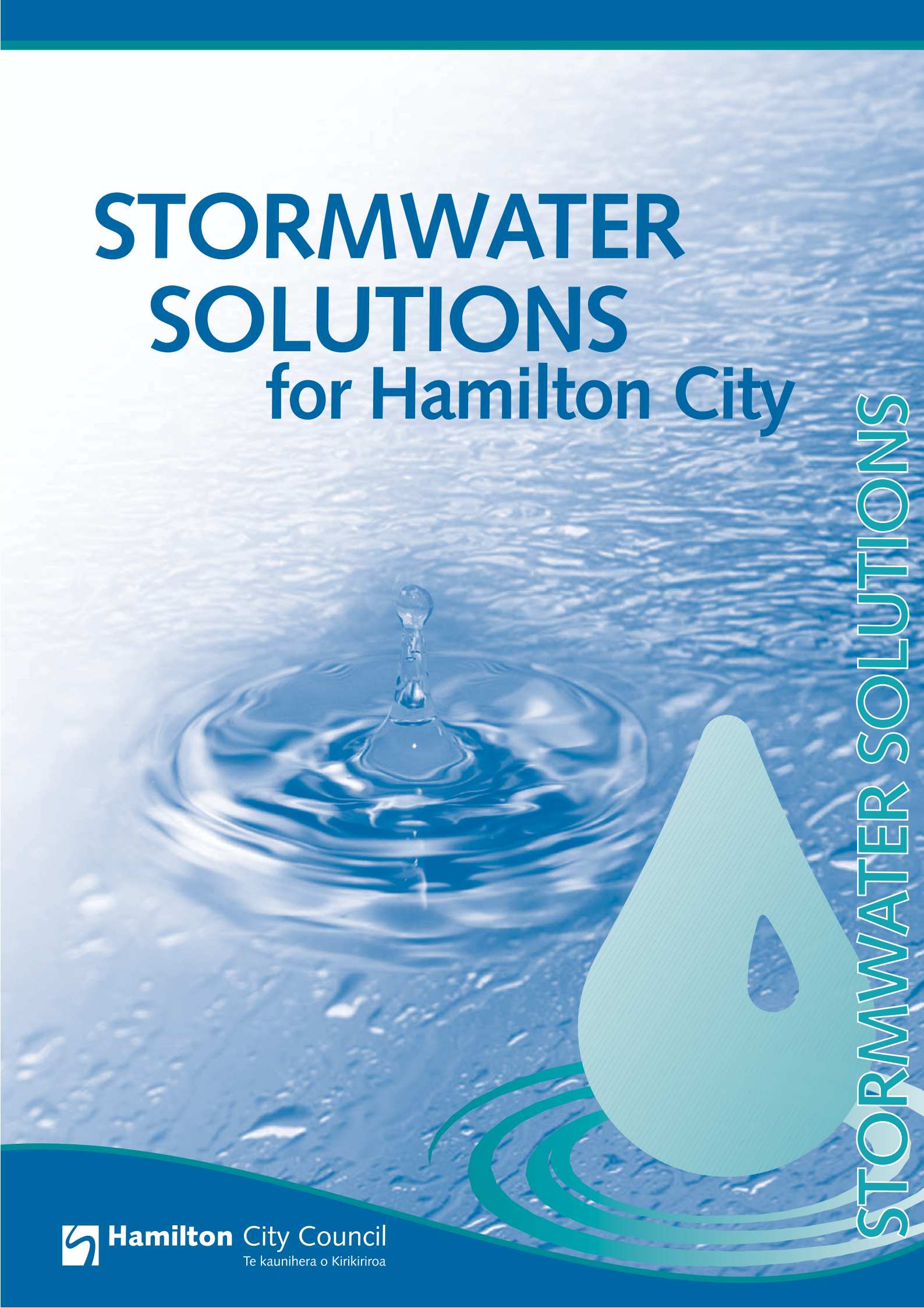
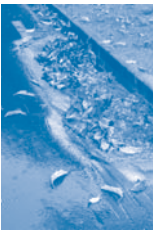
STORMWATER SOLUTIONS
for Hamilton City



STORMWATER SOLUTIONS

Hamilton City Council
Te kaunihera o Kirikiriroa



Introduction

When it rains, water comes into contact with many surfaces that it cannot soak through. These include the roofs on our houses, sealed roads, car parks, footpaths and some recreational areas. When rainwater cannot soak away, it can pond and may eventually flood some areas.

Because of this, water run-off must be managed correctly. One effective way to dispose of stormwater is by draining this into the ground through a process called soakage.

This booklet explains stormwater runoff, our city's current challenges in relation to stormwater disposal and what Hamilton City Council is doing to manage this.

What is stormwater runoff?

Urban development such as roads, buildings, car parks and other recreation facilities can create large areas where rainwater cannot soak through. When it rains, the water that collects and runs off these surfaces is called stormwater.

Stormwater runoff can contain materials that have been washed off the ground, roofs and streets. The quality of stormwater and its effects on the environment, such as land erosion and waterway pollution, will differ depending on where the stormwater has drained from.

Stormwater and wastewater systems are quite different. Stormwater often goes directly into waterways including the Waikato River. Wastewater is collected and transported to the Wastewater Treatment Plant where it is substantially treated before discharging to the Waikato River.

Hamilton's stormwater network at work

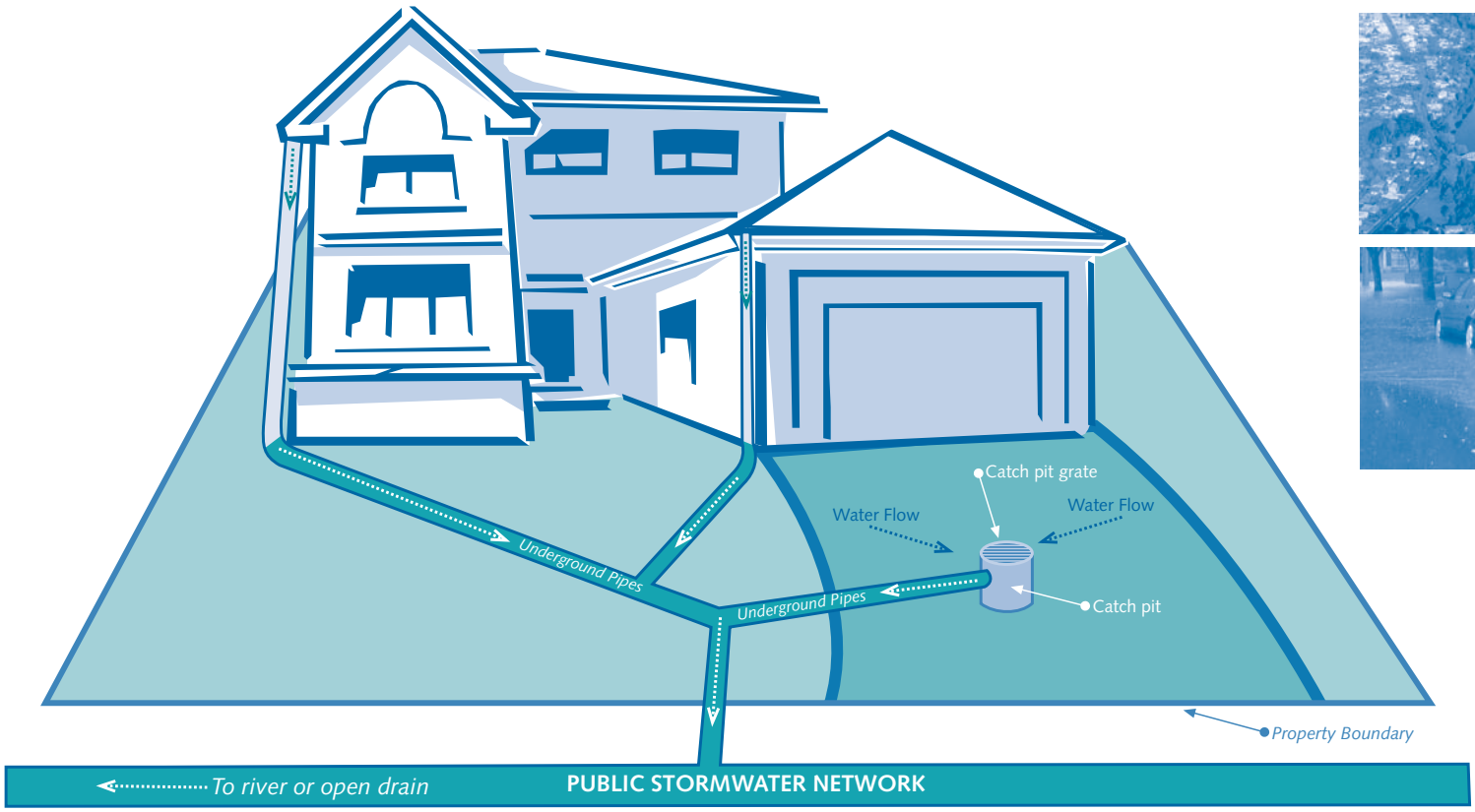
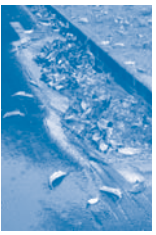


Diagram above: Shows the water's journey through the stormwater network.

As Hamilton continues to grow rapidly, more subdivision and higher density development has put an ever-increasing demand on our city stormwater network. One of the most conventional methods of stormwater disposal into street kerb and channel is no longer sufficient and is becoming less acceptable due to these increasing demands.

Increasing amounts of stormwater discharge to road kerb and channel has contributed to carriageway and property flooding in many areas of the city, particularly where infill development is occurring.

In older areas of the city, the stormwater catchpits and the pipes that connect them to the stormwater mains were not designed to take stormwater from adjacent properties. The catchpits in these areas have generally been spaced to collect carriageway water only. This means that any increased stormwater runoff in these areas must be discharged in a manner which has least impact on the environment and minimises any potential nuisance to others. These options can include localised soakage or direct discharge into the street stormwater main.



Unlike some other cities, Hamilton's stormwater pipes are completely separate from the wastewater network. This foresight in planning has benefited the city and environment by minimising the potential for wastewater overflows in extreme wet weather.

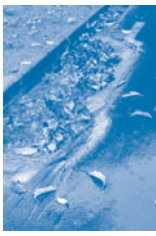
Stormwater generally enters the network through catchpits (of which there are over 8300 in the city) or by direct connection to the pipes from properties.

Catchpits are constructed with a coarse screen at the entry to catch large items of litter before the stormwater enters the network. Small particles such as silt settle at the bottom of the catchpit. Some catchpits are also fitted with baffles, which retain oils and floating objects within the pit. From these catchpits, stormwater is conveyed (through a lead pipe) to stormwater mains.

The size of the pipe installed is determined by the area of the catchment and the severity of rainstorm which the pipeline is expected to accommodate.

The stormwater network capacity in commercial areas (which usually have larger areas of surface that stormwater cannot soak through) is greater than in residential areas.

Diameters of the pipes range from as small as 100mm (connections) up to larger pipes of greater than 2300mm. Most pipes (60 per cent) are less than 375mm and only 8 percent are over 1200mm.



When stormwater exceeds the designed flows, surface flooding increases. The excess surface flooding mostly ponds within the carriageway or parks or flows via secondary flow paths into the gully system. There are a couple of areas in Hamilton where flood retention, dams and ponds have been installed to provide temporary storage for excess stormwater. The excess stormwater then either soaks into the ground or is discharged into the stormwater network through a controlled outlet.

How Council manages stormwater

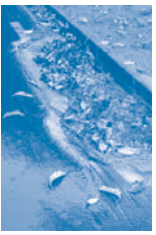
Council manages stormwater through the following means:
Hamilton City Council has incorporated industry best practice in stormwater network design.

Hamilton city's stormwater network is designed with capacity to dispose stormwater from a 2 – 10 year return storm.

Pipework is normally designed to discharge for:
- **Residential:** 2 year return storm
- **Industrial:** 5 year return storm
- **Commercial:** 10 year return storm

For further information regarding stormwater network design, contact Council's Water and Waste Services unit on (07) 838 6999.

Note: Please refer to Building Code on drainage design requirements for buildings and other structures.



If land surfaces and stormwater runoff is not managed properly, flooding of properties, erosion and pollution of our waterways can occur. Through a policy of encouraging ground soakage and a variety of other methods, Council manages the stormwater for Hamilton city.

What Council does to manage Hamilton's stormwater

- Planning, to identify and put plan in place to reduce the risk of flooding to residential, commercial and industrial areas.

- Regularly cleaning streets to significantly reduce the potential for contaminants to enter the stormwater network thus reducing contaminants discharging into waterways.

- Regularly clearing any accumulated litter and silt from catchpits to reduce blockages. Seasonal hot spots are identified for appropriate cleaning intervals.

  Note: The majority of surface flooding is caused by blocked catchpits.

What Council does to manage Hamilton's stormwater continued...

- Subdivision and development increases stormwater runoff. The eventual growth of lawns, trees and shrubs is important to impede and use stormwater naturally. Council maximises this natural way of absorbing stormwater through zoning, protection of green spaces and vegetation. It also carries out planting and landscaping and endeavours to maintain the natural environment by integrating green space with ongoing urban development of the city.

- All new structures (including garages and sleep-outs or any other type of extension to existing houses) are required to, where practical, utilise ground soakage or other low impact systems with overflow to Council's main stormwater network.

- Controls on earthworks, vegetation removal, site coverage, impermeable surfaces and modification of waterways are set by the Council and Environment Waikato to minimise stormwater runoff. This also helps to improve the quality and reduce environmental impacts.

- Regular inspection and maintenance of stormwater pipes as well as open drains are done. This is to ensure the network is adequately functional.

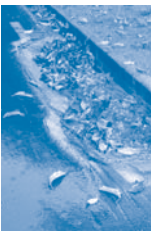
How you can manage stormwater on your property

While Council has incorporated stormwater disposal features into city design, you can help reduce flooding by ensuring that stormwater runoff on your own property or building is suitably discharged. Depending on your location and situation, there are a number of stormwater disposal options available to you.

In some areas, you may divert water to an existing soakhole or make plans to upgrade existing soakholes to achieve required capacity. For more information, contact Council's Building Control Unit on 07 838 6677.

Residential properties that are situated near natural waterways may consider, if feasible, diversion of stormwater to existing natural waterways. There are, however, detailed requirements from Environment Waikato regarding discharge rate and size of the pipe.

Drainage design for stormwater discharge to natural waterways requires approval by a Council Water and Waste Services network engineer. This is to ensure that sufficient consideration is given to the discharge to the waterway.



Challenges to stormwater management

For many years, Council permitted the disposal of stormwater from residential properties into the street kerb and channel. With increased infill development this disposal method has resulted in surface flooding and potential damage to surrounding properties, so street and kerb channel disposal is no longer viable for these areas.

Recently introduced legislation, such as the Resource Management Act 1991 (RMA) has also increased the demand for improved stormwater disposal options.

The RMA brought in requirements for protecting water bodies including ground water and also the expectation of low impact stormwater disposal. Disposal of stormwater via soakage systems addresses these requirements.

Impact of legislation

The Hamilton City Proposed District Plan and Development Manual both encourage the use of low impact stormwater discharge to meet the requirements of compliance. This approach follows through from the Regional Plan.

What stormwater disposal solution should I use?

There are a number of steps you can follow to determine the best stormwater disposal solution for your property. Soakage is usually the most favorable solution, although this is not suitable near banks for stability reasons.

Step 1 Get to know the site including aspects such as:

- Soil condition
- Capacity and stormwater network availability
- Your property's current stormwater disposal scheme (whether it is through soakage to Council main or to kerb and channel).

Step 2 Talk to Council's Building Control Unit to get a clear understanding of what are acceptable stormwater disposal options.

If you need to look into soakage for your property, you are welcome to ask for a Soak Up Your Stormwater booklet which is a step-by-step guide on how to prepare your property for soakage.

The Soak Up Your Stormwater booklet is available from the Council's main reception or by request from the Water and Waste Services Unit.