



Water Services Authority
Taumata Arowai

Stormwater Engagement Paper

Help shape the future of stormwater
management

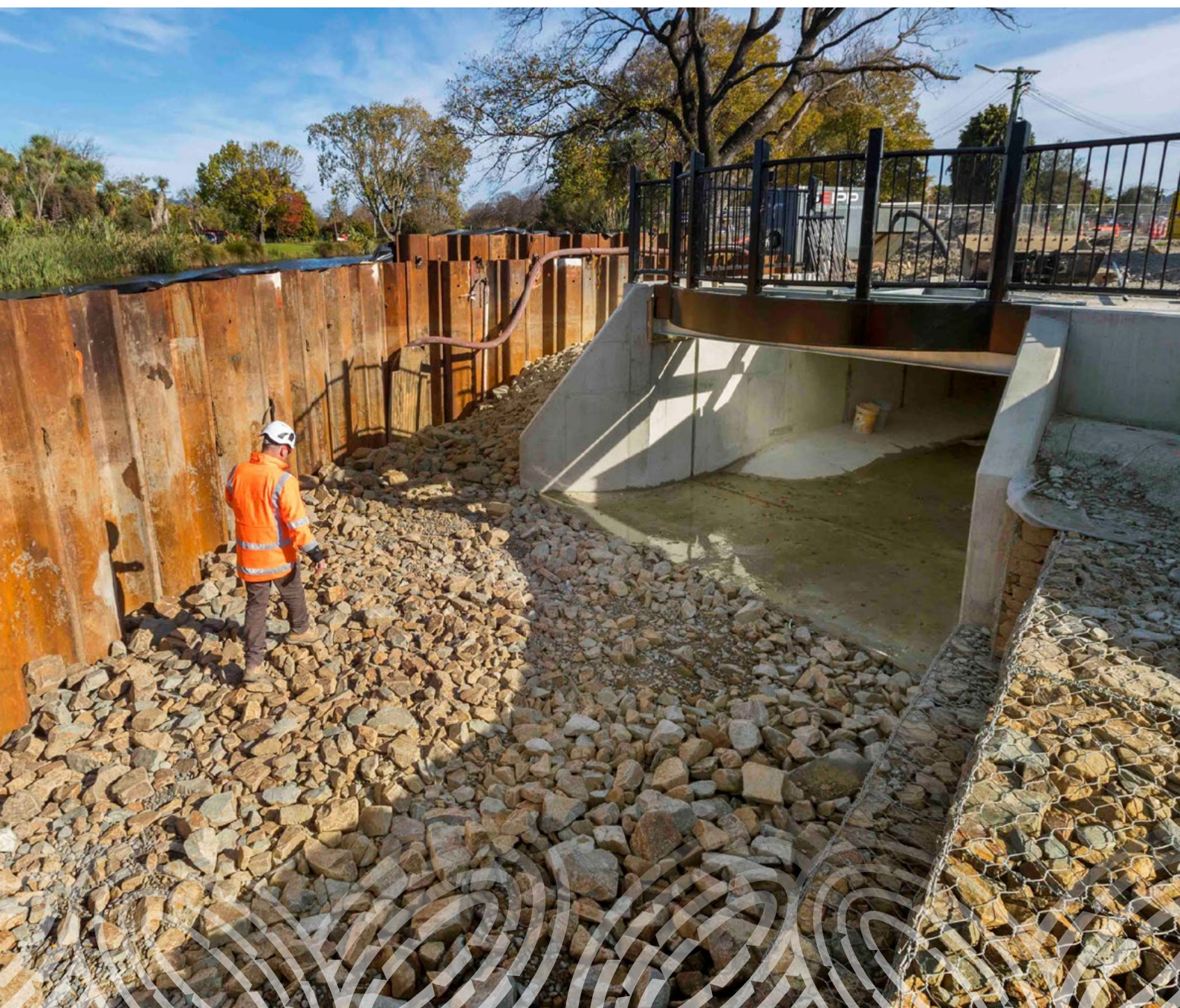


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Foreword

The Water Services Authority – Taumata Arowai (the Authority) has a leadership role to ensure New Zealand's water services are safe and effective, and deliver the outcomes communities expect. The Authority is tasked with taking a 'whole of system' view of water services, with functions across drinking water, wastewater and stormwater. This includes legislative tools that can help to promote national level co-ordination, consistency and oversight of water services.

The Authority has already applied a range of these regulatory tools to drive improvements to drinking water and wastewater services. These tools have been designed to support greater transparency of performance and safety, national oversight, sector capability and standardisation of infrastructure. The Authority is now looking to support the same system improvements in stormwater networks.

The Authority is developing an approach to stormwater leadership and oversight

We want to see stormwater infrastructure being designed and managed well, so that it protects people, property, the environment, and supports economic development for the benefit of all New Zealanders. Well-performing stormwater infrastructure supports resilient towns and cities, giving confidence to communities, businesses and insurers. This document opens a discussion with industry experts exploring how the Authority might best use its tools and influence to improve stormwater management.

Have your say on stormwater management

Your feedback will inform the sequencing of the Authority's stormwater and wider water infrastructure related tools. We have set out three immediate goals that we want to test with the sector:

- promoting infrastructure standardisation
- improving national stormwater data
- supporting risk-based planning and investment.

We want to understand how the Authority's tools will support coherence across the regulatory system. We value the passion and expertise that our stakeholders and partners bring to protecting communities and the environment, and we look forward to receiving valuable insights about how we might nationally respond to emerging stormwater challenges.

To share your perspective, please follow the link or QR code below. You are also welcome to email us at stormwater_wastewater@taumataarowai.govt.nz with any questions or direct comments you would like to provide.

Stormwater Sector Survey

Have your say on how the Authority could implement stormwater tools and functions. The following link will take you to a short survey and a place for you to share your thinking.



www.taumataarowai.govt.nz/stormwater-sector

Thank you for your interest in the early stages of this work. We look forward to engaging with you on this important topic.



Dr. Sara McFall
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How to read this document

This paper invites feedback from interested parties on the Authority's proposed stormwater work plan, including testing the merits of proposed priority work streams. The paper is structured into five sections:

1. **Background:** Contextual information on New Zealand's stormwater landscape and the role of the Authority relative to other stormwater stakeholders.
2. **Challenges and opportunities:** A summary of the pressing issues driving the need for change, and opportunities to recognise social and cultural priorities in stormwater design.
3. **The role of the Authority:** Approaches prioritised by the Authority and other ways the Authority could support stormwater management.
4. **International approaches:** How stormwater management challenges have been tackled in other jurisdictions.
5. **Next steps:** Timelines for engagement and next steps.

Feedback on the concepts and proposals in this paper may be provided via an online survey on the Authority's website, or directly to the Authority using the contact details on the back page. Relevant questions from the online survey are included at the end of each section of this paper.



1. Background

Section Summary:

- Stormwater networks are a vital part of our national infrastructure that help to manage rainwater and urban runoff.
- Stormwater infrastructure is primarily managed through consents, a regulatory tool that authorises the discharge of stormwater from networks or developments.
- There are a diverse range of interests involved in stormwater management. The Authority's role is to provide oversight and system leadership of urban stormwater networks.

We want to hear from you: Your primary interests in urban stormwater management and your view of the Authority's role as a water services regulator.

1.1 Stormwater system overview

Stormwater is the water that runs off surfaces when it rains.¹ The term 'stormwater network' refers to the infrastructure and processes that enable stormwater management in urban areas.² Our oversight focuses on these urban stormwater networks and does not include stormwater systems associated with transport corridors, such as roads and highways.³ In a natural environment, rainwater runoff is absorbed into soil, flows into natural waterways or recharges aquifers and eventually flows to sea.

In most urban areas, runoff is collected by stormwater networks – typically comprised of pipes, drains, green infrastructure and overland flow paths⁴ – and carried to rivers, lakes or the sea. Stormwater networks can help to manage both the volume of runoff (reducing flood risk) and the quality of runoff (minimising the discharge of harmful contaminants into the environment).⁵

Stormwater networks are dynamic and interconnected systems

Stormwater networks are complex and dynamic systems that consist of both piped and open infrastructure. Open infrastructure includes overland flow paths, waterbodies and blue/green devices. In contrast, drinking water and wastewater are contained within closed conveyance networks.

Well-managed stormwater networks have widespread benefits, protecting public infrastructure, private property, the environment, and managing impacts on wastewater and drinking water networks.⁶ Holistic management of stormwater also includes a mātauranga informed approach to water management *ki uta ki tai* (from the mountains to the sea), with a focus on long-term intergenerational wellbeing.⁷

Stormwater management is complex and often highly localised

New Zealand is a coastal, mountainous nation with changeable and variable weather patterns that mean stormwater systems are inherently complex to manage. Neighbouring catchments can experience very different rainfall and flow regimes due to differences in topography. Differences in soil types influence the proportion of rainfall that will contribute to surface water through runoff or groundwater recharge. Steep catchments can contain water courses that respond quickly to rainfall events (i.e. rising and falling quickly).⁸

Unlike wastewater and drinking water systems that generally have clearly defined users and consumers, stormwater infrastructure is a collective public good that responds to uneven rainfall events and impervious surface distribution across an urban area. Spreading the costs of infrastructure and determining minimum levels of service is also fraught with challenges. The unique characteristics of catchments, the priorities of people who live in the area, the sensitivity of receiving environments, Treaty obligations and economic constraints influence what is affordable for communities.

1 Auckland Council. (2024). Prepare for flooding and emergencies. [Preparing your property for flooding](#)

2 [Water Services Act 2021 | New Zealand Legislation](#)

3 [Local Government \(Water Services\) Act 2025 | New Zealand Legislation](#)

4 An **overland flow path** means any flow path taken by stormwater on the surface of land. See [Water Services Act 2021 | New Zealand Legislation](#)

5 https://www.taumataarowai.govt.nz/assets/Uploads/Network-Performance/Network-Environmental-Performance-Report-2023_24.pdf

6 For example, unmanaged stormwater runoff can cause damage to wastewater infrastructure through inflow and infiltration. See section 21 for more information.

7 [Case-studies-report-final.pdf](#)

8 [New Zealand Rainfall Patterns: Orography, Extremes & Data](#)

Recent events have highlighted why stormwater management is so critical

Severe weather events in New Zealand such as Cyclone Gabrielle and the Auckland Anniversary Day floods in 2023, Nelson/Tasman floods in 2025 and Wellington flooding in April 2026 have resulted in loss of life, damage to infrastructure and widespread impacts on private property. It is not possible to design stormwater systems that can manage all extreme events, however, robust stormwater systems minimise the impacts of runoff on people and property, and support recovery following severe weather events.

Dedicated response efforts have been taken following these, and other events, however New Zealand lacks a national picture of where the next failure could happen and the scale of existing stormwater challenges.

The growing immediacy and scale of stormwater risks justify a proactive role in developing a national framework for stormwater oversight and leadership. The Authority is progressing work related to national stormwater oversight in this context, recognising that development and implementation of effective regulatory responses will take time to embed and require early signalling.

1.2 Regulatory landscape – role of the Authority and others

The Authority was established to provide national level oversight of water services delivery and support the environmental performance of water networks

The Authority is a Crown entity that was established following the Government inquiry into the Havelock North drinking water contamination event in 2016, which demonstrated the need for a dedicated water services regulator. That inquiry found it likely that a heavy rain event caused contaminated runoff to enter the Havelock North reticulated water supply, highlighting connections between stormwater management and providing safe drinking water to consumers.⁹

Following its establishment in 2021, the Authority primarily focused on regulating drinking water safety in line with legislated accountabilities. This role was expanded in October 2023 with additional powers and accountabilities for wastewater and stormwater added through the Water Services Act 2021.

Stormwater management already involves a diverse range of stakeholders

Groups involved in stormwater management include the public (as property owners and community members) consenting authorities (typically regional councils), territorial authorities (city and district councils), Central Government agencies such as the Ministry for Cities, Environment, Regions and Transport, iwi and hapū, insurers, New Zealand Transport Agency – Waka Kotahi, stormwater operators (e.g. contractors, civil engineering firms and asset managers) and developers.

Noting the diverse range of interests in stormwater management, it will be important to maintain alignment and cooperation between the Authority's role and the functions of other stakeholders and regulatory partners as the Authority implements its tools and functions for stormwater oversight and system leadership. A further description of regulatory bodies involved in stormwater management is attached as [Annex One](#).

The Authority upholds obligations under the Treaty of Waitangi in the delivery of its functions

The Authority has obligations under the Taumata Arowai Act 2020 in relation to the Treaty of Waitangi, including to engage with Māori and understand the perspectives of Māori.¹⁰ The Authority also has specific, legislated obligations to iwi and hapū in the Whanganui, Whangāehu, Waikato and Waipā river catchments under relevant Treaty Settlement Acts.¹¹ These obligations apply when we exercise all of our functions, powers and duties under the Water Services Act 2021, including in our system leadership and national oversight role for stormwater.¹²

⁹ [https://www.dia.govt.nz/vwluResources/Report-Havelock-North-Water-Inquiry-Stage-1/\\$file/Report-Havelock-North-Water-Inquiry-Stage-1.pdf](https://www.dia.govt.nz/vwluResources/Report-Havelock-North-Water-Inquiry-Stage-1/$file/Report-Havelock-North-Water-Inquiry-Stage-1.pdf)

¹⁰ The Water Services Authority - Taumata Arowai Act 2020, s 5: [Water Services Authority—Taumata Arowai Act 2020](#)

¹¹ [Te Awa Tupua \(Whanganui River Claims Settlement\) Act 2017](#); [Ngāti Rangi Claims Settlement Act 2019](#); [Waikato-Tainui Raupatu Claims \(Waikato River\) Settlement Act 2010](#); [Ngāti Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2010](#); [Nga Wai o Maniapoto \(Waipa River\) Act 2012](#).

¹² There are also general obligations to act consistently with Treaty settlement obligations under section 7 of the Local Government (Water Services) Act 2025: [Local Government \(Water Services\) Act 2025](#)

Stormwater is primarily managed through regional plans and resource consents

Regional plans are a key regulatory tool in New Zealand (prepared under the Resource Management Act 1991¹³) that regional councils use to manage the discharge of stormwater from networks or developments to receiving environments (such as rivers, lakes, land and the ocean). Regional plans, rules and standards determine when resource consents are required for activities involving stormwater discharges. These rules and standards may set requirements such as minimum retention or detention volumes, treatment device specifications, or run-off quality targets.

Where stormwater discharge consents are required under regional plans, they can be used to:

- Set the conditions that operators must meet to protect water quality and aquatic life. Consent conditions may also include requirements for monitoring receiving environments, preparing catchment management plans, and managing the effects of construction.
- Establish a two-stage measurement and improvement plan (for example, as used in urban centres¹⁴) including a short-term consent to establish baselines, followed by longer-term consent requiring demonstrable improvements.
- Set requirements for individual developments, depending on the scale, risk and location of the planned work. Common triggers for consenting requirements include properties larger than a specified threshold, within flood prone catchments, industrial or trade premises with an elevated contamination risk, or developments in (or near) sensitive catchments.

Regional plans and the way resource consents are used, monitored and enforced varies across regions. This variability can impact stormwater designers and operators, the consistency of environmental outcomes and how stormwater networks are monitored. Regional variability in stormwater management can also impact the availability and consistency of data on stormwater system performance and operator capacity and capability, creating opportunities for national-level co-ordination and leadership.

Local Water Done Well supports changes in how stormwater is managed

Under Local Water Done Well, district and city councils are responsible for ensuring stormwater services are provided in their district but have the flexibility to choose the delivery arrangements.¹⁵

Local decisions about how stormwater should be managed were required in mid-2025 via Water Services Delivery Plans. As of March 2026, 53 councils had indicated in their Water Services Delivery Plan their intention to manage stormwater functions in-house. Delivery arrangements may evolve as implementation of Local Water Done Well and local government reforms progress.

Any district and city council that provide stormwater services must act in accordance with a set of financial principles. These include requirements around ring-fencing (to spend revenue and funding received for water services on water services) and transparency of revenue, funding and expenses.¹⁶

These changes to local government arrangements mean that work is already underway to identify which stormwater assets will be retained by councils or transferred to CCOs, and to clearly define the stormwater services delivered in relation to revenue and operating budgets.

The Authority's role in water service performance

The Authority has a role in system leadership and oversight to promote continuous improvement in water services and protect public interests. Our tools include provisions to:

- Enhance transparency on the performance of water networks and their operators.
- Provide oversight and assurance on how networks are regulated, managed, and performing.
- Develop sector capability through collaboration, education and training.
- Identify and promote national guidelines and best practices.
- Develop national standards and targets to drive improved performance and consistency.

¹³ [Resource Management Act 1991 | Ministry for the Environment](#)

¹⁴ Auckland, Wellington and Christchurch. See [Discharging stormwater under our Network Discharge Consent \(NDC\): Greater Wellington — Stormwater: Christchurch City Council – Comprehensive Stormwater Network Discharge | Environment Canterbury](#)

¹⁵ [LWDW-Bill-3-factsheet-Future-arrangements-for-stormwater.pdf](#)

¹⁶ [Local Government \(Water Services\) Act 2025 | New Zealand Legislation](#) The Commerce Commission can monitor and enforce the ring-fencing principle for water supply and wastewater services (not stormwater at this time).

There are also a number of aspects of stormwater management that are out of scope of the Authority's role. This includes:

- **Rural stormwater management:** regional councils are primarily responsible for rural stormwater management.¹⁷
- **Flood management and disaster recovery:** regional councils are responsible for flood management and mitigation (such as dams, spillways and stopbanks).
- **Economic regulation:** the Commerce Commission is responsible for the economic regulation of water services. The Commerce Commission doesn't regulate stormwater services yet, but may recommend that they be regulated in the future.¹⁸

These distinctions in regulatory arrangements mean that co-ordination and alignment is required.

1.3 Findings from previous engagement

The government has previously engaged with stormwater experts on issues and opportunities

The Authority has been engaging with the stormwater sector since 2021 on an ad hoc basis, including ongoing discussions with councils, sector experts, contractors, and asset managers. This has also included targeted engagement, most recently a workshop at the 2026 WaterNZ Stormwater Conference and previously on a draft stormwater code of

practice that could help to inform National Engineering Design Standards (NEDS), which was led by the National Transition Unit in October 2023. Industry experts have emphasised that managing stormwater infrastructure involves balancing competing objectives, such as minimising flood risk and harm, preventing erosion in sensitive areas, considering the feasibility of infrastructure options, recognising local rights and interests, and protection of culturally significant sites. Further themes identified through engagement to date include:

- **inadequate management** of stormwater infrastructure is a significant risk factor for flooding and adverse environmental and social impacts;
- **economic growth and development** is enabled by appropriate and resilient stormwater infrastructure;
- **cost** is a driving factor for stormwater infrastructure decisions and is sensitive to changes in the regulatory environment;
- **inconsistency** in stormwater management approaches is driving fragmentation and preventing alignment on best practice approaches; and
- **national level system leadership** is needed and should enable local level approaches while driving consistency and best practice.

Stakeholders have also sought further information about the Authority's role for stormwater and how this can support improvements for the sector. Further to that feedback, this paper aims to provide clarity on the Authority's tools, and tests how they should be implemented (see Section 3).



¹⁷ The Water Services Act (2021) defines that a stormwater network means the infrastructure and processes that are used to collect, treat, drain, store, reuse, or discharge stormwater in an urban area. However, National Engineering Design Standards are not limited to urban stormwater networks but apply to any stormwater network operated by a water service provider or that will be vested in a water service provider.

¹⁸ [Commerce Act 1986 | New Zealand Legislation](#)

2. Challenges and opportunities

Section Summary:

- The Authority is seeking feedback on emerging challenges in the stormwater sector.
- There are growing challenges associated with managing runoff from extreme weather events, with the costs of upgrading and maintaining stormwater infrastructure raising concerns about affordability.
- Other challenges include managing the impacts of stormwater on the rights, interest and values of New Zealanders; and protecting ecosystems from adverse environmental impacts caused by the volume of stormwater, or contaminants it contains.

We want to hear from you: What are the most important issues that you see impacting the stormwater sector at present as a water services regulator.

2.1 Public health and environmental impacts

Stormwater flows can contaminate waterways

Stormwater can carry pollutants such as litter, organic matter, grease, fertilisers from gardens, oil/hydrocarbons (such as petrol) and heavy metals (from brake pads and roofs etc) from roads and properties – this is often known as stormwater runoff.¹⁹

Stormwater runoff can lead to de-oxygenation of water, bioaccumulation of contaminants in animal or plant tissue, aesthetic impacts (e.g. sheens, coatings) and reductions in population numbers or the diversity of ecosystems.²⁰

Stormwater can be further contaminated by wastewater networks failures, inundation and cross-connected networks which can mobilise pathogens to areas where people swim, fish or otherwise interact with waterways. This has the potential to cause gastrointestinal illness (e.g. diarrhoea, gastroenteritis), skin infections or zoonotic diseases (e.g. leptospirosis).²¹

Stormwater runoff can also lead to wastewater overflows. Wastewater overflows are the intended or unintended discharge of untreated or partly treated wastewater from a wastewater network. In some cases, combined networks collect both wastewater and stormwater flows in a single pipe resulting in wastewater overflows during rainfall events, when the capacity of the system is overwhelmed (around 8% of all wastewater pipes in New Zealand are reported to be combined with stormwater pipes).²² Wastewater overflows can also occur due to stormwater 'inflow and intrusion' into wastewater networks (e.g. due to a rising water table), causing poor environmental outcomes and public health risk, as illustrated in the below case study.²³

Case Study One: The Warkworth catchment and Mahurangi Harbour

The Parliamentary Commissioner for the Environment report in March 2026 highlighted water network failures in the Warkworth catchment under wet weather conditions. These failures were reported to relate to the inflow and infiltration of ground and stormwater into the wastewater network, with overflows discharging into the Mahurangi River. Monitoring shows that:

- Clarity and turbidity of the Mahurangi River is among the worst 25% of all recorded sites.
- *E. coli* levels in the Mahurangi River had a 5-year median of 270n/100mL (the predicted average infection risk is >7%).
- There appear to have been changes in benthic communities in Mahurangi Harbour, with a decline in mud-sensitive species such as bivalve molluscs in some areas.
- Network overflows have resulted in disruptions to local aquaculture, with an increase in the frequency and duration of closures between November 2024 and October 2025.

This case study highlights some of the environmental impacts of stormwater inflow and infiltration. These impacts include degradation of local ecosystems and shellfish beds with flow on economic and public health impacts.

¹⁹ <https://environment.govt.nz/assets/publications/Environmental-Reporting/our-freshwater-2026.pdf> and [our-marine-environment-2025.pdf](https://environment.govt.nz/assets/publications/Environmental-Reporting/our-marine-environment-2025.pdf)

²⁰ Microsoft Word - TR2016 010 Management of hydrocarbons in stormwater - FINAL v2

²¹ See for example, <https://www.phfscience.nz/media/1mljcmuf/esr-environmental-health-report-wastewater-stormwater.pdf>

²² See for example, Table 7 on the length of combined stormwater and wastewater pipes by region here: [Network-Environmental-Performance-Report-2023-24.pdf](https://www.parliament.nz/assets/Parliamentary-Business-and-Committees/Environment-and-Climate/Network-Environmental-Performance-Report-2023-24.pdf)

²³ [Mahurangi Estuary ecological monitoring programme: report on data collected from July 1994 to January 2018](https://www.parliament.nz/assets/Parliamentary-Business-and-Committees/Environment-and-Climate/Mahurangi-Estuary-ecological-monitoring-programme-report-on-data-collected-from-July-1994-to-January-2018.pdf); <https://pce.parliament.nz/media/4bqjmmw4/pce-response-to-mahurangi-river-concern-1132026-pdf-242-kb.pdf>; Land, Air, Water Aotearoa (LAWA) - Mahurangi River (Lower at Brown Road)

2.2 Resilience

Infrastructure challenges can bring stormwater risks to your doorstep

Stormwater networks are comprised of built infrastructure (such as sediment ponds, soak pits) and blue/green infrastructure (such as raingardens, public parks, wetlands). Natural wetlands, waterways, and overland flow paths also form a functional part of the stormwater network (secondary network). Decisions regarding the design, purpose and implementation of treatment solutions for stormwater runoff can improve stormwater quality, which has a direct bearing on the contaminant load during runoff events, impacting the health of waterways and the broader environment.

When stormwater infrastructure fails to manage the quantity of stormwater runoff, this can introduce further public health risks as the public can come in closer contact with stormwater through flooding.

Urban surface flooding from uncontrolled stormwater can be caused by a range of factors including age of infrastructure, poor maintenance, and when growth outpaces capacity of stormwater networks. Land use is often a contributing factor, with research in Australia suggesting that urbanised environments lead to a 90% increase in the volume of water entering waterways.²⁴ Furthermore, extreme weather events or consecutive events can overwhelm stormwater capacity, or further compound wastewater network capacity challenges.

Extreme weather and consecutive events are exposing resilience challenges in our networks

Climate change is expected to increase rainfall intensity in some places and can bring sea level rise that may contribute to increased coastal inundation and reduced stormwater outfall capacity in low-lying areas.²⁵ While we lack nationally consistent data, Insurance Australia Group's (IAG) wild weather tracker indicates severe weather events are on the rise, seeing a 256% increase in storm-related claims compared to the year prior, with 46 storms between March 2025 and the end of February 2026.²⁶

An Earth Sciences New Zealand national hazard assessment indicates that approximately two-thirds of the New Zealand population live in areas exposed to flooding, coastal inundation or sea-level rise.²⁷ Shifting seasonal storm patterns and increased likelihood and duration of severe weather events reinforce that stormwater systems need to be designed to reduce the impact of increased intensity of rain events in order to protect public health, as illustrated by the effective management of stormwater in the Ta Ara Awataha Case Study below.²⁸

Case Study Two: Auckland Anniversary weekend flooding

In January 2023 during the Auckland Anniversary weekend, heavy rainfall and flooding occurred across the Auckland Region. Previous efforts in the Te Ara Awataha area to open up the local Awataha Stream provided an open channel with greater capacity to manage stormwater runoff, highlighting the role of blue-green stormwater infrastructure in managing the extreme weather events and protecting public health in flood prone areas.

During the event, the Te Ara Awataha greenway acted as a stormwater detention park, enabling stormwater to be held temporarily and protecting the surrounding residential area. This infrastructure helped to mitigate public health risks such as immediate risks to life and physical safety and exposure to contaminated floodwater.

Further information on this case study and how the Te Ara Awataha greenway managed extreme amounts of rainwater during the anniversary weekend floods is provided in the Authority's 2023/24 National Environmental Performance Report.

²⁴ [Stormwater management in Australia](#)

²⁵ [Changing-rainfall-extremes-wiht-climate-change-in-NZ_Guidance-for-Decision-makers.pdf](#) and [Supercharged thunderstorms: have we underestimated how climate change drives extreme rain and floods? : Find an Expert : The University of Melbourne](#)

²⁶ [Wild Weather Tracker Issue 8](#)

²⁷ [New reports highlight flood risk under climate change | Earth Sciences New Zealand | NIWA](#)

²⁸ [Water services insights and performance reports | The Water Services Authority - Taumata Arowai](#)

2.3 Affordability

There are significant costs associated with upgrading and maintaining stormwater infrastructure

The 2026 National Infrastructure Plan has highlighted that identifying cost effective flood infrastructure should be a priority for the decade ahead, with increasing exposure to flooding resulting in insurance premiums becoming prohibitively expensive for some New Zealanders.²⁹ The Local Water Done Well programme aims to support councils through enabling collaborative service delivery arrangements, economic regulation, and improved access to finance.³⁰ Standardisation, can support efficient infrastructure design and consenting and risk-based approaches can help to ensure that investment delivers the greatest possible public and environmental improvements.

2.4 Social and cultural significance

Stormwater networks have deep interconnections with people and place

Stormwater infrastructure in New Zealand has social and cultural significance that extends well beyond its technical function of managing runoff. Unlike drinking water and wastewater infrastructure, some components of stormwater networks such as swales, waterways, green spaces, public parks and drains are above ground, and the operation (and failure) of stormwater networks can be highly impactful to communities. Research conducted on social factors that impact stormwater management has highlighted the importance of community engagement and public awareness to help shape investment decisions and promote trust and confidence in stormwater solutions.³¹

Māori have rights and interests in effective stormwater management

Iwi/Māori rights and interests have both direct and indirect implications for how water is managed in New Zealand, including through Treaty of Waitangi settlements that commonly recognise the role of iwi and hapū in water governance and decision making. In the context of stormwater management, early and ongoing engagement with iwi/Māori in planning, design, and investment decisions helps to ensure water networks reflect cultural values, avoid further degradation of natural resources, and uphold Treaty settlement commitments.³²



29 [national-infrastructure-plan-03032026.pdf](#)

30 [Water Services Policy legislation and process - dia.govt.nz](#)

31 [Methods for Developing Sustainability Indicator Systems for Freshwater and Estuarine Receiving Bodies of Urban Stormwater; Managing stormwater | Building Performance; Implementing-Nga-Wai-Mangathe-Urban-Water-Principles-through-policy-and-practices_0.pdf; Integrated Urban Water Management Plans | Water Knowledge Hub; Water services insights and performance reports | The Water Services Authority - Taumata Arowai](#)

32 See for example, [INDIGENOUS PERSPECTIVES ON STORMWATER DISCHARGES : Water New Zealand](#)

3. The role of the Authority

Section Summary:

- The Authority's role in stormwater network leadership and oversight involves identifying system risks and influencing network design to drive consistency and performance.
- The Authority proposes prioritising work on the establishment of baseline measures, supporting stormwater risk management plans, and developing National Engineering Design Standards.
- This will set the foundations for a strong understanding of the system, network infrastructure and associated risks, helping to inform future actions.

We want to hear from you: What are the most important tools and objectives for improving stormwater oversight and performance, and do you agree with the Authority's proposed approach.

3.1 The Authority's role in water service performance

The Authority has a role in system leadership and oversight to promote continuous improvement in water services and protect public interests. Across stormwater, wastewater and drinking water, we have tools to increase the performance of water services by:

- Enhancing transparency on the performance of water networks and their operators.
- Providing oversight and assurance on how networks are regulated, managed, and performing.
- Developing sector capability through collaboration, education and training.
- Identifying, preparing and promoting national guidelines and best practices for water networks and operators.
- Developing national standards and targets to support network performance and consistency in practices.

We also play a role in compliance and enforcement of drinking water networks³³, however, we do not have equivalent compliance powers related to stormwater management. We have been considering how we could deploy our stormwater tools to support continuous improvement in the sector.

3.2 Stormwater network oversight and leadership

This section discusses how the Authority relies on data on the environmental performance of stormwater networks, influences the design of infrastructure, and sets regulatory rules and requirements for how infrastructure performs.

3.2.1 Identifying system risks

Making system risks visible by measuring and reporting on stormwater network environmental performance, can support a risk-based approach to stormwater management and increase awareness of how water services' impact on the public and the environment. The Authority has three tools that directly support improved transparency and public understanding of stormwater infrastructure:

- network environmental performance measures, reporting and targets;
- stormwater network risk management plans;
- public register of stormwater networks.

33 [Compliance, Monitoring and Enforcement Strategy | The Water Services Authority - Taumata Arowai](#)

At present, there is limited national-level information about the performance of stormwater networks and associated risks. There is also limited information on existing consents and their efficacy, such as how many consents are there, percentage coverage of urban networks, compliance levels, and any upcoming deadlines where a large percentage of stormwater consents will need to be renewed. Providing communities and stakeholders with access to trusted, comparable information will enable enhanced accountability which can in turn help to shape network performance and drive evidence-based decision making on infrastructure investment.

Measures and monitoring enable reporting which is foundational for stormwater oversight. Targets may help to focus attention on key measures and incentivise continuous improvement

Network environmental performance measures can be used to establish a monitoring framework that provides the Authority with data on stormwater network performance and enable public reporting.

The Authority already reports on key performance measures for water services through the Drinking Water Regulation Report and the Network Environmental Performance Report.³⁴ These documents examine how network operators are performing, helping to build a clearer picture of water management practices and gaps. Reliable data on stormwater network performance is a key enabler to identify emerging stormwater infrastructure risks and opportunities for improvement. Over time, this can indicate where further regulatory interventions such as standardisation may or may not be necessary.

The Authority proposes developing stormwater measures as a short-term priority to enable evidence-based decision making and support longer-term work streams. In the future this will enable public reporting by the Authority on stormwater as part of the Network Environmental Performance Report, and consideration of targets to focus attention on key measures. The Authority may also set targets for the environmental performance of networks, however, this would rely on information from baseline measures to calibrate targets appropriately. While targets will not be binding on network operators, once they are set they will be reported against in the Authority's annual Network Environmental Performance Report. In this way, targets can provide a useful lens to set expectations for the sector and enable clear benchmarking of performance over time.

Stormwater network operators must adopt network risk management plans by August 2028

The Local Government (Water Services) Act 2025 states that stormwater network risk management plans must be adopted by all network operators by August 2028.

The risk management plans require operators to map and identify risks and hazards to critical stormwater infrastructure and describe how risks are to be managed. Network operators must undertake public consultation on their plans and must also consult with the Authority.

Some network operators have already started developing their stormwater network risk management plans and have indicated that guidance on the required content and approach would be valuable. The Authority proposes prioritising the development of guidance to support delivery of the plans to encourage a nationally consistent approach.

A public register of stormwater networks can support transparency but requires maintenance

The Authority may maintain a register of stormwater networks under the Water Services Act 2021. While a public register can enable awareness of network infrastructure, and empower communities to hold network operators to account, its usefulness relies on the submission of comprehensive, accurate and up to date information by network operators. On this basis the Authority does not propose to prioritise development of a public register at present but will continue to assess future opportunities for this tool as further information becomes available.

3.2.2 Influencing improved network design

A fundamental component of stormwater management is having the right infrastructure in place. As part of its system leadership role, the Authority can influence the design, construction and operation of stormwater networks to promote best practice, improve efficiency and performance through:

- Network Engineering Design Standards
- Environmental Performance Standards
- Infrastructure Design Solutions

³⁴ [Water services insights and performance reports | The Water Services Authority - Taumata Arowai](#)

National Engineering Design Standards will enable standardisation of network infrastructure

Work to develop National Engineering Design Standards (NEDS) and associated codes of practice that will apply to three waters networks has recently commenced. NEDS will promote national consistency in the design, construction and operation of stormwater networks, containing mandatory performance-based requirements for stormwater infrastructure. There are currently around 45 different codes of practice governing the construction or renewal of water infrastructure, maintained locally by councils. This leads to multiple problems and inefficiencies that ultimately result in higher costs for communities and a handbrake on development.

These mandatory standards will be supported by detailed codes of practice, which provide one pathway to comply with the NEDS. Some of the key areas that NEDS are designed to address include faster, more efficient and more predictable regulatory requirements for developers, lowering the costs of infrastructure and charges to communities, better asset management, performance and resilience, and enabling innovation and modern construction methods. Water service providers will also be able to approve alternative solutions where appropriate as long as they meet the standards.³⁵ Once developed, NEDS will apply to water service providers and any people who intend to transfer water services infrastructure to a water service provider or connect stormwater infrastructure to a public network in the future.

Environmental performance standards could set requirements for the performance of stormwater networks

The Authority is empowered to create standards for the environmental performance of stormwater infrastructure, including for the quality (e.g. required treatment levels) and quantity (e.g. capacity of the network) of stormwater networks. These standards would be established in regulations and would be implemented via consents.

At present, the Authority does not propose progressing work on these standards, as further feedback and evidence are needed to understand how they could best deliver value for the sector. Feedback or comments on this opportunity can be provided via the survey or contact details linked in this paper. As understanding of stormwater infrastructure at a national level is developed, the Authority will continue to consider opportunities for environmental performance standards.

Infrastructure design solutions may offer a streamlined pathway for meeting standards

The Authority can establish a streamlined pathway for the consenting of stormwater infrastructure in some circumstances through infrastructure design solutions (IDS). IDS can provide an opt-in pathway to comply with any relevant environmental performance standards based on designs that are known to meet technical performance standards, with a set of pre-determined operating requirements. The Authority does not propose progressing IDS for stormwater at present, as it would first be necessary to establish national environmental performance standards. The Authority looks forward to hearing from stakeholders whether they consider this an appropriate way to sequence the work programme.



35 [National Engineering Design Standards | The Water Services Authority - Taumata Arowai](#)

4. International approaches

Section Summary:

- We have analysed stormwater management approaches taken across nine jurisdictions to better understand international best practice.
- National-level monitoring is a common feature of stormwater management internationally, and risk management planning is used effectively in some countries.

We want to hear from you: Are you aware of case studies or international examples that may provide useful direction or insights in a New Zealand context.

4.1 Overview of regulatory practices

The Authority has explored international regulatory approaches to stormwater management across nine countries. While differences in mandate (e.g. some regulators are responsible for both stormwater infrastructure and flood management) and national context (e.g. water scarcity in drought-prone areas) limit the value of direct comparison,

overseas examples provide useful insights on potential approaches for regulatory intervention in New Zealand. Table One highlights how other countries have developed and implemented regulatory tools to support stormwater management, and [Annex Two](#) has more detail on international practices.

Table One, use of national-level regulatory interventions in international jurisdictions.

Country	National monitoring & reporting	National performance standards	National design standards	National performance targets	Public register	Risk management planning
New Zealand	No	No	No	No	No	Yes
Australia	Yes	No	Yes	Yes	No	No
Canada	No	No	No	No	No	Yes
Denmark	Yes	Yes	No	Partial	No	Yes
England	Yes	Yes	Yes	Yes	No	Partial
Ireland	Yes	No	Yes	No	Partial	Yes
The Netherlands	Yes	Yes	Partial	No	No	Yes
Scotland	Yes	Yes	Yes	Partial	Partial	Yes
Singapore	Yes	Yes	Yes	Yes	Yes	Partial

4.2 Measurement practices

National level monitoring is a consistent feature of stormwater management

Almost all countries included in the analysis conduct national-level monitoring of stormwater network performance. In European Union (EU) member states (Ireland and the Netherlands), monitoring is driven by nationally-binding EU laws, particularly the Water Framework Directive (WFD) which requires systematic monitoring of water quality, hydrology and ecological status, usually organised at catchment level.

England and Scotland follow a similar approach that is underpinned by national regulators that link monitoring of risk management and environmental compliance. Singapore represents the most centralised model, with the Public Utilities Board (PUB) managing monitoring of drainage systems. In Canada, by contrast, provincial and municipal monitoring frameworks are used, with no single national stormwater monitoring system.

4.3 Risk Management Planning

Risk management planning often leverages overflow data to inform investment decisions

Several countries included in the research (Ireland, Scotland and Denmark) conduct national or regional-level risk assessments and risk management planning. Risk management planning is generally used to identify and map watercourses and groundwater characteristics and identify opportunities or necessary controls to mitigate flood risk, protect ecosystem health, manage human uses and improve water quality from runoff.

In England, Water UK published a National Storm Overflows Plan for England in 2024³⁶ which informs prioritisation of efforts regarding stormwater retention capability, use of technology to manage networks, management of infiltration and addressing public health and environmental impacts in sensitive areas.

4.4 Targets and Standards

Use of national targets and standards differs across jurisdictions

Standards and targets are a mechanism for setting prescriptive requirements for stormwater management and network design, but their role and applications differ across jurisdictions. Most of the countries included in this research regulate stormwater through an oversight and guidance function i.e. by influencing stormwater management indirectly through water quality and stormwater frameworks.

A smaller number of jurisdictions have set national level targets and/or introduced stormwater design and performance standards:

- in England, national standards for sustainable drainage systems (SuDS) have been adopted to set minimum design expectations for flow control, water quality and drainage hierarchy in new developments;³⁷
- in Singapore, mandatory codes of practice set detailed engineering requirements including hydraulic capacity, detention storage and runoff control thresholds;³⁸
- in Canada, where there is a decentralised model for stormwater management, the national regulatory agency has combined enforceable engineering design standards with voluntary national management standards.

Scotland, Ireland, the Netherlands and Canada do not appear to set mandatory regulatory standards, but provide nationally-issued/regulator endorsed guidance documents to shape design, maintenance and approval processes for stormwater infrastructure. In Denmark, Singapore and Ireland, guidance is used to encourage alignment with national level objectives (such as climate adaptation) or to provide technical instructions that help regulated entities to meet compliance obligations.

³⁶ WEB. Water UK National Storm Overflows Plan for England 0.pdf

³⁷ National standards for sustainable drainage systems (SuDS) - GOV.UK

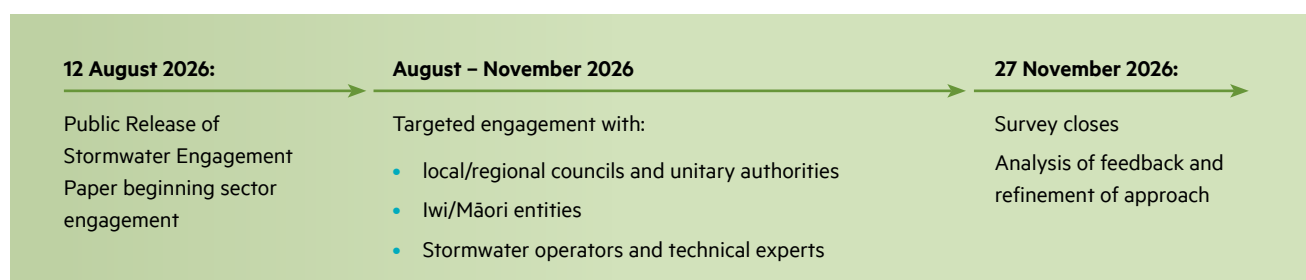
³⁸ See for example: <https://www.pub.gov.sg/-/media/PUB/PDF/Code-of-Practices-and-Submission-Guidelines/Surface-Water-Drainage/Code-of-Practice-on-Surface-Water-Drainage.pdf>

5. Next steps

This paper opens a conversation with industry experts and interested parties on how the Authority will progress the implementation of regulatory tools for stormwater network infrastructure. Stormwater management requires collective action, involving central and local government, iwi and hapū, infrastructure providers, planners, developers, regulators, and communities. We welcome input on any of the issues outlined in this paper, and any matters that you consider the Authority may have overlooked. Figure two below sets out an indicative timeline for further engagement.

The Authority's intention is to take a collaborative approach to regulatory design which delivers proportionate, practical solutions that meet the needs of the sector and their communities. On this basis, an immediate focus is proposed on developing baseline information regarding current practices, supporting stormwater risk management planning, and developing stormwater National Engineering Design Standards.

Figure Two, Indicative timeline for further engagement in 2026.



Reminder: How to have your say

To share your thoughts as part of this early conversation, please follow the link or QR code below.

You are also welcome to email us at stormwater_wastewater@taumataarowai.govt.nz with any questions or direct comments you would like to provide.

The survey will be live until Friday 27 November 2026, and a summary of outcomes from engagement on this paper will be published on our website later in 2026.

Stormwater Sector Survey

Have your say on how the Authority could implement stormwater tools and functions. The following link will take you to a short survey and a place for you to share your thinking.

www.taumataarowai.govt.nz/stormwater-sector

The survey has 11 questions, including open text questions, and should take approximately 20 minutes to complete.



Annex One: Regulatory landscape – key actors and roles

Entity	Main roles in stormwater management	Key legal or regulatory tools and responsibilities
Water Services Authority – Taumata Arowai	Oversee urban stormwater networks at national level under the Water Services Act. It can set stormwater environmental performance and issue national engineering standards. It also collects information through the stormwater register and sector reporting.	Water Services Act 2021, including stormwater provisions such as sections 139A and 139B. The Authority can set national expectations for stormwater networks, but it does not replace regional councils' resource management functions or territorial authorities network ownership and operations.
Consenting Authorities (typically regional councils)	Regulate the environmental effects of stormwater discharges. They issue and enforce resource consents for discharges to land, water and coastal areas. They also manage regional plans, water quality, natural hazards and catchment level monitoring.	Resource Management Act 1991 functions, regional policy statements, regional plans, resource consents, compliance monitoring and enforcement tools.
Building consent authorities	Oversee building work affecting site drainage and surface water management on individual properties and developments.	Building Act 2004 and Building Code requirements, including building consent decisions and drainage related compliance. Building controls apply at site level, while district plans and regional rules also affect stormwater.
Territorial authorities	Often own, operate and maintain most urban stormwater networks. They manage local drainage, prepare and implement district plans, issue building consents, and can make bylaws for drainage and stormwater networks. Under the Local Government (Water Services) Act 2025, territorial authorities are responsible for ensuring water services are provided in their district and can choose different delivery models.	Local Government Act 2002, including bylaw powers for drainage and stormwater related infrastructure. Local Government (Water Services) Act 2025. Building Act 2004 through building consent responsibilities. District plans under the RMA. Networks discharge consents issued by regional councils.
Council controlled organisations (CCO)	A council can transfer water services responsibilities to a water organisation Under the Local Government (Water Services) Act 2025. These organisations can provide stormwater services, depending on local arrangements.	Local Government (Water Services) Act 2025. Responsibilities may sit with the territorial authority, a jointly owned organisation, or another delivery arrangement.
Private property owners and developers	Private property owners are also responsible for managing stormwater within their property boundaries, to avoid harm to neighbours and the environment. Property owners must comply with requirements in the Building Act 2004 and associated instruments, as well as requirements set by the relevant local council.	District plan rules, engineering standards, building consent requirements, local bylaws, and in some cases, resource consent conditions under regional plans. Responsibilities on private land are defined and enforced across councils.

Entity	Main roles in stormwater management	Key legal or regulatory tools and responsibilities
Ministry for Cities, Environment, Regions and Transport (previously DIA and MfE)	Sets national planning direction under the Resource Management Act 1991 and administers legislation (such as the Local Government (Water Services) Act 2025) to support the Government's objectives for stormwater services infrastructure.	Issue National policy statements. Oversee the reform of the RMA, Simplification of Local Government and Local Water Done Well.
Commerce Commission	Regulates councils and water organisations that provide water supply and wastewater services, with flexibility to include stormwater services or other types of suppliers in future, if necessary.	Economic regulation of water services to promote outcomes consistent with a competitive market such that regulated suppliers maintain their networks, invest efficiently, deliver services at a quality consumers demand, and recover sufficient (but not excessive) revenue. The primary tool is information disclosure.
Waka Kotahi NZ Transport Agency (NZTA)	Manages stormwater from the state highway network and applies its own standards and specifications for highway stormwater design, treatment and operation, complying with regional council requirements and resource consents.	NZTA P46 Stormwater Management Standard provides the minimum standards for stormwater management on all Waka Kotahi projects. Resource consents under the Resource Management Act 1991 where needed.
KiwiRail	Manages stormwater risks and environmental compliance within the rail corridors as well as implementing environmental and engineering standards specifically designed for rail infrastructure.	Resource consent requirements set by local authorities.



Annex Two: Summary of International Practices

Country	National stormwater regulator (s)	Research	Monitoring / performance measures	National performance standards	National design standards	Performance targets	Public register of stormwater networks	Guidance	Risk management plans
Australia	Water Quality Australia Department of Climate Change, Energy, the Environment and Water (DCCEEW) No single national stormwater regulator. States and territories are primarily responsible for water management within their jurisdictions. DCCEEW, National water policy	Stormwater management in Australia	CSIRO Stormwater Report National monitoring framework is provided through water quality guidance (ANZG guidelines), not stormwater asset monitoring.	National Construction Code and Australian Standards National Water Quality Management Strategy (NWQMS) suite and Australia and New Zealand guidelines (ANZG 2018) provide nationally agreed guidance (not mandatory standards).	National design standards Australian Rainfall and Runoff (ARR) is the national guideline suite for design flood and runoff estimation, published and supported by the Commonwealth (Geoscience Australia).	Targets are typically set by states and catchment plans, using national guidance frameworks.	Local level data sets available No national public register identified for stormwater networks. Governance and asset records are generally local or state based.	Australian Guidelines for urban stormwater management Urban stormwater guidance (NWQMS Paper 10) plus ANZG and ARR	No national development of stormwater risk management plans
Canada	No single national regulator. Federal: Environment and Climate Change Canada (ECCC) Provincial authorities (e.g. Ontario Ministry of Environment, Conservation & Parks - MECP)	Stormwater management planning and design manual Ontario Ministry of Environment) Developing a stormwater quality management standard Fisheries Act pollution prevention provisions (subsection 36(3)) and registry information.	CSA W211:21 requires operating authorities to document monitoring programmes and audit management (provincial requirements vary) National monitoring or performance measures are not set for stormwater networks as a whole. There is a national management standard exists for operating authorities	Standards Council of Canada, 2021 (it defines a risk-based management framework for municipal operating authorities National monitoring or performance measures are not set for stormwater networks as a whole. There is a national management standard exists for operating authorities	Provincial and municipal design standards (e.g. Ontario)	No national targets: CSA W211:21 requires operating authorities to establish their own; therefore provincial targets vary.	No national public register. Stormwater system management is municipal and provincial. Some municipalities publish GIS drainage data.	The municipal how to guide for CSA community water standards Federal compliance guidance through Fisheries Act pollution prevention	Stormwater management plan and SWMP design Stormwater Management Planning and Design Manual ontario.ca
Denmark	Danish Environmental Protection Agency Municipalities hold discharge permit authority and operate sewer systems	Danish regulations - The Danish Environmental Protection Agency From EU Directives to Local Stormwater Discharge Permits: A Study of Regulatory Uncertainty and Practice Gaps in Denmark	Yes National WFD (Water Framework Directive) monitoring via River Basin Management Plans. No single national stormwater performance dashboard.	EU directive (WFD) and national laws (Environmental objectives act)	No national design standards, local permits. Water Course Act regulates drainage and discharges. Municipal permit conditions govern individual discharges.	National target: municipalities required to have climate adaptation plans under 2012 Action Plan for a Climate-Proof Denmark	No national public register	National plans and local guidelines (RBMPs- River basin management plans permits) Action Plan: How to Manage Cloudburst and Rainwater — A Climate-Proof Denmark (2012) Copenhagen Cloudburst Management plan (2012, ongoing)	Yes – Danish municipalities have developed risk management plans as part of climate adaptation. Climate Adaptation in Denmark - Climate Change Adaptation

Country	National stormwater regulator (s)	Research	Monitoring / performance measures	National performance standards	National design standards	Performance targets	Public register of stormwater networks	Guidance	Risk management plans
England	Department for Environment, Food and Rural affairs – Defra (policy), Environment Agency - EA (implementation and environmental enforcement), Ofwat (economic regulator regulates the water sector in England and Wales)	National standards for sustainable drainage systems - GOV.UK Storm overflow assessment frameworks 2025 Storm overflows discharge reduction plan Research Briefing 2026 – Sustainable drainage systems (SuDs) (house of Commons Library) Regulating the water industry – our approach, what we're changing and new powers in the Water Bill – Creating a better place	Environmental Performance Assessment (EPA) is a tool to compare performance between the 9 water and sewerage companies. Every 5 years the EPA metrics for data reporting review aligns with the 5 year Asset Management Plan (AMP) Environment Agency required event duration monitors on storm overflows (end of 2023) and uses the data for compliance action	National standards for Sustainable drainage systems (SuDs) Storm overflows legislation Environment Act 2021	These standards are intended for application in the design of surface water drainage systems for new infrastructure and development, whether on greenfield or brownfield sites. They are not designed to apply to retrofit SuDS designs.	Storm Overflows Discharge Reduction Plan (SODRP, 2022): eliminate harmful overflows by 2050; no overflow to cause ecological harm by 2035; reduce spills at environmentally sensitive sites by 2035. All overflows monitored in near real-time from 2025	No national stormwater register EA publishes annual EDM Storm Overflow data (Event Duration Monitoring – Storm Overflows -annual returns) County councils maintain a register of flood defences infrastructure	Storm overflow assessment framework 2025 - GOV.UK Storm overflows: policy and guidance - GOV.UK	Partial. National Stormwater Overflow Plan completed at a national level. water.org.uk/sites/default/files/2024-03/WEB_Water_UK_National_Storm_Overflows_Plan_for_England_0.pdf
European Union directives	European Commission/ Dg Environment sets directives. Member States and competent authorities transpose the law and implement via river basin management plans and programmes of measures. European Environment Agency (EEA) monitors	Research conducted by the European Commission, for example, to look at the effectiveness of EU funded projects: Building resilience: EU-funded projects helping prevent floods - European Research Executive Agency	Monitoring requirements are explicit under WFD EU WISE reporting dashboards	EU level “standards” are legal environmental objectives and Ecological Quality Status (EQS) frameworks, not engineering standards. Detailed standards set by Member States In the EU, regulation is governed by the Water Framework Directive (WFD) and the Floods Directive, but national implementation varies and is often supplemented with local non-legislative guidelines.	No EU wide design standard for stormwater networks or SuDS. Design remains national and local.	The Urban Wastewater Treatment Directive- UWWTD (revised 2024) WFD requires River Basin Management Plans with water body status reporting every 6 years Integrated Urban Wastewater Management Plans must include concrete stormwater management actions.	No EU-level register. WFD requires Member States to report river basin data to EEA (accessible via WISE Freshwater portal). Discharge point registers are member-state obligations. River basin reporting systems	WFD Guidance Documents (Common Implementation Strategy) ec.europa.eu UWWTD Implementation Guidance wareg.org	The EU Floods Directive includes flood risk assessments, flood maps and flood risk management plans.
Ireland	Environmental Protection Agency (EPA) is the environmental regulator Irish water, now CRU is the economic regulator Local authorities	Greater Dublin Strategic Drainage Study (GDSDS) 2005 Greater Dublin Regional Code of Practice for drainage works Greater Dublin Drainage project 2023 Nature Based Management of Urban Rainwater and Urban Surface Water Discharges - A National Strategy	EPA sets trigger values for stormwater discharges from licensed sites. Monitoring frequency minimum weekly for key parameters Licensee-Guidance-on-the-setting-of-trigger-values---Final-.pdf	EU directive transposed into national regulations (OECD) No single national stormwater standard	090151b28087d351.pdf	No national stormwater discharge reduction targets. EPA enforces individual site licence conditions and trigger values	Partial: Dublin City Council published a Sustainable Urban Drainage Systems (SUDs) Register and Map DCC	Draft-guidance-on-the-management-of-stormwater-at-EPA-licensed-sites.pdf Licensee-Guidance-on-the-setting-of-trigger-values---Final-.pdf	Catchment Flood Risk Assessment and Management Plans Catchment Flood Risk Assessment and Management Plans

Country	National stormwater regulator (s)	Research	Monitoring / performance measures	National performance standards	National design standards	Performance targets	Public register of stormwater networks	Guidance	Risk management plans
The Netherlands	Ministry of Infrastructure, Water Management(national policy). Rijkswaterstaat(national waters). 21 Water Authorities(regional drainage & quality). Municipalities manage urban stormwater.	Dutch Delta programme for urban water reports Nationaal Water Programma 2022-2027 Informatiepunt Leefomgeving About - Dutch Water Authorities KWR (national research centre on water management) Publications	Water Authorities conduct water quality and quantity monitoring of regional waterbodies. Municipalities must produce sewerage plans every 5 years with management objectives. NEN-EN 752 and Dutch Urban Drainage Guidelines set asset management procedures.	NEN-EN 752:2017 — Drain and Sewer Systems Outside Buildings (design standard). NEN 3225 — Sewerage design and construction. Dutch Urban Drainage Guidelines (RIONED Foundation). National policy set in the Environmental and Planning Act 2024	Design standards NEN-EN 752 and Dutch Urban Drainage Guidelines (RIONED). Municipalities set level of service criteria. Delta Programme spatial adaptation standards guide climate-resilient design.	Performance target	Municipalities legally required to maintain sewerage plans (updated every 5 years) which include network descriptions. No single national public facing stormwater network register	Delta programme on spatial adaptation NEN-EN 752:2017 en Swales: guidelines for design, construction, and maintenance	Delta Plan for Flood Risk Management Delta Plan for Flood Risk Management Delta Programme
Scotland	Sepa (Scottish Environmental Protection Agency) is the principal regulator under Water Environment & Water Services (Scotland) Act 2003 (WEWS). Scottish Water is the statutory asset owner of adopted public Sustainable Drainage Systems (SuDS).	Water Environment and Water Services (Scotland) Act 2003 (changes in force from 24 April 2026) Responsibilities for flooding Beta SEPA Scottish Environment Protection Agency Knowledge base & downloads UK SuDS	Compliance monitoring under WFD	Controlled activities regulations (CAR)	Mandatory SuDS for most developments (Scottish Water, 2015) Microsoft Word - SUDS Report Final - 6 August 2018[2].docx	Flood risk control The Surface Water Management Planning Guidance document also has a useful list of the role and responsibilities in relation to surface water flooding.	Public Register Search Scottish Environment Protection Agency SEPA	SEPA SuDS guidance and CAR handbook Water drainage assessment guide (by the Sustainable Urban Drainage Scottish Working Party (SUDSWP)) Scottish Environment Protection Agency (SEPA). <i>Regulatory Method WATRM08: Regulation of Sustainable Urban Drainage Systems.</i> Scottish Water (2018). Sewers for Scotland, 4th edition.	Flood Risk Management Plans Beta SEPA Scottish Environment Protection Agency
Singapore	PUB (Singapore national water agency) National regulator and operator of all stormwater drainage infrastructure	managingUrbanRunoff.pdf	system performance and flood monitoring	Sewerage and Drainage Act (Cap. 294). Part IV Drainage Code of Practice on Surface Water Drainage, 7th Edition (2018, Addendum 3 April 2025) for the statutory minimum engineering requirements	Mandatory on-site detention for development ≥0.2 ha (since 2014) Hydraulic and safety design standards set out mandatory or expected design criteria. Condensed Booklet of Engin Procedures.pdf	Performance targets for water quality treatment: Condensed Booklet of Engin Procedures.pdf	Public drains are inspected regularly. PUB maintains records of the 8,000 km drainage network. No publicly accessible open-data network register. Application Forms PUB, Singapore's National Water Agency	Guides and Handbooks PUB, Singapore's National Water Agency detentionTank.pdf ABC Waters Design Guidelines.pdf managingUrbanRunoff.pdf	Flood risk maps published on PUB website. Risk Assessment studies carried out at national level: PUB to conduct Risk Assessment Study to evaluate impact of sea level rise on offshore islands PUB, Singapore's National Water Agency



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