

WASTEWATER

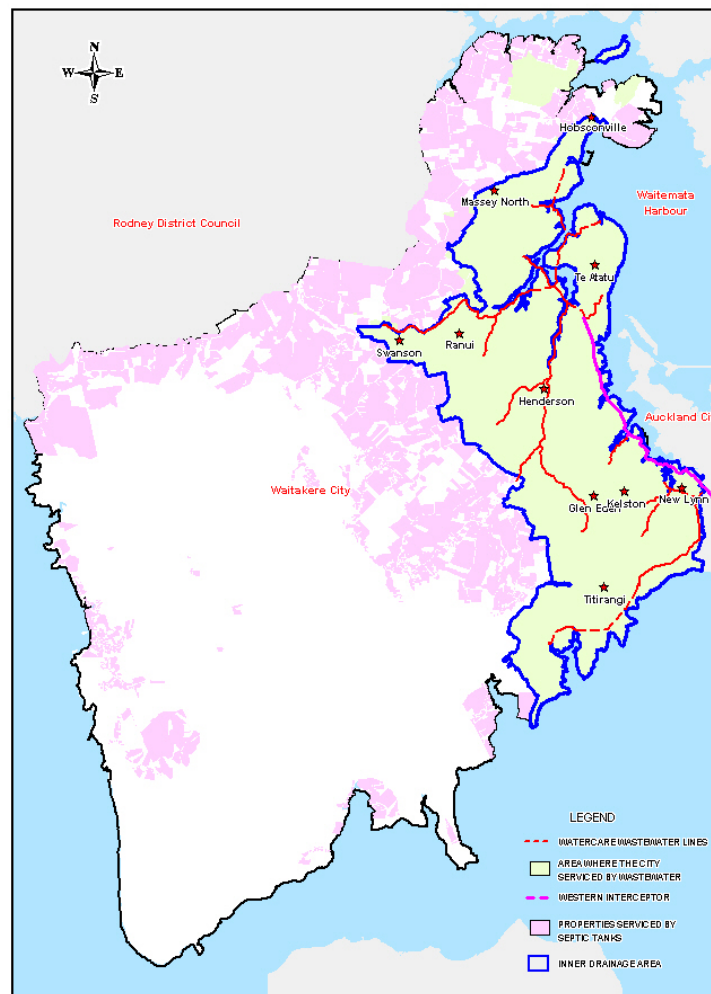
Description of Services Provided

Council provides wastewater services as follows:

- Within the Inner Drainage Area, wastewater is collected from domestic and trade premises by Council. It is then transferred to Watercare Services Limited for conveyance to the Mangere Wastewater Treatment Plant, where it is treated to high environmental standards and disposed to the Manukau Harbour. This system has been in place since 1960.
- Properties located outside the Inner Drainage Area have on-site wastewater systems such as septic tanks, high-tech treatment plants and composting toilets. The owners of these properties are responsible for their own systems but Council provides a 3-yearly septic tank pump-out programme and an environmental monitoring programme for all systems.
- Private drains are also an integral part of the system, as they provide the method of collecting wastewater from properties for disposal to the Council network or on-site systems. Many of these drains date prior to 1960 and are leaking, allowing an excessive and unacceptable amount of rainfall to enter the wastewater systems.

The location of the services provided is shown on the following map.

Figure 12: Wastewater System Coverage



Wastewater Volumes at a Glance

- Asset value \$298 million
- Annual expenditure \$19.8 million
- 59,600 household and business connections to the network
- 5,400 septic tanks to be serviced (3 year cycle)
- 2,800 customer service calls per annum
- 1,027 km of pipes
- 492 pipe bridges:
- 1000 sewer blocks and overflows per annum

The services provided are supported by the following programmes:

- Wastewater flow reduction programme, through infiltration & inflow control
- Maintenance and Operations
- Preventative Maintenance including a regular flushing programme
- Compliance with environmental standards
- Renewals and new connections
- Upgrading programme

Wastewater services in the Inner Drainage Area are funded from rates, with the average cost per residential property being \$436.01 per annum.

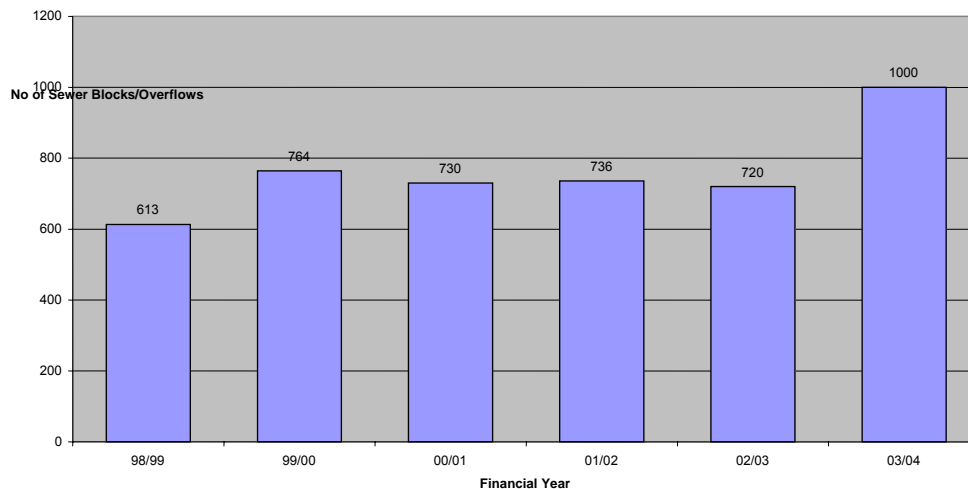
Wastewater services outside the Inner Drainage Area are funded from a uniform annual charge comprising \$153 per annum to cover pump-out costs and \$15 per annum environmental monitoring fee (these amounts are subject to consultation in the draft 2005-2006 Annual Plan).

Assessment of Risks to the Community

Within the Inner Drainage Area, the most significant public health risk arises from wastewater overflows to ground areas and water bodies, and the potential for adverse effects on any members of the community that come into contact with this.

Due to the increasing age of the networks, the number of the overflows has increased over the last 6 years, as shown on the graph below, and this trend will continue if Council takes no direct action. The overflows are caused by the following:

- Broken and/or blocked sewer pipes
- Damage and blockages due to tree roots
- Disposal of unauthorised materials into the sewers, such as fats, oils, rubbish etc
- Infiltration & inflow through cracks and displaced joints, and illegal private connections
- Blockages in private drains
- Identified faulty private drains or illegal connections not being repaired or replaced by property owners

Figure 13: Number of Sewer Blockages and Overflows

Another adverse effect related to aging sewers is exfiltration - wastewater that leaks from sewers into the ground during dry weather conditions.

Council has carried out an assessment of the risks to the community in properties outside the Inner Drainage Area and these are detailed in a report prepared by URS NZ Ltd entitled “Assessment of Public Health Risk Associated with Onsite Wastewater Disposal in Waitakere City”, based on the Ministry of Health criteria.

Council has also sought comments from the Medical Officer of Health.

The conclusions from the work are summarised below.

1. 4 of the sub-communities score significantly higher than the remaining 20. These were:
 - a. Bethells-Te Henga (12)
 - b. Piha Camping Ground (14)
 - c. Huia-Little Huia (17)
 - d. Fosters Bay (18)
2. The sub-communities b, c, and d above have reticulated water supply systems, which increases the risk of over-use
3. All 4 scored “Extreme” risk on all events assessed.
4. Of the other 20 sub-communities assessed, the following had “High” risks:
 - a. Waitakere Township (2) 5 Highs
 - b. Henderson Valley (9), Karekare (16), Parau (20) & Piha North (13) 4 Highs
 - c. 6 others had 3 Highs
 - d. 6 others had between 1 and 2 Highs
5. The most at-risk communities above had a number of coinciding factors that resulted in high risk scores, including:
 - a. Poor draining soils and high water tables, a typical situation throughout the city
 - b. The real potential for adverse effects in water bodies used for contact recreation
 - c. Mainly older on-site systems in place, together with likelihood of root intrusion

Figure 14: Wastewater Overflow

Assessment of Quality and Quantity of Services Provided

Wastewater overflows from the pipe networks are at present untreated. Under the Air, Land and Water Plan, overflows greater than 1,000 cubic metres will need to be treated and Council is developing a programme to address this issue.



Figure 15: Wastewater overflow containment unit



Council also has in place a programme to ensure effective clean-up after overflows. This includes containment procedures, erection of warning signs and testing of water quality to ensure there are no long term adverse public health and environmental effects.

93% of the wastewater assets are considered to be in excellent to average condition. Council has adopted a just-in-time replacement strategy, which ensures there is no significant backlog of renewals. There is a backlog of infiltration & inflow work in the older areas of the city such as New Lynn, Glen Eden, Henderson and Te Atatu.

Wastewater treated at the Mangere Wastewater Treatment Plant complies with stringent resource consent conditions set by the ARC. Due to the high treatment standards, the discharge of treated wastewater from the Mangere Wastewater Treatment Plant to the Manukau Harbour is considered to have minimal public health risks. The amount of wastewater collected for treatment at Mangere Wastewater Treatment Plant from Waitakere City is shown in table 7:

Table 7: Composition of Wastewater flows

Component	Cubic Metres per annum	Comment
Dry Weather Flow	11,400,000	80% of total water usage =
Wet Weather Flow	3,600,000	Depends on the number of significant rainfall events during the year
Total	15,000,000	

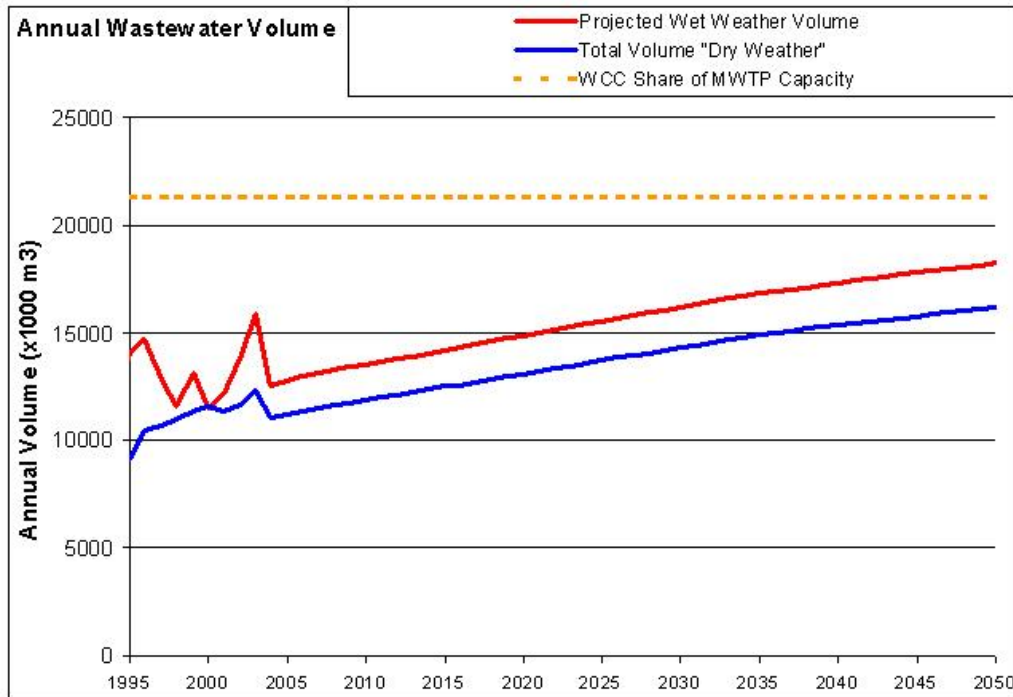
For properties located outside the Inner Drainage Area, there are a number of public health risks arising from some poorly designed and maintained on-site wastewater systems.

Statement of Current and Estimated Future Demands for Services

The long-term forecast of annual wastewater production from the city based on medium growth with demand management initiatives is shown in the graph below. Though the effects of water supply demand management on total wastewater production is effective in the long-term, historical data indicate that the effect of infiltration & inflow on wastewater volume is significant.

Also of interest is that the annual wastewater peak is in July when the water supply demand is lowest; similarly the lowest wastewater production is in February when potable water demand is at its highest. Despite this, even wet weather annual wastewater volume is still considerably lower than Waitakere City’s population-based share of the Mangere Wastewater Treatment Plant capacity.

Figure 16: Projected Annual Wastewater Volume

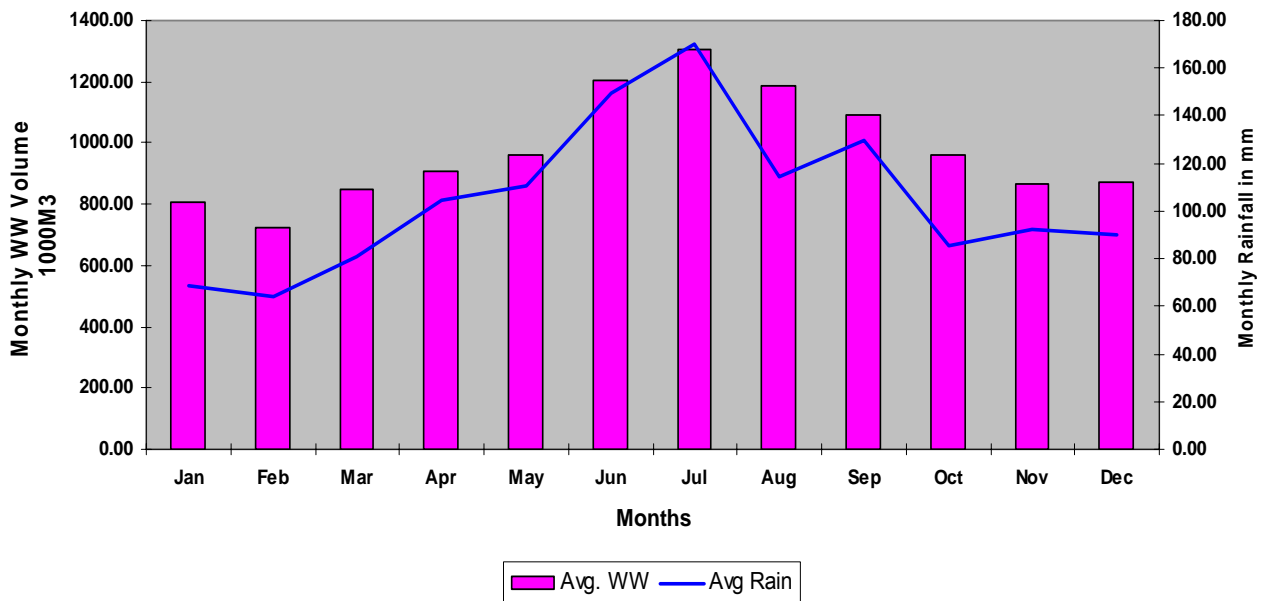


The projected annual wastewater volume in the above graph is computed allowing for infiltration in an 'average' rainfall year. The total for any particular year will change depending on the actual rainfall. Though the capacity of the Watercare Services Limited system (trunk mains and treatment plant) is such that it is able to convey and treat the overall wastewater volume produced by the city annually, the system is unable to meet peak demand in certain wet weather events. This peaking phenomenon is caused by infiltration & inflow in both in the territorial authority and Watercare Services Limited wastewater networks.

The daily wastewater production for the city is around 33,000 cubic metres whereas the actual wastewater trying to enter the Watercare Services Limited system varies from 14,000 m³ to 183,000 m³ depending on rainfall intensity. This illustrates the significant effect that infiltration & inflow has on wastewater flows, and consequent overflows to the environment. Modelled performance of the wastewater system as a whole shows that infiltration & inflow represents on average 26% of the total annual wastewater flow.

The following graph in figure 17 shows the correlation between monthly average wastewater volume (production) and monthly rainfall.

Figure 17: Monthly Wastewater Volume vs Monthly Average Rainfall



Inflow refers to the rapid entry of surface water into the wastewater network via surface faults such as low gulley traps, illegal connections of stormwater down pipes into sewers and damaged wastewater manholes, and thus occurs during and immediately after a rain event. Infiltration however, which occurs below ground via cracked or disjointed pipes, is typified by long slow entry to the system that can continue for days after the rain event has abated.

During storm events of short duration the system capacity of pipes and manholes can sustain the peak flows without causing any overflows. However high rainfall events during wet winter months will cause wastewater overflows from both the Waitakere City and Watercare pipe networks. From flow gauging studies conducted for the New Lynn catchment it was observed that the peak factors vary from 8 to 21 times dry weather flow for the sub catchments analysed. The following map and data illustrates the number of annual maintenance callouts made by Waitakere City, due to problems in the wastewater system – usually blockages or overflows due to infiltration & inflow. Approximately 10% of these callouts, or 100 in 2003, are actual overflows of dilute sewage due to infiltration & inflow.

The capacity of Council’s wastewater pipes is generally adequate for dry weather flows but is sometimes not adequate for wet weather flows.

During heavy rainfall events there is insufficient capacity in Watercare Services Limited’s Western Interceptor. The Mangere Wastewater Treatment Plant has been designed for 3 times average dry weather flow and an equivalent serviced population (comprising ACC, MCC, Waitakere City Council and PDC) of 1.2 million persons. However if flows can be reduced on a regional basis then there will be the potential for the Mangere Wastewater Treatment Plant to provide a service to an additional population.

Statement of Options Available to Meet Current and Future Demands

Council has considered 4 broad scenarios to meet current and future wastewater demands and these are summarised in the table below (and detailed in Appendix 2):

Table 8: Scenarios for Current & Future Wastewater Demand

Scenario	Description	2005 Costs \$per Household	2015 Costs \$per Household	Comment
1	Current rate of progress	\$436.01	\$520.28	Gradual reduction in wastewater volumes. However if this is not achieved in rest of region then additional regional capacity will be required.
2	Slowing progress	\$436.01	\$485.51	Increase in wastewater overflows. This is not sustainable.
3	Accelerated progress within Waitakere City Council	\$436.01	\$570.98	Reduction in wastewater volumes. However if this is not achieved in rest of region then additional regional capacity will be required.
4	Accelerated progress/virtual regional integration	\$436.01	\$550.32	Regional reduction in wastewater volumes delaying the need for additional regional capacity.

In terms of meeting future demand, Council's intended outcomes include the following:

Table 9: Outcomes for Future Wastewater Demand

Location	Outcomes
Outside Inner Drainage Area	Introduce bylaws and inspection certificates to improve performance of on-site wastewater systems, at an estimated cost of \$50 per household.
Inner Drainage Area	Reduce overflows by 50%, compared to 2003-04, over the next 20 years.
NORSGA	Install new wastewater systems that have low infiltration rates, i.e. 50% of current systems. Promote and implement community based wastewater treatment, recycling and disposal systems.

Statement of Council's Intended Role

Council will continue to provide wastewater services in accordance with the current levels of service, but with additional emphasis on reducing wastewater flows.

It is not proposed to extend the currently reticulated area, but further work will be carried out in the areas serviced by on-site wastewater systems that have been identified as having potential public health risks. A programme for these areas will be established through consultation for the 2006-2016 Long Term Council Community Plan.

Council will, through its part ownership of Watercare Services Limited, continue to advocate for a more sustainable approach for services provided that organisation.

Council intends to implement a comprehensive work programme for the sustainable management of wastewater as set out in the guiding principles and the 8 draft action tactics set out in this assessment.

This Assessment concludes that the most efficient and effective method of providing wastewater services is through regional cooperation and planning. Thus Council will continue to work closely with the other stakeholders in the Auckland regional water industry.

Council will actively promote change to the current practice through a number of methods including economic instruments and demonstration projects.

Statement of Councils Proposals for Meeting Current and Future Demand

Council intends to meet current and future demand by implementing a comprehensive programme to reduce wastewater overflows and improve the management of on-site wastewater systems.

Wastewater flows in the Inner Drainage Area will be reduced through the following actions:

- Working closely with Watercare Services Limited and other local network operators to identify and implement optimum regional solutions.
- Introducing user pays for wastewater services, subject to clarification of Council's legal ability to do so.
- Carrying out house-to-house inspection programmes on a 5-yearly cycle to identify properties with faulty or illegal wastewater connections.
- Enhancing preventative maintenance and infiltration & inflow control programmes.
- Requiring property owners to repair, replace or upgrade faulty private drains.
- Implementing new technology such as holding tanks, infiltration proof wastewater systems, construction of wastewater overflow devices, real-time control of wastewater networks, greywater and wastewater recycling and reuse systems.

For properties located within the Inner Drainage Area, Council will continue to provide wastewater collection and removal services to current levels of service.

For development in new growth areas such as the Northern Strategic Growth Area, Council will promote the use of new wastewater systems that have low infiltration rates, (50% of current systems) and community-based wastewater treatment, recycling and disposal systems.

For the rest of the city, where properties are not connected to the reticulated wastewater system, residents will continue to be responsible for their own on-site wastewater systems, which may range from simple septic tanks to 'high-tech' systems. Council will assist residents in this by providing up to date advice on their particular system, and by continuing the 3-yearly pump-out of septic tanks to avoid public health risks.
