From: Karen Gamble
Sent: Tuesday, 29 September 2020 4:49 PM
To: Brian Richmond; rob@hartland.co.nz; RUD Compliance Data
CC: Len Whittaker; Mohamed Imtiaz; Derek Wood; Natasha Bekker
Subject: Stormwater Annual Plan 2018-2020 and Draft Stormwater Management Plan

Good afternoon gentlemen

You will have received an email from me containing a link to the OneDrive folder that contains the CSDC Annual Report 2018-2020 and the Draft Stormwater Management Plan – September 2020 for review and comment. If you have not received this link, please check your Spam folder.

Please note the following:

- The draft version of the Stormwater Management Plan remains unsigned. The final, agreed, document will be signed
- I am now away on annual leave, returning Monday 2 November.
- Please contact Len Whittaker for any content queries during October: len.whittaker@tcdc.govt.nz
- Please contact Natasha Bekker for any document access issues during October: natasha.bekker@tcdc.govt.nz

Kind regards
Karen

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TCDC




The Coromandel will be NZ's most desirable place to live, work and visit..

DRAFT STORMWATER MANAGEMENT PLAN



Thames-Coromandel Urban Areas

September 2020

Revision History

Revision Number	Prepared By	Description	Handover Date
1	Karen Gamble	Final Draft for submission to WRC	29 September 2020

Document Acceptance

Action	Name & Position	Signed	Date
Prepared by:	Karen Gamble 3 Waters Operations		
Approved by:	Mohamed Imtiaz Infrastructure Manager		

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INTRODUCTION

Thames-Coromandel District Council (TCDC) owns and maintains stormwater networks within each urban area within the District. The Council networks consist of approximately 278 km of stormwater pipes, approximately 3,900 manholes, four pump stations, stormwater inlet and outlet structures, and assorted minor drainage structures such as soakage pits, detention ponds, and treatment devices.

TCDC has some legislative and planning mechanisms available to influence and regulate land-use activities that may have adverse effects on networks and their receiving environments.

Stormwater management is managed between three departments within TCDC (Water Services, Roading, and Parks & Reserves). It is also a multi-agency, multi layered complex activity and there are limitations to the extent to which TCDC, as a local authority, can manage stormwater. The effective management of stormwater relies on proactive collaboration with other governing bodies.

The Waikato Regional Council has issued Comprehensive Stormwater Discharge Consents (CSDC) for eight urban areas in the Thames-Coromandel District as shown in Figure 1 below:

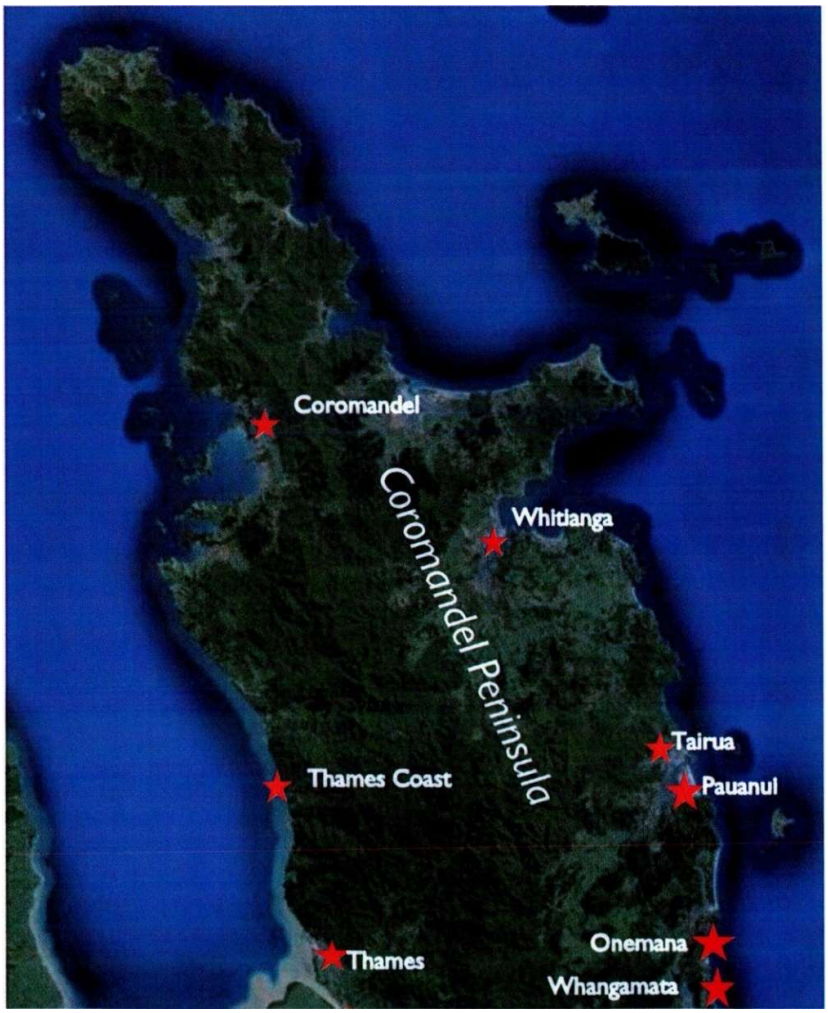


Figure 1 - Urban areas within the Thames-Coromandel District subject to Comprehensive Stormwater Discharge Consents (CSDC's).

The CDSC's are referenced as follows:

Consent Number	Urban Area
122521	Thames
105661	Pauanui
105663	Coromandel
105664	Tairua
105665	Whitianga
105666	Onemana
105667	Whangamata
105668	Thames Coast

This Stormwater Management Plan (SMP) has been developed in accordance with Condition 30 (Schedule A) of the CDSC's, following the numbering convention within the Schedule.

a) Plans / Drawings

Appendix A holds the series of documents that shows the Thames-Coromandel District Council administrative areas, main hydrological catchments, main stormwater network (including sites of key stormwater management devices), major secondary overland flow-paths and stormwater receiving bodies. These are split into urban areas as defined by consents as follows:

A-1 Thames Urban Area
A-2 Pauanui Urban Area
A-3 Coromandel Urban Area
A-4 Tairua Urban Area
A-5 Whitianga Urban Area
A-6 Onemana Urban Area
A-7 Whangamata Urban Area
A-8 Thames Coast Urban Area

b) Relationship and Integration between SMP and other documents

The following sections describes the relationship and integration between the SMP and other key planning instruments and regulatory / non-regulatory processes, including all those utilised in the management of the stormwater network.

i) National Legislation

TCDC is legally required to maintain current stormwater schemes in certain areas identified by the Ministry of Health (except that it may, under some circumstances, close down or transfer the service where less than 200 people are served).

Council's mandate for the provision of public stormwater services and for monitoring and enforcement of appropriate stormwater control measures on and from private properties is prescribed through a range of national legislation, the principal Acts being:

The Health Act 1956

The Health Act 1956 requires local authorities to provide sanitary works, including drainage, (Section 25). There are however no associated provisions in the Act defining what sort of drainage system should be provided, and what capacity it should have.

The Local Government Act 2002

The Local Government Act 2002, with regards to stormwater, requires local authorities to:

- As part of its long-term plan, prepare and adopt an infrastructure strategy for a period of at least 30 consecutive financial years
- Assess the health risks to communities from absence of or deficiency in stormwater services; the quality of services currently available; the current and estimated future demands for stormwater services; and actual or potential consequences of stormwater discharges
- Report on defined levels of service, measures, and targets
- Continue the operation of any community water service (including the provision of stormwater drainage).
- Include strategic assets in Significance and Engagement Policy

The Building Act 2004

The Building Act 2004 enforces the provisions of the Building Code in relation to safe and adequate stormwater provision and flood protection.

The Resource Management Act 1991 (RMA)

The RMA is an effects-based legislation that has the overarching purpose of promoting the sustainable management of resources. The RMA is relevant to the stormwater activity as the receiving land and watercourses that TCDC disposes stormwater to are valuable resources.

The Civil Defence Emergency Management Act 2002

The purpose of this Act is to ensure essential lifelines, including stormwater collection, are able to function effectively both during and after Civil Defence emergencies.

Hazardous Substances and New Organisms Act 1996 (HSNO)

The purpose of this Act is to ensure the health and safety of people and communities by preventing or managing the adverse effects of hazardous substances and new organisms.

Climate Change Response Act 2002

This Act requires Territorial Authorities to comply with the New Zealand Emissions Trading scheme in the delivery of its three water services.

Health and Safety at Work Act 2015

The Health and Safety at Work Act 2015 ensures that everyone has a role to play in health and safety and makes everyone's responsibilities clear.

Heritage New Zealand Pouhere Taonga Act 2014

This act requires Territorial Authorities to consider historical and cultural heritage when working on infrastructure.

Land Drainage Act 1908

This act outlines the powers of local authorities with regards to clearing of watercourses / drains and the obligations to maintain and repair existing drainage systems

Local Government (Rating) Act 2002

This act provides Territorial Authorities with flexible powers to set, assess, and collect rates.

The Hauraki Gulf Marine Park Act 2000

The purpose of this Act is to integrate the management of the natural, historic, and physical resources of the Hauraki Gulf, its islands and catchments, as well as to establish the Hauraki Gulf Marine Park and the Hauraki Gulf Forum. A number of Thames-Coromandel District Council's western seaboard stormwater catchments drain to the Hauraki Gulf.

Utilities Access Act 2010

This act requires TCDC to work with other utility operators and corridor managers to install, maintain, and upgrade infrastructure within transport corridors.

ii) National Policy Statements

National policy statements provide a means for central government to prescribe objectives and policies on resource management matters of national importance. The following National policies are relevant to the Stormwater Activity:

National Policy Statement for Freshwater Management 2020

The National Policy Statement for Freshwater Management came into effect on 3 September 2020. It includes provisions required to be included in regional policy statements and regional and district plans. It requires an integrated management approach.

The objective of the National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:

(a) first, the health and well-being of water bodies and freshwater ecosystems
(b) second, the health needs of people (such as drinking water)
(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

National Policy Statement on Urban Development 2020

Thames-Coromandel District Council is not listed as a tier 1 or 2 local authority under this policy statement, so it is therefore assumed to be a tier 3 local authority. As such, Thames-Coromandel District Council is strongly encouraged to do the things that tier 1 or 2 local authorities are obliged to due under Parts 2 (Objectives and Policies), and 3 (Implementation) of this National Policy Statement.

This policy statement outlines requirements for development infrastructure (including stormwater) and additional infrastructure required to support or service development capacity.

New Zealand Coastal Policy Statement (NZCPS) 2010

The purpose of the NZCPS is to state policies to achieve the purpose of the RMA to promote the sustainable management of natural and physical resources in relation to the coastal environment of New Zealand. Policy 23 (4), outlined below, specifically relates to stormwater discharges.

In managing discharges of stormwater take steps to avoid adverse effects of stormwater discharge to water in the coastal environment, on a catchment by catchment basis, by:

(d) avoiding where practicable and otherwise remedying cross contamination of sewage and stormwater systems;

(e) reducing contaminant and sediment loadings in stormwater at source, through contaminant treatment and by controls on land use activities;

(f) promoting integrated management of catchments and stormwater networks; and

(g) promoting design options that reduce flows to stormwater reticulation systems at source.

iii) Regional Policies and Plans

The following Regional Policies and Plans are relevant to Stormwater Activities:

Waikato Regional Policy Statement: Te Tauākī Kaupapahere Te-Rohe O Waikato

The Waikato Regional Policy Statement, published by Waikato Regional Council, became operative on 20 May 2016. It provides an overview of resource management issues in the Waikato Region. It provides policies and a range of methods to achieve integrated management of natural and physical resources across resources, jurisdiction boundaries and agency functions, and guides the development of sub-ordinate plans (Regional as well as District) and the consideration of resource consents.

Waikato Regional Coastal Plan

The Waikato Regional Coastal Plan, published by Waikato Regional Council, became operative in 2005. The purpose of this plan is to enable Waikato Regional Council, in conjunction with the Minister of Conservation, to promote sustainable management and achieve integrated management of the Coastal Marine Area (CMA). It outlines permitted, controlled, and prohibited activities and associated rules e.g. stormwater discharges (Sections 16.3.5 and 16.3.6) and stormwater structures (16.4.10).

Waikato Regional Plan

The Waikato Regional Plan sets out the objectives, policies and rules to give effect to the Waikato Regional Policy Statement. Method 3.5.11 outlines implementation methods for stormwater discharges including the requirement for Waikato Regional Council to work with both Territorial Authorities and resource users to effectively manage stormwater within the region.

iv) Guideline Documents

NZS 4404:2010

This is a New Zealand standard that provides local authorities, developers, and their professional advisors with criteria for design and construction of land development and subdivision infrastructure. The Standard incorporates up-to-date design principles such as low impact design (LID) solutions to stormwater management, and urban design principles that encourage more sustainable places, spaces, and networks in towns and cities.

Tools for Estimating the Effects of Climate Change on Flood Flow

This guidance manual for Local Government in New Zealand was published by the Ministry for the Environment in May 2010. It outlines methods for estimating changes in the frequency and / or magnitude of rainfall and methods for converting changes in rainfall to changes in flow rate which will exacerbate the existing effects of flooding on infrastructure, including stormwater specifically stormwater drainage in coastal regions, which make up the vast portion of Thames-Coromandel District Council's stormwater catchments.

Preparing for Future Flooding

This guide for local government in New Zealand was published by the Ministry for the Environment in May 2010. It is made up of four parts:

- Parts 1 and 2 are a summary of the guidance manual Tools for Estimating the Effects of Climate Change on Flood Flow (outlined above).
- Part 3 provides a method of considering the consequences of future flood risk within a risk management framework.
- Part 4 highlights principles and options for managing future flood risk.

Climate Change Effects and Impacts Assessment

This guidance manual for Local Government in New Zealand published by the Ministry for the Environment in May 2008. It includes a roadmap designed for people dealing with issues for whom climate and climate change play an important role, e.g. upgrading stormwater systems.

Preparing for Coastal Change

This guide for Local Government in New Zealand was published by the Ministry for the Environment in December 2017. It is targeted at local government functions dealing with coastal and estuarine areas. The need to increase clearing stormwater drainage systems in coastal areas is considered a useful early alert to aid in Council decision making.

Climate Change Projections for New Zealand

This report, prepared for the Ministry for the Environment, was published in September 2018. It addresses expected changes in New Zealand's climate (temperature and many other climate variables) out to 2120, including regional variations.

v) Thames-Coromandel District Council Documents

Our Council exists to ensure our communities have a good quality of life, both now and in the future. That means that we, as a local authority, not only have to identify what our Council needs, we also must demonstrate how we'll fulfil those needs. Our vision, strategies, plans and policies are all designed to support this goal.

Thames-Coromandel District Council currently does not have a Stormwater Bylaw, and this does create some difficulties enforcing compliance. Guidance will be sought from Council on the enactment of a district-wide Stormwater Bylaw.

Our Vision

We will provide quality services and facilities, which are affordable, and delivered with a high standard of customer service.

We will be a good community citizen through our support of community organisations, economic development and the protection of the environment.

The Coromandel Peninsula is a desirable place to live, work and visit.

30 Year Infrastructure Strategy

The 30 year strategy provides an overview of:

- Issues identified as likely to have a significant impact on infrastructure over the next 30 years
- Options identified for managing these issues and the implications of these options
- Significant capital projects that are expected to be undertaken over the next 30 years.

District Plan

Thames-Coromandel District Council is currently operating under two District Plans. The Operative District Plan became fully operative in 2010. The Resource Management Act requires TCDC review the District Plan every 10 years and the current District Plan review has been underway since 2012. We now have a Proposed District Plan; this is the new District Plan, but it has some areas that are still subject to appeal (legal challenge).

Both plans set out a number of objectives, policies, rules, and development standards in relation to stormwater. The Plan guides how new land use and subdivision developments should occur to promote the effective and efficient management of the stormwater network into the future. The District Plan refers to the TCDC Code of Practice for Subdivision and Development.

Specifically, Section 4 of Part 1 of the Proposed District Plan titled Information Requirements for Resource Consents, Section 4, Subdivision Application Requirements, Section 4k) requires applicants to advise "How stormwater will be managed having regard to a total catchment management approach achieving no increase in the peak stormwater flow from the site and using low impact urban design and development methods."

Code of Practice for Subdivision and Development

The Code of Practice provides a guide to subdivision and development within the Thames-Coromandel District. defines the performance standards that infrastructure for subdivisions and development with the Thames-Coromandel district must comply with. For stormwater, these standards include the design life, hydraulic capacity and quality / treatment requirements. For matters not covered by the Code of Practice, TCDC may refer to NZS 4404 or RITS, as appropriate. A copy of the current Code of Practice for Subdivision and Development can be found in ECM (Doc Set # 355394).

Long Term Plan

Our main strategic plan is a 10-year business plan called the Long Term Plan. This is a statutory requirement under the Local Government Act 2002.

This plan brings together all of the community outcomes, plans, policies, strategies, and levels of service to ensure we will deliver the services required of us by our communities.

The stormwater activity includes managing stormwater as well as land drainage. Stormwater systems collect and dispose of stormwater to limit the effects of surface ponding. We have a number of stormwater systems throughout our district to manage runoff and reduce surface water ponding. This reduces risks to public health and safety, damage to property, and avoids dangerous road conditions.

Service Levels and Performance Measures for Stormwater, as mandated by the Department of Internal Affairs, are as follows:

- The Council's stormwater services protect habitable areas from flooding (measured by flooding events and number of habitable floors affected)
- The Council provides a responsive stormwater request service (measured by number of complaints and response time to complaints)
- The Council minimises the environment impact of protecting habitable areas from flooding (measured by number of operational resource consent conditions not complied with, number of abatement notices, number of infringement notices, number of enforcement orders, and number of successful prosecutions)

Annual Plan

The Local Government Act 2002 also requires Council to prepare an Annual Plan. The annual plan sets out Council priorities and budgets for services and infrastructure provision and supports the aims of the Long Term Plan. The Annual Plan focuses on the next three years and is more specific about what needs to be done right now.

Public consultation occurs on both the Annual Plan and Long Term Plan and these public processes provide the community with the opportunity to have input into Council's provision of stormwater services, funding, and priorities.

Asset Management Policy

The Thames-Coromandel District Council's Asset Management Policy was first adopted by Council on 20 June 2017 (latest update dated 18 June 2020) The policy incorporates all areas of asset management including stormwater. It enshrines Council's commitment to asset management including the following points:

- Council is committed to implementing a systematic asset management methodology in order to apply appropriate asset management practices across all public asset areas. This includes ensuring that assets are planned, created, operated, maintained, renewed and disposed of in accordance with Council's priorities for service delivery.
- Council is committed to meeting core asset management status for all activities.

Stormwater Asset Management Plan

The Stormwater Asset Management Plan is a tactical, infrastructural plan that gives effect to a range of other strategic and tactical planning documents including Council's strategic direction, Long Term Plan and 30 Year Infrastructure Strategy.

The Asset Management Plan demonstrates how Council's goals and strategic targets will be achieved through effective sustainable management of stormwater infrastructure assets. It is a central document that is linked to the other strategic documents both internally at Council and externally with its key stakeholders.

c) Description of Stormwater Network

Appendix A holds a series of documents that includes the description of the stormwater network in relation to contributing catchments, existing land uses within these catchments, low impact urban design measures, stormwater management devices, and main pipe reticulation.

d) Description of Stormwater Receiving Water Bodies

Also included in Appendix A with the description of each stormwater network are descriptions of all stormwater discharge receiving bodies, including their locations, key characteristics (e.g. water quality, ecological, and hydrological characteristics), existing uses, and values.

e) Key Stakeholders

Thames-Coromandel District Council believe key stakeholders generally share the view that the stormwater networks within the District shall be designed and implemented to protect the relevant communities from flooding and also avoid, as far as practicable, the adverse effects on receiving waters and habitats. Key stakeholders include:

i) Community

Community includes citizens, ratepayers, and iwi. There are a number of ways Council engages with the community to solicit views on stormwater (amongst other topics) including:

- Long Term Plan consultation process including advertisement of process, public meetings, social media polls, and formal submissions / hearing process.
- Customer Satisfaction Survey available to be completed on the Thames-Coromandel District Council website at any time (stormwater is one of the options). Of the 1640 responses received to this survey only one related to stormwater and was a compliment.
- Request for Service system. The community may raise a request for service regarding stormwater at any time via the Thames-Coromandel District Council website or via phoning customer services.
- Resource Consent applications including consultation with relevant stakeholders (including Fish & Game; Forest & Bird; and DOC), community (via Community Boards and notification) and relevant iwi.
- Consultation on significant projects through Community Boards.

As outlined in Council's Stormwater Asset Management Plan community views on stormwater include:

- Ratepayers: interested in safe and sustainable stormwater services while being conscious of rates impact. This group is further subdivided into two groups:
  - Resident Ratepayers: These customers make up about half of ratepayers and are focussed on retaining current levels of service and, where possible, to make savings to minimise rating impacts.
  - Non-Resident Ratepayers: These customers are mainly holiday makers and have a focus on receiving services that are provided over the peak summer period.
- Visitors to the District: These customers expect prompt and reliable stormwater services.
- Industry and Commercial: The District has a number of small industrial zones that support the local economy. They expect reliable services to continue their business operation uninterrupted, as well as the least cost.
- Iwi: requires Council to consult on resource consent applications due to the cultural effects of discharging stormwater to the natural environment.

ii) Internal Stakeholders

- Mayor and Councillors: Concerned with strategic outcomes and rates impact which also impact on customer satisfaction
- Community Boards: Interested in specific projects in their area, levels of service and rates impact, and working with community groups
- Asset and Planning Manager: Provides a centralised guidance and direction role across all of Council's assets
- Infrastructure Group, Transport Manager: Interested in the co-ordination of capital programmes in the road corridor

iii) Waikato Regional Council

Waikato Regional Council states in its Principles of Stormwater Management: Waikato Stormwater Management Guideline "Adequate stormwater management for urban and rural areas is necessary to preserve and promote the general health, welfare, enhancement of ecological values and economic wellbeing of the Waikato Region."

iv) Ministry of Health

On 2 December 2019 the Ministry of Health published a proactive release of Cabinet material about strengthening the regulation of drinking water, wastewater and stormwater dated 1 July 2019. No formal outcomes have been implemented as yet; however, of particular note this document includes the following points:

- agreed that a central regulator be required to undertake functions relating to identifying and promoting national good practices for wastewater and stormwater network design and management, including the development and dissemination of national guidelines (44)
- wastewater and stormwater systems need to be designed and managed to minimise the risks to people, property, and the environment, while providing levels of service that meet community expectations and provide for iwi/Māori cultural values (116)

v) Ministry for the Environment

In March 2005, the New Zealand Climate Change Office (NZCCO) of the Ministry for the Environment published a paper titled Incorporating *climate change into stormwater design – Why and how?* to aid Local Government in future design of stormwater networks.

vi) Department of Conservation

The Department of Conservation's view on managing stormwater diversion and discharge is outlined in their NZ Coast Policy Statement outlined in Section b) ii) above.

f) Description of Stormwater Network Operation and Maintenance Procedures

The operations and maintenance of the TCDC stormwater network is contracted to third parties by way of the Water Services Operations and Maintenance Contract; and the Roading Operations and Maintenance Contract. These contracts share the responsibility for the effective management of a majority of the stormwater networks within the District. Parts of the stormwater network that are not managed under these contracts include those devices within parks and reserves which are the responsibility of the TCDC Parks and Reserves department, managed by a third party by way of the Parks, Gardens, Cemeteries, and Community Facilities Operations and Maintenance Contract. Lateral connections from private properties to the boundary remain the responsibility of individual landowners.

Summary Table of Stormwater related contracts				
Business Unit	**Contract #**	**Contractor**	**Commenced**	**Expires**
3Waters	C15/05	Veolia Water	2015	2025
Roading	C18/25	Broadspectrum	2019	2023
Parks & Reserves	C12/21	Smart Environmental	2013	2021

Figure 2 depicts the split in responsibilities for the operation and maintenance of the stormwater network between the contracts.

Contractors across all departments are responsible for attending requests for service. These are formally measured as part of Council's quarterly reporting with the following categories:

- Number of flooding events
- For each flooding event the number of habitable floors affected (per 1,000 connected properties)
- The median response time to attend a flooding event, measured from the time Council receives notification to the time that service personnel reach the site
- Number of complaints received about the performance of the stormwater system (per 1,000 connected properties)

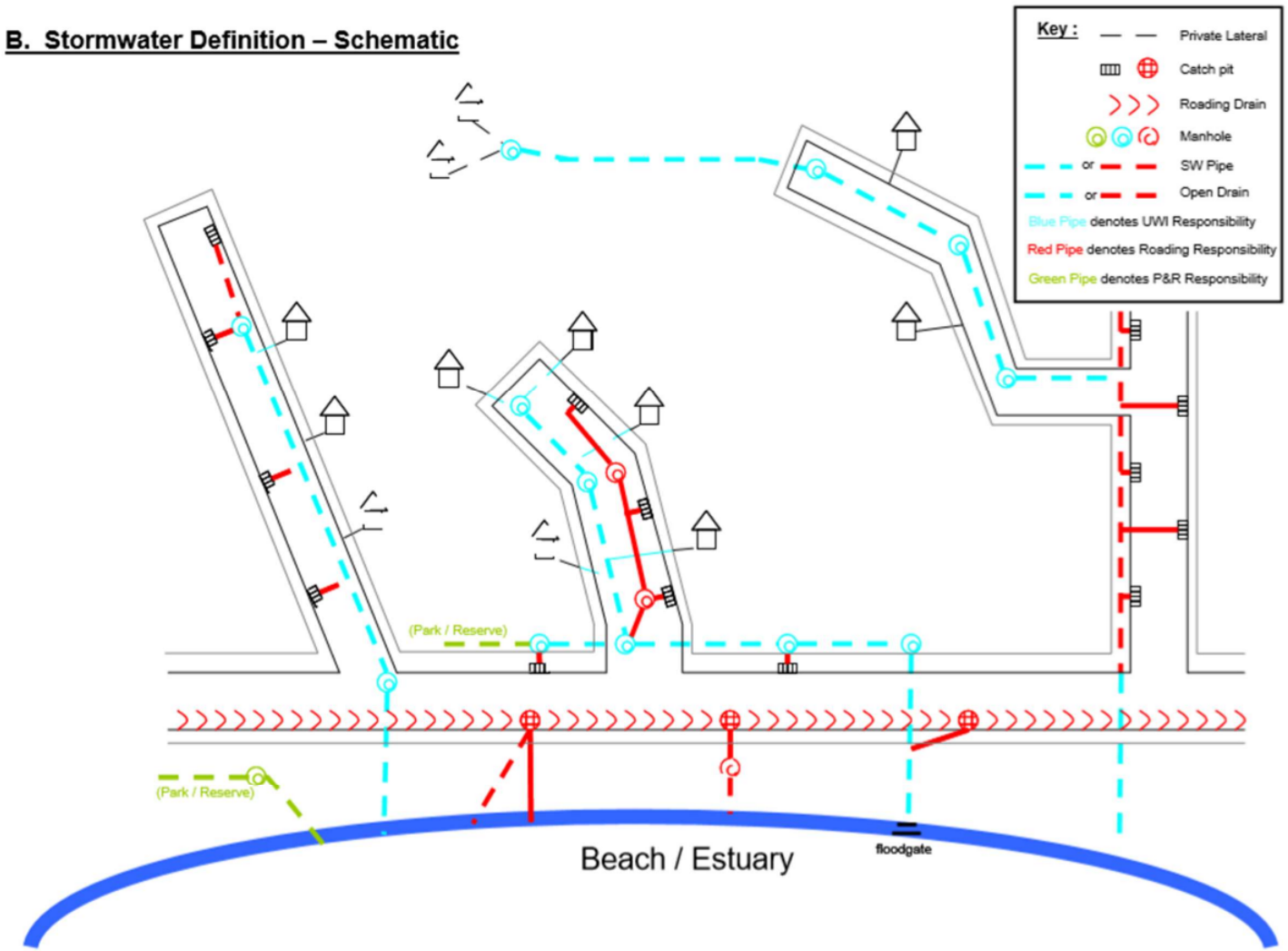


Figure 2: Schematic showing the split in responsibilities for the operation and maintenance of the stormwater network between the contracts.

Water Services and Maintenance Contract (C15/05)

This contract, between Thames-Coromandel District Council and Veolia Water (the contractor) came into effect in 2015 and expires in 2025.

The contractor is responsible for managing utilities owned stormwater assets (see Figure 2). Responsibilities include, but are not limited to, the following operations and maintenance procedures:

- Operation of the utilities stormwater reticulation assets and their components including mains and pumping stations, the SCADA system (within access rights) to maximise the functionality of the system;
- Regular servicing and maintenance of all pumps, motors, valves, meters, telemetry and other equipment associated with pump stations, consistent with their functionality and condition and the relevant O&M Manuals and industry best practice;
- Preventive maintenance program to clean stormwater mains, channels and outfalls to minimise the number of avoidable chokes resulting in flooding or disruption of service to individual consumers including flushing and vegetation control;
- Breakdown maintenance associated with pump stations including failure of pumps, telemetry, pipework, structures, mechanical, electrical and instrumentation equipment;
- Clearance of blockages in mains and channels designated as public assets (does not include private laterals);
- Repair of pipes, manholes and castings to maintain functionality;
- Inspect known areas of concern prior to a rain event and clean-up of stormwater facilities following a flooding event;
- Reinstatement of roadways, verges and property after repairs to prevailing standards required by the relevant authority;
- Land and general building maintenance including mowing, weed control, track and general site maintenance;
- CCTV investigations as part of the reactive work and preventive maintenance program;
- Maintenance of all stormwater detention facilities, including silt desludging and vegetation control.

Specific preventative maintenance with prescribed timeframes includes:

- Switchboard inspection (Annually)
- Outfall and pumpstation inspection and service (Monthly or as circumstances require)
- Pump inspection / service (Annually)
- Matarangi subsurface reticulation cleaning (Annually)

Further detail is available in Appendix B.

Roading Operations and Maintenance Contract (C18/25)

This contract, between Thames-Coromandel District Council and Broadspectrum (the contractor) came into effect in 2019 and expires in 2023.

The contractor is responsible for managing roading owned stormwater assets (see Figure 2). Responsibilities include, but are not limited to, the following operations and maintenance procedures:

- Develop and implement an inspection and cleaning programme that minimises the likelihood of blockages and minimises the likelihood of faults forming
- Inspect and, if required, clean all stormwater structures at least once every six months
- Maintenance of rain garden drainage systems including:
    a) Uplifting and stockpiling of the existing rocks from the surface of the rain garden.
    b) Screening and washing the rock to remove sand, debris and plant matter.
    c) Excavate and remove the sand filter material down to, and expose the underlying geotextile filter cloth. Cart the filter material to an approved disposal area.
    d) Supply and place a new sand filter layer. The filter material shall meet the requirements of NZTA F2.
    e) Replace the screened rock over the sand filter layer to the original shape and profile.
- CBD and Urban Street cleaning, including removal of detritus and litter from sump grates to keep all town centres within the District safe, neat, tidy and visually appealing at all times.
- Inspections and removal of detritus and litter from urban streets is required in the following frequency:

Road Classification	Sealed Surfaces, Lined and Unlined Channels
Primary / Secondary Collector	Two days
Access / Low Volume	Five days

- Inspections and removal of detritus and litter from CBDs is required in the following frequency:

Periods	Sealed Surfaces, Lined and Unlined Channels
Holiday Periods*	Mondays / Wednesdays / Fridays
Non Holiday Periods	Mondays and Thursdays

** 1 Dec – 31 Jan inclusive and 1 week either side of public holiday weekends inclusive*

The Contractor employs cyclic crews that have the responsibility to implement these requirements throughout the district. Monthly, a cyclic inspection of a random 10% of the network is undertaken by Council's Roading Professional Services Contractor to ensure compliance with the requirements of the contract.

Parks, Gardens, Cemeteries, and Community Facilities Operations and Maintenance Contract (C12/21)

This contract, between Thames-Coromandel District Council and Smart Environmental (the contractor) came into effect in 2013 and expires in 2021.

The contractor is responsible for managing parks and reserves owned stormwater assets (see Figure 2). Responsibilities include, but are not limited to, vegetation control of all streams, waterways and open drains in parks/reserves and cemeteries. Treatment shall ensure the free flow of water by eliminating rank growth and aquatic growth in side streams and waterways. If any stream or waterway becomes subject to erosion, treatment shall be modified to minimise the instability of the drain. Care is to be undertaken to ensure that re-vegetation projects are not impacted by herbicides. Treatment around streams and waterways must be consistent with Waikato Regional Council Policy and Rules.

g) Asset Management Initiatives

The Stormwater Asset Management Plan is the main source of asset related initiatives that assist Thames-Coromandel District Council with meeting the conditions of our Comprehensive Stormwater Discharge Consents. This includes the Stormwater Lifecycle Management Plan comprising:

- Operations Plan (Operations and Maintenance Needs, Service Delivery Arrangements, Maintenance Contract Overview, and Reactive and Preventative Maintenance)
- Renewal Plan (Historic Renewals Strategy, Current Renewals Strategy, Stormwater Renewals Focus)
- Capital Plan (Capacity Drivers, Levels of Service Drivers, Health and Safety Drivers, Flood Mitigation Drivers, Quality Drivers)
- Asset Disposal Plan

Council's current renewal approach is depicted in Figure 3 below.

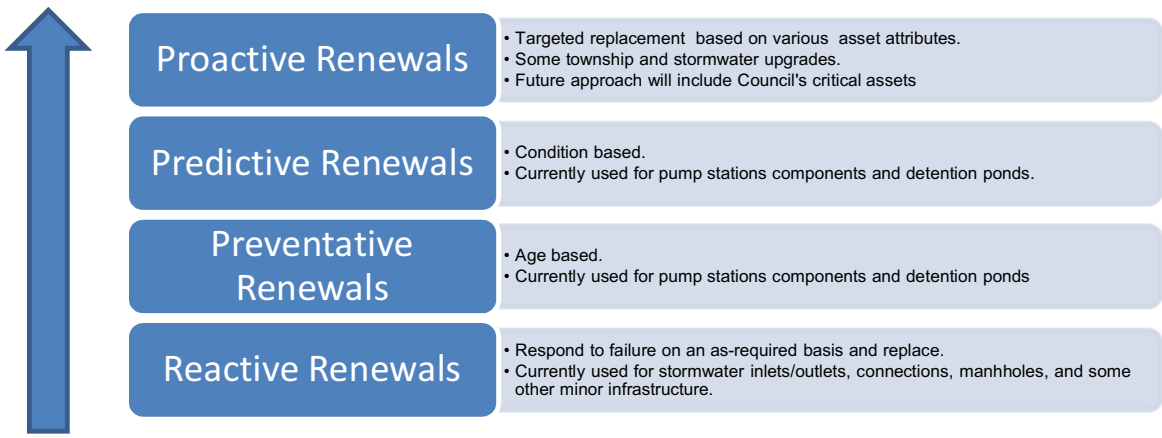


Figure 3: Renewal Approach

Asset Management initiatives focus on Stormwater CCTV and updating Stormwater Modelling over the next ten years with significant funds requested via the LTP Budget process. Where amendments to the stormwater network are made, treatment devices are included in project planning.

Appendix C contains the administrative process for incorporating new municipal stormwater diversion and discharge activities into the comprehensive discharge consents.

h) Management Initiatives to avoid environmental harm

There are a variety of management initiatives and implementation methods that Thames-Coromandel District Council currently uses to avoid as far as practicable, and otherwise minimise:

- Adverse scour, erosion and sedimentation deposition on land, property and the beds of stormwater receiving bodies
- Adverse flooding of land, property and stormwater receiving bodies
- Adverse effects on aquatic ecosystems

These include, but are not limited to the following:

i) Maintenance and Operations

As described in Section f) above, suitably qualified professional companies are contracted to carry out day to day maintenance and management of the existing stormwater networks. Council also has a number of staff that oversees the maintenance and operations contracts, provides field engineering support, monitors the effectiveness of the contractor's activities and provides community liaison.

Specifically, maintenance and management of the existing stormwater networks include, but are not limited to:

- Regularly inspecting and maintaining open drains and streams to keep them clear and to manage scour and erosion.
- Inspection of known areas of concern prior to a rain event to prevent adverse flooding of land, property and stormwater receiving water bodies.
- Preventive maintenance program to clean stormwater mains, channels and outfalls to minimise the number of avoidable chokes resulting in flooding.
- Regular removal of detritus and litter from urban streets along with street cleaning to improve stormwater quality thereby reducing adverse effects on aquatic ecosystems.

ii) Renewals and Replacement

Where the stormwater network is to be upgraded, e.g. Coromandel Town Main Street, TCDC engages the services of a suitably qualified engineering firm to design the upgraded system to ensure the continued effective operation of the network in terms of stormwater quality and quantity. Stormwater quality is always considered when planning renewals and the feasibility of installing treatment devices is assessed as part of the renewal / upgrade.

Renewals and replacements are planned based on a number of factors:

- CCTV investigations (significant funds have recently been requested in the LTP Budget to continue this programme over the next ten years)
- Stormwater modelling ((significant funds have recently been requested in the LTP Budget to update current stormwater models over the next ten years)
- Information received from operations team, contractors, and ratepayers (via the request for service) system.

iii) New Assets / Development

The District Plan, Resource Consent conditions, and Code of Practice – Stormwater and Land Drainage contain rules for development to mitigate the potential to introduce adverse environmental effects such as scour and erosion due to increased volume and duration of stormwater discharges or stormwater contaminants related to the relevant land uses.

As part of both resource consent and building consent application processes, Council aims to ensure that applications contain sufficient detail to enable informed and accurate decisions to be made on a particular application. Through these processes, all stormwater disposal associated with new development is required to be carried out in accordance with the TCDC Code of Practice for Subdivision and Development, the District Plan, and the Building Act 2004. Hydraulic neutrality with respect to buildings is a requirement of all new development.

Specific requirements within the stormwater section of the Code of Practice for Subdivision and Development includes:

6.2.1.3 Stormwater generated by a property is required to be disposed of within the boundary of that property unless there is sufficient capacity within the network and discharge to the network is specifically authorised by Council

6.3.2.2 All developments within catchments where TCDC have discharge resource consents will need to comply with any of the conditions that may apply to the proposed drainage system. In addition, any Catchment Management Plans' recommendations must be adhered to

6.4.20.1 Specific Ward Requirements for Stormwater & Land Drainage as shown in Table 6.3. These requirements are a minimum and may be increased at the Councils discretion.

Table 6.3

Specific Ward requirements for Stormwater & Land Drainage		
Community	**Function**	**Requirement**
All Ward communities	**Properties**	Stormwater generated on a property will be disposed of in a managed manner and authorisation of disposal will be required in each case. The on-site system must be capable of carrying a 1 in 10-year rain event and must be maintainable

Increased impermeable surfaces resulting from more intensive development and subdivision in urban areas can have a significant impact on the capacity and effectiveness of the stormwater network, which in turn can adversely impact receiving environments. Managing new development is therefore vital when managing stormwater quality and quantity and also when considering the future provision of stormwater services within the District.

Council is instigating the requirement for hydraulic neutrality for all impervious surfaces at the time of building consent application. To aid this, guidance will be sought from Council on the enactment of a district-wide Stormwater Bylaw. A review of the stormwater section of the Code of Practice for Subdivision and Development and a formalisation of the connection application procedure will also be completed. The requirement for stormwater management devices will be considered as these documents are created / updated (see Section h).

As part of the subdivision consent application process, Council also ensures all new stormwater networks and devices that are to be vested in TCDC are designed, constructed, and certified by Charted Professional Engineers in accordance with the Code of Practice for Subdivision and Development.

Council engineers and planners promote low impact urban design as set out in NZS4404:2010 and the Code of Practice for Subdivision and Development.

Stormwater retention and treatment on site in the form of soakage pits or detention tanks are also promoted, and often required, to help reduce surface flooding. Many of the Coromandel urban areas have excellent soakage capacity and therefore on-site disposal is highly cost effective and, accordingly, is often promoted by Council.

i) Effects of existing structures on fish movement

Fish Habitat and Passage were reviewed by Kessel's Ecology, in their Ecological Assessment carried out in 2018 (see Annual Report 2018 – 2020 Appendix 8). No stormwater management structures within the Thames-Coromandel District Council stormwater network have currently been identified as a priority in terms of mitigating the effects of structures on fish movement.

j) Draft Guidelines for Stream Channel Works

Background

Thames-Coromandel District Council is responsible for maintaining a number of streams, drains, and watercourses around the District where they form key components of Council's stormwater networks. Operation and maintenance of these stormwater networks is managed by Council's 3Waters contractor under terms and conditions of the Contract. Routine maintenance activities carried out by the contractor primarily involve vegetation control, erosion protection, and clearing of obstructions. These activities are recognised as having significant benefit in mitigating flood risk.

In certain communities, TCDC also has responsibility for maintaining stream mouth openings. This requirement has been determined based on public use of location for recreational purposes, a requirement to comply with specific Resource Consent conditions or where it is necessary to mitigate flood risk to Council property and / or infrastructure. Work in these locations is typically planned maintenance where monitoring occurs in the lead up to public holidays, long weekends, and forecast high rainfall events.

The streams, drains, and watercourses within the Thames-Coromandel are fragile environments which provide important ecological, public amenity, and land drainage functions. Any works occurring in or around these features pose a level of risk to the receiving environments if not managed appropriately.

Purpose

The purpose of this document is to provide guidance on maintenance activities thereby ensuring stormwater systems are well maintained while minimising any disturbance to the stream channel, pollution of downstream environment, or impact on aquatic flora and fauna.

Maintenance Objectives

- Ensure that any streams, drains and watercourses that function as part of Council stormwater networks are kept free of obstructions in order to maintain optimum discharge capacity
- Ensure that said streams, drains and watercourses are well maintained to mitigate flood risk and avoid costly emergency works.
- Environmental considerations (i.e. maintenance is planned and carried out in a way to avoid or minimise impact on the natural ecology and structures within the waterway).

Maintenance Requirements

- Water Courses (Natural, open drains and streams) – Keep watercourse free of vegetation, silt, gravels or other encroachment. This is particularly important around outfalls of minor drains into the main channel
- Vegetation control (weed spraying) – Mechanical removal is required to maximise capacity of the existing system. Machines to operate weed bucket or similar attachment. Weed spraying of open drains can support this activity. Spraying should be carried out twice each year typically in Autumn and Spring. Location and extent of spraying will be determined by extent of growth and historical knowledge.

Work Practices

- Minimise work carried out in the stream or watercourse
- Manage operation to prevent discharge of sediments into water
- Manage operation to prevent discharge of other contaminants of into water
- Mitigate any effect on fish passage both during and after work activity
- Minimise area affected by work activity and keep duration of works short

Considerations

- Health & Safety
    - Safety of Council staff, contractor and members of the public
    - Hazard identification and appropriate control measures
    - Disruption to recreational activities/public access
- Legislation:
    - Ensure works are undertaken in accordance with Resource Consent or relevant Permitted Activity

- Environmental:
    - Disturbance to flora and fauna, nesting areas
    - Disturbance of soils / sediments
    - Compliance with relevant WRC Permitted Activity Rules / Resource Consents
    - Refueling of machinery

Responsibilities

- TCDC
    - Formal inspection procedures that are not only confined to removal of silt / debris / obstructions but also identify the condition of system around which maintenance / capital works programmes can be developed.
    - Reporting

- Contractor
    - Develop SOP
    - Ensure equipment and machinery suitably cleaned prior to use of
    - ERP – spill response

k) Sources of Stormwater Contaminants

Stormwater networks within the District's urban areas typically include a reticulated stormwater collection and disposal system to manage stormwater runoff from impervious surfaces. These drainage systems convey the runoff to the nearest water body, or in some instances, to constructed wetlands and / or detention ponds. In addition, many overland flow paths within District have been modified, by piping or by the construction of drains, to improve drainage.

Adverse effects associated with stormwater management include the unintended collection of contaminants entering the stormwater system. Some of these contaminants are continually generated and released to the environment but are concentrated by a piped collection system and therefore the effects of these contaminants can be amplified at outlet locations within the receiving environment.

Non-routine contaminants

Schedule A – General Conditions of Comprehensive Stormwater Discharge Consents defines Non-routine contaminants as an unauthorised discharge (accidental or deliberate) of contaminants directly to the stormwater network or to land where it may then enter the municipal stormwater network.

Non-routine contamination is likely to be the most significant issue in terms of stormwater management within urban catchments in the District and it is considered to present the most significant threat to the health of stormwater receiving bodies. Typically, this can occur as a result of accidental spills on roads, at commercial or industrial sites, or the deliberate discharge of contaminants directly into stormwater drains.

This Stormwater Management Plan provides a description of the various stormwater catchments within each urban area (refer to Appendix A). These urban area descriptions highlight the risk of non-routine contaminant discharge within the various catchments. Areas which are considered to pose a higher risk of a non-routine contaminant discharge event are identified as areas including industrial zoned land, commercial sites, or high-risk facilities (e.g. petrol stations). The stormwater network and outlets from these 'high-risk' catchments will be the focus of the stormwater monitoring programme.

As described above, a non-routine discharge event is considered to pose the highest level of risk to the environment. Appendix D outlines the standard operating procedures for managing non-routine contaminant discharges.

Routine (typical) contaminants of urban stormwater

Schedule A – General Conditions of Comprehensive Stormwater Discharge Consents define routine contaminants as those "contaminants that run off impervious surfaces and enter the stormwater network during rain events, where the types and concentrations of the contaminants are consistent with the contributing catchment". The build-up of hydrocarbons and other contaminants found on roads within urban environments are routinely associated with urban stormwater runoff.

Potential routine contaminants include:

- Heavy metals, sediments
- Hydrocarbons from oils & lubricants
- Fuel combustion residues
- Gross pollutants such as litter and leaf litter
- Zinc and copper due to roof construction materials
- Bacteria from roof runoff and hard surfaces
- Organic material
- Wash water from vehicle washing activities

Kerb and channel, and catchpits within public roads are cleaned regularly as part of the Roading Operations and Maintenance Contract (see Section f) for more detail). A monthly 10% random audit of all roads within the Thames-Coromandel District Council network includes auditing of the cleanliness of kerb and channel and catchpits.

l) SOPs for managing non-routine contaminant discharge events

Current standard operating procedures are found in Appendix D.

m) Stormwater Quality Improvement Programme

i) Education Programmes

- Internal Education programme to be run to ensure all TCDC team members and their contractors are familiar with and play their part in implementing the conditions of the Comprehensive Stormwater Discharge Consents.
- Stormwater Education brochure to be created and sent out with rates notices
- Stormwater Education brochure for businesses to be created (including at-source stormwater management measures)

ii) Site Inspections / Contamination Audits

Guidance will be sought from Council on the enactment of a district-wide Stormwater Bylaw. The purpose of this is to authorise Thames-Coromandel District Council Warranted Staff to carry out site inspections / stormwater contamination audits.

iii) Illicit Wastewater Connections

A protocol will be created for managing illicit wastewater connections when identified. Budget has been requested via the LTP Budget process carried out in August 2020 for an investigative programme to commence in 2021-2022.

iv) Stormwater Catchpit Upgrade Programmes

Budget has been requested via the LTP Budget process carried out in August 2020 (Investigations) for the 2021/2022 year to create a prioritised programme. Budget has also been requested for each financial year from 2022-2023 onwards to carry out physical works based on the programme created.

v) Retrofitting of Stormwater Management Devices

Budget has been requested via the LTP Budget process carried out in August 2020 (Investigations) for the 2021-2022 year to create a prioritised programme. Budget has also been requested for each financial year from 2022-2023 onwards to carry out physical works based on the programme created.

vi) Regulatory Powers

Guidance will be sought from Council on the enactment of a district-wide Stormwater Bylaw. This will reinforce initiatives e.g. requiring hydraulic neutrality for all new impervious surfaces and avoid, remedy, and mitigate the adverse effect of stormwater discharges. The requirement for roof water harvesting for all new builds is also being considered as part of the creation of the Stormwater Bylaw.

n) Management Initiatives to promote WRC Sustainable Subdivision Development

Thames-Coromandel District Council believes 'Sustainable Subdivision Development – An Environment Waikato Perspective' (WRC 2006) to be out of date. In lieu of this document, management initiatives to promote Waikato Regional Council's Waikato Stormwater Management Guideline (TR2020/07) are in the process of being developed.

o) Management Initiatives to provide LIUD and Stormwater Management Devices

The Stormwater Section of the Code of Practice for Subdivision and Development is scheduled to be reviewed and this will include LIUD and Stormwater Management Device promotion.

p) Register of Stormwater Management Devices

Council records all of its stormwater assets in a formal asset management system (AMS) linked to GIS. This includes stormwater management devices, which are attributed accordingly to allow them to be readily identified and reported. Appendix E contains a report listing stormwater management devices currently recorded in Council's asset management system.

q) Works schedule for implementing procedures / management initiatives

The schedule for implementing procedures and management initiatives is reviewed regularly and updated in Section h) of the Annual Report.

r) Performance Measures

Compliance with the Conditions of the Comprehensive Stormwater Discharge Consents is assessed annually and reported in Appendix 1 of the Stormwater Annual Report.

Section f) outlines Contractor performance measures.

A-1: Thames Urban Area (Consent 122521)

A1-1 General Description

Thames Township (NZ Census 2018: population 7,881) is the oldest township within the Coromandel Peninsula (founded 1867). It is situated at the south-western end of the Peninsula in the southern Firth of Thames. The township is adjacent to the eastern side of the mouth of the Waihou River and is built around the mouth of Kauaeranga River.

Thames can be generally divided into two topographical areas. The first is a steep area of mostly regenerating bush / scrub and scattered residential development to the east of the township. The other area, the western side of the township, is generally flat to medium contour on the edge of the Firth of Thames. This more gently sloping contour contains most of the urban development within the town, which contains predominantly low to medium density residential land use activities. In terms of stormwater, the Thames urban area is made up of a series of relatively small parallel stormwater catchments flowing east to west, eventually through outlets into stream, rivers and the Coastal Marine Area of the Firth of Thames.

Most of the Thames Township is characterised by clay soils and a high water table. Soakage is therefore not usually a practical option for stormwater disposal.

The inner Firth of Thames is recognised in the Waikato Regional Coastal Plan as an Area of Significant Conservation Value (ASCV). ASCV sites cover the southern Firth of Thames and the Miranda / Kaiaua coastlines further west, and from the Waihou River as far north as Tararu. The Regional Coastal Plan states that important conservation values include the cultural significance of the area to Hauraki iwi, nationally significant mangrove and mudflat communities, shellfish beds and habitat for threatened birds. The area is also listed as a wetland of international importance under the RAMSAR Convention on Wetlands of International Importance.

The coastal area in Thames is highly valued by the local community and visitors for a wide range of contact and non-contact recreational activities, including swimming, kayaking, fishing, bird watching and shellfish gathering.

A-1.2 Thames Stormwater Network

Thames has an aging comprehensive stormwater collection and disposal system for the township, which comprises the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Stormwater pump stations (Fergusson Drive and Richmond Street)

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-1.3 Physical Description of the Receiving Environments in Thames

The receiving environments of the stormwater discharges within the Thames urban area can be generally described as:

- Kauaeranga River
- Various streams: A mixture of boulder and pebble stream beds. Some of these are tidal.
- Firth of Thames: Sandy and muddy sediments with vegetation in some areas (dominated by mangroves) and diverse marine ecology in some areas.
- Pastoral farmland and grassed drains.

Any discharges to the coastal environment are likely to be subject to relatively rapid dispersion and flushing, due to extensive flushing from tidal action, and inflow from the Waihou and Kauaeranga Rivers. This flushing effect is increased during storm events (i.e. at the same time as stormwater runoff is at its greatest). Flushing and sediment dispersion also aided by wave action in coastal receiving environments. These factors are likely to naturally mitigate any visible environmental effects of discharge quite quickly.

While most contaminant loadings within the stormwater are likely to be mobilised and quickly dispersed by these natural flushing effects, some accumulation of contaminants is possible in the receiving environments where fine silty sediments are present.

A-1.4 Thames Stormwater Catchments

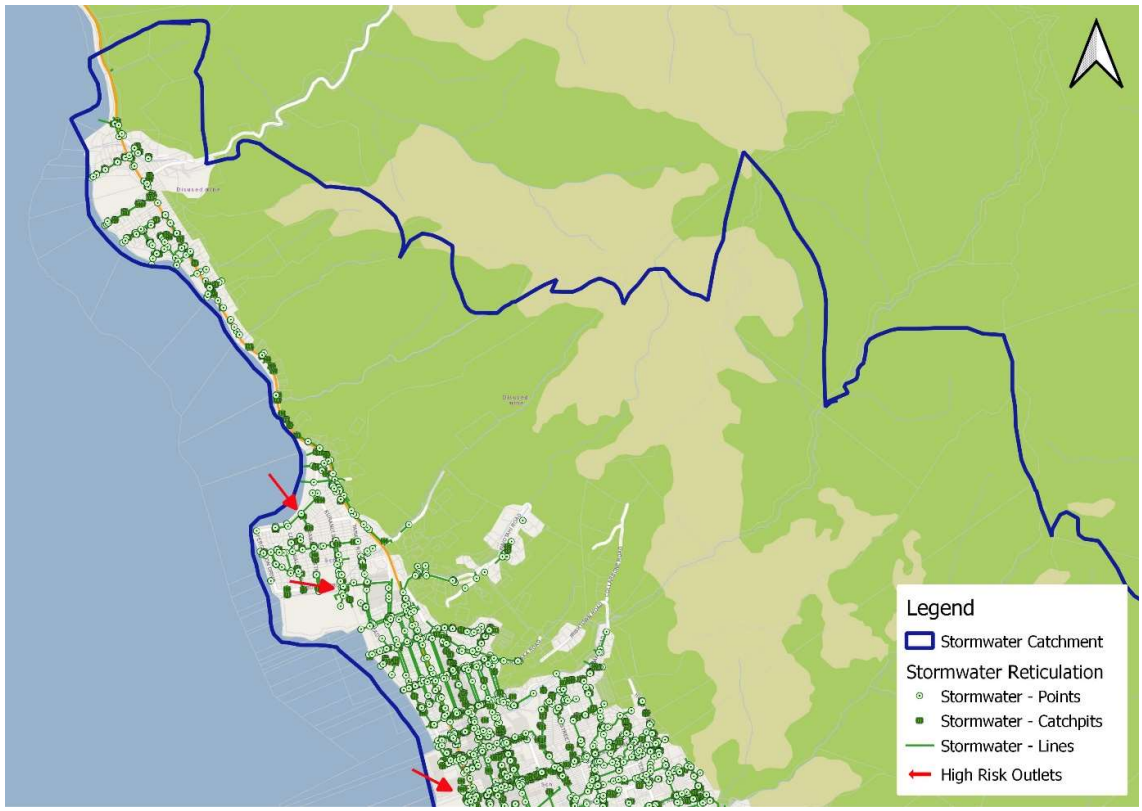
Thames has a comprehensive stormwater collection and disposal system for the township, which discharges stormwater to various receiving water bodies including the Tararu Creek (3 outlets), the Kauaeranga River (10 outlets) and the Firth of Thames (23 outlets).

The Thames urban area is made up of many small catchments but for the purposes of stormwater management can be divided into six general areas:

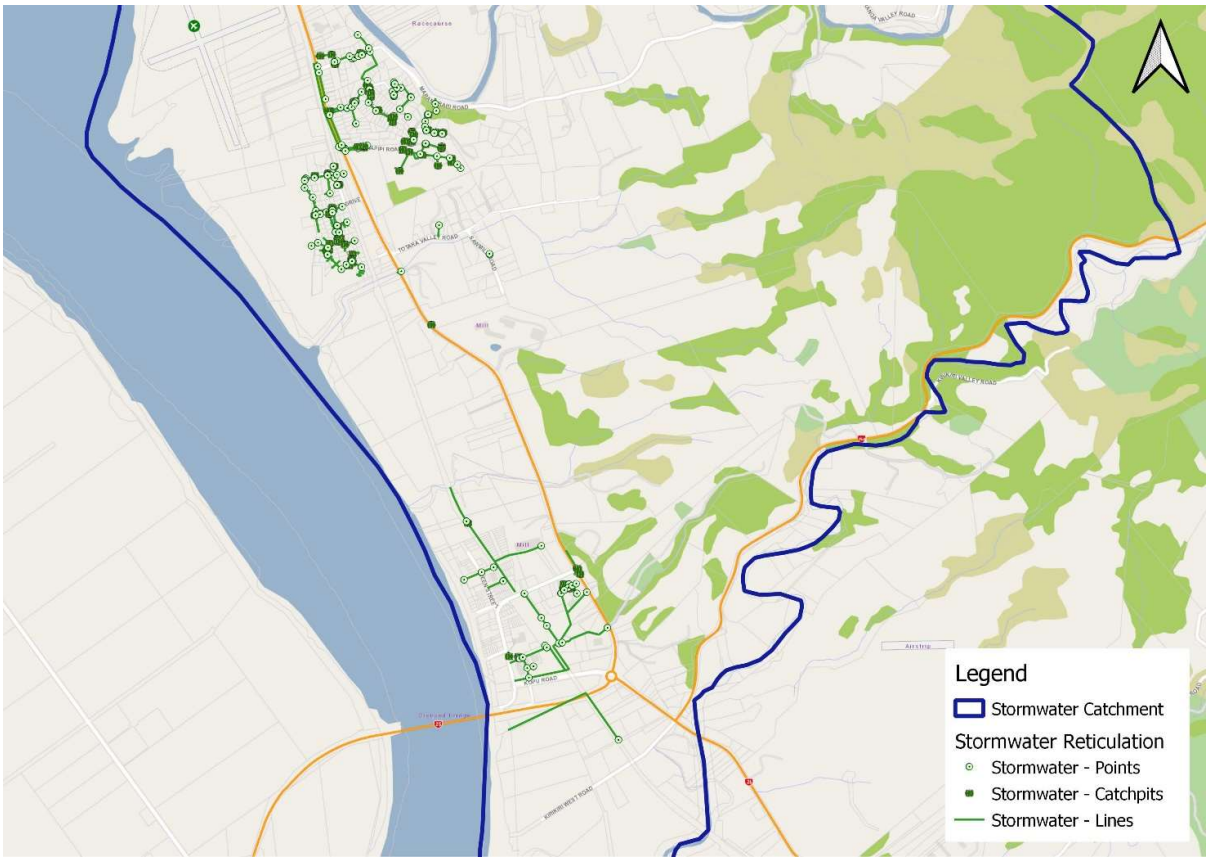
- Totara West: south of Thames town centre, on the western side of SH25.
- Totara East: south of Thames town centre, on the eastern side of SH25.
- Thames South: residential and industrial land use adjacent to the Kauaeranga River.
- Thames Central: main shopping centre with a mix of residential and commercial land use.
- Thames North: residential and some industrial land use.
- Tararu: residential land use

Most of Thames Township is located on clay soils with a high water table, making onsite soakage often impractical for on-site stormwater disposal, therefore hydraulic neutrality by way of detention tanks is required. The majority of the catchment is in medium density residential land use.

The maps below cover the Thames Urban Catchment:






Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines

Totara West

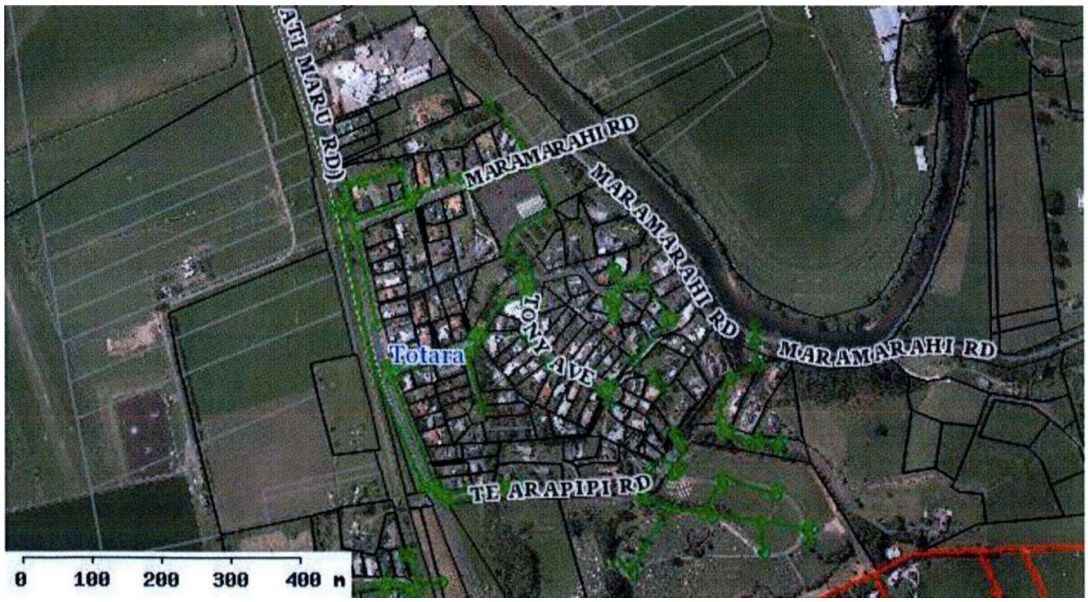
There is a small area of residential development south of Thames, on the western side of the main SH25 (Ngati Maru Highway). This area is predominantly residential development with no high-risk facilities. This area is of low risk in terms of routine or non-routine stormwater contamination.

The following aerial photo is representative of the Totara West catchment. Stormwater discharge drains lead into the Waihou River.



Totara East

There is a small area of residential development on the eastern side of Ngati Maru Highway. This area is predominantly residential development. The previously identified high risk facility (Coromandel Meat Processors Ltd) was dissolved in 2006. The following aerial photo is representative of the Totara East catchment. Stormwater discharges to the Kauaeranga River.

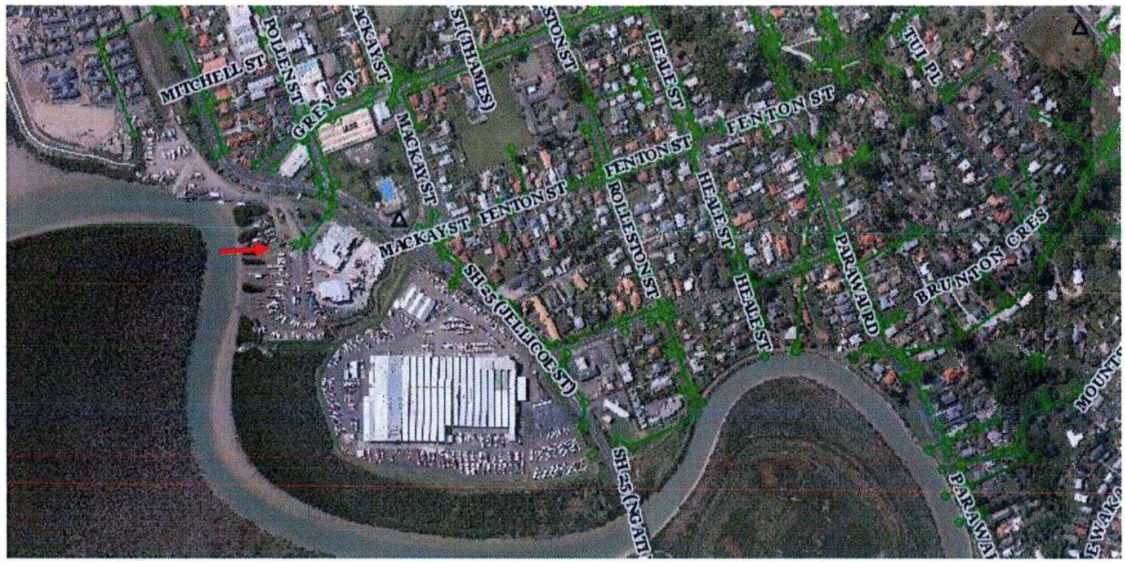


Thames South

This catchment is predominantly residential but contains an industrial area adjacent to the mouth of the Kauaeranga River. This industrial site contains Toyota New Zealand's Signature Class Vehicle Testing Site; the Thames Marina and boat yard; the Firth Concrete plant; a panel and paint workshop; and a small fish processing business.

Receiving environments in this catchment could be exposed to both routine and non-routine stormwater contamination from the several high-risk facilities. The very fine sediments and low energy environment (limited sediment disturbance) makes this area more susceptible than most to contaminant accumulation in the sediments.

The following aerial photo is representative of the Thames South catchment. The red arrow indicates the network outlet location that should receive most attention in the Monitoring Programme. Stormwater discharges into the Kauaeranga River.



Thames Central

This area contains many high-risk facilities for non-routine stormwater contamination, including petrol stations, panel beaters and workshops, vehicle painters, and pharmacies.

The following aerial photo is representative of the Thames Central catchment. The red arrow indicates the network outlet location that should receive most attention in the Monitoring Programme. Stormwater discharges into the Firth of Thames.



Thames North

North of the town centre, there is an area of mostly residential development (known as Moanataiari), situated largely on reclaimed land. This subdivision was built on land reclaimed from the sea using old mine tailings. In 2011 soil tests revealed that there are elevated levels of naturally occurring arsenic in the soil. Since this time further testing and investigations have been undertaken and the health risk to residents has been deemed to be negligible.

Given the potentially elevated levels of contaminants in Moanataiari sediments, and the presence of the waste management operation, the receiving environments in this area may be a sensible target for ongoing monitoring of coastal sediments.

The following aerial photo is representative of the Thames North catchment. The red arrows indicate the network outlet locations that should receive most attention in the Monitoring Programme. Stormwater is discharged into the Firth of Thames and tributaries.



Tararu

Tararu is a small residential settlement on the northern outskirts of Thames. The town is situated on a river delta, so has mostly low lying, flat topography. These areas are prone to inundation both from the Tararu stream during high rainfall events and from the sea during storms. The following aerial photo is representative of the Tararu catchment.

In terms of stormwater, most of the township drains directly to the Firth of Thames, however small areas in the northern township drain to the Tararu Stream which, in turn, flows to the Firth. The land use in Tararu is residential and there are no known high-risk facilities.



A-1.5 Significant Features

TCDC has a wastewater treatment and disposal system servicing the Thames Township. This does not discharge into the stormwater network and has its own discharge consent requirements.

An abandoned mine structure ("The Saxon mine shaft") introduces a constant flow into the stormwater reticulation at the corner of Albert and Pollen Street. This discharge is approximately 17 l/s and it is estimated that this discharge has been occurring for at least 40 years. This flow could be significant in terms of the total annual volume but is not significant in respect of the peak flow rate predicted during design storm events (Thames-Coromandel District Council – Assessment of Environmental Effects 2001).

Tararu Stream is occasionally discoloured due to release of iron from old mine shafts in the catchment.

A-2: Pauanui Urban Area (Consent 105661)

A2-1 General Description

Pauanui Township (NZ Census 2018: population 1,005) is situated on the eastern coast of the Coromandel Peninsula. Pauanui is situated adjacent to the Pacific Ocean and is fronted by a long white sandy beach. The township lies at the mouth of the Tairua Estuary (on its south bank), directly opposite the township of Tairua. Pauanui is predominantly a holiday township. Population numbers increase dramatically during summer months.

The estuary coastline is influenced by tidal fluctuations which, at low tide, expose large areas of mud flats that support a diverse tidal marine ecology. The intertidal habitats provide feeding, roosting and nesting sites for many bird species including rare and threatened wading and coastal bird species. As a result, the upper Tairua Harbour is recognised in the Waikato Coastal Plan as an Area of Significant Conservation Value (ASCV). The extent of the ASCV defined in the Regional Coastal Plan does not extend to lie directly adjacent to the urban area in Pauanui but could be influenced by water quality impacts.

A-2.2 Pauanui Stormwater Network

A comprehensive stormwater collection system exists for the township comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Detention Pond (1)
- Hynds Up-Flo Filter (1)

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-2.3 Physical Description of the Receiving Environments in Pauanui

The receiving environments of the stormwater discharges within Pauanui urban area can be generally described as:

- Tairua Estuary: sandflats and sandy sediments which are mostly without vegetation adjacent to the urban area.
- Sandy Beach.
- Pastoral / rural type grassed drains.

The Tairua Estuary and Pauanui Ocean Beach are highly valued by residents and visitors for recreation, including paddling, swimming, surfing, shellfish gathering and fishing. The stream at the southern end of the beach is also very popular as a bathing area for children and adults alike.

It is likely that any discharges to the coastal environment will be relatively rapidly dispersed and flushed due to the extensive tidal flushing and sediment movement in the Tairua Estuary. Increased stormwater runoff during high rainfall events often coincides with wave action and storm surge, further increasing the flushing capacity of the coastal environment. Therefore, any visible environmental effect of discharges within the receiving waters is likely to be mitigated naturally within a short period of time (AEE Pauanui (June 2001)). Accumulation of contaminants is possible in areas where the receiving environment has very fine sediments in a coastal environment sheltered from waves and currents.

A-2.4 Pauanui Stormwater Catchments

The Pauanui urban catchments are largely flat, with some development located on the base of steeper foothills. Land use is predominantly residential and there are few vacant lots remaining. In addition to the residential land use, there is an airport, and a small block of commercially zoned land in the town centre. Rainfall runs off the foothills in the upper catchments and out onto the flat urban area. Pauanui generally experiences good on-site stormwater management due to highly permeable sandy sediments. This is less feasible in the hilly areas.

The piped stormwater reticulation serves only roadways, with private properties disposing of their stormwater by way of hydraulic neutrality, mainly in-ground soakage. Stormwater from roads is typically channelled to a centre island and allowed to soak into the ground through swales with any excess overland flows being piped via the reticulated system.

There are approximately 58 discharge points throughout the Pauanui stormwater system discharging to the Tairua Harbour (20 outlets), the Pacific Ocean (3 outlets), and Pauanui Stream and unnamed tributaries at the south end of Pauanui (14 outlets). There are also approximately 21 discharges onto land.

Urban Pauanui can be divided into a series of small stormwater catchments, which either discharge into the Tairua Harbour or into the Pauanui Beach area:

- Pauanui Residential (North)
- Central Pauanui
- Pauanui Residential (South)
- Pauanui Waterways

The map below covers the Pauanui Urban Catchment:

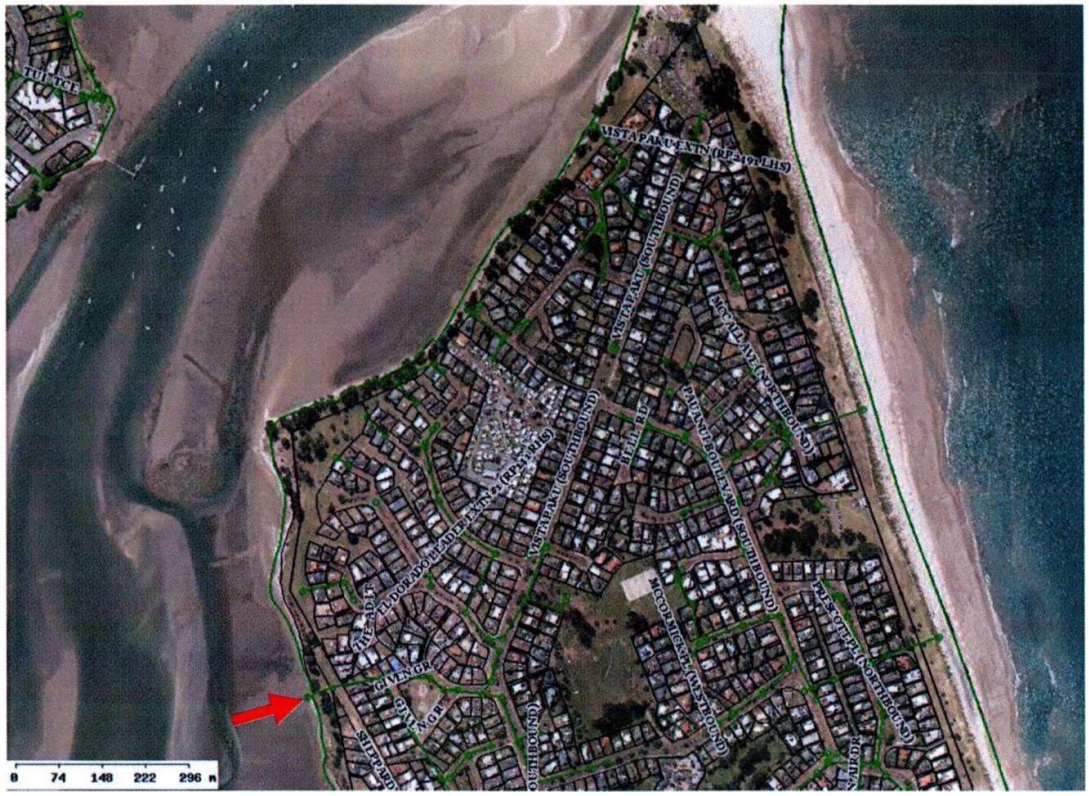


Pauanui Residential (North)

Northern Pauanui is comprised of low to medium density residential development, on flat land, with several large reserve areas.

There are no high-risk facilities within this part of the Pauanui urban area and this stormwater is disposed of on-site. This is not considered to be a high risk catchment; however, part of the stormwater network drains from the service station on the corner of Vista Paku and Sheppard Avenue (in a northerly direction) and also collects stormwater from a reasonably large residential area. This outlet (as shown by the red arrow in the image below) is identified as an appropriate monitoring location for Pauanui.

The following aerial photo is representative of the Pauanui Residential (North) catchment.



Central Pauanui

This catchment includes a small commercial area in the centre of town and the local airfield. There are large areas of parks and reserves, with the catchment having good infiltration properties. The airstrip in Pauanui occupies a significant area and is the middle of the central catchment. The airstrip is grassed and has little or no runoff during high intensity rain events.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants; however, given that there are commercial activities and high risk facilities (e.g. petrol station, LPG storage and timber storage) in the CBD of Pauanui, there is a small risk of a non-routine contaminant discharge incident.

The following aerial photo is representative of the Central Pauanui catchment.



Pauanui Residential (South)

Southern Pauanui is comprised of low to medium density residential development, mostly on flat land, with several large reserve areas. There is also a small residential area on the adjacent foothills, at the southern margin of town, which is founded on steeper, less free-draining soils.

There are no high-risk facilities within this part of the Pauanui urban area, and this stormwater is disposed of via hydraulic neutrality being on-site in-ground soakage and / or detention. This is not considered to be a high risk catchment.

The following aerial photo is representative of the Pauanui Residential (South) catchment.



Pauanui Waterways

The waterways development lies directly adjacent to the Tairua Estuary. Several canals have been excavated into coastal margin land to provide private boat access from the estuary to residential properties within the development. Stormwater runoff from these areas discharges directly to the canals and ultimately the estuary.

The following aerial photo is representative of the Pauanui Waterways catchment.



A-2.5 Significant Features

TCDC has a wastewater treatment and disposal system servicing the Pauanui Township. This does not discharge into the stormwater network and has its own discharge consent requirements.

The Pauanui sand bar area as defined in the TCDC Subdivision and Development Code of Practice 2013 Appendix I6C and is copied below.



A-3: Coromandel Urban Area (Consent 105663)

A3-1 General Description

Coromandel Township (NZ Census 2018: 1,743) is situated on the inner Coromandel Harbour and to the west of Ruffin's Peninsula. The surrounding coastline is influenced by tidal fluctuations which, at low tide, expose large areas of mud flats that support a diverse tidal marine ecology. In areas where human development has not occurred the coastline is dominated by large stands of mangroves and extensive mudflats. These habitats provide feeding, roosting and nesting sites for many bird species including rare and threatened wading and coastal bird species. As a result, the inner Coromandel Harbour is recognised in the Waikato Coastal Plan as an Area of Significant Conservation Value (ASCV).

A-3.2 Coromandel Stormwater Network

A comprehensive stormwater collection system exists for Coromandel township comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Detention pond (1)
- Gravel Filled Stormwater Attenuation Basin (2)
- Hynds First Defense High Capacity

The bulk of the existing piped stormwater reticulation that serves roadways was constructed in the early 1960's, with existing private properties (pre 2015) disposing of their stormwater by way of overflow to road or open drains. New private properties are disposing of their stormwater by way of hydraulic neutrality being in-ground soakage and / or on-site detention.

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-3.3 Physical Description of the Receiving Environments in Coromandel

The receiving environments of the stormwater discharges within Coromandel urban area can be generally described as:

- Coromandel Harbour: estuarine sand flats and mudflats with some vegetation, including mangrove communities.
- Streams: a mixture of boulder and pebble stream beds, some of which are tidal and contain relatively high levels of deposited sediment.
- Land: pastoral farmland and grassed drains.

A-3.4 Coromandel Stormwater Catchments

Coromandel has a reticulated stormwater collection and disposal system designed to cater for stormwater runoff from urban areas. Stormwater is discharged into the Whangarahi Stream, Karaka Stream, Whakanekeneke Stream and the Coromandel Harbour.

There are approximately 55 outlets throughout the Coromandel stormwater system discharging to; the Coromandel Harbour (14 outlets), Oamaru Bay (2 outlets), Driving Creek (2 outlets), Whangarahi Stream (9 outlets), Karaka Stream (6 outlets), Taumatawhahine Stream (4 outlets) and Whakanekeneke Stream (5 outlets). There are also approximately 13 discharges onto land.

The urban area of Coromandel is made up of a series of relatively small catchments which can be simply divided into four main catchments as follows:

- The Central Coromandel catchments
- Wyuna Bay catchments
- Long Bay catchments
- Oamaru Bay catchments

The maps below cover the Coromandel Urban Catchment:




Legend
Stormwater Catchment
Stormwater Devices
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines
High Risk Outlet
Detention Pond
Gravel Filled Stormwater Attenuation Basin
Gravel Filled Stormwater Attenuation Basin
Hynds First Defense High Capacity


Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Lines

Central Coromandel Catchment

The Central Coromandel stormwater catchment is generally sloping from the east / northeast of the Central Business District (CBD) to the west, with many localised gullies and depressions that act as overland flow paths and ponding areas in extreme events. Most of the central Coromandel catchments are residential, with a small commercial area at the south-western end of the catchment on Wharf Road, Tiki Road and Kapanga Road.

A majority of the stormwater in central Coromandel catchment discharges into Whangarahi Stream and the Karaka Stream. These streams then discharge into the Coromandel harbour. This catchment has the highest risk in the Coromandel urban area in terms of potential contaminants entering the environment. However, it is important to note that a majority of the hydrological catchments are undeveloped in the headwaters of the Coromandel ranges.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants; however, given that there are a low number of commercial activities and high risk facilities (e.g. petrol stations) in the CBD of Coromandel (highlighted in yellow below), there is a risk of a non-routine contaminant discharge incident.

The following aerial photo is representative of the Central Coromandel catchment. The red arrow indicates the network outlet location that should receive the most attention in the Monitoring Programme.

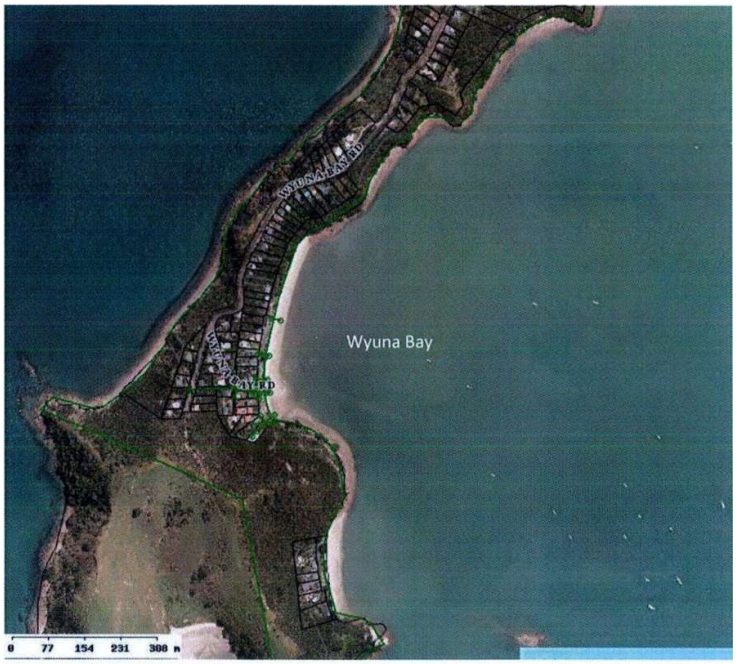


Wyuna Bay, Long Bay, and Oamaru Bay

Wyuna Bay and Long Bay are located to the west of the central area on the Ruffin Peninsula where the terrain is of a moderately steep nature. Oamaru Bay is to the northeast of Coromandel. These areas are small residential environments with a low risk for potential contaminants entering the environment.

These are not considered to be high risk catchments.

The following aerial photo shows the Wyuna Bay catchment.



The following aerial photo shows the Long Bay catchment.



The following aerial photo shows the Oamaru Bay catchment.



A-3.5 Significant Features

TCDC has a municipal wastewater treatment plant, located on Hauraki Road, servicing the Coromandel Township. This does not discharge into the stormwater network and has its own discharge consent requirements.

Historic mining activities have resulted in significant sediment and mining waste being deposited within the hydrological catchment of the Coromandel Harbour and there is a possibility that sediment monitoring data within the stormwater catchment may be influenced. It is therefore important that any monitoring programme has appropriate control test sites.

A4-1 General Description

Tairua Township (NZ Census 2018: population 1,479) is situated on the eastern coast of the Coromandel Peninsula. Tairua is situated adjacent to the Pacific Ocean and is fronted by a sandy beach with well vegetated sand dunes. The township lies at the mouth of the Tairua Estuary (on its north bank), directly opposite the township of Pauanui. Graham's Stream and Pepe Stream dissect the township. In terms of District Plan zoning, the majority of the Tairua community is zoned residential or coastal, with a small commercial area at the centre of the town. There is a small section of industrial zoning at the southern end of Tairua on Red Bridge Road. There are no Council owned stormwater services within this area.

The estuary coastline is influenced by tidal fluctuations which, at low tide, expose large areas of mud flats that support a diverse tidal marine ecology. The intertidal habitats provide feeding, roosting and nesting sites for many bird species including rare and threatened wading and coastal bird species. As a result, the upper Tairua Harbour is recognised in the Waikato Coastal Plan as an Area of Significant Conservation Value (ASCV). The extent of the ASCV defined in the Regional Coastal plan does not extend to lie directly adjacent to the urban area in Tairua but could be influenced by water quality impacts.

The Tairua harbour and the local streams have significant recreational value (surfing, diving, swimming, boating, fishing), cultural values, kaimoana resource, and landscape and amenity values. There are no discharges to Tairua Ocean Beach.

A-4.2 Tairua Stormwater Network

Stormwater in Tairua has historically been diverted to ground soakage, as the accumulated beach sands in the lower areas of the township have good soakage rates. Sediments in the more elevated areas are less suited to on site soakage. As Tairua has become more developed over the years, reticulated systems have been added.

A comprehensive stormwater collection system exists for the township comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Detention Ponds (2)
- Hynds First Defense High Capacity (1)

The bulk of the existing piped stormwater reticulation that serves roadways was constructed in the early 1980's, with existing private properties (pre 2015) on the lower flat area disposing of their stormwater by way of in-ground soakage and steep areas by way of overflow to road or open drains. New private properties (post 2015) are disposing of their stormwater by way of hydraulic neutrality being in-ground soakage and / or on-site detention.

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-4.3 Physical Description of the Receiving Environments in Tairua

The receiving environments of the stormwater discharges within Tairua urban area can be generally described as:

- Estuarine mudflats and sandflats: adjacent to the urban area, mostly without vegetation
- Streams: a mixture of sandy, boulder and pebble streambeds. Some of these are tidal.
- Sandy estuarine beaches.
- Pastoral / rural type grassed drains.
- Steep coastal cliffs: discharging to boulder beaches.

It is likely that any discharges to the coastal environment will be relatively rapidly dispersed and flushed due to the extensive tidal flushing and sediment movement in the Tairua Estuary. Increased stormwater runoff during high rainfall events often coincides with wave action and storm surge, further increasing the flushing capacity of the coastal environment. Therefore, any visible environmental effect of discharges within the receiving waters in the estuary is likely to be mitigated naturally within a short period of time (AEE Tairua (June 2001)). Accumulation of contaminants is possible in areas where the receiving environment has very fine sediments in streams or coastal environments sheltered from waves and currents.

A-4.4 Tairua Stormwater Catchments

Tairua has a reticulated stormwater collection and disposal system designed to cater for stormwater runoff from urban areas.

There are approximately 92 outlets throughout the Tairua stormwater system discharging to the Tairua Harbour (37 outlets), Oamaru Bay (2 outlets), the Pacific Ocean (1 outlet), Pepe Stream (13 outlets) and Graham's Creek (9 outlets). There are also approximately 32 discharges to land.

In terms of topography, the urban area of Tairua can be divided into six areas:

- Paku Hill
- Tairua town centre (north of Pepe Stream bridge)
- Tairua Heights residential area (south of Pepe Stream)
- Grahams Stream residential area.
- Pepe Stream area.
- Azimuth

The map below covers the Tairua Urban Catchment:



Paku Hill

The Paku Hill area is a steep graded hill on the coast of the Pacific Ocean and the Tairua Harbour. Land use is low density residential with small areas of native bush on the upper slopes. Stormwater reticulation is in the form of underground pipes, with the majority of discharges to the sea and onto or into land (from which many drain naturally to the sea). The hard volcanic sediments in this area do not have good soakage.

In terms of the Comprehensive Stormwater Discharge Consent, the Paku Hill catchment is not exposed to high concentrations of routine contaminants, however, given the presence of the marina (marked on the photo below), there is a small risk of a non-routine contaminant discharge incident.

The following aerial photo is representative of the Paku Hill catchment.



Tairua Town Centre (north of Pepe Stream)

The area north of the Pepe Stream forms the Tairua town centre stormwater catchment area. The central part of this catchment includes the CBD of Tairua, with a small number of shops situated along SH25. The remainder of this area is generally low density housing, with a few recreational reserves. A service station is located close to the Pepe Stream and Tairua Estuary, at the intersection of Marguet Place and SH25. There is also rural land, used for grazing and orchards, which drains directly to the Pepe Stream catchment.

In terms of the Comprehensive Stormwater Discharge Consent, this Tairua urban catchment is not exposed to high concentrations of routine contaminants, however, given that there are some commercial activities and high risk facilities (e.g. petrol station and workshop) within the Tairua urban area, there is a risk of a non-routine contaminant discharge incident.

The following aerial photo is representative of the Tairua Town Centre (north of Pepe Stream) catchment. The red arrow indicates a network outlet location that should receive most attention in the Monitoring Programme.



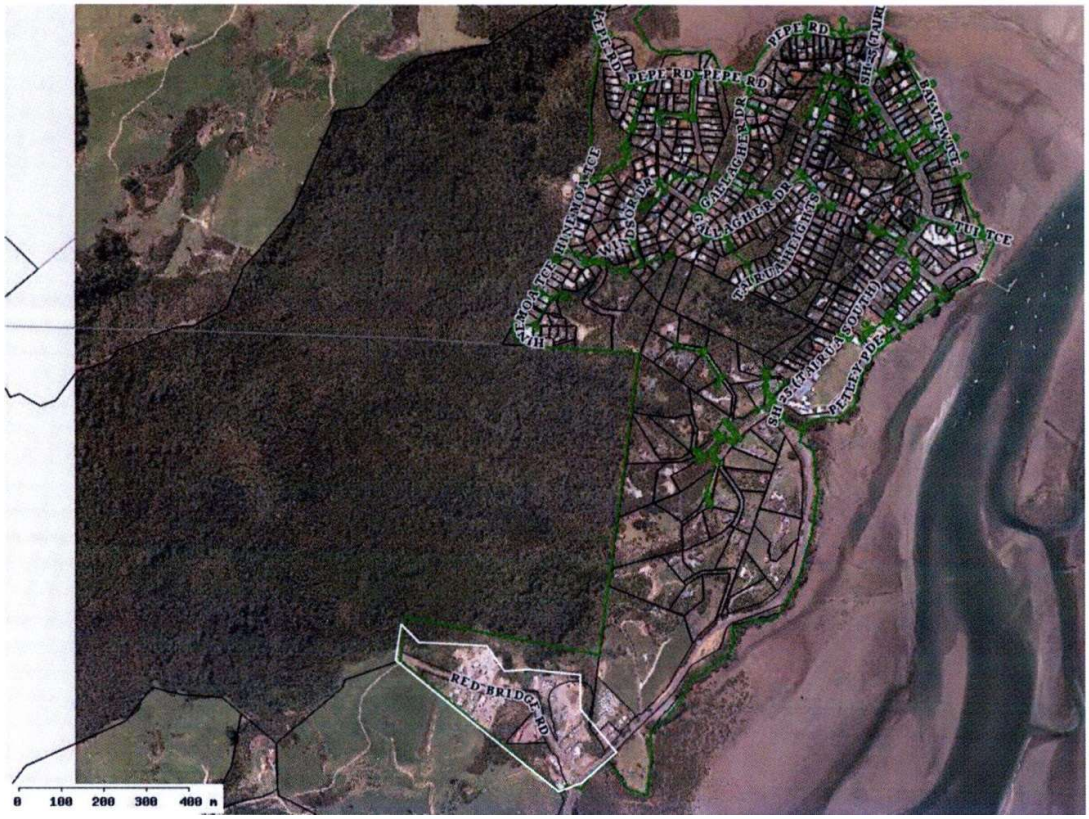
Tairua Town Centre (north of Pepe Stream)

The stormwater reticulation is mainly in the form of underground pipes. Most of the discharges are to the Tairua Harbour, Pepe Stream and onto or into land. Land use is predominantly (80%) residential, with the balance in open space.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and does not contain any high risk facilities. This catchment is considered to be at low risk from stormwater contamination.

There is an area of land zoned for industrial use (Red Bridge Road) at the southern extent of the urban area. Activities in this area include a panel repair workshop and the council refuse transfer station, however there is no stormwater infrastructure within the Red Bridge Road area.

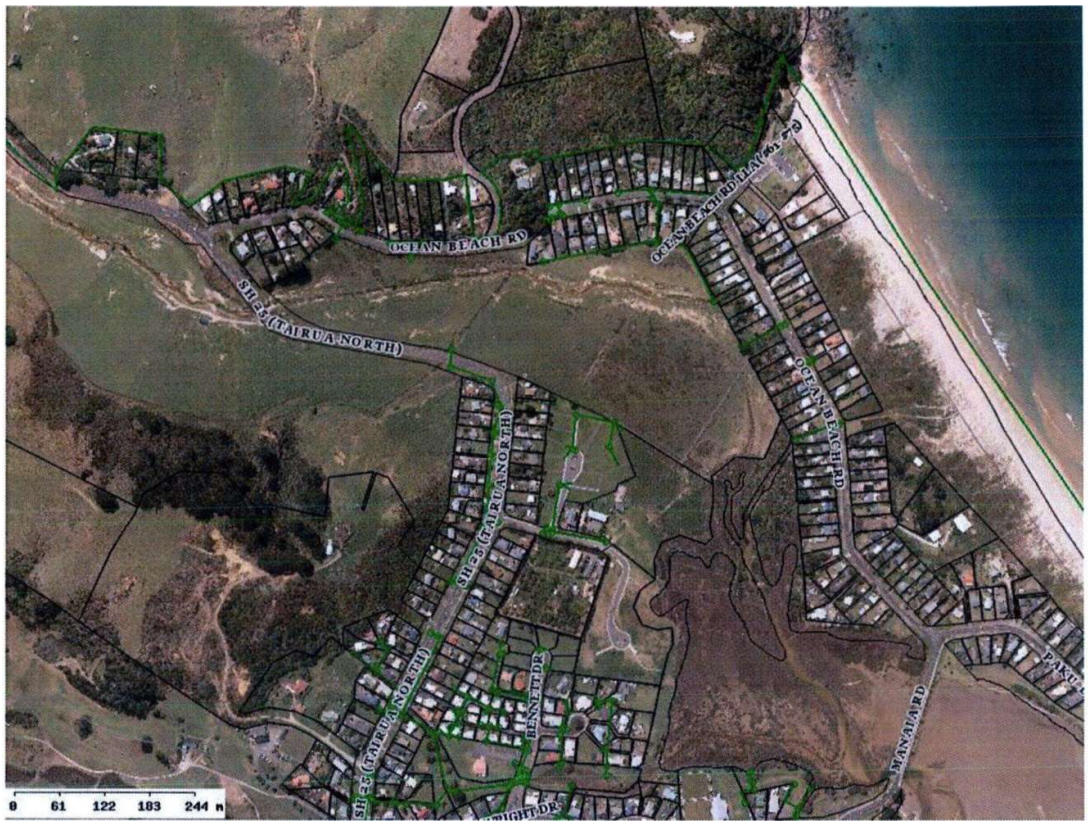
The following aerial photo is representative of the Tairua Town Centre (north of Pepe Stream) catchment.



Graham's Stream Residential Area

This part of Tairua is entirely residential with small reserve areas and is situated adjacent to Graham's stream on the northern boundary of the township. Some houses in this area are located on very low lying flood-prone land, while others are elevated on the adjacent foothills.

This is not considered to be a high risk catchment in terms of routine or non-routine contaminant discharge. The following aerial photo is representative of the Graham's Stream (Residential Area) catchment.



Azimuth

This is a new subdivision of 27 lots of medium to low density and is situated on the hill on the northern side of Tairua landward side. Houses are just starting to be built, disposing of their stormwater by way of a 25,000 litre water tank for primary water supply to each lot, with overflow from these tanks directed to on-site detention at 80% pre- development greenfield rate with overflow to the road. The reticulation is discharged to either existing reticulation in the main road, or to a new stormwater detention pond at the lower site of the development.

This is not considered to be a high risk catchment in terms of routine or non-routine contaminant discharge.

The aerial photo below shows the major devices within the network.



Currently there is a separate WRC stormwater discharge consent that is being handed over to TCDC for inclusion in the Comprehensive Discharge Consent.

A-4.5 Significant Features

TCDC has a wastewater treatment and disposal system servicing the Tairua Township (Pauanui system). This does not discharge into the stormwater network and has its own discharge consent requirements.

A-5 Whitianga Urban Area (Consent 105665)

A5-1 General Description

Whitianga Township (NZ Census 2018: population 5,493) is located within Mercury Bay on the eastern coast of the Coromandel Peninsula. To the south the Township is bound by the Whitianga Estuary. The eastern edge is bordered by Buffalo Beach, a white sandy beach backed by low sand dunes which is gradually being modified by erosion protection structures (seawalls). The Township is built on ancient low lying dunes, so is low lying, relatively flat land with sandy free draining soils.

Within the estuary, the shoreline is influenced by tidal fluctuations which, at low tide, expose large areas of mud flats that support a diverse tidal marine ecology. The Whitianga Harbour is recognised in the Waikato Regional Coastal Plan as an Area of Significant Conservation Value (ASCV) for a range of reasons, including (but not limited to) the significance of the estuary to Hauraki iwi, the provision of habitat for rare and threatened wading, coastal and freshwater birds, intertidal vegetation and habitat (including extensive eel grass and mangrove communities), resident dolphins, geo-preservation, archaeological sites, and adjoining forest scenic reserves.

Most of Whitianga Township is low lying and flat and is therefore vulnerable to flooding. The risk of flooding is further exacerbated by the tidal nature of the receiving environment, meaning if heavy rainfall occurs at high stages of the tide, the risk of flooding is further increased.

A-5.2 Whitianga Stormwater Network

Whitianga has a reticulated stormwater collection and disposal system designed to cater for stormwater runoff from urban areas and to discharge this runoff into the Taputapuatea Stream, Whitianga Estuary, and into a range of grassed farm drains and channelised creeks and drains throughout the town.

The stormwater collection system for the township comprises the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Stormwater Pump Stations (Jackman Avenue and Cook Drive)
- Wetlands (2)
- Soakage Cells (1)
- Rain Gardens (122)
- Detention Ponds (1)

As a general rule, the piped stormwater reticulation serves only roadways, with private properties disposing of their stormwater by way of available hydraulic neutrality being in-ground soakage and / or on-site detention.

There are four main drains which take stormwater from urban Whitianga to the estuary, and these are known as the Racecourse Road drain, Kareena Creek, Tennis Court Creek, and White Street drain.

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-5.3 Physical Description of the Receiving Environments in Whitianga

The receiving environments for stormwater discharges in Whitianga can be described as:

- Whitianga Estuary: intertidal sandflats and mudflats, some areas vegetated with eel grass, mangroves or salt marsh species.
- Streams: sandy or muddy bed.
- Pastoral / rural type grassed drains.
- Channelised drains.

Stormwater discharges to the coastal receiving environments in Whitianga are likely to be relatively rapidly dispersed by the tidal flushing effects in Whitianga Estuary and natural flushing in Taputapuatea Stream. These flushing effects are increased during high rainfall events, at the same time that stormwater discharges (and associated potential contamination) increase. There is, however, potential for localised build-up of contaminated sediment in sheltered estuarine areas characterised by fine sediments.

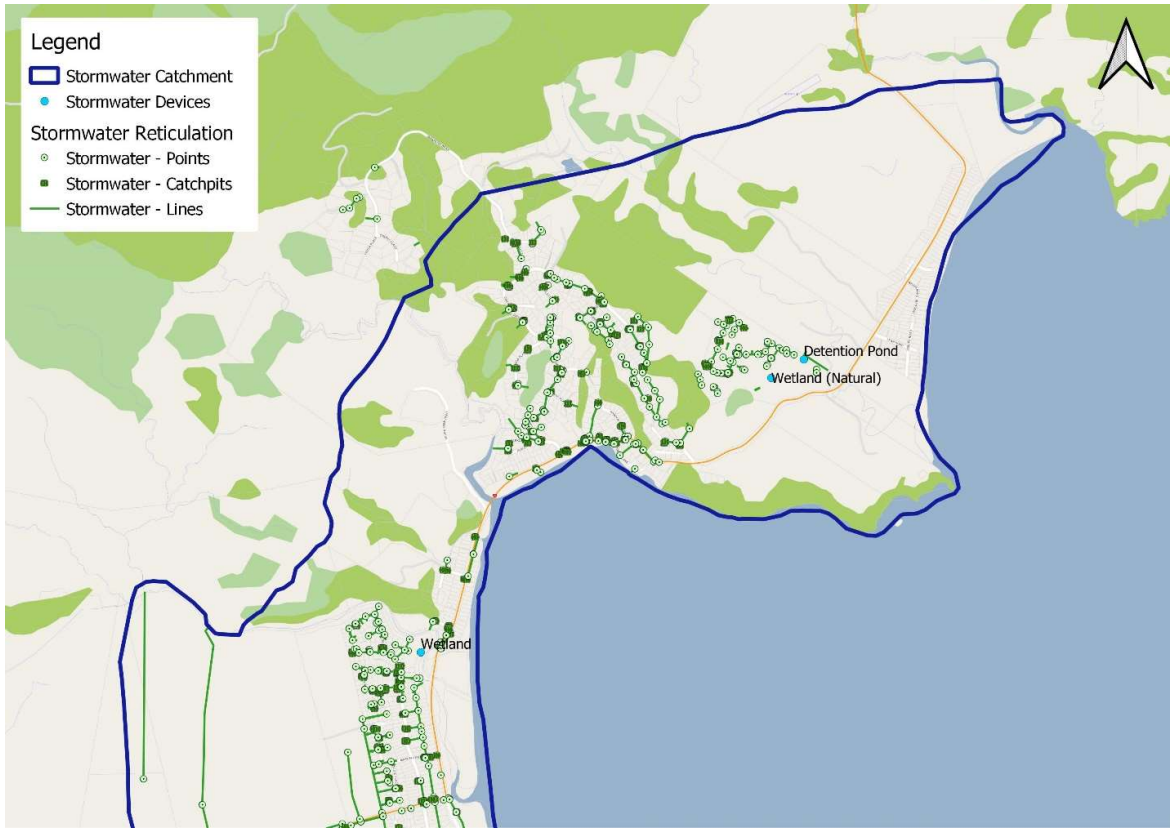
A-5.4 Whitianga Stormwater Catchments

There are approximately 90 outlets throughout the Whitianga stormwater system discharging to the Whitianga Estuary (41 outlets), internal drains (17 outlets) and Taputapuatea Stream (7 outlets). There are also approximately 25 discharges onto land.

The urban area of Whitianga is made up of series of relatively small catchments. For the purposes of stormwater planning, the urban area can be divided into seven areas:

- Centennial Heights: relatively steep residentially zoned area at the northern end of the Whitianga Township.
- Buffalo Beach Foreshore: sandy coast with low dunes, intercepted by Taputapuatea Stream.
- Whitianga Inland Residential area: flat, low lying area with mix of rural and relatively new residential development.
- Central Whitianga: commercial, industrial and moderate to high density residential land use, adjacent to the shore of the Whitianga estuary.
- Moewai Road: industrial area at the western outskirts of the Whitianga urban area.
- Whitianga Waterways: a series of artificial canals providing boat access to residential development.
- Wharekaho: A new subdivision located on the northern side of the Centennial Heights ridge incorporating some of Centennial Heights.

The maps below cover the Whitianga Urban Catchment:





Centennial Heights

The Centennial Heights urban catchment area is entirely residential and has a relatively modern (post-1980s) underground stormwater reticulation system. The majority of the discharges are to ground soakage or to Ohuka Beach. The steep nature of the catchment means that most stormwater disposed to ground flows into creeks and drains. The following aerial photo is representative of the Centennial Heights catchment.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and also does not contain any high risk land uses in terms of non-routine contaminant discharge risk. This catchment is likely to be of low risk in terms of stormwater contamination.

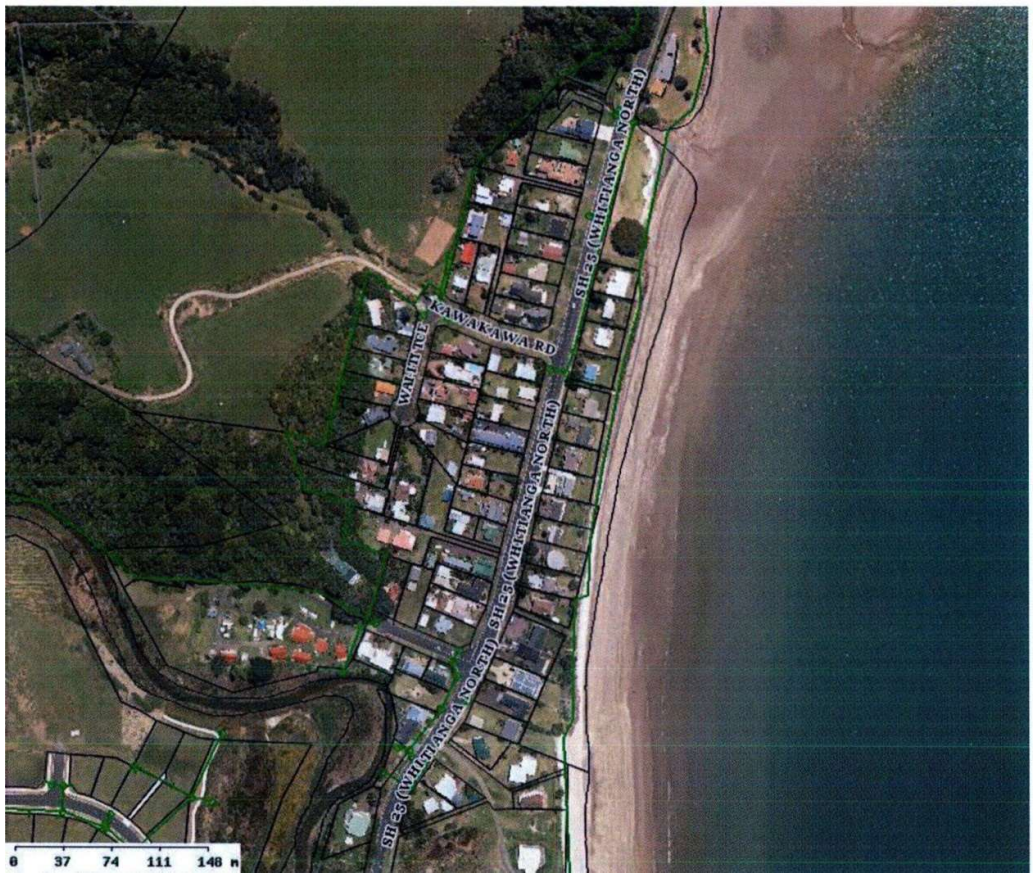

CENTENNIAL DR
CENTENNIAL DR
CENTENNIAL DR

Buffalo Beach Foreshore

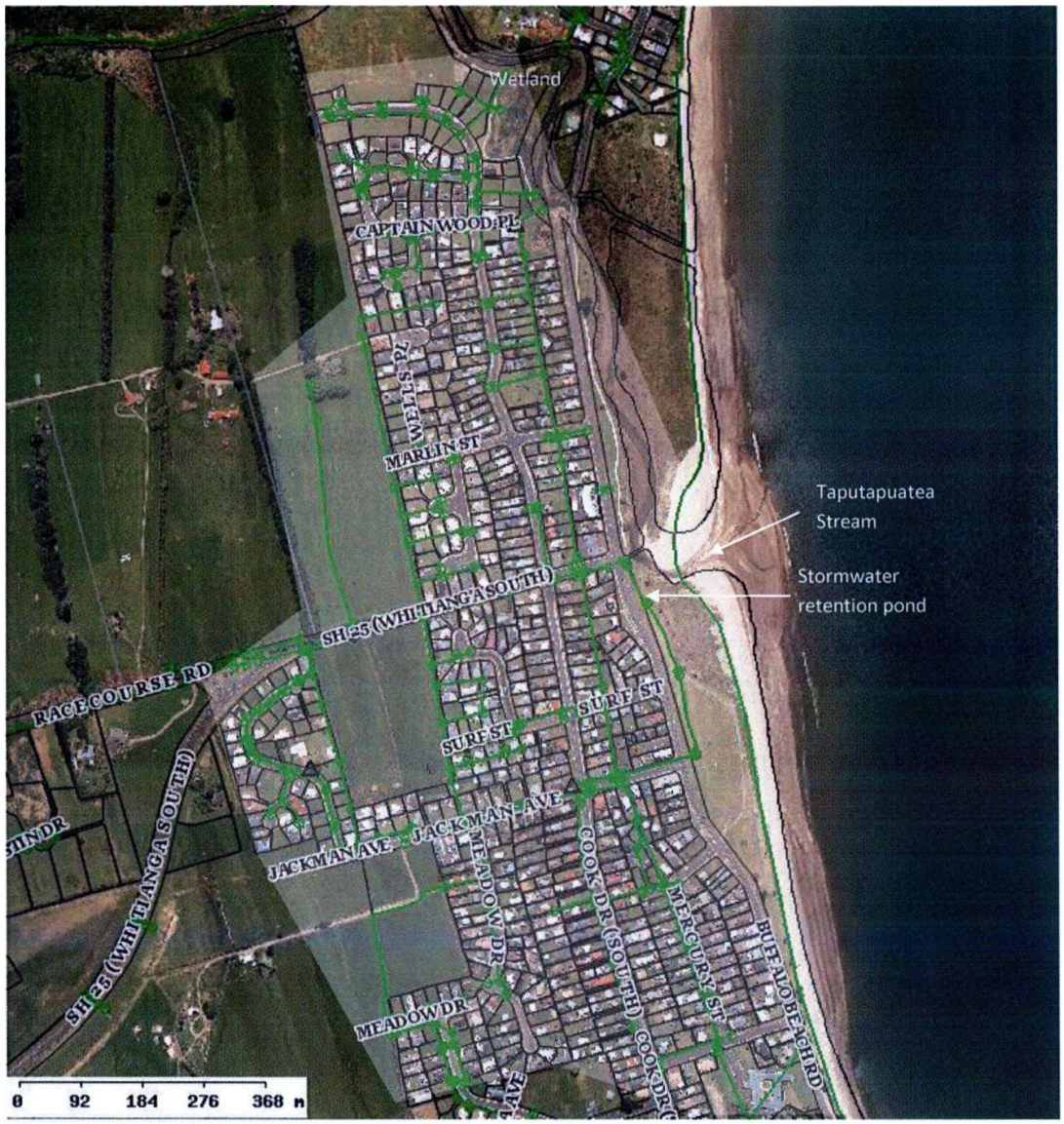
This catchment includes reserve areas and areas of low to medium density residential development close to Buffalo Beach. This area has a mixture of open drain and underground piped reticulation, which all ultimately discharges to the Taputapuatea Stream, which exits onto Buffalo Beach. An area of recent development at the north end of Cook Drive discharges stormwater to a wetland adjacent to the southern bank of the Taputapuatea Stream, which is vested in Council. There is also a stormwater ponding area on the beach reserve that the Jackman Avenue Pumpstation discharges to, which then ultimately discharges to Taputapuatea Stream adjacent to Buffalo Beach Road. The Cook Drive Stormwater Pumpstation captures the discharge from the northern Cook Drive area and discharges directly to the Taputapuatea Stream

Although there are no high risk commercial activities in this area, there is a relatively large area of residential development discharging into one stream. The Taputapuatea Stream is highly valued and heavily utilised as a safe environment for small children to swim. This is not considered to be a high risk catchment but, given the extent of the catchment and the high use of the area, monitoring or water quality and sediment contamination may be justified.

The photo below shows the catchment north of the Taputapuatea Stream. This area is flat land with residential and reserve areas.



The aerial photo below shows the Buffalo Beach foreshore catchment south of the Taputapuatea Stream. This area is mostly flat land with residential and reserve areas. The shaded area indicates the approximate extent of the catchment discharging to the stream.



Whitianga Inland Residential Area

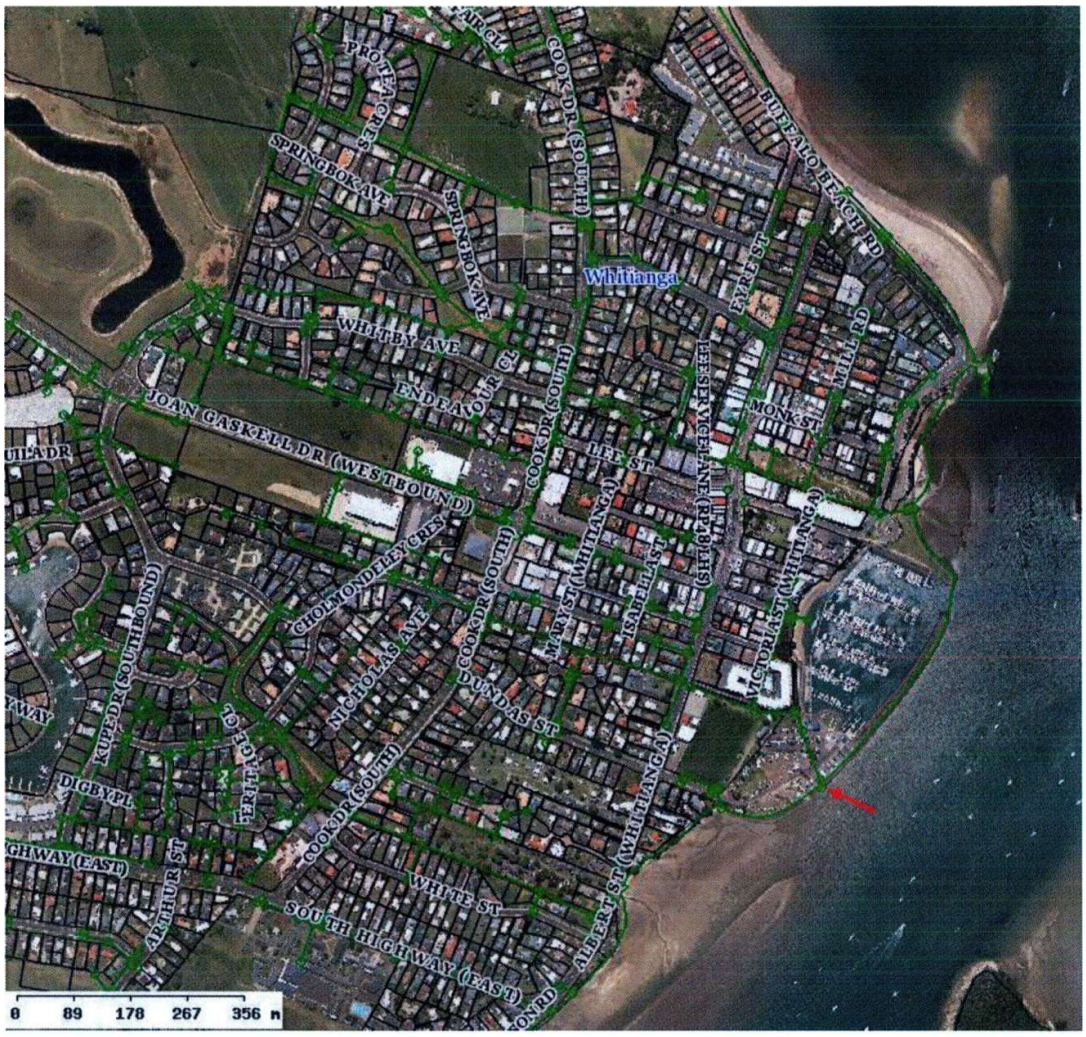
Inland from the coastal margin there is a large rural and residentially zoned area of land. The topography of the area is flat and low lying. There are several open drains that run through the rural area and discharge to Taputapuatea Stream, or to the Whitianga Estuary.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants; and there are no high risk facilities in this area. Most areas remain in rural land use (pasture). This catchment is considered to be low risk in terms of stormwater contamination.

Central Whitianga

The Central Whitianga Township area has a mix of residential, commercial and industrial zoning and land use. There are some businesses within the central township that can be considered high risk for occasional non-routine contamination of stormwater, including mechanical workshops and service stations. There is also the Wharf and marina on the estuary margin.

The following aerial photo is representative of the Central Whitianga catchment. The red arrow indicates the network outlet location that should receive most attention in the Monitoring Programme



The photo below shows Central Whitianga south. This area is low lying flat land in residential housing and reserves / parks.



Moewai Road Industrial Area

Moewai Road industrial area is located on the western outskirts of Whitianga Township. This is where the majority of industrial activities occur within the wider Whitianga urban area. Two open drains discharging to the inner Whitianga Harbour service this area.

There are several commercial operations within this catchment that could be considered "high risk facilities" in respect of the Waikato Regional Plan, including mechanical workshops, spray painting facilities, fabrication of metal products, a concrete plant and timber storage. The Whitianga wastewater treatment plant is also located in this area.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not considered to be exposed to high concentrations of routine contaminants, however, given that there are a number of commercial activities and high risk facilities in the Moewai Road area, there is a risk of a non-routine contaminant discharge incident.

The following aerial photo is representative of the Moewai Road Industrial Area catchment. Stormwater is discharged to the Whitianga Estuary via two drains. The red arrows indicate the network outlet locations that should receive most attention in the Monitoring Programme

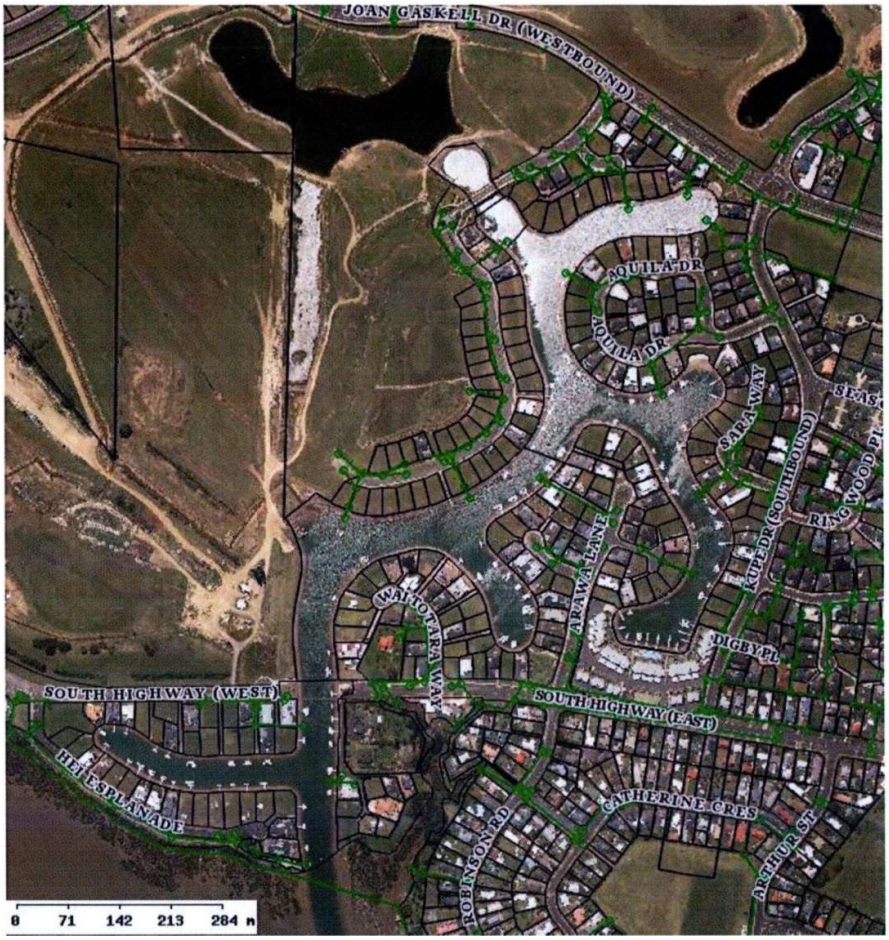


Whitianga Waterways

The Whitianga Waterways development comprises a network of artificial canals providing private boating access to residential development. The canal development is only partially completed; however, further development is occurring. The area is currently residential with one service station (with a small commercial shopping centre planned adjacent to the service station), and all stormwater from roads and reserves are discharged to the canals which then flows into the Whitianga Estuary. Private stormwater is disposed of on-site with good soakage capacity being available within the sandy soils of the area.

Given that the majority of the Whitianga Waterways development is for medium density housing it is considered that there is low risk of contamination as a result of stormwater. There are also grass swales and rain gardens within most of the road reserves.

The following aerial photo is slightly out of date however, it generally shows the stormwater network within the network in the Whitianga Waterways catchment.



The below diagram shows the ultimate future development of the Whitianga Waterways.

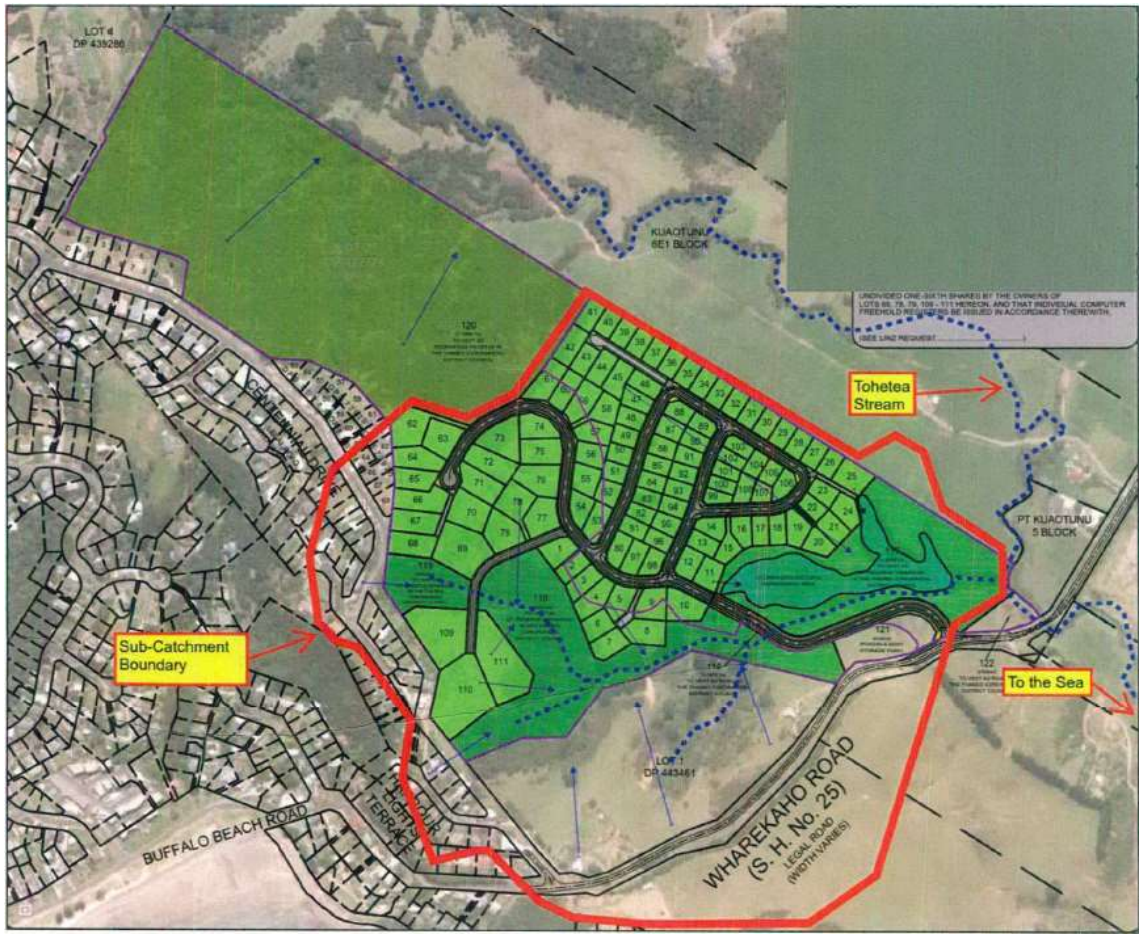


Wharekaho

Wharekaho is a new residential subdivision currently under development (50%) that discharges on-site stormwater via hydraulic neutrality being detention tanks. Road water and property overflows discharge into a detention pond that discharges into a natural wetland then to the Tohetea Stream that ultimately discharges onto the south end of Wharekaho Beach.

This catchment includes reserve areas and medium density residential development. In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and also does not contain any high risk land uses in terms of non-routine contaminant discharge risk. This catchment is likely to be of low risk in terms of stormwater contamination.





Below is an excerpt from the Wharekaho Subdivision Stormwater Management Plan (ECM Doc Set # 3602783)

- *Soakage*: In general soakage is not considered to be suitable for use on the majority of the site. The topography doesn't provide sufficient flat areas for large soakage fields and the concentration of stormwater runoff to a number of discrete locations for soakage would adversely affect slope stability across the sloping site.
- *Rain gardens*: Due to the relatively steep nature of the site the topography doesn't generally provide for sufficient/suitable flat areas for rain gardens.
- *Swales:* The vast majority of the road system is proposed to be constructed at grades in excess of the recommended maximum 5% gradient suitable for the use of swales. The steep gradient, coupled with the need for frequent driveway crossings, means the provision of swale drains to service the new subdivision road network system is considered impractical.
- *Wetlands/Ponds:* Suitable areas for the provision of storage ponds/wetlands are available in the eastern corner of the site at and around the location of the existing wetland. Due to the presence of significant vegetation in the existing wetland area (and upstream gully systems), permanent alterations to the existing ground levels or ponding levels in the wetland or gullies is not recommended. New permanent pond areas would need to be provided off-line and outside the areas of significant vegetation.

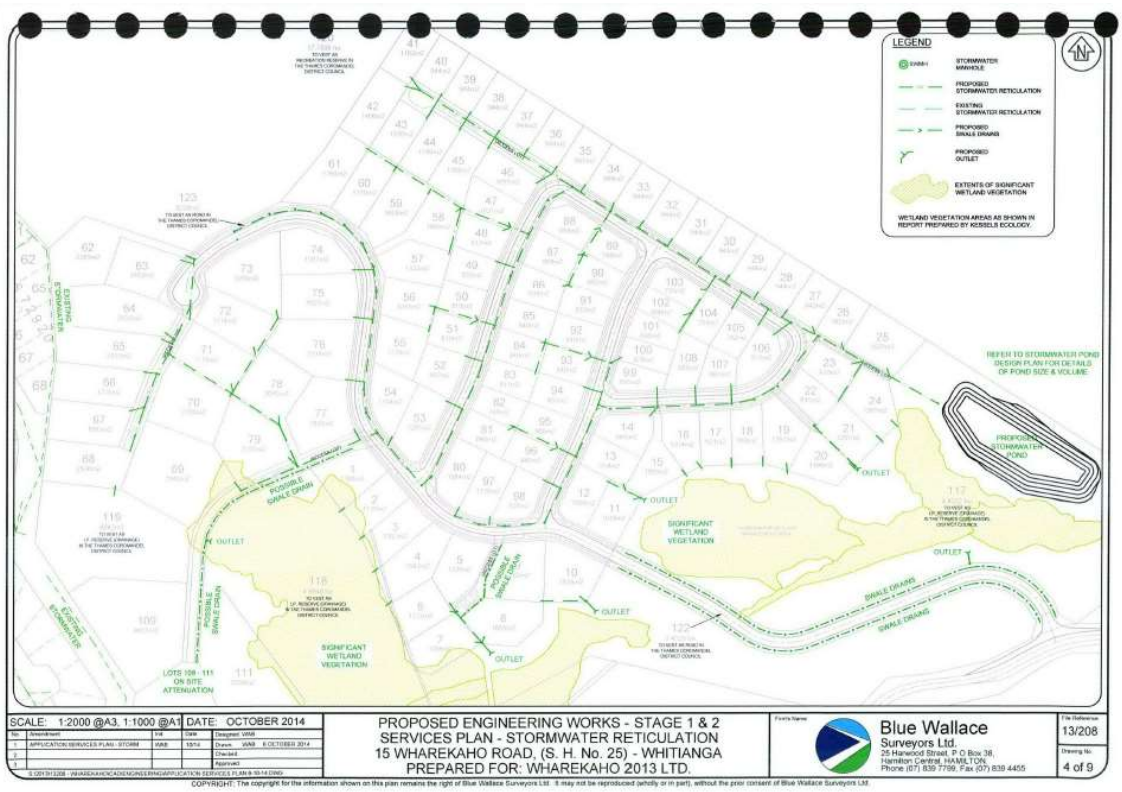
Following the high-level investigation of options for the site, the recommended stormwater management system for the development is to drain stormwater runoff from the majority of the developed area (lots and roads), via a piped system to the east, and provide sufficient water storage volume for water quality in a new ponding area to be constructed on the edges of the existing wetlands area. Treated water from the new ponding area would then discharge into the existing wetlands in a controlled manner.

Overall water quantity control for the sub-catchment would be provided in the existing wetlands area by constructing a new outlet system. The use of the existing wetland is considered acceptable for this purpose as it only results in minor and short term alterations to storage levels and durations in the wetland when compared to the existing scenario. Using the existing wetland also enables control of peak flows from the entire sub-catchment (for up to and including the 100 year storm event) prior to discharge to the Tohetea Stream. This provides additional benefit and certainty downstream of the site.

Key advantages of the proposed system are:

- It utilises standard, low technology systems with proven effectiveness (as detailed in TP10)
- It minimises the number of stormwater management devices required for the sub-catchment
- Key elements of the system are under the control of Council, who can then manage, operate and maintain the system such that it continues to work effectively (without the risk of a lack of public maintenance or understanding adversely affecting the desired system outcomes)

The above factors combine to minimise the cost of ongoing maintenance for Council, whilst allowing Council to retain control over elements of the system that are key to its operational effectiveness.



A-5.5 Significant Features

TCDC has a wastewater treatment and disposal system servicing the Whitianga Township. This does not discharge into the stormwater network and has its own discharge consent requirements.

Significant features of the Whitianga Urban Catchment are:

- Jackman Ave stormwater Pumpstation
- Cook Drive stormwater Pumpstation
- Whitianga Waterways (Private WRC stormwater discharge consent)
- Whitianga Wharf
- Whitianga Marina
- Moewai Road commercial and industrial site

A-6 Onemana Urban Area (Consent 105666)

A-6.1 General Description

Onemana Township is predominantly a holiday destination (permanent population approximately 120) situated on the eastern coast of the Coromandel Peninsula, less than 10 km north of Whangamata. The town lies on topography of rolling to steep contour with several unnamed streams running through it. The settlement is fronted by an open coast sandy beach. Onemana is a residential settlement with a small block of shops located near the beachfront.

Onemana lies on quite steep land and three catchments flow into a single outlet near sea level.

A-6.2 Onemana Stormwater Network

The Onemana stormwater system was installed in 1984 and services approximately 100 properties that discharge to streams, which in turn discharge to the Pacific Ocean.

Private properties on the Coromandel Peninsula are required to achieve hydraulic neutrality by way of on-site stormwater management by soakage to ground and / or detention tanks. Due to the steep nature of the Onemana catchments, on-site stormwater management is not universally feasible, with runoff likely from both private properties and road reserve. Onemana has a piped stormwater system with kerb and channel stormwater management in place throughout the town. The stormwater catchments are generally made up of two catchments (north and south) that flow to a single discharge location on Onemana Beach esplanade reserve. Stormwater from the southern catchment is discharged to a stream which flows in a northerly direction. Stormwater from the northern catchment flows into a two stage stormwater detention pond to the east of Tuna Place. Ultimately all stormwater is transported underneath the road through piped reticulation and discharged to the beach via one outlet. The stormwater typically soaks through into the beach dune system.

A comprehensive stormwater collection system exists for the township comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Detention Pond (1)

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

The map below covers the Onemana Urban Catchment:



A-6.3 Physical Description of the Receiving Environments in Onemana

The receiving environments of the stormwater discharges within the Onemana urban area can be generally described as:

- Ocean Beach (Pacific Ocean): Open coast sandy beach.
- Streams: highly modified stream with sandy bed.

A-6.4 Onemana Stormwater Catchments

There are approximately 20 stormwater discharge outlets throughout the Onemana stormwater system, with most discharging to unnamed streams that run through the Onemana community. The hilly catchments in Onemana mean that stormwater is readily able to flow away, and ponding and flooding are not widespread problems. For the same reason, silt and sand build up is only an issue at the lower outlet channel at the beach. In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants. In terms of non-routine discharges, there are no high risk facilities in Onemana. In general, the risk of significant stormwater contamination at Onemana is low. The following aerial photo shows the stormwater network in the Onemana Township catchment. Topography is elevated and sloping. There is a single beach outlet, which discharges stormwater from throughout the Onemana urban area.



A-6.5 Significant Features

TCDC has a wastewater treatment and disposal system servicing the Onemana Township. This does not discharge into the stormwater network and has its own discharge consent requirements.

A-7 Whangamata Urban Area (Consent 105667)

A7-1 General Description

Whangamata Township (NZ Census 2018: population 4,074) is situated on the foreshore of the Whangamata Estuary, the Otahu Estuary and the Pacific Ocean. The Pacific Ocean coast is characterised by white sandy beaches and vegetated sand dunes. The estuary shorelines are more influenced by tidal fluctuations which, at low tide, expose large areas of mud flats that support diverse tidal marine ecology. Large areas of the upper portion of the intertidal flats are vegetated with mangroves and. in some areas, salt marsh communities. Both the upper Whangamata Estuary and the Otahu Estuary are recognised in the Regional Coastal Plan as Areas of Significant Conservation Value (ASCVs) for a range of reasons, including (but not limited to) their significance to Hauraki iwi, the provision of habitat for rare and threatened wading and coastal birds, intertidal vegetation and habitat (salt marsh, mangroves, eel grass and shellfish beds) and native fisheries habitat.

Whangamata is dominated by residential land use (>90% by area), with a small area of commercial development in the centre of town and a small amount of industrial zoned land south of the Moana Anu Anu River and causeway.

The beaches and estuaries in the Whangamata area are highly valued by the local community and visitors for a wide range of contact and non-contact recreational activities, as well as for shellfish gathering, including popular shellfish beds in close proximity to the Wharf and Marina. The area also has considerable cultural, landscape and natural character values.

A-7.2 Whangamata Stormwater Network

A comprehensive stormwater collection system exists for the township comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales
- Detention Ponds (4)
- Soakage Cells / Soakpits (9)
- Pump Stations (Tangaroa Road and Otahu Road)

Large areas of the town are built on flat, free draining soils and in these areas, stormwater is disposed of on-site by way of soakage. The council stormwater network is therefore designed predominantly to cater for stormwater generated within roadways. Roadways are often overland flow paths with grass swales and no reticulation. The grass swales provide significant soakage capacity within these sandy free draining soils.

Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-7.3 Physical Description of the Receiving Environments in Whangamata

The receiving environments of the stormwater discharges within the Whangamata urban area can be generally described as:

- Whangamata and Otahu Estuaries: Mudflats, sandy silty sediments, with or without vegetation.
- Streams: a mixture of boulder and pebble streambeds.
- Land: Pastoral farmland and grassed drains.
- Sandy Beaches.

It is likely that any discharges to the coastal environment will be relatively rapidly dispersed and flushed due to the extensive tidal and river flushing and sediment movement in the Whangamata and Otahu Estuaries and the ocean beach. Increased stormwater runoff during high rainfall events often coincides with wave action, storm surges and increased river flows, further increasing the flushing capacity of the receiving environment. Therefore, any visible environmental effect of discharges within the receiving waters in the estuary and on the beach is likely to be mitigated naturally within a short period of time (TCDC Assessment of Environmental Effects (June 2001)). Accumulation of contaminants is possible in areas where the receiving environment has very fine sediments in streams or coastal environments sheltered from waves and currents.

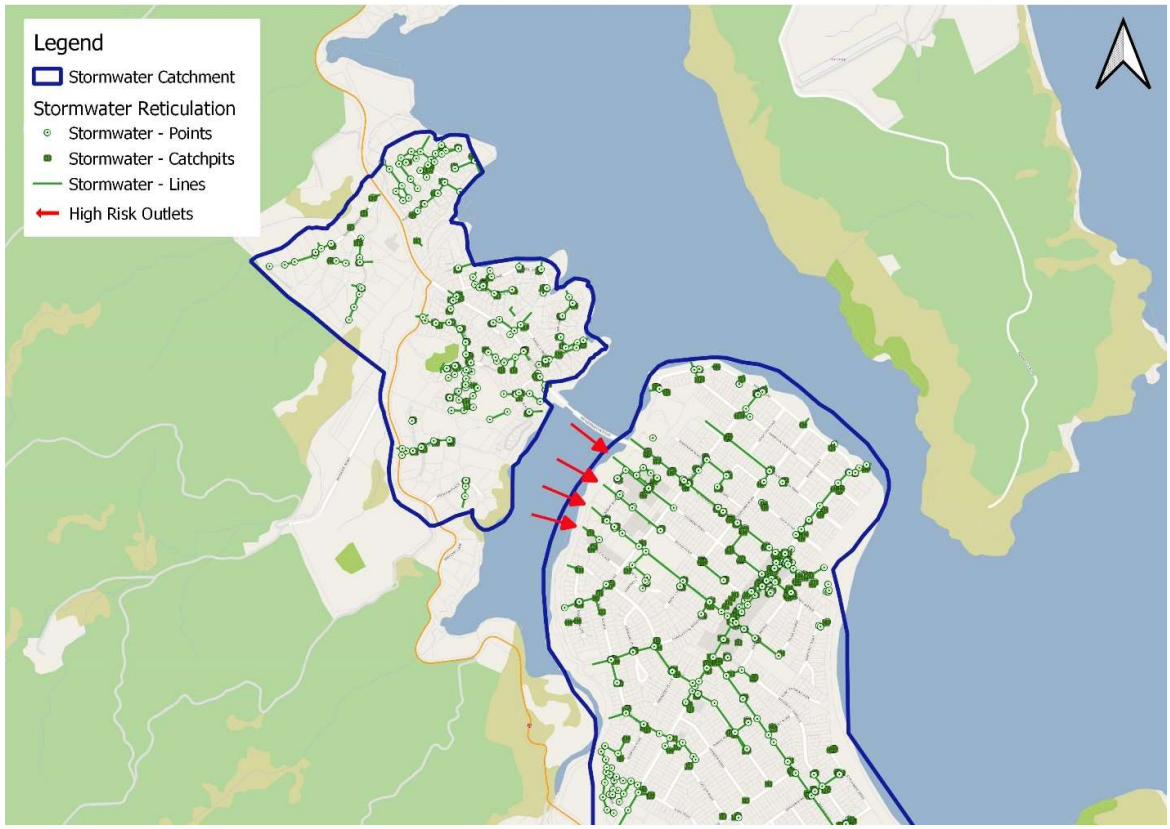
A-7.4 Whangamata Stormwater Catchments

The Whangamata stormwater system includes approximately 88 outlets discharging to the Whangamata Harbour (20 outlets), the Pacific Ocean (7 outlets), Moana Anu Anu River (15 outlets), Moana Anu Anu Estuary (3 outlets), Te Weiti Stream and tributaries (4 outlets), Waikiekie Stream (3 outlets) and Otahu Estuary / River (3 outlets). There are also approximately 32 discharges onto or into land.

The Whangamata urban area is made up of a series of relatively small catchments which can be broadly separated into five areas:

- North of Moana Anu Anu River: residential area with gently rolling contour.
- Whangamata North: Industrial Area and CBD (and residential).
- Whangamata Central: residential area.
- Whangamata South: residential area.
- Beverly Hills: range of hills that look out over the central Whangamata area

The maps below cover the Whangamata Urban Catchment:





Moana Anu Anu River North

The area north of Te Moana Anu Anu River is characterised by gently rolling contour, which slopes towards the River and the Whangamata Estuary. Stormwater in this area is serviced through reticulated underground pipes which discharge to the two estuaries

This is a small residential catchment with no high risk activities operating in the area. The topography in this area is sloping and soils are predominantly clay. This catchment is considered to be low risk for potential contaminants entering the environment.

The following aerial photo is representative of the Moana Anu Anu River North catchment.



Whangamata Industrial Area and CBD

This catchment includes the main industrial and commercial zones within the Whangamata urban area. There is also a large catchment of low-medium density residential development.

The retail centre is on Port Road, while the industrial area is located to the west of Martyn Road, adjacent to the Moana Anu Anu Estuary. Stormwater from these catchments flows through into Te Moana Anu Anu estuary at a number of locations adjacent to the Moana Anu Anu causeway.

In terms of potential stormwater contamination, there are a number of high risk facilities in the industrial area, including a concrete plant, vehicle workshops, a hire centre, building merchants (including timber storage), storage, heavy vehicle depots, and a petrol station. Within the CBD, most businesses are low risk, but do include a petrol station.

The Whangamata Marina is also located in this area, downstream of the causeway, where Te Moana Anu Anu estuary flows into the Whangamata Harbour. The marina is subject to its own stormwater discharge consents.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants, however, given that there are numerous commercial activities and high risk facilities, there is a relatively high risk of a non-routine contaminant discharge incident.

The receiving environment for this commercial and industrial area is relatively sheltered from wave and current action due to the causeway, which reduces its natural flushing and dispersal. Due to the sheltered estuarine environment, the sediments in the area are very fine coastal muds and silts. Discharges from industrial land use could be accumulating contaminants within these sediments and this is likely to be a priority area for future sediment monitoring.

The following aerial photo is representative of the Whangamata Industrial Area and CBD catchment. The Industrial area is shaded white and the CBD is shaded yellow. The red arrows indicate the network outlet locations that should receive most attention in the Monitoring Programme.



Whangamata Central

This area includes a large proportion of the urban area of Whangamata. Land use is entirely residential (varying densities) or reserve. Stormwater in this area drains to a number of locations on the ocean beach, the Whangamata estuary and to Te Moana Anu Anu estuary.

A principal pipe system runs along Ocean Road and Williamson Road in Whangamata and this is the main contributor of flow to a detention pond at Williamson Park. This stormwater discharge is from a residential area and small retail activities on Beach road. The detention pond provides a degree of treatment, peak flow attenuation and soakage which significantly reduces the frequency of discharge across the beach and any associated scouring. The pond contains gabion baskets at the outlet to the main beach which are occasionally subject to erosion during large wave and storm events. Williamson Reserve is a popular public reserve area and therefore, there is a high degree of public (informal) surveillance of the stormwater detention pond. For this reason, and the fact that this is not a high risk catchment, this location has not been identified for monitoring.

Topography in this area is flat and the soils are dominantly free draining (sand). The following aerial photo is representative of the Whangamata Central catchment.

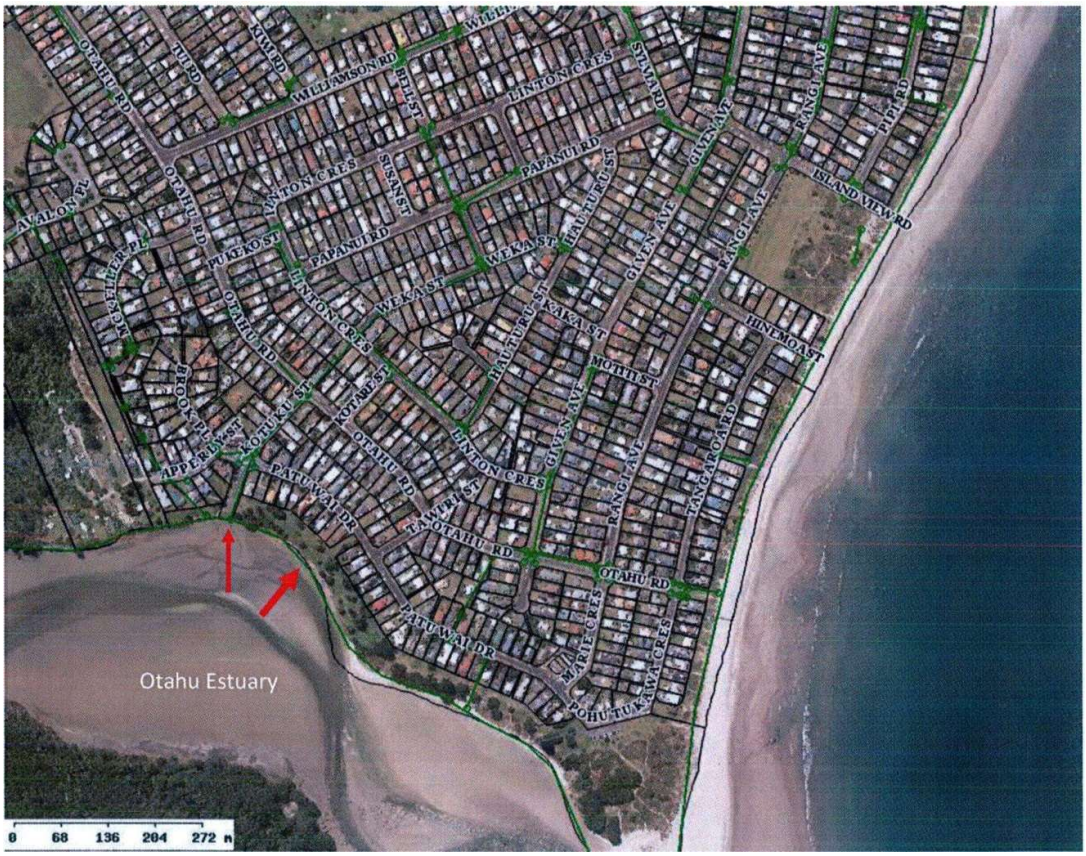


Whangamata South

This is a relatively small residential area (medium to low density) south of Williamson Road and (at the Beach) Hinemoa Street. This is approximately one quarter of the urban area in central Whangamata and developed areas are residential with minor retail activities. Stormwater in this area drains south to the ocean beach and to the Otahu estuary.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and contains no commercial or high risk facilities. There is therefore a very low risk of a non-routine contaminant discharge incident.

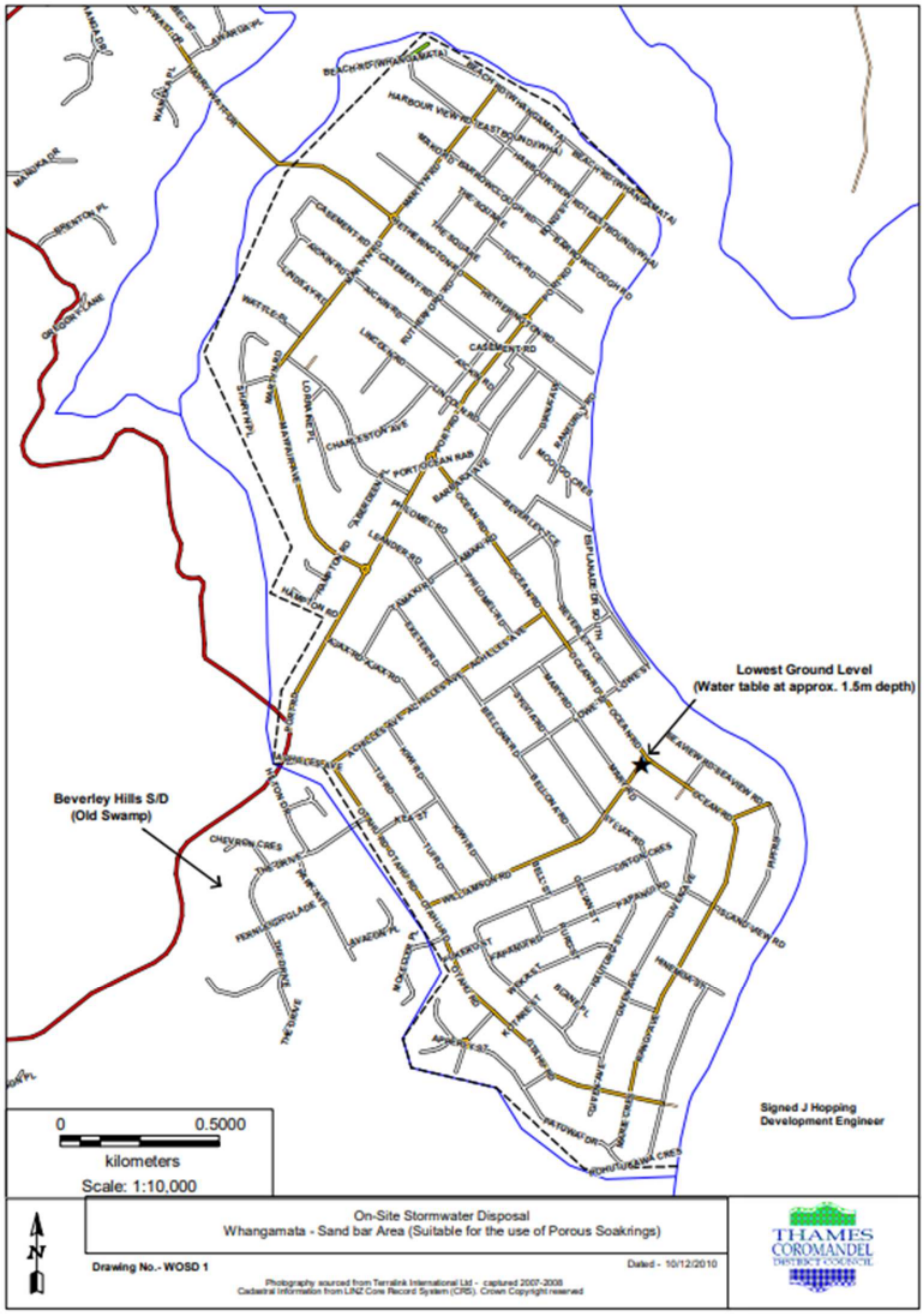
Topography in this area is flat and the soils are dominantly free-draining (sand). The following aerial photo is representative of the Whangamata South catchment. The red arrows indicate the network outlet locations that should receive most attention in the Monitoring Programme.



A-7.5 Significant Features

TCDC has a wastewater treatment and disposal system servicing the Whangamata Township. This does not discharge into the stormwater network and has its own discharge consent requirements.

The Whangamata sand bar area as defined in the TCDC Subdivision and Development Code of Practice 2013 Appendix I6C and is copied below.



This area is free draining sand suitable for on-site soakage. All other parts of Whangamata are of differing soakage rate from rapid to zero, therefore hydraulic neutrality (on site soakage and / or detention) are to be installed for all impervious areas at the time of building consent.

A-8 Thames Coast Urban Area (Consent 105668)

A8-1 General Description

Thames Coast (NZ Census 2018: population 1,704) is made up of a number of small coastal communities along the western coast of the Coromandel Peninsula, between Thames and Coromandel. For the purposes of this stormwater management plan, these communities are:

- Ngarimu Bay
- Te Puru
- Waiomu
- Ruamahunga
- Tapu
- Te Mata

All of these communities are small coastal settlements that are situated on the foreshore of the Firth of Thames at the base of the range of hills that stretch from Thames to Coromandel.

The adjacent coastline is influenced by tidal fluctuations which, at low tide, expose large areas of mud flats that support a diverse tidal marine ecology and, in some places, estuarine vegetation. These habitats provide feeding, roosting and nesting sites for many bird species including rare and threatened wading and coastal bird species.

The inner Firth of Thames is recognised in the Waikato Coastal Plan as an Area of Significant Conservation Value (ASCV). The area is highly valued and is also listed as a wetland of international importance under the Ramsar Convention. ASCV sites cover the southern Firth of Thames and the Miranda / Kaiaua coastlines, and from the Waihou River as far north as Tararu. Stormwater discharge from the Thames Coast settlements does not therefore discharge directly to the conservation area, but major contamination of stormwater could impact on the Firth of Thames ASCV area.

The coastal environment along the Thames Coast is highly valued by the local community and visitors for a wide range of contact and non-contact recreational activities, including swimming, kayaking, fishing, bird watching, and shellfish gathering.

A-8.2 Thames Coast Stormwater Network

A comprehensive stormwater collection system exists for the townships comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales

Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

A-8.3 Physical Description of the Receiving Environments on the Thames Coast

The receiving environments of the stormwater discharges within the Thames Coast urban areas can be generally described as:

- Firth of Thames: sandy silty sediments with vegetation in some areas such as mangrove communities.
- Streams: a mixture of mud, sand, boulder and pebble streambeds. Some of these are tidal and contain relatively high levels of deposited sediment.
- Sandy: silty beaches
- Land: Pastoral farmland and grassed drains.

Stormwater discharges into the coastal receiving environments on the Thames Coast are likely to be rapidly dispersed due to tidal flushing and sediment transport in the Firth of Thames. During high rainfall events (when stormwater flows increase), river flows and mixing by waves in the coastal environment are also increased, further enhancing dispersion and flushing. These effects are likely to reduce the likelihood of adverse effects in receiving environments. It is, however, possible that accumulation of contaminants could occur in sheltered receiving environments with fine sediments.

A-8.4 Thames Coast Stormwater Catchments

Settlements along this coastline have reticulated stormwater collection and disposal systems designed to cater for stormwater runoff from urban areas and to discharge this runoff into the Firth of Thames and into a number of streams along the coast.

The urban areas of Thames Coast include a number of relatively small settlements. These settlements and the associated receiving environments for stormwater discharge are listed below:

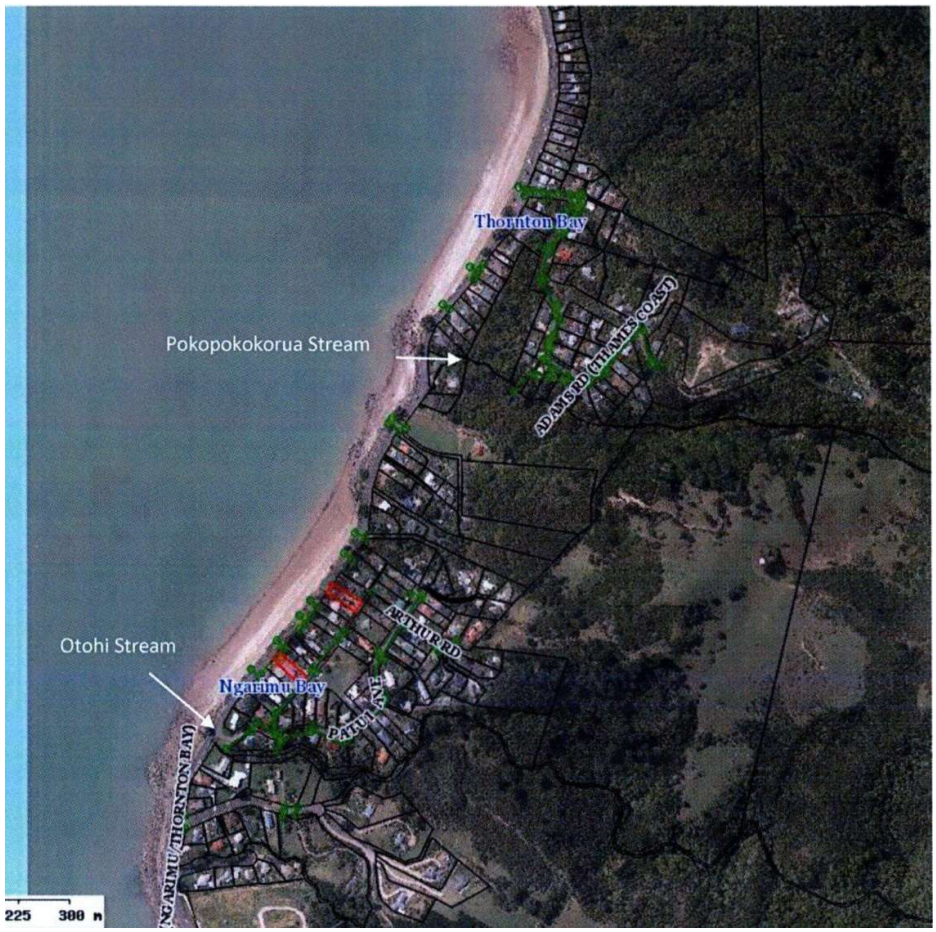
Community	Receiving Environment (number of discharge points)
Ngarimu Bay	Otohi Stream (2) Pokopokokorua Stream (1) Firth of Thames (9)
Te Puru	Te Puru Stream (6) Firth of Thames (9)
Waiomu	Waiomu Stream (5) Pohue Stream (1) Firth of Thames (7)
Ruamahunga	Otuturu Creek (3) Firth of Thames (1)
Tapu	Tapu River (1) Firth of Thames (3) Ground (1)
Te Mata	Te Mata River (8)

Ngarimu Bay

Ngarimu Bay is a small settlement 9 km north of Thames. The stormwater system servicing the Ngarimu Bay community is very simple, consisting of piped and open drain stormwater reticulation systems. Stormwater discharges are to the Otohi and Pokopokokorua streams that run through Ngarimu Bay that lead to the Firth of Thames. There are also discharges to the nine outlets scatted along the coast of the settlement directly to the Firth of Thames.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and there are no commercial activities or high risk facilities, there is a low risk of a non-routine contaminant discharge incident.

The following aerial photo and map is representative of the Ngarimu Bay catchment.




Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines

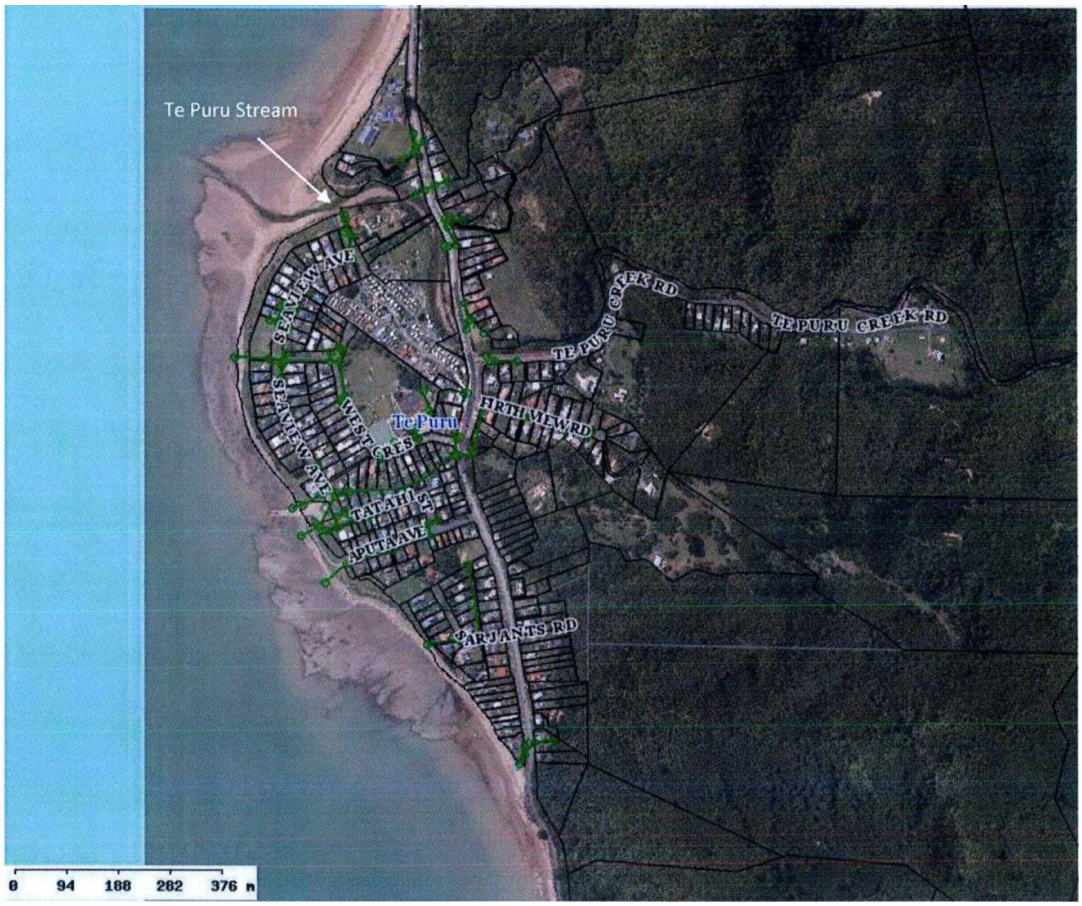
Te Puru

Te Puru is a small settlement 13 km north of Thames. The town is located on low lying flood deposits at the mouth of the Te Puru Stream.

The stormwater system servicing the Te Puru community is very simple, consisting of piped and open drain stormwater reticulation systems. Stormwater discharges are to small streams that run through Te Puru that lead to the Firth of Thames. There are also discharges directly to the Firth of Thames.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and does not contain any high risk facilities. Te Puru is considered to be low risk in terms of stormwater contamination.

The following aerial photo and map is representative of the Te Puru catchment.




Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines

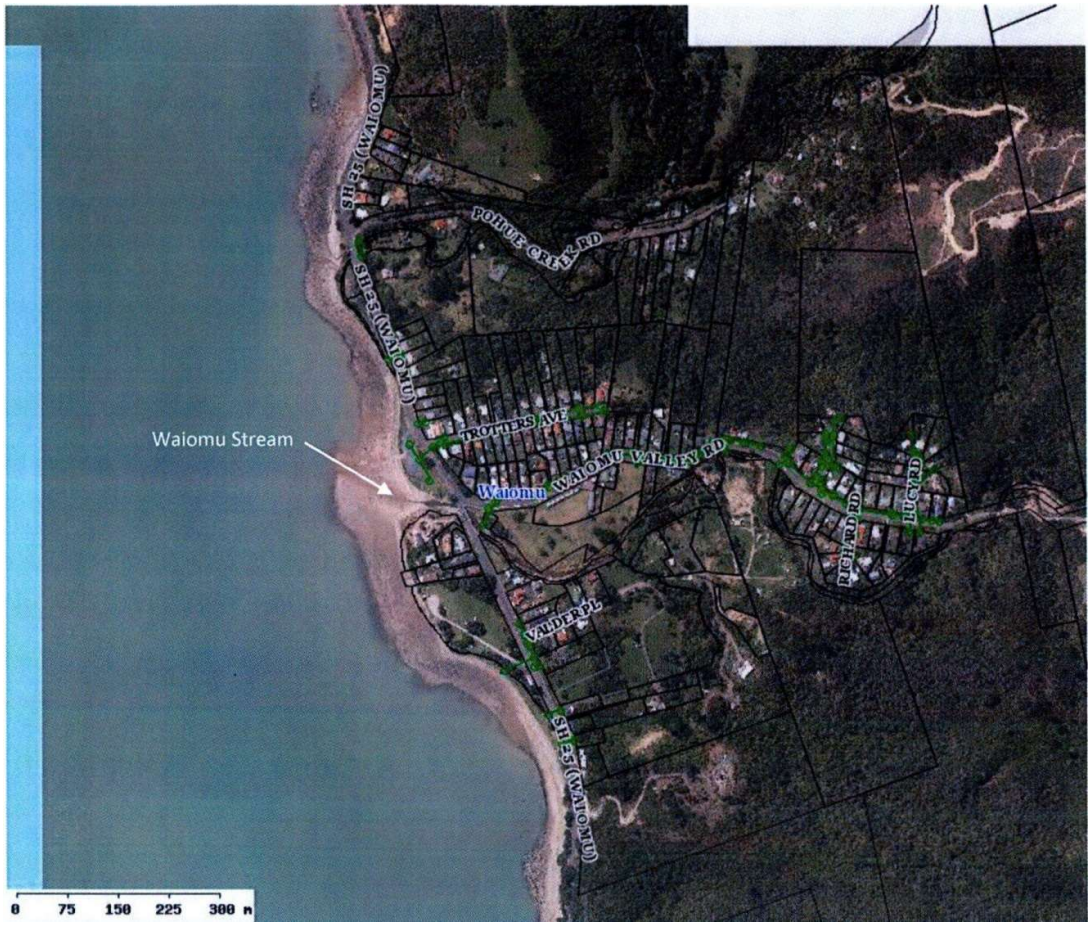
Waiomu

Waiomu is a very small settlement approximately 15 km north of Thames. The town is low density residential development located on low lying flood deposits at the mouth of the Waiomu Stream.

The stormwater system servicing the Waiomu community is very simple, consisting of piped and open drain stormwater reticulation systems. Stormwater discharges are to small streams that run through Waiomu and lead to the Firth of Thames. There are also seven outlets with discharges directly to the Firth of Thames. The following aerial photo is representative of the Waiomu catchment.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and does not contain any high-risk facilities. This catchment is considered to be low-risk in terms of stormwater contamination.

The following aerial photo and map is representative of the Waiomu catchment.




Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines

Ruamahunga

Ruamahunga is a very small, low density residential, settlement approximately 17 km north of Thames. The stormwater system servicing the Ruamahunga community is very simple, consisting of piped and open drain stormwater reticulation systems. Stormwater discharges are to small streams that run through Ruamahunga that lead to the Firth of Thames. There are also discharges directly to the Firth of Thames. The following aerial photo is representative of the Ruamahunga catchment.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and does not contain any high-risk facilities. This catchment is considered to be low-risk in terms of stormwater contamination.

The following aerial photo and map is representative of the Ruamahunga catchment.




Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines

Tapu

Tapu is a small, low density residential, settlement approximately 20 km north of Thames. The town is located on low lying flood deposits at the mouth of the Tapu Stream.

The stormwater system servicing the Tapu community is very simple, consisting of piped and open drain stormwater reticulation systems. Stormwater discharges are to small streams that run through Tapu that lead to the Firth of Thames. There are also discharges directly to the Firth of Thames. The following aerial photo is representative of the Tapu catchment.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and does not contain any high-risk facilities. This catchment is considered low-risk in terms of stormwater contamination.

The following aerial photo and map is representative of the Tapu catchment.



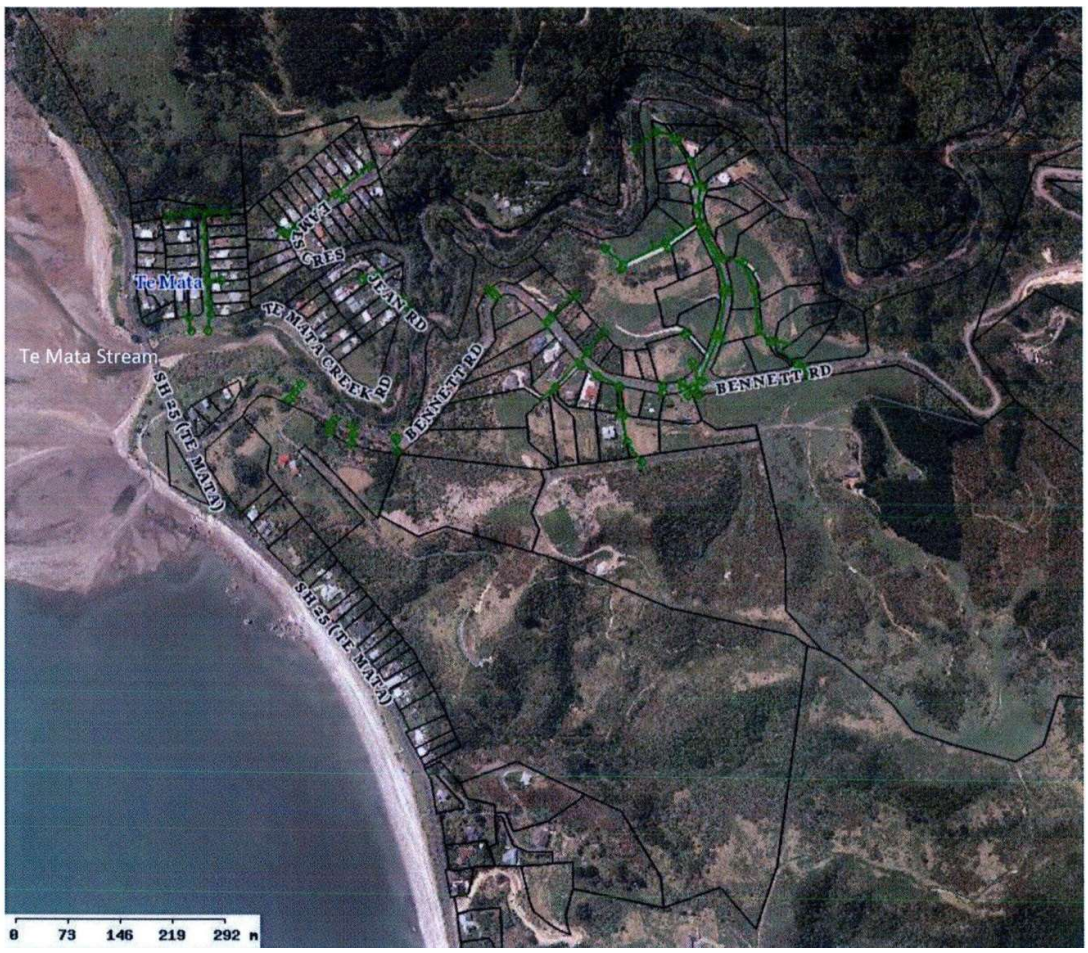

Legend
Stormwater Catchment
Stormwater Reticulation
Stormwater - Points
Stormwater - Catchpits
Stormwater - Lines

Te Mata

Te Mata is a small, low density residential, settlement approximately 22 km north of Thames. The stormwater system servicing the Te Mata community is very simple, consisting of piped and open drain stormwater reticulation systems. Stormwater discharges are to small streams that run through Te Mata and lead to the Firth of Thames. There are also discharges directly to the Firth of Thames. The following aerial photo is representative of the Te Mata catchment.

In terms of the Comprehensive Stormwater Discharge Consent, this catchment is not exposed to high concentrations of routine contaminants and does not contain any high-risk facilities. This catchment is considered to be low-risk in terms of stormwater contamination.

The following aerial photo and map is representative of the Te Mata catchment.





A-8.5 Significant Features

None of the communities in this area are serviced by Thames-Coromandel District Council in terms of wastewater treatment. All wastewater services are private and mainly in the form of septic tank systems. In some instances, these septic tanks do not treat the wastewater to a high standard and any discharges from them could contaminate stormwater reducing the water quality of the receiving waters.

APPENDIX B: C15/05 WATER SERVICES OPERATIONS AND MAINTENANCE CONTRACT STORMWATER PROCEDURES

VEOLIA

Stormwater operation and maintenance procedure overview.

Objective
To maintain the effective function of the Stormwater network to ensure systems operate to design capacity and achieve the levels of stormwater service required by the TCDC.

1.0 Scope of work
The maintenance programme applies to those stormwater services as described by contract 15/05 Schedule 13. Activity excludes road network SW catchpits and associated outfalls and open drains within the road corridor.

2.0 Maintenance activities
Programmed and reactive maintenance activities are required to achieve the objectives.The activities are;

Reactive maintenance includes

Response to RFS (includes the BD activities listed)
Locating services and connections.
Unblocking stormwater services, Manholes, pipes and open channels
Repairing SW manholes including manhole benching and covers
Repairing damaged SW pipelines (gravity and rising).
Repairs to SWPS
Clearing designated outfalls as required *eg Mania road, Tairua outfalls*
Clear stream outlets as required
CCTV inspection of mains and manholes.
Attendance at contaminant spills to stormwater services.

Programmed maintenance activities (are funded by the contract lump sum) include
Stormwater outfall inspections,
SW pump station inspection and servicing of pumps and associated control systems and equipment.
Subsurface drainage cleaning and outfall inspections at Matarangi.
Vegetation control in open drains *(limited to drains as specified by Schedule 13)*
Inspection and clearing inlet screens to SW services. *Inspections carried out when instructed by a NTC are charged to TCDC as Dayworks*
Inspection of SW manholes.
Kopu open drains maintenance (*removal of bank collapse debris etc are charged to TCDC at dayworks rates*) Inspection of floodgate performance at critical areas during seasonal high tides *eg areas of Brown, Albert and Queen Streets in Thames*

VEOLIA

2.1 Reactive maintenance activities

2.1.1 Response to Request For Service
TCDC sends via the Pathway system a Request For Service (RFS) for SW faults. This process requires faults identified by Veolia staff also to be reported in this manner so all work is included in KPI attainment determination. During out of hours response the TCDC answer service does not issue RFS with their after hours process contacting Veolia staff directly

The process for management of work Orders (WO) is detailed in the VAMS manual with all reactive work coded Break Down (BD) A brief outline of the requirements is provided:-

2.1.1.1 For normal work hours Veolia staff receive the request and dispatch it via VAMS to a Field Operative.

- When received the Operative updates the status of the WO as work progresses.
- At arrival the Operative selects attendance and records the site condition with a time stamped image and commences work, consistent with the selected job plan.
- When the service is restored the Operative selects mobile finished / awaiting reinstate and records a time stamped image of the work.
- Where the Operative cannot restore the service within the required time due to site conditions, a request for extension is to be requested from the TCDC field representative.
- The Operative escalates the issue to the On-call Supervisor when it occurs out of normal business hours.
- Where an approved Contractor or Supplier service is retained a Veolia PO is required
- Work orders requiring follow up reinstatement to be actioned promptly
- Supervisor to assign "sign off" status when WO is reviewed and work details confirmed.
- Pathways record is completed by the Veolia Dispatch function when the WO is set to Mobile finished or awaiting reinstatement. A report of WO entering these statuses is produced twice daily to support this function

2.1.1.2 Outside normal work hours

- TCDC after service contacts the designated on call Operative.
- Operative attends the site and records site condition and location with a time stamped image
- Work is undertaken according to selected job plan with details recorded to a field dairy
- When service is restored a time stamped image is recorded
- TCDC provides a RFS the next working day. The completion of the Pathways record follows the process identified for normal hours RFS
- The Operative completes the WO in Vams using details retained in the work diary (*this type of record is excluded from real time reporting assessment*)

- PO details to be provided to any supplier or approved contractor used on the response by the next working day
- Work orders requiring reinstatement actioned as appropriate
- Supervisor to assign "sign off" status when WO is reviewed and work details confirmed

2.1.2 Location of SW infrastructure and connections

- The Field Operative accesses the TCDC 3 waters GIS information to identify location of services
- Where GIS is not available/ incorrect and the location is not obvious, methods such as CCTV, potholing or sonar device can be applied to identify the location of services. Where the location of the service is at variance to the GIS the Operative provides a revised location plan.

2.1.3 Unblocking stormwater services, manholes, pipes and open channels.

- Operator attends the site and ascertains the likely repair option. Bockages or chokes are usually only apparent during rainfall events and can create flooding related hazards.
- Where the operator can safely access and work at the site, remedial activity can be attempted. This can be jetting, rodding or removal of debris from an intake or outlet structure and/or a manhole
- Where safe access is not possible remedial activity will be delayed until the site becomes safe. Refer to the request for service description for delays/ extension to work

2.1.4 Repairing SW manholes including manhole benching and covers

- WO management as outlined in the RFS section
- The most common fault reported is the failure of the haunching around the manhole cover and lid. Repairs are completed at a scheduled rate
- Repairs to manhole benching require a confined space entry permit and or elevated work notification. Refer to relevant Veolia procedures for this work. Work requires TCDC approval as it is completed at dayworks rates

2.1.5 Repairing damaged SW pipelines

- WO management as outlined in the RFS section
- Repairs to SW services require TCDC approval (RFS)

2.1.6 Repairs to SW pump stations

- WO management as outlined in the RFS section.
- Faults identified to Operative via a Scada alarm and/or RFS

2.1.7 Clearing designated outfalls as required

- WO management as outlined in the RFS section

- At specific locations the outlets to SW services require clearance as their function has been compromised by approved developments. Example is Manaia road, Tairua outfalls.

2.1.8 Clear stream outlets as required

- WO management as outlined in the RFS section
- Stream outlets are located in the Coastal Marine area and do not form part of the SW scope of work (schedule13)
- Wigmore stream clearance to be completed as requested by TCDC. WO records are required . The work is associated with the Hahei WWTP resource consent and work must comply with the process outlined by WRC.
- Mother Browns Stream at Buffalo Beach, Whitianga as requested.
- Other streams as instructed. Generally these are cleared by WRC eg Burke street Thames. Channels downstream of floodgates or outlet structures *eg Drains both sides of Danby field, Thames.*

Attendance at contaminant spills to stormwater services.

- WO management as outlined in the RFS section
- A guideline is provided to cover the actions required for this activity.

2.2 Programmed maintenance activities

Programmed maintenance activity is managed by the PM Technical Officer with the issue of Veolia WOs allocated with the PS code to the Area Supervisors. The Supervisors allocate the work to Field Operatives

2.2.1, Stormwater outfall inspections

- Monthly, inspect stormwater outfalls and record findings and or required actions on SW checklist form.
- Where action is required a WO and or PO to be sought from the Veolia Administration and or the Supervisor.
- Where the action requires TCDC approval request a RFS
- Inspection of floodgate performance at critical areas during seasonal high tides (*eg areas of Brown, Albert and Queen Streets in Thames)*

2.2.2, SW pump station inspection and servicing of pumps and associated control systems and equipment.

- Monthly inspect the SWPS sites and test run equipment to prove operation and record in site diary. Where a fault is identified a WO is required to action/ response
- Annually inspect/ service the pumps and associated control systems
- Record and advise modifications to the facilities that will improve asset life and or performance.

2.2.3, Vegetation control in open drains *(limited to drains as specified by Schedule 13)*

- The objective is to ensure the capacity and stability of the drain.

- Following the monthly inspection of outfalls, the decision to apply vegetation control can be made and a programme of work developed. A WO coded PS to be used to record the required activity and monitor progress. An RFS is not required for this work
- Control of vegetation in drains is with a glyphosate based chemical e.g. Roundup 360.

2.2.4 Inspection and clearing inlet screens to SW services.

- Critical outfall and inlet screens to be inspected and cleared as required as part of the monthly outfall inspections. Follow the WO process including.
- Vegetation control around surface structures at time of inspection
- As part of the WO record, advise any modifications that may improve asset life and or performance.

2.2.5 Inspection of SW manholes.

- SW manholes are inspected in response to reports of diminished service levels or during other planned or reactive work.
- Record and advise modifications to the facilities that may improve asset life and or performance

2.2.6 Kopu land drainage system

Maintenance of the open drains associated with system

The programme of work is attached and provides for

- Six monthly work includes chemical vegetation control limited to the lower 50 % of drain profile and inspection for bank collapses.
- Regrading of drains and debris removal from bank collapses is completed on issue of a TCDC PO.
- Mechanical vegetation control around structures above the bottom 50 % of the drain channel
- Work order record to include comments on any observed system constraints and options /methods to improve system performance.

2.2.7 Subsurface drainage cleaning and outfall inspections at Matarangi.

- This work as detailed in the O&M is to ensure the system continues to operate as designed.
- Monthly inspections of outfalls and removal of any observed restrictions to outflow
- At frequencies detailed in the O&M manual. water blast system to remove Iron and Manganese and other accumulations.
- Work order record to include comments on any observed system constraints and improvements that can be made to the system.

VEOLIA

3.0 Monitoring

Activities related to the Comprehensive Stormwater Discharge consent monitoring plan. This includes

- Annually a visual inspection of selected SW outlets during February and June to assess any changes to the site
- 4 yearly intervals from the same site the collection and analysis of sediment samples for a range of heavy metals and hydrocarbon based substances. These occurred 2014 and 18 and the next is due 2022
- Ecological study of the same sites in February (after rain if possible) by an approved contractor ie Tonkin and Taylor

4.0 Reporting

- RFS responses as described above
- Provision of GIS information where the GIS is not accurate or no record of the asset exists
- Work order comments to include detail of contamination issues observed during response to RFS or scheduled inspection activities. See guideline for reported contamination events.
- Significance items are included to the early warnings or operational section of the Veolia monthly 3 waters O&M report.
- Provision of information for the SW consent annual reports as outlined in the Comprehensive SW discharge consent plan. This is limited to the work order activity types completed/ reported during the July 1 to June 30 year and is to be provided to TCDC by August 30 each year. At 4-yearly intervals specified locations are to be sampled for contamination levels and an ecological assessment to be completed by Tonkin and Taylor
- The consent reporting requires contribution of multiple parties including Road maintenance, Parks and Reserves and 3 Water O&M contractors and TCDC management functions.

APPENDIX C: ADMINISTRATIVE PROCESS FOR INCORPORATING NEW MUNICIPAL STORMWATER DIVERSION AND DISCHARGE ACTIVITIES INTO THE CSDC'S

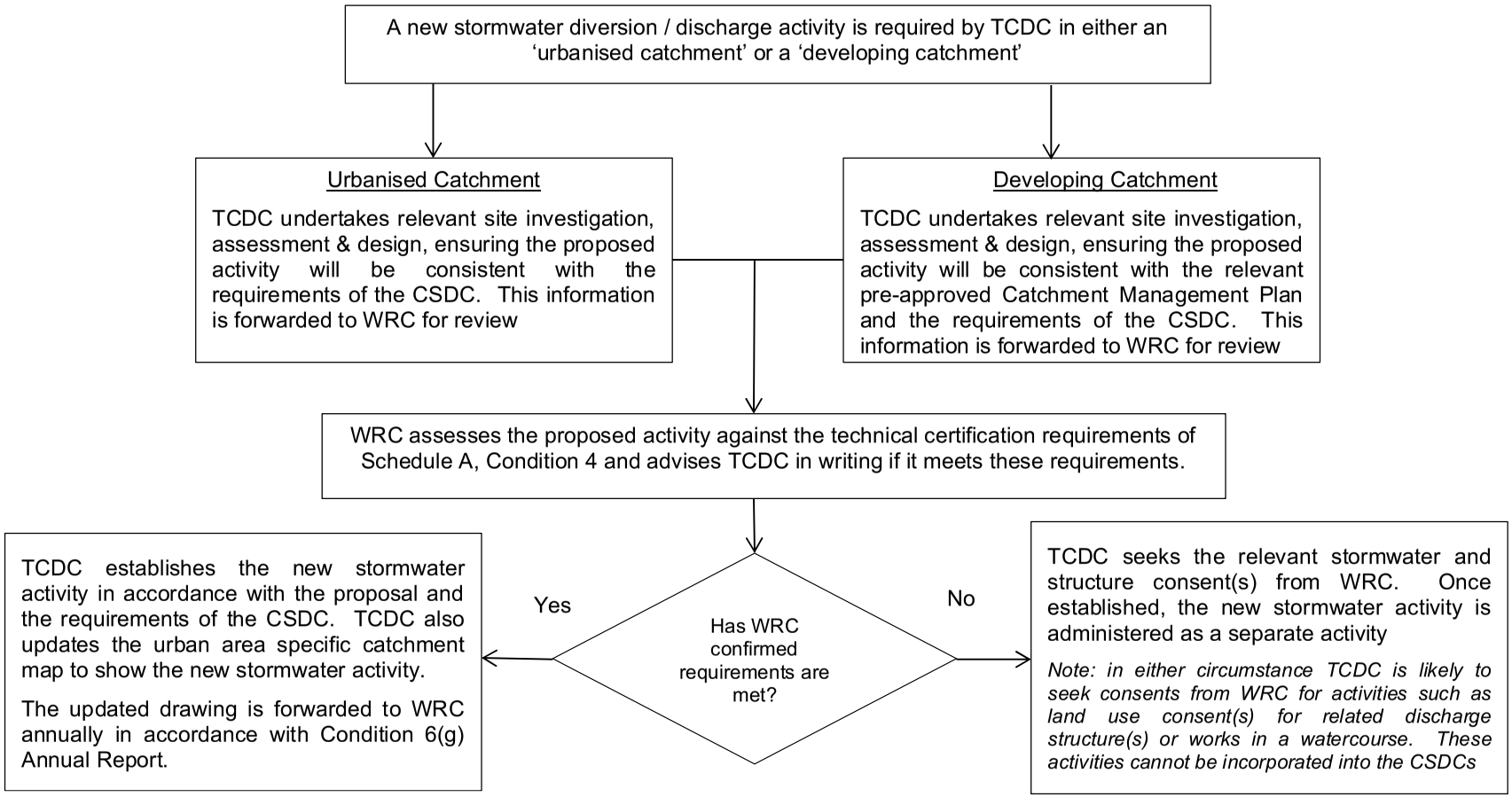
There are essentially two ways in which new municipal stormwater diversion and discharge activities come about. The first way is through TCDC directly establishing these activities, undertaking (or directly overseeing) all design and construction aspects of related stormwater infrastructure. The second way is through land developers who independently establish private stormwater networks and then seek to vest these networks with TCDC (generally on completion of all associated development). In both circumstances the relevant infrastructural information is recorded in TCDC asset management system, and the new infrastructure forms part of the municipal stormwater network.

The administrative process for incorporating new municipal stormwater diversion and discharge activities into the CSDCs, involves assessment against the technical certification requirements of Schedule A, Condition 4. This condition provides for new municipal stormwater activities in 'urbanised catchments' (Condition 4b) and 'developing catchments' (Condition 4c). These activities are also assessed for their consistency with the other conditions of the CSDCs. In particular, Schedule A, Condition 2 requires TCDC to not undertake any changes to the municipal stormwater network which would increase the scale or intensity of the actual and potential adverse effects of the authorise activities on the environment.

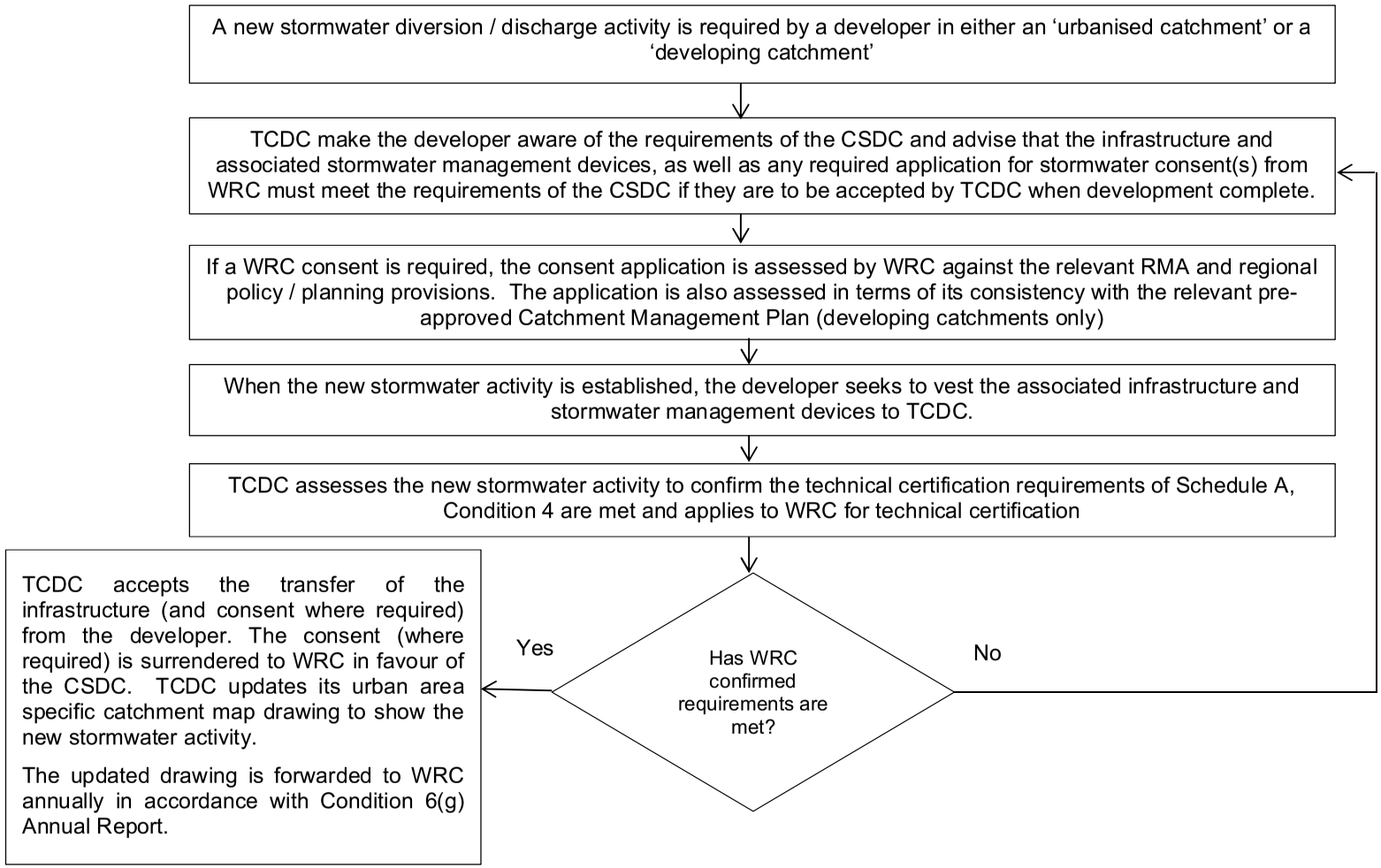
Therefore, for TCDC to incorporate new municipal stormwater diversion and discharge activities into the CSDC's, it will first need to undertake relevant site investigations and assessments to determine if the proposed new activities will in fact meet the technical certification requirements of Schedule A, Condition 4. If the proposed new activities will not meet these requirements, or if there is any doubt about this, then these activities will require separate resource consents in accordance with section 88 of the RMA (1991) and the rules of the Waikato Regional Plan and Regional Coastal Plan.

The following two diagrams show the respective administrative process for incorporating new municipal stormwater diversion and discharge activities into the CSDCs.

Administrative Process for new stormwater diversion and discharge activities established by TCDC



Administrative process for new stormwater diversion and discharge activities established by developers



APPENDIX D: STANDARD OPERATING PROCEDURES NON-ROUTINE CONTAMINANT DISCHARGE INCIDENT

Standard Operating Procedures

Non-routine contaminant discharge incident

In the event of a potentially significant discharge (spill) of contaminants carry out the following procedures:

- Call 111 - ask for Emergency Services - FIRE SERVICE
- Call Thames-Coromandel District Council 24HOURS (07) 8680200
- Call Waikato Regional Council - 24 hours 0800 800 401
- Clearly identify location and/or source of the discharge (to the best extent possible) to response staff.
- Clearly identify nature of the discharge (to the best extent possible) to response staff.
- Clearly identify whether there is any stormwater infrastructure in the general location of the oil spill - using TCDC online GIS system (http://www.tcdc.govt.nz/Our-Services/Maps-Geographical-data-GIS/) or in the Maps provided in Appendix 1.

Carry out the necessary Spill Response and Clean-up Procedures generally as follows:

- Immediately protect yourself from harm – use protective equipment if available.
- Identify the source of the spill.
- Obtain Spill Response Kit from Service Stations, Fire Service Stations and all TCDC Refuse Transfer Stations.

- **STOP THE SPILL CONTINUING**

- **CONTAIN THE SPILL – STOP THE SPILL FROM SPREADING**

- **DO NOT FLUSH OR WASH THE SPILL INTO THE NEAREST STORMWATER CATCHPIT UNLESS THERE IS A RISK TO PUBLIC HEALTH AND SAFETY**

- Do not add anything to the spill that may cause harm or increase the risk from, or amount of, contamination.
- Locate the nearest stormwater drains/catchpits and protect from the spill.
- Cover catchpit grates and plug drainage pipes if possible. Create dams around grates, open drains and any areas of unsealed ground.
- Remove all residues of the spill as carefully as possible, keeping stormwater grates and at risk areas protected at all times.
- Carefully remove the hazardous material and clean-up material (e.g. absorbents) and store in an appropriate container.
- Inform any people that may come in contact with the area that there has been a spill.
- Take note of clean up materials used and replace.
- Follow provisions of Waikato Regional Council Guidelines: Oil Spill Contingency Guidelines Environment Waikato Technical Report 2006/24 May 2006, where applicable.

APPENDIX E: STORMWATER MANAGEMENT DEVICES REGISTER

In addition to a network of swales and open drains, the following stormwater management devices are located within the TCDC network:

Catchment: Thames Urban Area (Consent 122521)

Device	Location
Pump Station	Fergusson Drive
Pump Station	Richmond Street

Catchment: Pauanui Urban Area (Consent 105661)

Device	Location
Detention Pond	Holland Close
Hynds Up-Flo Filter	1 Ian Hopper Way
Soakpit	Mount Avenue
Soakpit (2)	Low Park Lane
Soakpit	McCall Avenue
Soakpit (5)	Sheppard Avenue
Soakpit	Parsons Dell

Catchment: Coromandel Urban Area (Consent 105663)

Device	Location
Gravel Filled Stormwater Attenuation Basin	2 Victoria Street
Gravel Filled Stormwater Attenuation Basin	71 - 93 Golden Shore Place
Hynds First Defense High Capacity	Wharf Road
Detention Pond	Long Bay Road

Catchment: Tairua Urban Area (Consent 105664)

Device	Location
Detention Pond	Rewa Rewa Valley
Detention Pond	Mason Rise
Hynds First Defense High Capacity	Tairua Marina

Catchment: Whitianga Urban Area (Consent 105665)

Device	Location
Wetland	Cook Drive
Soakage Cells	Austin Drive
Pump Station	Jackman Avenue
Pump Station	Cook Drive
Rain Garden (5)	Waitotara Way
Rain Garden (7)	Arawa Lane
Rain Garden (3)	Pelican Place
Rain Garden	Kelly Place
Rain Garden (22)	Kupe Drive (Northbound)
Rain Garden	Little George Place
Rain Garden (2)	Sara Way
Rain Garden (7)	Aquila Drive
Rain Garden (3)	Vanita Drive
Rain Garden (3)	Mermaid Place
Rain Garden (14)	Debenham Drive
Rain Garden	Tango Way
Rain Garden	Bravo Place
Rain Garden	Oscar Place
Rain Garden (2)	Jackman Avenue
Rain Garden (4)	Park Lane
Rain Garden (2)	Rena Place
Rain Garden	Meadow Drive
Rain Garden (4)	Lady Jocelyn Place
Rain Garden (17)	Leeward Drive
Rain Garden	Topping Place
Rain Garden	Kudu Drive
Rain Garden (2)	Springbok Avenue
Rain Garden (2)	Jacaranda Drive
Rain Garden (2)	Onerere Drive
Rain Garden (7)	Awatea Drive
Rain Garden	Puawai Street
Rain Garden	Raumati Lane
Detention Pond	Discovery Drive
Wetland (Natural)	Discovery Drive

Catchment: Onemana Urban Area (Consent 105666)

Device	Location
Detention Pond	Tuna Place

Catchment: Whangamata Urban Area (Consent 105667)

Device	Location
Detention Pond	Estuary View
Detention Pond	Rangituia Street
Detention Pond	Williamson Park
Detention Pond	Te Tutu Street
Aquacell Soakage Pit	Otahu Road
Soakage Cells	Esplanade Drive
Soakage Cells	Port Road
Soakage Cells	Ranfurly Road
Atlantis Drainage Cell	Tuck Road
Soakage Cells	Barbara Avenue
Soakage Cells	Service Lane behind TCDC (off Port Road)
Pump Station	Tangaroa Road
Pump Station	Otahu Road
Rain Garden	Widdison Place
Rain Garden (5)	Rangituia Street
Rain Garden (6)	Te Tutu Street
Soakpit (2)	Graham Street

Catchment: Thames Coast Urban Area (Consent 105668)

There are no additional stormwater management devices in the Thames Coast Urban Area catchment.

Operations and Maintenance of Stormwater Management Devices

Device	Contract	O&M Procedures
Aquacell Soakage Pit	3Waters	ECM Doc Set # 6599795
Atlantis Drainage Cell	3Waters	ECM Doc Set # 6599797
Detention Pond	3Waters	ECM Doc Set # 6040209
Gravel Filled Stormwater Attenuation Basin	3Waters	ECM Doc Set # 6040209
Hynds First Defense High Capacity	3Waters	ECM Doc Set # 6599117
Hynds Up-Flo Filter	3Waters	ECM Doc Set # 6599730
Pump Station	3Waters	ECM Doc Set # 6599256
Rain Garden	Roading	ECM Doc Set # 6112771
Soakage Cells	3Waters	ECM Doc Set # 6040209
Soakpit	3Waters	ECM Doc Set # 6040209
Wetland	3Waters	ECM Doc Set # 6599755

From: Rob Hart
Sent: Thursday, 30 September 2021 2:49 PM
To: Mike Chapman; 'Sakti Gounder'
CC: Brian Richmond
Subject: RE: TCDC SWMP draft report
Attachments: R001 SNMP_TCDC_DRAFT (TMWv2) - RobH comments 30-09-21.docx

CAUTION: This email originated from outside of Waikato Regional Council. Do not follow guidance, click links, or open attachments unless you recognise the sender and know the content is safe.

Hi Mike and Sakti

Thank you for the opportunity to comment on the current draft SNMP template. I have made some track change comments in the draft document, along with the comments below.

I also note the similarities with the HCC SNMP which is entirely appropriate. Obviously there'll be some differences between the TCDC SNMP and that of HCC's, but more on reflection of the multiple townships/stormwater networks/receiving environments across the district and the scale of the stormwater network operations relating to these (Sections 2, 3 and 4).

Section 1 – Introduction: It would be useful to also include the HCC SNMP sections for 'document structure', 'new growth areas' (in context to the CSDC authorisation scope and technical certification requirements/Condition 4; as well as projected growth), and 'key stakeholders'. These should include local Iwi groups among other stakeholders, however, there's no need at this stage to have dedicated sections to Iwi as per the HCC SNMP. I would also ID TCDC's main service providers who effectively manage the operation of the stormwater networks. These are clearly key stakeholders who can affect the necessary management improvements via existing and varied contractual arangements.

Section 1 could also include the relevant background info as identified in the context section, however it doesn't seem like a good fit here. The context section should be concise and on point as per the HCC SNMP. I note the HCC plan covers the majority of background info in dedicated sections titled 'legislated planning mechanisms', internal planning documents' etcetera. The previous TCDC SMP versions also have that information, it's just a case of where it best sits in the current draft plan.

Otherwise, the draft plan is shaping up well and almost ready for the next phase of populating it with detailed content.

From here it's probably best to submit the plan to TCDC as an outline draft in order that they meet their deadline requirement. Then, carry on with it as you are.

Thanks,
Rob

Rob Hart
Director

M 027 412 5813
E rob@hartland.co.nz

Hartland Environmental Ltd
P O Box 290
Whitianga
3542

From: Mike Chapman <mike@temirowater.co.nz>
Sent: Wednesday, 29 September 2021 6:10 PM
To: Rob Hart <rob@hartland.co.nz>
Cc: Sakti Gounder <sakti@temirowater.co.nz>
Subject: FW: TCDC SWMP draft report

Hi Rob

Please find attached the latest draft SNMP template with each subheadings cross referenced to the relevant CSDC condition/sub condition that it needs to address.

Please add comments (either 'add comment' in track changes or simply colour code your text)

Regards

Mike Chapman
Director
Water Resources Engineer
m. (+64) 21 477 801
e. mike@temirowater.co.nz
Te Miro Water Consultants


TE
MIRO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WATER

STORMWATER NETWORK MANAGEMENT PLAN

DRAFT OUTLINE TEMPLATE FOR REVIEW BY TCDC AND WRC

Version Control

Version	Date	Author	Reviewer	Change Description

This report has been prepared for Thames Coromandel District Council for the project described to us and its extent is limited to the scope of work agreed between the client and Te Miro Water Limited and the data available for the model build. No responsibility is accepted by Te Miro Water Limited, or its directors, servants, agents, staff, employees, or subcontractors related to the inherent flood model limitations, or the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purpose.

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1.0 INTRODUCTION

1.1 CONTEXT

SECTION TO ADDRESS:

- Condition 30, a, b, e, g,
- Condition 23, a, b, f

Background to this report ref 2020 draft by Karen and earlier KTB report – set the scene across all urban catchments – purpose of the SMP with ref to condition 30.

The SMP will be revied again in 2024.

1.2 COMPREHENSIVE STORMWATER DISCHARGE CONSENT

Summarise history, annual reporting summarises consent and compliance history from the 2019-2020 compliance report – can introduce here some of the key outcomes from discussion with WRC ie. This is a long-term journey and looking for simple easy wins or low hanging fruit over the next 3 years.

The goal is to use this SMP to set TCDC in the right direction to work towards making some tangible improvements to the way it manages stormwater from its existing urban areas. The SMP will outline a strong focus on O&M improvements along with best practice option implementation in high-risk catchments (informed by existing land use/practices).

1.3 STORMWATER NETWORK MANAGEMENT PRINCIPLES

Take from other sources at TCDC ie. LoS, O+M, asset management plan – safe and effective network meeting LoS and environment protection etc.

(Omaru) In the absence of being able to identify point and diffuse sources of contamination a more generic approach to water quality management is proposed. This approach targets those areas where high contaminant generating activities are potentially occurring, while also targeting areas where growth and redevelopment provide opportunities to incorporate water quality treatment devices.

1.4 PURPOSE OF THE STORMWATER NETWORK MANAGEMENT PLAN

Purpose of the plan - The Stormwater Network Management Plan shall record the way in which the stormwater network is operated, and shall include best practicable stormwater measures to avoid, remedy or mitigate adverse effects on the environment – Condition 30

The bulk content of the SNMP reflects the differences in townships and receiving environments across the peninsula. The SNMP contains generic content that applies to all townships and receiving environments, along with township specific content. For example, the larger townships (Thames, Tairua, Whangamata and Whitianga) have multiple land uses and HRF sites compared to smaller townships which are primarily residential.

In terms of risk management, stormwater improvements and O&M etc, the focus is on the larger townships new methods that can be considered for this report include for example special O&M provisions that come into effect at busy holiday times when there's more people around.

***BPO 'easy win' solutions such as** gross litter trips in high people traffic areas could significantly reduce gross litter volume in stormwater systems and the coastal environment.*

1.5 LITERATURE REVIEW

<4SIGHT REPORTING TO GO IN HERE>

1.6 PROJECTED GROWTH (?)

From council planning and growth team – for stormwater this is directly related to stresses from growth related to network capacity and increases imperviousness (MPD layer/assumptions) such as brownfield infill, land use change (zone changes i.e., residential to commercial) high er density etc. Not related to MPD for new growth (plan change/structure planning) areas which sit under CMPs Condition 25.

2.0 DESCRIPTION OF TOWNSHIP AND RECEIVING ENVIRONMENT

<SHORT DESCRIPTION OUTLINING THAT THIS SECTION DISCUSSES THE 8 TOWNSHIPS FROM THE CSDC> REF SECTIONS FROM DRAFT 2020 SMP

SECTION TO ADDRESS:

- Condition 30, a, c, d,

2.1 COROMANDEL

2.1.1 LAND USE

<SHORT DESCRIPTION FOR EXISTING LAND USE AND FUTURE LAND USE ZONES>

2.1.2 RECEIVING ENVIRONMENT

2.1.3 NETWORK EXTENT

2.1.4 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.1.5 LAND USE

<SHORT DESCRIPTION FOR EXISTING LAND USE AND FUTURE LAND USE ZONES>

2.1.6 RECEIVING ENVIRONMENT

2.1.7 NETWORK EXTENT

2.1.8 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.2 WHANGAMATA

2.2.1 LAND USE

<SHORT DESCRIPTION FOR EXISTING LAND USE AND FUTURE LAND USE ZONES>

2.2.2 RECEIVING ENVIRONMENT

2.2.3 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.2.4 NETWORK EXTENT

2.2.5 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.3 THAMES (URBAN AREA)

2.3.1 LAND USE

Example wording below from 2020 SMP – needs some rewording. Likewise take text from 2020 SMP for all other areas and re-word as necessary.

Thames Township (NZ Census 2018: population 7,881) is the oldest township within the Coromandel Peninsula (founded 1867). It is situated at the south-western end of the Peninsula in the southern Firth of Thames. The township is adjacent to the eastern side of the mouth of the Waihou River and is built around the mouth of Kauaeranga River.

Thames can be generally divided into two topographical areas. The first is a steep area of mostly regenerating bush / scrub and scattered residential development to the east of the township. The other area, the western side of the township, is generally flat to medium contour on the edge of the Firth of Thames. This more gently sloping contour contains most of the urban development within the town, which contains predominantly low to medium density residential land use activities.

The Thames urban area is made up of many small catchments but for the purposes of stormwater management can be divided into six general areas:

- Totara West: south of Thames town centre, on the western side of SH25.
- Totara East: south of Thames town centre, on the eastern side of SH25.
- Thames South: residential and industrial land use adjacent to the Kauaeranga River.
- Thames Central: main shopping centre with a mix of residential and commercial land use.
- Thames North: residential and some industrial land use.
- Tararu: residential land use

2.3.2 RECEIVING ENVIRONMENT

In terms of stormwater, the Thames urban area is made up of a series of relatively small parallel stormwater catchments flowing east to west, eventually through outlets into stream, rivers and the Coastal Marine Area of the Firth of Thames.

Most of the Thames Township is characterised by clay soils and a high-water table. Soakage is therefore not usually a practical option for stormwater disposal.

The inner Firth of Thames is recognised in the Waikato Regional Coastal Plan as an Area of Significant Conservation Value (ASCV). ASCV sites cover the southern Firth of Thames and the Miranda / Kaiaua coastlines further west, and from the Waihou River as far north as Tararu.

The Regional Coastal Plan states that important conservation values include the cultural significance of the area to Hauraki iwi, nationally significant mangrove and mudflat communities, shellfish beds and habitat for threatened birds. The area is also listed as a wetland of international importance under the RAMSAR Convention on Wetlands of International Importance. The coastal area in Thames is highly valued by the local community and visitors for a wide range of contact and non-contact recreational activities, including swimming, kayaking, fishing, bird watching and shellfish gathering.

The receiving environments of the stormwater discharges within the Thames urban area can be generally described as:

- Kauaeranga River
- Various streams: A mixture of boulder and pebble stream beds. Some of these are tidal.
- Firth of Thames: Sandy and muddy sediments with vegetation in some areas (dominated by mangroves) and diverse marine ecology in some areas.
- Pastoral farmland and grassed drains.

Any discharges to the coastal environment are likely to be subject to relatively rapid dispersion and flushing, due to extensive flushing from tidal action, and inflow from the Waihou and Kauaeranga Rivers. This flushing effect is increased during storm events (i.e. at the same time as stormwater runoff is at its greatest).

Flushing and sediment dispersion also aided by wave action in coastal receiving environments. These factors are likely to naturally mitigate any visible environmental effects of discharge quite quickly. While most contaminant loadings within the stormwater are likely to be mobilised and quickly dispersed by these natural flushing effects, some accumulation of contaminants is possible in the receiving environments where fine silty sediments are present.

2.3.3 NETWORK EXTENT

Thames has an aging comprehensive stormwater collection and disposal system for the township, which comprises the following stormwater elements:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)

- Open drains and swales
- Stormwater pump stations (Fergusson Drive and Richmond Street)

The Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

An abandoned mine structure ("The Saxon mine shaft") introduces a constant flow into the stormwater reticulation at the corner of Albert and Pollen Street. This discharge is approximately 17 l/s and it is estimated that this discharge has been occurring for at least 40 years. This flow could be significant in terms of the total annual volume but is not significant in respect of the peak flow rate predicted during design storm events (Thames-Coromandel District Council – Assessment of Environmental Effects 2001). Tararu Stream is occasionally discoloured due to release of iron from old mine shafts in the catchment.

2.3.4 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.4 THAMES COAST

From 2018 report – re-word as necessary in next draft

Thames Coast (NZ Census 2018: population 1,704) is made up of several small coastal communities along the western coast of the Coromandel Peninsula, between Thames and Coromandel. For the purposes of this stormwater management plan, these communities are:

- Ngarimu Bay
- Te Puru
- Waiomu
- Ruamahunga
- Tapu
- Te Mata

All these communities are small coastal settlements that are situated on the foreshore of the Firth of Thames at the base of the range of hills that stretch from Thames to Coromandel.

2.4.1 LAND USE

<SHORT DESCRIPTION FOR EXISTING LAND USE AND FUTURE LAND USE ZONES>

2.4.2 RECEIVING ENVIRONMENT

The inner Firth of Thames is recognised in the Waikato Coastal Plan as an Area of Significant Conservation Value (ASCV). The area is highly valued and is also listed as a wetland of international importance under the Ramsar Convention. ASCV sites cover the southern Firth of Thames and the Miranda / Kaiaua coastlines, and from the Waihou River as far north as Tararu. Stormwater discharge from the Thames Coast settlements does not therefore discharge directly to the conservation area, but major contamination of stormwater could impact on the Firth of Thames ASCV area. The coastal environment along the Thames Coast is highly valued by the local community and visitors for a wide range of contact and non-contact recreational activities, including swimming, kayaking, fishing, bird watching, and shellfish gathering.

2.4.3 NETWORK EXTENT

A comprehensive stormwater collection system exists for the townships comprising the following stormwater management devices:

- Catchpits
- Manhole inspection chambers
- Stormwater pipes (reticulation)
- Open drains and swales

Thames-Coromandel District Council is responsible for the operation and maintenance of this stormwater collection and disposal system. It is typically managed through a utilities Operations and Maintenance Agreement that is contracted to suitable third parties (contractor).

2.4.4 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.5 TAIRUA

2.5.1 LAND USE

<SHORT DESCRIPTION FOR EXISTING LAND USE AND FUTURE LAND USE ZONES>

2.5.2 RECEIVING ENVIRONMENT

2.5.3 NETWORK EXTENT

2.5.4 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.6 PAUANUI

2.6.1 LAND USE

2.6.2 RECEIVING ENVIRONMENT

2.6.3 NETWORK EXTENT

2.6.4 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

2.7 ONEMANA

2.7.1 LAND USE

2.7.2 RECEIVING ENVIRONMENT

2.7.3 NETWORK EXTENT

2.7.4 STORMWATER ASSETS

<SHORT DESCRIPTION OR TABLE OUTLINING THE STORMWATER MANAGEMENT ASSETS WITHIN THE TOWNSHIP BOUNDARIES AND ITS PURPOSE>

3.0 DISCHARGES TO THE STORMWATER NETWORK

<BLURB DESCRIBING THAT THE NETWORK RECEIVES DISCHARGES FROM DIFFERENT LAND USES>

This section essentially describes the potential impacts of discharges from different land use types within the district.

SECTION TO ADDRESS:

- Condition 30, f, k,
- Condition 28 (since we are advising BPO in this section)

3.1 TRANSPORTATION

DESCRIPTION	Roads, cycleways
EFFECTS	
CONSENT REQUIREMENT	
CONTROLS AND QUALITY IMPROVEMENTS	
MONITORING	
PERFORMANCE INDICATORS	
ENFORCEMENT OPTIONS	
REPORTING	
RESPONSIBILITY	

3.2 RESIDENTIAL

DESCRIPTION
EFFECTS
CONSENT REQUIREMENT
CONTROLS AND QUALITY IMPROVEMENTS
MONITORING
PERFORMANCE INDICATORS
ENFORCEMENT OPTIONS
REPORTING
RESPONSIBILITY

3.3 RESERVES

DESCRIPTION
EFFECTS
CONSENT REQUIREMENT
CONTROLS AND QUALITY IMPROVEMENTS
MONITORING
PERFORMANCE INDICATORS
ENFORCEMENT OPTIONS
REPORTING
RESPONSIBILITY

3.4 COMMERCIAL AND INDUSTRIAL

DESCRIPTION
EFFECTS
CONSENT REQUIREMENT
CONTROLS AND QUALITY IMPROVEMENTS
MONITORING
PERFORMANCE INDICATORS
ENFORCEMENT OPTIONS
REPORTING
RESPONSIBILITY

3.5 CONSTRUCTION

DESCRIPTION
EFFECTS
CONSENT REQUIREMENT
CONTROLS AND QUALITY IMPROVEMENTS
MONITORING
PERFORMANCE INDICATORS
ENFORCEMENT OPTIONS
REPORTING
RESPONSIBILITY

3.6 NON-ROUTINE SPILLS

SECTION TO ADDRESS:

- Condition 30, l

DESCRIPTION
EFFECTS
CONSENT REQUIREMENT
CONTROLS AND QUALITY IMPROVEMENTS
MONITORING
PERFORMANCE INDICATORS
ENFORCEMENT OPTIONS
REPORTING
RESPONSIBILITY

4.0 MANAGING THE EXISTING STORMWATER NETWORK

Section 3 describes the impacts, and this section is essentially about how TCDC is managing impacts in accordance with Condition 30

Sub-conditions e (stakeholders), f (O+M procedures), g (other asset mgt activities), h (initiatives and implementation to avoid adverse effects), I, l, m, n

SECTION TO ADDRESS:

- Condition 30, f, n, o, p,
- Condition 23, c, d, e

4.1 OPEN WATERCOURSE MANAGEMENT

This section is where we could also discuss flood risk

SECTION TO ADDRESS:

- Condition 30, h (and sub conditions), I, j

DESCRIPTION	
EFFECTS	
CONSENT REQUIREMENT	
CONTROLS AND QUALITY IMPROVEMENTS	Addresses: 1. Condition 23 2. Condition 30 clause h) i) ii) iii) 3. Condition 30 clause I – SW MGMT structures that require practicable measure to mitigate the effect that structures have on fish passage in accordance with condition 8. Specific measures/programme to implement these measures

	4. Condition 30 clause j – stream works guidelines 5. Condition 30 clause m - stormwater quality improvement programme 6. Audit report
STANDARD OPERATING PROCEDURES (CONTROLS)	Addresses 1. Condition 22 2. Condition 30 clause q and r and 3. Audit report. 4. Ref the actual SOP in the consent, through the annual report update asset register with new activities as they come online
TOWNSHIPS IDENTIFIED	
MONITORING	
PERFORMANCE MEASURES	
REPORTING	
RESPONSIBILITY	

4.2 STORMWATER PIPES AND CULVERTS

DESCRIPTION	
EFFECTS	
CONSENT REQUIREMENT	
CONTROLS AND QUALITY IMPROVEMENTS	Addresses: 1. Condition 23 clause c – remove illicit connections

	2. Condition 23 clause d – catchpit upgrade programme (existing assets) 3. Condition 23 clause e – network upgrade programme to retrofit BPOs in high risk catchments 4. Condition 30 clause m – stormwater quality improvement programme 5. Condition 30 clause o – management initiatives for LIUD measures 6. Audit report
STANDARD OPERATING PROCEDURES (CONTROLS)	Addresses 1. Condition 22 2. Condition 30 clause q and r and 3. Audit report.
MONITORING	
PERFORMANCE INDICATORS	
REPORTING	
RESPONSIBILITY	

4.3 STORMWATER MANAGEMENT DEVICES

This seciton should be guided by codes of practice and catchment management planning around hydraulic neutrality.

DESCRIPTION	
EFFECTS	
CONSENT REQUIREMENT	Addresses:

	1. Condition 4 (excl 4c) – hydraulic neutrality recommended in urbanized catchments may not be suitable and BPO measures to be in accordance with the CMP. Ties in with the RITS updates? 2. Condition 29 – new devices added to asset register in the stormwater management plan (*Asset register to be added to the SMP appendices)*
CONTROLS AND QUALITY IMPROVEMENTS	1. Condition 23 clause d – catchpit upgrade programme 2. Condition 23 clause e – network upgrade programme to retrofit BPOs in high risk catchments 3. Condition 30 clause o – management initiatives for LIUD measures 4. Condition 30 clause o – management initiatives for LIUD measures 5.
STANDARD OPERATING PROCEDURES (CONTROLS)	Addresses 1. Condition 22 2. Condition 30 clause q and r and 3. Audit report.
MONITORING	
PERFORMANCE MEASURES	
REPORTING	
RESPONSIBILITY	

4.4 NEW STORMWATER NETWORK ASSETS

SECTION TO ADDRESS:

- Condition 4 (new diversion or discharge activities)
- Condition 22 (new or replacement connections)
- Condition 29

DESCRIPTION	
EFFECTS	
CONSENT REQUIREMENT	Addresses: 3. Condition 4 (excl 4c) 4. Condition 22 – new or replacement connections to avoid routine contaminant discharge to the SW network
CONTROLS AND QUALITY IMPROVEMENTS	Addresses: 1. Condition 23 - SQIP
STANDARD OPERATING PROCEDURES (CONTROLS)	Addresses 1. Condition 3 - 2. Condition 22 – new/replacement connections to avoid or minimize routine contaminant discharge 3. Condition 29 – new stormwater devices to be included in the asset register (to be included in Appendices) 4. Condition 30 clause q and r and 5. Audit report.

MONITORING
ENFORCEMENT OPTIONS
REPORTING
RESPONSIBILITY

4.5 LIFE CYCLE COSTS

5.0 MONITORING AND REPORTING

There will be some synergies between the SNMP and the Monitoring Programme in that any emerging data trends can feed into specific management responses etc. However, this will take a few years to accumulate and is a long-term goal. Noting the SNMP will be up for review again in 2024, and the SNMP can likely be 'tweaked' to respond to the data collected.

Aligning the documents, and interrelationships - Condition 4; condition 23 clause b),

4sight review: devices, flooding, RE, subdivision, the current plan focuses on RE but revised plan (improve and bring up to current BPO) then needs to cover off more of condition 4 a-l, but also note the preamble ref the purpose and how to use data to enable compliance and feedback loops into SWNMP to address long term trends and changes from a procedural point of view introduce for example adaptive approaches and implement 'fixes' and BPOs

New locations? Maybe u/s of the outlets within smaller streams, have to think carefully before changing and building a new dataset.

5.1 STORMWATER EFFECTS MORNITORING REVIEW

5.2 MONITORING PLAN

5.3 MANAGEMENT MONITORING

5.4 RESPONSES TO MONITORING RESULTS/TRENDS

5.5 ANNUAL REPORTING

5.6 REVIEW

In accordance with consent conditions, the SNMP is next due for review in July 2021 . The documents that require review prior to the review of the SNMP include:

- Stormwater Quality Improvement Programme (condition 28, now forms part of the SNMP);
- Monitoring Plan (condition 37);
- Non-routine discharge procedure (condition 24);
- Stormwater Management Review (condition 40).

Finalising the SNMP immediately after the adoption of a Long Term Plan ensures that proposed actions in the SNMP are funded and are able to be undertaken.

6.0 RECOMMENDATIONS

APPENDISES