

Timaru / Te Tihi o Maru

Stormwater Issues Summary October 2021

Timaru District Council (TDC) and Te Rūnanga o Arowhenua are making a plan to help manage stormwater discharges from the urban area of Timaru. This Stormwater Management Plan will help us better manage stormwater and protect our waterways. It will also help us meet the legal requirements for discharge of stormwater into the Ōtipua/Saltwater Creek, Whales Creek (Caroline Bay), Waimataitai Creek, Te Ahi tarakhi/Taitarakihi Creek, and the Ocean.

We have completed baseline studies and have identified key stormwater issues that will be addressed in the plan. This document summarizes the issues and provides additional context for what we've discovered with the current stormwater management system.

Issues Summary

We have identified six key issues which are discussed in detail below:

1. **Flooding**
2. **Pollution**
3. **Reduced Aquatic Life**
4. **Maintenance**
5. **Increased Development**
6. **Climate Change**

Issue 1 - Flooding

Parts of the urban area of Timaru suffer from nuisance flooding and ponding, particularly when it rains for an extended amount of time. This is due to limited drainage and blockage of natural flow paths and restrictions along waterways (e.g. culverts).

Flooding is a natural phenomenon and typically occurs around waterway corridors, overland flow paths and in low lying areas. Our stormwater network is designed to a specific capacity or level of service, so that it can carry stormwater to the streams and the river. This helps reduce flood risks for houses, business and roads during relatively small rain events. This level of service may not prevent stormwater flooding from some large rain events. The stormwater ponding related issues we have identified in Timaru include:

- 1.1 Poorly drained soils in most of Timaru presents issues for draining stormwater to ground and causes ponding for extended amounts of time. This happens more often in low lying areas and areas with no established connection to the stormwater system.
- 1.2 The height of the ocean tide impacts on how quickly stormwater can drain from the system, as sometimes the stormwater ocean outfalls (i.e. in Taitarakihi Creek, Waimataitai Creek, Whales Creek and the Ōtipua/Saltwater Creek) are already full with sea water, leaving little room for stormwater to drain. This can increase flooding on properties and roadways including Caroline Bay and low lying areas close to the coast.
- 1.3 Limited and undersized pipe network in some areas cause stormwater to flow over ground when the pipe system is full or not available. This happens more often in areas with significant flood risk.
- 1.4 Several areas have been identified as having a significant flood risk, including the Taitarakihi catchment, Caroline Bay, June Street, and the commercial areas downstream of the Highfield Golf Course.
- 1.5 Blocked overland flow paths are causing stormwater ponding, as we have built in or obstructed places where stormwater would naturally flow. The loss of these natural flow paths mean stormwater moves into, and impacts more on the built environment. In these areas, stormwater can no longer flow along the natural path and will continue to build up and cause flooding or other damage.
- 1.6 In general, increasing impervious areas in Timaru, combined with more frequent heavy rainfall events, are exceeding the capacity of the existing stormwater system and causing ponding.

Issue 2 – Pollution

Polluted stormwater is contributing to reduced water quality and diminished ecosystems in our local streams and coastal waters and affects bathing water quality – this impacts how Arowhenua Runanga whanau and the community interact with these ecosystem.

Stormwater runoff picks up pollutants from hard surfaces such as roads, carparks, industrial yards and certain building materials. Polluted stormwater is discharged to the environment, putting strain on the health of our waterways. This affects what lives in them and how we interact with them. This affects what lives in them and how we interact with them. The stormwater pollution related issues we have identified in Timaru include:

- 2.1 Pollution in stormwater, and from other activities across Timaru, can directly enter the urban waterways, untreated and unchecked.
- 2.2 Pollution in stormwater is making some of the waterways unsuitable for use. High concentration of bacteria in the seawater can be attributed to waste from animals (e.g. dogs/birds/livestock) in the stormwater flowing into Waimataitai and Whales Creek and then to Caroline Bay.
- 2.3 High nutrient concentrations (Nitrogen and Phosphorus) have been found in the waterways, with phosphorus being particularly high. This is consistent with nutrients from agricultural runoff and surrounding urban activities in the areas. Elevated nutrients can result in algae growth that can harm aquatic life.
- 2.4 High heavy metal concentrations (Zinc and Lead) have been found accumulating in the sediments in the waterways, particularly in the upper and middle reaches of waterways flowing through Timaru. These can be attributed to vehicle movements and roofs/building materials.
- 2.5 High petroleum hydrocarbon concentrations have been found in most of the waterways. This can be attributed to vehicles from the high use roads and carparks in the area.
- 2.6 High use roads (e.g. State Highway 1) and carparks without treatment of the stormwater runoff contributes to pollution in waterways.
- 2.7 Industrial and commercial activities in Timaru present risks to the quality of stormwater and waterways. There are numerous commercial and industrial properties in the plan area, some of these have been identified as high risk due to the potential impacts of spills and discharge to the system.

Stormwater Management in Timaru

TDC provides stormwater management for the urban areas of Timaru, approximately 1900 ha including 13,046 properties via a stormwater system of pipes and open channel network. The network is limited in some areas and most of the stormwater that travels through it is not treated before discharge to the waterways and Ocean.

Stormwater System	Quantity
Stormwater Pipes	148887m
Swales and Open Channels	4319m
Sumps and Inlets	2156
Soak Pits	0
Outfalls to waterways	58
Waterways	Ōtipua/Saltwater Creek, Whales Creek (Caroline Bay), Waimataitai Creek, Te Ahi tarakhi Creek, and the Ocean.

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2.8 Sewage/wastewater can overflow into the stormwater system and the waterways in Timaru. This can happen during very heavy rainfall, particularly in low lying areas, when stormwater flooding enters the sewer system, causing it to overflow into the stormwater system and the waterways. This can also happen when the sewer system is blocked causing overflows.

Issue 3 – Reduced Aquatic life

Wildlife in the waterways is being reduced by both pollution and loss of natural habitat or shading - birds, fish, eels, plants and other native species are unable to thrive.

Our waterways have recreation and cultural significance and the protection and return to a healthy mauri / life-force is very important. A measure of the health of a waterway is the presence and variety of aquatic life like fish, plants and other native species, and the ability of these organisms to thrive and travel. The waterways in Timaru are habitats for fish and vital for their migration to and from the coast. They are also important for mahinga kai, cultural use and the transmission of matauranga Māori. The stream and coastal waters are also important features in the urban landscape and contribute to the general wellbeing of our community. The key stormwater issues related to aquatic life identified in Timaru include:

3.1 Low number and variety of aquatic life was measured in all the waterways.

3.2 Fine sediment has been observed smothering vegetation, insects and fish. This is likely from erosion of soils within the urban area, stream bank erosion or upstream agricultural practices. This fine sediment can be resuspended in rainfall events resulting in low water clarity.

3.1 Barriers to fish passage-including-culverts have been identified in all the waterways. These in-stream structures can prevent certain species from breeding and their offspring from migrating to suitable habitats, which can result in a decline in fish population.

Issue 4 – Maintenance

The limited maintenance of the stormwater system and waterways is impacting their function and our ability to enjoy the waterways.

Maintenance of the stormwater system ensures its proper functioning and reduces the impact of discharge into the waterways. Preventive maintenance will help reduce the need for expensive improvements to the stormwater system and will also ensure waterways are more accessible for our enjoyment. The key stormwater issues related to maintenance identified in Timaru include:

4.1 Operations and maintenance responsibilities of the stormwater system and waterways are spread amongst multiple organisations. This impacts the consistency and level of service provided.

4.2 Parts of the streams are on private property which affects the maintenance and use of the waterways.

4.3 Some maintenance of waterways that occurs generally falls under Environment Canterbury's drainage bylaw, which focuses on maintaining conveyance/flood capacity. There is currently no mechanism to consider maintenance of waterways from a water quality or aquatic health perspective.

4.4 The stormwater network in Timaru is ageing and there is limited information on the condition of some of the stormwater infrastructure. This means that some parts of the network may be at the end of their service life and could be damaged or blocked.

Issue 5 – Development

Our communities will continue to grow and as development intensifies, stormwater will increase. This puts greater pressure on the existing stormwater system and our environment.

Stormwater is runoff from rainfall on hard surfaces, this increases in line with development. Previously as development occurred, stormwater systems were designed to collect and transport runoff as quickly as possible to waterways, largely untreated. This approach has resulted in damage to the natural environment and limitations for the system to cope with increased development and the need to provide treatment before discharge into waterways. Growth and development in the town requires careful stormwater planning and management to ensure adequate level of service is provided. The key stormwater issues related to development identified in Timaru include:

5.1 Legacy issues due to the previous approach to development, where existing stormwater networks are no longer meeting the capacity and treatment level of service

5.2 Development will increase stormwater runoff and put greater pressure on the existing capacity of stormwater networks, making flooding and water quality issues worse if we don't change the way we develop.

Issue 6 - Climate Change

Our climate is changing and more extreme weather and sea level rise will heighten existing issues with our stormwater system and the coastal discharges/outfalls

The magnitude of the effects of climate are uncertain due to the long-term nature of climate change. Predictions indicate an increase in rainfall intensity in the area, which will increase stormwater runoff. The key stormwater issues related to climate change identified in Timaru include:

6.1 It is likely that more intense rain events will occur more frequently, which will further increase flooding, pollution and damage to the natural environment.

6.2 Sea level rise and projected future erosion of the coastline will significantly impact the ability of the stormwater system in Timaru to discharge to the waterways and the ocean.

6.3 The projected erosion of the coast and sea level rise is expected to result in significant increase in groundwater levels (1m or more) over parts of Timaru. This may result in groundwater inundating or coming up to the surface at times.

6.4 The stormwater management system will need to be resilient and adaptable to cope with the impacts of climate change.