	At capacity	At capacity
Rutherford	Closed			
Sydenham	170	30	At capacity	At capacity
Waimairi	122	0	At capacity	At capacity
Wainui	1	13	53	198
Yaldhurst	68	510	1158	2260
TOTAL	940	2494	5745	16015

There are a significant number of pre-purchased burial plots in the Christchurch cemeteries, representing about 3 to 5 years of total burial capacity for the City. At present there is no restriction on the pre-purchase of plots, accelerating the need for additional burial plots. The impact is highlighted by the 457 plots sold but unoccupied at Belfast Cemetery. It now has only a few burial plots remaining and a new cemetery site for the northern part of the city is being sought. The draft Cemeteries Handbook proposes to limit pre-purchases to two per person to assist in addressing this issue

Future demand

In the 6 years to June 2012, the average full burial rate at city cemeteries was 568, with 250 for ashes. Given 1,519 full burial plots and 824 ashes plots are available as at November 2012 within the urban cemeteries, even discounting future growth predictions, full burial plots would become exhausted in just over 2 years, with ashes in just over 3 years. Many cemeteries have room for further development, however. If all currently available cemeteries land were to be developed as plots, 3,600 ash plots and 11,000 full burial plots would be available, which would allow for 14 years worth of ash interments

and 19 years of full burial interments at current demand levels. A predicted 2% annual growth rate would reduce this to 12 years for ashes and 16 years for full burials. This does not take into account other potential factors such as a pandemic or setting aside areas for particular groups.

No new plots are available at Bromley and Linwood cemeteries but land is available for development if the former sexton's house is removed at Bromley and there are a number of pre-sold plots still remaining at these cemeteries.

The first operational cemetery to reach capacity is Belfast which has only one new plot available. This creates a significant gap in the cemetery distribution, there being no operational cemetery in the northern part of the district. At February 2013 it is proposed to purchase a block adjacent to the existing cemetery which would increase capacity by 780 ash plots and 1654 full burial plots. It is also hoped to be able to purchase a block adjacent to Avonhead Cemetery for which demand is increasing. Demand for interments in the west side of the city is expected to increase following the quakes.

Over the last six years burial numbers have remained fairly static reflecting a greater preference for cremation, which is outside the scope of the Christchurch City Council's responsibility. Urban cemeteries have areas of land available but with new beams to be installed as part of the capital programme for the next eight years.

In the mainly rural area of Banks Peninsula there is capacity based on an average of 10 burials per year for 90 years, with overall undeveloped capacity for the very long term at this current rate. However the two Lyttelton cemeteries are full and the Akaroa cemeteries are in a similar situation which is an issue that needs to be addressed. Diamond Harbour Cemetery will need to take over for the burials in the Lyttelton Basin area and Duvauchelle for Akaroa

Another trend that needs to be addressed is that as people become larger, so do full burial caskets and plot sizes will need to be increased which will again use more land.

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Ash Plots

Ash plots are easily accommodated as they take up minimal area. At present there are 940 plots available in Council cemeteries. It is possible that additional ash plots could be created if required.

Based on the continuation of the high demand forecast for new ash plots, which is averaging 250 per year, capacity will be reached in 2015 (all available plots used). It should be noted that Christchurch City Council provides for only a small proportion of ash burials in the district. The majority are held or scattered by friends and relatives, interred in an ash plot or columbarium at one of the churches, or in the memorial gardens at one of the crematoria.

Pre-purchased ash plots represent a small proportion of total ash plot capacity for the City, in the order of one to two years. Although allowing pre-purchase has no major effect on the long term net capacity of the city's cemeteries, except where they remain unused, they accelerate the need for new areas and additional infrastructure. The draft Cemeteries handbook (2013) proposes limiting pre-purchased plots to two per person.

Special designated areas

Special burial plots available in Council cemeteries include White Russian, (Belfast), Indian, (Sydenham), Muslim (Rum Lawn; Memorial Park), non-local Maori (268 plots, Memorial Park), Jewish, (Linwood), and at Memorial Park Cemetery for Russian Orthodox. In addition, a request has been received for an area to be set aside for the Bhutanese community at Memorial. Such requests are required to be considered under Burial and Cremation Act 1964.

Representatives of Pacific Island people have asked that a more culturally-sensitive approach be applied to their burial needs which could involve the designation of special areas to meet these requirements. The proposed Cemeteries Master Plan will consider community and other needs for denominational areas in cemeteries

as the newer ones no longer have different religions in segregated areas.

Returned Services Association plots

Returned Services Association (RSA) plots are provided in the Ruru Lawn cemetery. Analysis of the actual burial records and plot availability indicates that the RSA ash plots section will have room for further headstones beams extension. RSA burial plots can be extended as well as there is room in the current location for more headstone beams to be laid.

The expected use of the RSA section is expected to taper off in the next 10 years as the WWII veterans pass away.

It is therefore recommended that RSA areas be monitored regularly and if another area is required that a dedicated site could be provided across the road at Memorial Park Cemetery.

Crematoria

There was a lack of detailed information provided by the crematorium operators for the 2005 assessment perhaps relating to commercial sensitivities. It was therefore difficult to accurately assess the provision for cremation. However, from the cremation information available and the Christchurch City burial records, assumptions could be made about the expected average annual resident and out-of-district cremations. Analysis showed that the total capacity of the operating crematoria in the district was well in excess of forecast demand. Time has not allowed for renewed discussions with the cremation owners but will be followed up.

Options to meet demand

The assessment of cemeteries and crematoria has shown that the overall provision of land for cemeteries and total number of cremators is adequate to meet overall demand within the district for the 10 year planning period and beyond. However there are localised issues that need to be addressed with Lyttelton cemeteries full and a similar

situation in the north of the urban district with more land needed in that locality.

- The assessment highlights a community preference for the provision of local cemeteries. In order to continue to meet this need the following actions are recommended:
- A new cemetery is provided in the northern part of the city as a replacement for Belfast Cemetery for which it is intended to extend this cemetery.
- Develop additional capacity with additional adjoining land purchase at Avonhead Cemetery.
- Investigate provision of designated burial areas to meet the needs of Pacific Island people.
- A limit on the pre-purchase of plots is established
- Further explore the shared use of Shands Road Cemetery with Selwyn District Council and continue to use Yaldhurst in the meantime.
- Options for improved use of plots are investigated, particularly ash plots.
- A public promotion plan for less known cemetery sites is developed and implemented.
- Investigate future provision of an area that could be used for mass burial purposes and as a future cemetery site.
- Lyttelton basin area burials will need to be located in
- Diamond Harbour Cemetery.
- Akaroa are burials will need to be located in Duvauchelles Cemetery.
- Larger casket sizes being used will require larger plot sizes and the uptake of available full burial space at a faster rate than currently.

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Role of the Council

The Council owns and operates all but three of the operational cemeteries in the city, excluding the church cemeteries, and has proposed purchasing land for an extension to Belfast Cemetery. Funding for further provision in the north or west of the urban area will be sought through the draft 2013 -2022 Long Term Plan. It provides a service for interment by burial and of ashes. The management, design, development and maintenance of both operational and closed cemeteries are also provided by Christchurch City Council.

In order to meet future demand, the Council will plan for increased need and develop new areas for cemeteries. It will provide funding for cemetery infrastructure, such as landscape treatment, roads, footpaths, water supply and drainage. Appropriate funding provision for cemetery infrastructure will be made in The Christchurch City Council Long Term Plan.

Identification of issues

Discussions were held with the following persons/ organisations in 2005 in order to identify any issues relating to the provision of cemeteries and crematoria and/ or any public health issues. It was considered important to ensure that any issues were identified and addressed through the assessment.

The Medical Officer of Health did not identify any current public health concerns relating to cemeteries and crematoria in the Christchurch district.

Environment Canterbury raised potential issues as being air discharges from crematoria and contamination groundwater from cemeteries.

Christchurch City Council Environmental Health raised a number of issues including high water tables

in some cemeteries, potential hazards from unstable headstones and ensuring that burials are performed at correct depths. Measures have been taken to eliminate or manage all of these concerns to mitigate any public health risks.

The Selwyn District Council raised the possibility of joint development with Christchurch City Council of the Shands Road cemetery, located close to the Christchurch City boundary. Further investigation into this option was proposed.

Post earthquakes many cemeteries have suffered damage to headstones, land and infrastructure. A programme of making headstones safe has been completed (2012) and currently (February 2013) headstones and other cemetery memorials are being prioritised for repair. Limited access only will be possible to Lyttelton Cemeteries until retaining walls and land can be made safe.

Adequacy of assessment

The assessment of 2005 was considered to fully meet the requirements for a sanitary services assessment as set out in Part 7 Sub-part 1 of the Local Government Act 2002. The information has been updated to 2008 figures.

The information used in the assessment is considered to be adequate to provide an informed view about the adequacy of cemetery services and facilities in the Christchurch district. In preparing the assessment, a number of assumptions have been made relating to death rates, the ratio of burials to cremations, and the number of out-of-district burials. The information used in calculating future demand is based on statistical information provided by the Department of Statistics and burial and cremation records held by the Christchurch City Council. This information has been extrapolated to provide a comprehensive view of capacity and future demand.

Little data was available relating to the provision for cremation. However, enough information was gathered to determine that operators are operating at capacity. Therefore, this is unlikely to become an issue within the assessment period. If capacity were to become an issue, it is likely that one of the operators would install an additional cremator or one of the larger funeral directors would consider purchase of a cremator.

The assessment has not been compromised by a lack of information or by cost of obtaining information and is considered to be a full and balanced assessment of cemeteries and crematoria

Public Conveniences Summary

Under the Local Government Act 2002 (LGA) councils are required to periodically assess the provision of sanitary services – including public toilets.

This assessment focuses on non-residential toilets as a sanitary service provided in the City, mainly in public parks. This report is a compilation of information provided by a 2008 survey of all buildings in parks in relation to building maintenance and updates the Sanitary Services Assessment in 2005. Updates have been made to assets numbers and where improvements have been implemented following the 2008 assessment. Further updates detail earthquake related matters affecting the provision of public toilets in the city. No update information was available for non parks toilets and the cleanliness survey has not been repeated.

In delivering this assessment the report:

- identifies the current and forecast metropolitan situation relative to the total supply and demand for public conveniences, as distinct from those provided in residential dwellings, in order to ensure that appropriate and adequate provision is made
- identifies Councils current response, both regulatory and through direct provision of services, to the demand and to the maintenance of appropriate health outcomes for the community
- identifies and presents options for ongoing and future provision – including options to reduce, maintain, change or enhance levels of service provided directly or indirectly to the public
- recommends Council preferred options to meet ongoing demand and maintain appropriate health outcomes for the community.

This assessment considers the public access to non-residential toilets in terms of the:

- contribution to achieving public health outcomes through ensuring the public have adequate access to clean and safe toilet facilities, while away from home
- capacity to meet reasonable expectations of
- Christchurch residents visiting public places
- capacity to meet reasonable expectations of tourists visiting public places.

Identification of public health and other issues

The flowing perspectives and issues have been identified through consultation with stakeholders and interested parties, and also through complaints received by the Council about public toilets.

Public toilets need to be:

- located in convenient places
- open at convenient times
- occur in sufficient quantities to reflect demand (e.g. at events)
- hygienic, safe and secure (e.g. are clean at all times, have sufficient hand washing facilities, have sufficient lighting, have safe disposal for other wastes left by the public including sanitary items, condoms and syringes etc)
- fully functioning and regularly maintained (e.g. all fixtures are fully operational, and septic tanks or composting toilets are emptied and cleaned appropriately).

Council's role and other service providers

Public access to toilets, other than those in residential homes, is currently provided by a wide range of businesses activities, educations, institutions and other organisations – with toilets located either within or associated with their facilities. These businesses and organisations have an obligation to provide toilet facilities for their staff and in most cases for their customers (for the purposes of this report these toilets are referred to as in the Public Domain”).

The provision of public toilets is not the primary driver for most organisations, consequently the extent and quality of the toilets is driven by staff and/or customer expectations and regulatory compliance. However, some businesses do view the provision of toilets as part of a complementary service (e.g. service stations generically provide toilet facilities, in much the same way as they provide free air for tyres). In general the presence of staff at these businesses and the requirements of customers result in reasonable levels of monitoring toilets in terms of cleanliness, supplies and condition.

The Council is also engaged in a number of activities such as libraries, community centres, parking buildings and services centres, providing toilets for staff and visitors at these locations (for the purposes of this report these toilets are referred to as “Secondary Council Sites”). Separate to these are “public toilets” provided by the City Council and hire companies. The latter generically provide portable toilets for specific events or worksites (in this report these toilets will be referred to as “Primary Public Toilets”).

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Within the Christchurch district there are 215 Council-owned public toilets:

- 171 are toilets located in or associated with parks;
- 34 toilets are also located in pavilions
- 10 are located in predominantly urban retail areas such as Addington and Papanui.

Assessment of the level of service

In this assessment of the sanitary services, a city-wide audit was made on the levels of service provided by Primary Council sites and a sample survey of both Secondary Council and Public Domain sites. In addition, a building condition assessment was completed on Primary Council sites to determine current maintenance issues and long term maintenance and renewal requirements.

The results of the condition assessment showed that on the whole the buildings were in relatively good condition with some notable exceptions. Future maintenance and renewal requirements for surfaces, fixtures and fittings are planned based on the passing of time, industry standards and/ or a decline in condition. It can also be triggered by other enhancement programmes associated with the facility.

Shopping centres and major fast food outlets perform well in terms of the provision of public conveniences due to their location at high usage points, availability during all normal shopping hours, high standard of amenity, and in particular, frequency and standard of cleaning. Petrol stations also performed well but with less consistency in terms of access for non-patrons, the standard of amenity and the level and frequency of cleaning.

As a large, diverse portfolio of properties, Council's secondary sites scored better than petrol stations in terms of availability but inferior to other providers with some facilities providing staff-only access. The general level

of amenity was also inferior to shopping centres and fast food outlets as was the standard and frequency of cleaning. Location factors were however high. Within the secondary Council sites are several sub-groupings and their performance varied markedly. In general terms, for example, libraries performed very well on all criteria, whereas other community facilities such as parking buildings did not. Mostly this related to availability and cleanliness.

It is clear that the overall assessed performance of Private Domain toilets is at a consistently high level against the criteria used in the audit and that in general Council-owned facilities are inferior, in particular with regard to cleanliness.

While most of the Primary Council sites scored well, the cleanliness criterion was the poorest performing category by a significant factor and highlights the difficulty of keeping these sites clean with a lack of on-site monitoring by staff, and the open nature of the facilities.

The following details criteria used in the evaluation with the average scores for the 2005, then 171 Primary site toilets.

- Toilets are clean and hygienic with no build up of excessive litter - 80%
- Litter bins are installed internally and available adjacent externally to the site - 57%
- The site is free of unpleasant odour - 84%
- Sanitary bins are supplied and clean - 46%
- Automatic flush unit is operational and sufficient to dispose of waste - 97%
- Soap dispensers and automatic hand driers are fully functional - 35%
- Overall average 2005 66%

Particular issues that impact on the performance of cleaning at Primary and Secondary Council sites are

- Cleaning regimes only as good as the last person using the facility, therefore, frequency of cleaning is a crucial factor in maintaining standards and public perceptions;
- Some surfaces more difficult to clean and maintain hygiene standards than others;

New auditing

An auditing system developed by the city contractor who is the primary cleaning provider for the majority of public parks toilets in the city has been developed and covers areas such as, cleanliness and hygiene, refreshed with toilet paper, pipes and sumps are working satisfactorily, and the internal and external walls are clean after each service. Auditing shows that the demerit points system for not meeting the standards taken across all factors is that 3% of these factors relate to not meeting the toilet cleaning standards. Banks Peninsula toilets have now been merged in the City contract and a different cleaning standard no longer exists.

Some of the toilets in the domains and camping grounds are maintained by the reserves committees that manage the reserves. No recent detailed assessment has been undertaken for the peninsula toilets for the condition of the building asset or cleanliness.

Current and future demand

Demand for public conveniences is influenced and modified by compliance and customer expectations, however in total capacity terms it is driven by population. This needs to account not only for the resident population, but also tourist numbers and those outside the immediate geographic area who frequent the city for work, leisure or other reasons. The earthquakes experienced in 2010 and 2011 have also altered residential

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population centres and popular areas for tourists to visit. In the context of a total city wide provision of toilets in public places by Primary, Secondary and Public Domain providers, the current supply is considered adequate. The standard of some facilities, however, is less than adequate and presents a modest degree of public health concerns. More detailed demand analysis is required to inform site specific requirements with options to expand, maintain or contract (over time) the number and nature of facilities provided at individual sites. A 2008 condition assessment of 103 toilets and changing rooms on parks has found that operational maintenance of \$125,000 per year is required over the next six years to address needed maintenance repairs. A proper Facilities Management (FM) contract has now been introduced and up until the earthquakes a regular maintenance programme. There is sufficient funding for operational maintenance in the current programme, however many of the facilities require capital upgrade to ensure there are better surfaces to aid cleaning and replacement of fixtures and fittings.

Many of the toilet facilities on the peninsula which cater for visitors sometimes in larger numbers and the buildings are not adequate for this purpose due to age and size. Water supply can also be a problem with untreated water or slow supply. Again there needs to be a complete appraisal of the peninsula toilets to ascertain the capital upgrades that are needed to bring the facilities to a required standard.

In some cases total replacement is required. Many of these toilets are the old concrete block type with inadequate access, light, and air movement or are from converted buildings that were not designed to be toilets.

While site specific provision falls outside the statutory requirements of this assessment, the Special Consultative Procedure provided a legitimate vehicle for individuals, groups and the wider community to express their desires for additional or different facilities at specific locations.

Options to meet demand

Public Domain and Secondary Council toilets are subject to the Building Act and Building Code in terms of toilet design and capacity. Most of these sites take responsibility for the toilets on behalf of their staff and customers, based on user expectations and compliance. This also applies to parks and locations where Council encourages large numbers of residents and tourists to aggregate, such as at Council-run events.

However, the Building Code fails to require retailers to provide facilities for their customers in the same way that a Shopping Centre must. While true for all retailers, this inconsistent approach is most noticeable with the larger retail outlets, such as supermarkets, large format warehouse-styled retailers and bulk retailers. Similar issues exist with the provision of toilet facilities within nightclubs and other late night venues. Anecdotal evidence suggests inadequate toilet facilities are provided, which in turn contributes to anti-social behaviour in adjacent public areas.

In light of these factors, the following options are available:

1. Status Quo. Provision by a mix of Council and non-Council providers is adequate to meet the overall demand. This does not address differences in the quality of the toilets provided.
2. Improve level of service at existing Council-owned toilets. Options to achieve this include:
3. Increase provision of Council-owned toilets in retail locations. Council could choose to provide toilet facilities in retail areas to address the lack of services provided by the retailers linked to the limitations of the Building Code.
4. Reduce provision of Council-owned toilets in retail locations. Council could rely more fully on businesses to provide services for their customers.

5. Lobby for changes to the Building Code. Council could lobby central government for amendments to the Building Code that would require the retail sector, including nightclubs to provide (or enhance) sanitary facilities.
6. Complete site specific monitoring of demand. Commission monitoring to develop demand profile for specific groups of sites identifying current demand on a seasonal basis and at peak demand periods, etc. This would enable services to be customised better to demand.
7. Improve community awareness of availability and standards. Explore opportunities to improve awareness of the availability of public conveniences for residents and tourists, the standards they should expect and the options available for them to raise concerns.
8. Charge for access to public toilets. Some cities in other parts of the world charge for access to public toilets as a means to fund the service. The same could be implemented here.
9. Options for sanitary waste disposal from vehicles. Some provision for sanitary waste disposal from trailer homes and motor homes exists with camping ground facilities and truck stop facilities (ostensibly for livestock). However, the adequacy and appropriateness of these needs to be researched and alternate options considered

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Council's preferred options

The recommendation of the assessment is for adoption by Council of a combination of options included within 1, 2, 5, 6, 7 and 9 outlined above. Where there is no existing funding within Council's budgets, the initiatives should be considered within the context of a Long Term Plan, most likely after significant progress has been made recovering from the earthquakes.

Once detailed site specific demand profiles have been identified and the private sectors provision of toilet facilities for public access is better understood, Council needs to indicate clearly and consistently its provision of service relating to options three, four and eight.

With regard to 24-hour, central city public conveniences, additional facilities are most likely to be safe and effective if staffed and delivered as part of a wider strategy for addressing behavioural problems within the Central City. This wider strategy is outside the scope of this assessment and the role that public conveniences may or may not have in this strategy is yet to be determined.

Council also needs to take stock of the earthquake recovery situation it now finds itself in. The Facilities Rebuild project is likely to result in a number of new toilets being built which will increase the quality of the portfolio across the board. Funding limitations in upcoming years also need to be considered and planned for.

Stormwater

Stormwater summary

Purpose and scope

The objective of the stormwater assessment is to identify risks and show how these services will be managed by the Christchurch City Council to achieve community outcomes in a sustainable manner.

Stormwater services in Christchurch city

The roles of Council with respect to stormwater drainage services in the city are to coordinate the setting of Community Outcomes and as a service provider. The key service functions of storm water drainage infrastructure are the:

- protection of property, public safety and access
- protection of ecosystems
- creation of productive land

Adequacy of stormwater services

Christchurch city has invested heavily in flood relief works over the past 50 years in response to a series of destructive floods through the 1960s, 1970s and 1980s. A combination of historical investment in physical upgrading works and planning measures has effectively mitigated risks associated with the inundation of dwellings and buildings, and there are few urban development constraints in the city that are not mitigated by planning rules, proper subdivision design and building design.

Investment in urban stormwater services on Banks Peninsula has been more modest, and service improvements are warranted in some Peninsula communities. In rural areas, stormwater is generally disposed of by ground soakage or to watercourses. There are unlikely to be any significant constraints on additional rural-type development related to drainage or disposal of stormwater.

Public health risks

Risks associated with stormwater services

Potential health impacts associated with the stormwater drainage network are:

- Illness caused by contact with micro-biological or chemical contaminants in natural water resources, through the use of streams, rivers, estuaries and beaches for recreational purposes, or drinking potable water drawn from polluted water sources.
- Injury or death caused by falls from stormwater structures or drowning.
- Illness from mosquito bites.

The range of contaminants in stormwater and the extent of environmental impacts on the city's watercourses are:

- Microbiological concentrations, including bacteria, viruses and protozoa, generally exceeding contact recreation guidelines. The main source of contamination in dry weather is believed to be waterfowl. The impact of wet weather pollution is lessened by rain water dilution and the low level of recreational activity at these times.
- Chemical contaminants, including organic compounds, such as hydrocarbons, pesticides and organic wastes, and inorganic compounds, such as metals and metalloids.
- The concentration of heavy metals in stormwater and river sediments exceeding the relevant water quality guidelines for the protection of aquatic organisms.
- Nutrients, including nitrogen and phosphorus, can cause algal blooms and prolific growth of aquatic plants when at elevated levels. There can be extensive growth of algae, especially in the Avon River and Lake Forsyth. This may be evident during warm summer

weather. Lake Forsyth has been opened using the new canal which limits the entry of sea water in the lake. The salinity of the Lake Forsyth water is now lower than during the previous mid-beach lake opening regime. Over these last three years there have been no incidents of serious toxic algae blooms. It is hopeful that this management regime may be a means of limiting these blooms.

Although microbiological concentrations, at times, exceed contact recreation guidelines, neither the Council nor the Medical Officer of Health has any record of injury or illness that is attributable to deficiencies in the design, operation or maintenance of the stormwater network, and health risks are assessed as low.

Risks associated with the lack of a reticulated stormwater drainage system

There are less likely to be stormwater systems in rural areas.

Because of the much larger allotments in rural areas and the higher proportion of permeable, vegetated areas, there are few problems when reticulated stormwater disposal is unavailable.

Assessments of Various Services

Stormwater

Risks to stormwater communities

Assessments of stormwater services were carried out at a “community” level to identify risks to particular communities. (see table below)

Risks to stormwater communities		
Types of communities	Community	Risk assessment
Communities served by public drainage systems	Urban area to receiving waters– drained by street channels, street, sumps, pipes, open water courses and streams	<ul style="list-style-type: none"> • Quality of water in urban rivers and streams continues to degrade due to urban discharges • Increasing risk of land flooding due to inner urban intensification • Developments encroaching on stream setbacks limiting maintenance and stream health • Risk of flooding from increased rainfall intensities and sea level rise related to climate change • Risk of insect borne diseases.
	Banks Peninsula Settlements	<ul style="list-style-type: none"> • Risk of flooding and access difficulties from under–capacity stormwater infrastructure • Water quality from time to time not compliant with ECan rules
	Rural areas serviced by Council maintained streams and drains	Low levels of risk
Communities served by private drainage systems	Rural areas discharging storm–water run–off by either direct soakage to ground or to open drains funded privately	Low levels of risk
	Industrial areas discharging to ground via soakage basins	Risks of ground water contamination through leakage or spills onto ground or contaminants entering soak pits

Environmental risks

Water–quality monitoring indicates that several of the environmental parameters monitored exceed minimum guideline levels. Ecosystems in the majority of streams are in a degraded condition, however the impact on waterway habitats appears to be accepted by the majority of the community and a rigorous debate on the community costs and benefits of markedly improving environmental outcomes is required.

Environment Canterbury has a Natural Resources Plan which sets the rules and water–quality standards with which Council must comply for all existing point source discharges. The City Council has developed a Surface Water Strategy which among other things establishes a programme to develop Stormwater Management Plans (SMPs). These address the six values of Culture, Heritage, Recreation, Ecology, Landscape and Drainage – and are probably better termed Integrated Catchment Management Plans. These SMPs form the basis of Stormwater Discharge Consent applications to the Regional Council so that the City can effectively manage stormwater by authorizing discharges which are managed according to these global consents. To date one of the consents has been granted (South West Area), one other has been lodged (Styx Catchment) and one is in preparation (Avon Catchment). Projects already implemented include both managing new developments and retrofitting stormwater management systems to some existing unmitigated areas.

Assessments of Various Services

Stormwater

Options to address the risk of land flooding due to urban intensification:

- Continuous improvement of stormwater infrastructure, as proposed in the storm water drainage asset management plan;
- An increase in stormwater capacity early in the development cycle.
- Options to address the risk of insect-borne diseases:
- Minimise the potential habitat for insects by minimising the number of open water bodies in the city (i.e. eliminate ornamental and environmental water bodies);
- Limit the number of likely habitats while monitoring for insect nuisances and maintaining an awareness of potential problems. The Council currently implements this option;
- Control insect populations only if an exotic insect establishes in Canterbury.

Climate change and associated effects is a risk which is being addressed with through planning measures advised by the Ministry for the Environment and will be kept under review.

- The risk of groundwater contamination in industrial areas through private stormwater soakage is primarily controlled by Environment Canterbury which authorises these discharges via resource consents. Options available to the Christchurch City Council are:
- Advocate for appropriate levels of environmental protection;
- Construct additional stormwater infrastructure to provide services to at-risk areas.

Council's role

The proposed role of Council is to continue as:

- Facilitator of community consultation to establish community outcomes and service standards for stormwater services;
- Owner of infrastructure delivering public stormwater services to the community;
- Partner to Environment Canterbury and the Ministry of Health in the achievement of regulatory outcomes, and advocate for the community in the setting of environmental standards;
- Monitoring city growth, water quality and the health of habitats, and the development of policies, infrastructure management and Stormwater Management Plans, District Plan measures and public education programmes to ensure environmental and public health standards are achieved.

Wastewater Collection and Treatment

Wastewater summary

This is a compilation of two assessments; the 2005 Council assessment and the 2005 Banks Peninsula District Council assessment. It has also been adjusted to take into account known changes that have occurred since the assessments were prepared.

Methods used to dispose of wastewater

For the purpose of making the assessment, the city has been broken up into a number of separate community classifications. These are Christchurch City urban community, the Banks Peninsula wastewater reticulated communities, the Banks Peninsula non reticulated settlements. In addition there are a significant number of individual premises located away from others on the city fringe and throughout the peninsula with their own individual treatment and disposal systems.

The city urban community is defined by all those properties that are connected to the Council's sewer network that delivers wastewater to the treatment plant at Bromley.

Banks Peninsula Reticulated communities include Lyttelton, Diamond harbour, Governors Bay, Akaroa, Duvauchelle, Robinsons Bay Tikao Bay and part of Wainui. In addition two non Council schemes (Wainui YMCA and Living Springs) are known to be operating.

The Banks Peninsula non-reticulated settlements number approx 14 and include Purau, Charteris Bay, Little River, Birdlings Flat, parts of Wainui, Takamatua, Pigeon Bay and Le Bons Bay.

Wastewater from Christchurch treated at the wastewater treatment plant at Bromley and the treated effluent is discharged into the ocean via the ocean outfall.

Individual stand alone properties use stand-alone schemes for wastewater treatment and disposal. These schemes consist mostly of single-chamber septic tanks with gravity disposal trenches.

Risk assessment

Commissioning of the Ocean Outfall in 2010 has eliminated any health risk associated with the previous Estuary discharge.

Wet weather overflows from the sewer reticulation into the Avon and Heathcote Rivers contribute to the increase the levels of contaminants in these rivers during this time and for a period afterwards, presenting a public health risk to users of the rivers.

Damage to the network as a result of the earthquakes has significantly increased the infiltration of groundwater into the network impacting on both the system capacity and on the frequency and volume of wet weather overflows from the network into the rivers. A significant mitigating factor is the prevalence of low-contact water related activities being discouraged by the poor weather or high river flow conditions that coincide with the sewer overflows. Rebuild and renewal of the most damaged parts of the network will in time reduce the impact of the earthquake damage.

Risks with the Peninsula reticulated schemes are degradation of receiving sea water quality due to discharge of treated effluent, and the Maori cultural concerns in respect to human waste being discharged into water rather than to land or via a land element prior to discharge.

- The main risks associated with septic tanks (particularly when several are in close proximity) are summarised below:

- Treatment plant or disposal field poorly designed leading to a low level of treatment;
- Treatment plant or disposal field poorly maintained leading to uneven distribution of effluent;
- Shallow groundwater leading to contamination of groundwater;
- Poor quality or hydraulically limited soils leading to surface ponding or shallow groundwater contamination.
- Free draining spoils that allow wastewater to drain directly into groundwater or surface water.

The higher risk areas identified are:

- Marshlands owing to its shallow groundwater and peaty soils.
- Wainui consents have been renewed for a land application solution which will include connection of the previously overloaded private YMCA scheme.
- Birdlings Flat due to the potential impact on groundwater quality.
- Little River due to high water table and water quality problems due to its proximity to Lake Forsythe.
- Purau and Charteris Bay due to the increasing numbers of holiday homes with poor septic tanks being used as permanent residences.
- Takamatua due to the number of individual schemes and some poor maintenance practices.
- Aging pipe work particularly Lyttelton, Akaroa and Christchurch allowing increasing volumes of infiltration into the systems and thus overloading treatment plants and causing overflows into water bodies.

Quality and quantity of discharged wastewater

The Christchurch City wastewater system collects about 55 million cubic metres of wastewater each year, transporting it through a series of sewers and pump stations to the treatment plant at Bromley. The advanced secondary treatment process produces a high-quality effluent which is disinfected through the oxidation ponds and into the ocean outfall pipe and discharged three kilometres off shore.

There are also 22 consented locations, and a further 20 recently identified additional overflow locations largely as a result of earthquake damage to the network that discharge during periods of high rainfall, into the Avon and Heathcote Rivers.

There are a considerable number of domestic septic tank systems in operation on the of Christchurch area. These systems consist mainly of single chamber septic tanks with gravity disposal trenches. The estimated volume of effluent associated with this number of tanks is 500–800 cubic metres a day. The effluent quality of these systems is highly variable and dependent on design, construction and maintenance standards adopted by the owners.

Waste Management Strategy

Waste Management Plan 2006

Waste minimisation and the efficient use of our natural resources is fundamental to a sustainable way of life and to the future wellbeing of our city and its residents.

The Council's Waste Management Plan 2006 is focussed on solid waste and establishes a vision, goals and targets for waste in the city. The Plan is in the process of being reviewed, with a 2013 waste minimisation and management plan to be consulted on during April and May 2013, for final consideration by the Council by September 2013.

Vision

A prosperous city, where each person and business takes responsibility for waste minimisation and actively works towards zero waste.

Goals

- Individuals and businesses take greater responsibility for waste minimisation
- Council provides much enhanced reuse and recycling services at the kerbside
- Council supports and incentivises waste reduction, reuse and recycling
- Council ensures that environmentally sound waste disposal services are provided

The 2006 Plan also contains specific targets for the different components of the waste stream.

More than 207,000 tonnes of waste was generated in Christchurch and disposed to landfill in 2011/12, or approximately 524 kilograms for each person in Christchurch. Actions taken to date to reduce solid waste to landfill include, but are not limited to:

- The introduction in early 2009 of a new kerbside collection service for a large part of the city with separate wheelie-bins for recyclables, kitchen and garden waste, and residual waste;
- The commissioning in early 2009 of a new enclosed composting plant and a new mechanised sorting plant for recyclables;
- Offering assistance to businesses to become more resource efficient through the Target Sustainability programme;
- Providing free drop-off facilities for domestic quantities of recyclable materials at Council owned transfer stations;
- Offering free drop-off facilities for domestic quantities of paints and hazardous wastes at Council owned transfer stations;
- Facilitating recycling at public events; and
- Implementing opportunities within the Council to become more resource efficient and sustainable in its operations.

Total waste to landfill has started declining in the recent past; however more needs to be done to achieve the targets contained in the Plan.

Each person in Christchurch can affect how successful we are in meeting our vision, goals and waste reduction targets. How each person and business responds to this challenge will determine our success in making Christchurch a more sustainable place to live.

Water Supply

This is a compilation of two assessments; the 2005 Council assessment and the 2005 Banks Peninsula District Council assessment. It has also been adjusted to take into account known changes that have occurred since the assessments were prepared

How drinking water is obtained

For the purpose of making this assessment, the city has been divided into a number of separate communities: the Christchurch City urban community, the Banks Peninsula water reticulated communities, private community schemes, and the Banks Peninsula non-reticulated settlements.

In addition there are a significant number of individual premises located away from others on the city fringe and throughout the peninsula, with their own individual systems.

The Christchurch City urban community includes Lyttelton, Diamond Harbour and Governors Bay, and several hospitals and schools which have independent supplies within the urban area. The Peninsula has seven reticulated public schemes: Akaroa, Takamatua, Duvauchelle, Wainui, Pigeon Bay, Birdlings Flat, and Little River.

Private schemes number about 12, plus a number of schools, hospitals and Christchurch Airport. The Banks Peninsula non-reticulated settlements number approximately nine and include Purau, Charteris Bay, parts of Le Bons Bay, and Port Levy. The urban fringe community includes supplies on the outskirts of the city.

Christchurch City and the surrounding areas on the plains source their water from wells into the aquifers, extending under the city and the Canterbury Plains. However water sources for Bank Peninsula supplies are from a variety of sources including wells, springs and streams.

Risk assessment

Contamination can occur at any point in the water supply system, being at the source, during treatment, storage or reticulation. The various public supplies provide different levels of treatment or mitigation of these risks resulting in differing probabilities of a contamination event occurring.

The potential risks to each of the supplies with a groundwater source (well) are similar. The main risks identified are summarised below:

- inappropriate repair of earthquake damaged wells, well heads, pumping, pipes and reservoirs
- Ill fitting well heads or access hatches leading to contamination of the source or stored water;
- No residual treatment provided, except for Paparua Prison, leading to risk of contamination of water during storage or reticulation;
- Contamination (protozoa – cryptosporidium and giardia, and faecal) in shallow wells (known as non secure wells)
- Salt water intrusion into aquifers that discharge into the sea;
- Loss of service due to lack of storage or backup electricity;
- Insufficient backflow protection leading to backflow of contaminants into the reticulation from industrial, commercial or domestic premises.

For schemes with surface water sources (streams, springs etc) the potential risks are similar to each other:

- Unsecured access hatches etc on reservoirs leading to contamination of the stored water;
- No residual treatment provided, leading to increased risk of contamination of water during storage or

reticulation (all stream/spring fed public schemes do have treatment);

- Contamination (protozoa – cryptosporidium and giardia) in water source.
- Contamination (faecal) from animals in vicinity of water sources as well as from poorly performing septic tanks etc.
- Insufficient backflow protection leading to backflow of contaminants into the reticulation.

All these risks can be treated in order to reduce the probability of a contamination event occurring. Christchurch City Council has Public Health Risk Management Plans in place. Operators of other supplies have some preventative measures in place. Additional water quality testing may be necessary to guard against any public health risks resulting from some of these risks.

Quality and adequacy of drinking water

Most of the water supplies have sufficient water to meet their current demand. Akaroa is the immediate exception, but growth in some other smaller communities may be limited due to the water scheme. The North West supply zone of the City has a very good history for water quality but the relatively shallow groundwater (wells) does not meet the technical requirements to be classified as low risk.

Dirty water overloading treatment processes during storm events is an issue with a number of peninsula supplies. Also treatment processes for most of the peninsula schemes do not meet Ministry of Health standards. Rudimentary controls and the lack of remote (electronic) monitoring limit the performance of these schemes.

The Council currently abstracts over 50 million cubic metres of water a year for its reticulated supply. This

Assessments of Various Services

Water Supply

represents about half of the water taken annually within the city boundaries.

The policies and rules set out in Chapter 4 and 5 of Environment Canterbury's proposed National Resources Regional Plan have been developed to ensure no significant long-term decline in groundwater levels as a result of abstraction; no significant long-term decline in water quality as a result of land-use activities, particularly the Christchurch aquifers source water and no contamination of groundwater as a result of abstraction. These rules will ensure that the long-term sustainability of the aquifers as a water source is protected. It is expected that the new Land and Water plan currently under preparation will aim to achieve the same objectives and policies and contain similar rules to achieve those.

However the geology of the peninsula is predominantly fractured volcanic basalt and much of it is steep and rocky. Groundwater is generally only located in fractured rock near streams and the water quality is highly variable.

There are no major rivers on the peninsula and so most water supplies are sourced from small streams on farmed land. In general, this area is poor for water quantity and quality and droughts severely aggravate the problem. Water restrictions can be severe.

Christchurch City groundwater is well known for its high quality. As a result, this water has not needed to be treated to date to meet drinking water standards. Paparua Prison, in the Urban Fringe community, is the only supply which treats its water with a chlorine solution to provide residual treatment. There is no infection incidence data suggesting that any of the sources of drinking water in either the Urban or Urban Fringe Communities have been a cause of water-borne diseases.

The Council-owned water supply schemes are operated by adequately trained staff to ensure compliance with the New Zealand Drinking Water Standards. The training and qualifications of the operators of non-council-operated supplies have not been established. Supplies to schools are generally operated by school caretakers with only a rudimentary understanding of their supply systems. It is believed that preventative maintenance is generally not practiced on school supplies. The hospital, airport and prison supplies appear to be operated by personnel knowledgeable in the operation and maintenance of water-supply systems. They have preventative maintenance systems in place.

Current and estimated future demands

The current total annual consumption from the Christchurch City Water Supply is about 50 million cubic metres per year. The Council has consented approvals with Environment Canterbury to draw in about 75 million cubic metres per annum from the aquifers serving the city. The peak demand for the whole city is about 21,000 cubic metres an hour. Accurate consumption figures are not available for the non-Council-operated supplies.

Future demand for the Council-operated supplies is assessed in detail in the Water Supply Asset Management Plan. The population served by the Christchurch City Water Supply is expected to increase by about 7% in the next 10 years. A large proportion of the peak water demand in Christchurch is for domestic irrigation. For new greenfield developments the peak demand will increase proportionally to the number of households. Infill housing decreases the irrigable land area and therefore does not increase peak demand. Only a small

increase in the total annual consumption is expected because of the demand management methods already in place. The Water Supply Activity Management Plan includes an aim to reduce consumption from 369 Cubic Metres/property/annum 2007/08 to 321 Cubic Metres/property /annum in 2019/20.)

Future demands are not expected to increase for non-council urban suppliers. Of the known private schemes, only the Christchurch Airport and Paparua Prison are predicting an increase in demand. The increase is expected to be in the order of 10% to 15%.

The Health (Drinking Water) Amendment Act (2007) requires greater responsibilities with regard to the quality of water supplied. This may become too onerous for many non-council suppliers and therefore increased demand for the council provided supply may result.

Options to meet the demand

Demand resulting from population growth can be met in the following ways:

- construction of additional pumping stations, wells and other infrastructure to increase capacity to help meet peak demands up to the agreed maximum take levels as stipulated in Environment Canterbury consents
- implementation of demand management programmes, including public education to encourage efficient water use, water loss reduction programmes, implementation of water restrictions
- water system modelling to identify operational changes to increase system efficiencies, monitor effectiveness of capital works and rehabilitation programmes, assist with pipe sizing and capacities required

Assessments of Various Services

Water Supply

Options to meet demand related to non-secure groundwater sources can be met by:

- additional water quality testing
- addition or upgrading of water treatment
- connection to Council reticulated supply, for non-council supplies
- drilling new wells into secure (deeper) sources. Options to meet demand related to supplies in areas with septic tanks and insufficient drainage:
- further investigation to establish if there is a public health risk
- ensure supplies are operated correctly
- addition to or upgrading of water treatment
- abandon existing supply and connect to Council reticulated supply.

Options to meet demand related to the Health (Drinking Water) Amendment Bill and the greater responsibilities with regard to the quality of water supplied:

- continue to manage own supply ensuring staff are adequately trained and risk management procedures are in place
- employing external qualified staff to operate and maintain supply and manage risks
- addition or upgrading of water treatment, or the drilling of new deeper wells
- renewals programmes to retain assets in acceptable condition
- backflow protection programme to reduce the risk of backflow of contaminants into the reticulation
- abandon existing supply and connect to Council reticulated supply.

Council's role in meeting the demand

Most of the responsibility for ensuring water supplies are appropriate rests with the local Medical Officer of Health (Community Public Health Unit of Christchurch District Health Board) who is charged with this responsibility through the Health Act and via administration arrangements with the Ministry of Health.

The Council's role will be to ensure its own public water supply system is managed in an appropriate manner to meet compliance and community needs.

It is expected that any new infrastructure for growth will be funded by developers. The Council may consider assistance with funding of the service where there are significant public health issues. This would be assessed on a case-by-case basis. The Council may also have a future role to liaise with water scheme owners and other agencies, such as Environment Canterbury and Community Public Health, to ensure appropriate water supply arrangements are in place to meet the total community's reasonable needs. This would be assessed on a case-by-case basis.

Proposals for meeting the demand

The Health (Drinking Water) Amendment Act (2007) requires water-supply owners to construct, manage and monitor the supplies in a manner that will ensure acceptable levels of risk are achieved.

The Christchurch City Council, for its own supply, is already implementing plans to meet future demand. This includes:

- capital works programmes to provide additional infrastructure for growth
- demand management programmes to reduce per capita consumption
- implementation of Public Health Risk Management Plans

- a projected increase in the operating budget to cover likely additional water-testing and compliance requirements
- upgrading of water treatment at most Banks Peninsula schemes
- consideration of options for Akaroa and Takamatua schemes to overcome demand and water quality issues
- water system modelling to identify operational changes to increase system efficiencies, monitor effectiveness of capital works and rehabilitation programmes, assist with pipe sizing and capacities required
- renewals programmes to retain assets in acceptable condition
- backflow protection programme to reduce the risk of backflow of contaminants into the reticulation
- provision of programmed water treatment and/or deeper wells for the Christchurch North West zone.

The Council will consider applications to connect to the supply from non-council-operated supplies within the reticulated area, although there may be restrictions on the size of connection that can be made. Non-council supplies outside the city's reticulated area may also apply but permission to connect will be made on a case-by-case basis. Extension of reticulation beyond appropriate land use zonings will not generally be allowed. Assistance with funding to connect, where there are public health issues, will also be assessed on a case-by-case basis.