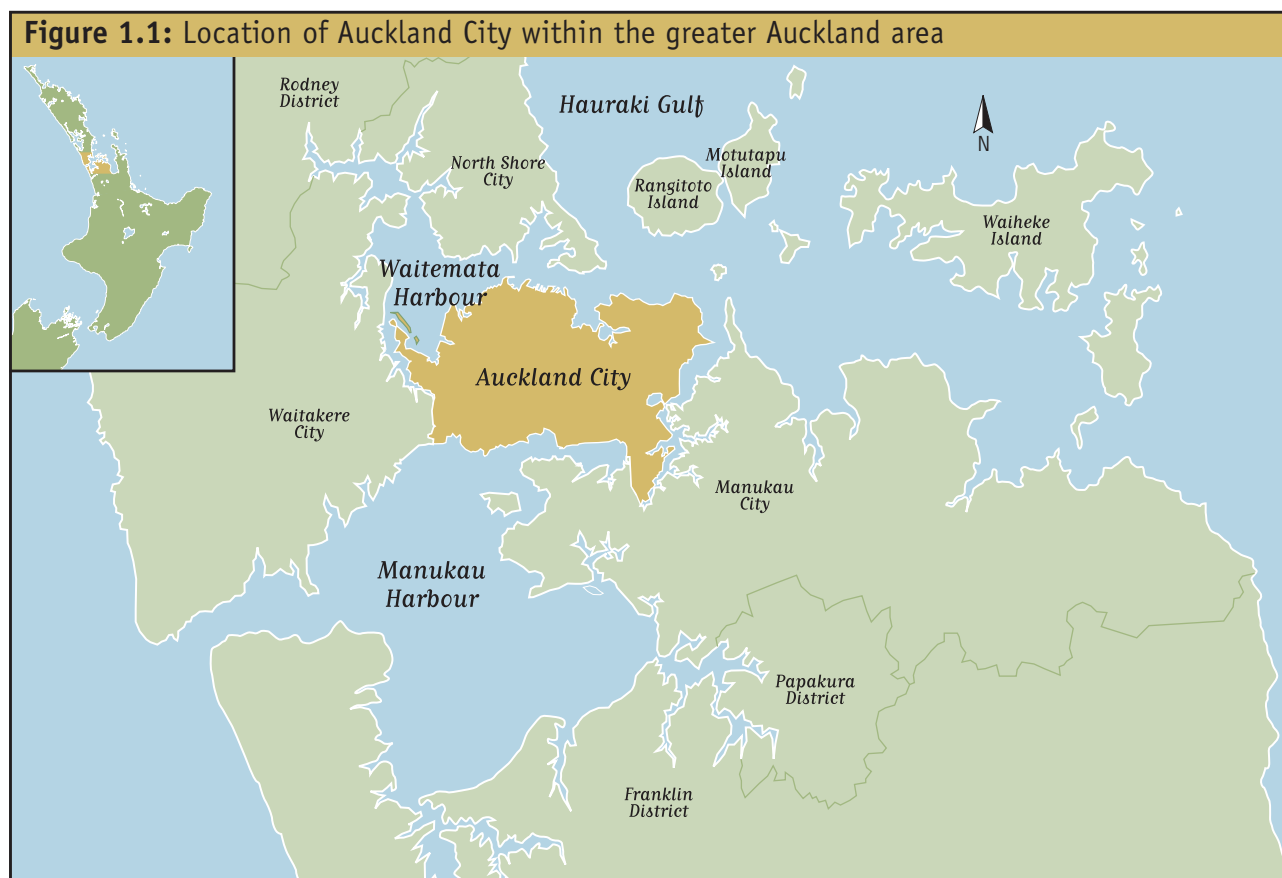


1. Introduction

1.1 The Purpose and Structure of this Document

This document has been prepared by Auckland City Council (“**Auckland City**”) and Metro Water Limited (“**Metrowater**”) to accompany applications for discharge and associated resource consents to enable the continued operation of Auckland City’s stormwater, wastewater and combined stormwater and wastewater systems. It describes the systems and their interrelations, sets out in detail the philosophy behind the management of the systems, and provides an assessment of the environmental effects (“**AEE**”) of the operation of the systems.

The location of Auckland City within the greater Auckland region is shown in Figure 1.1.



Discharges from Auckland City’s stormwater, wastewater and combined systems are currently authorised by a mixture of granted and deemed resource consents under the Resource Management Act 1991 (“**RMA**”). A number of these resource consents expire on 1 October 2001, ten years after the date of enactment of the RMA.

Auckland City and Metrowater are seeking resource consents to replace the expiring consents and authorise any activities lacking authority. These applications seek consents for a further 35 years of operation.

This report describes the stormwater, wastewater and combined systems in Auckland City, describes the environmental effects of the operation of these systems and provides the information required under the RMA to assess the resource consent applications. The AEE is set out in 12 chapters as follows.

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- Chapter 1** Provides a brief introduction to the purpose and structure of the report. This chapter also outlines the respective roles of Auckland *City* and Metrowater.
- Chapter 2** Outlines the Auckland City drainage system and the requirement for resource consents. It describes the applicants' approach to environmental management and to these resource consent applications in particular, and sets out their relationships with other similar organisations involved in stormwater and wastewater management in the Auckland area.
- Chapter 3** Summarises the various components of Auckland's drainage system. The historical development of Auckland's drainage system is outlined, and the key issues and concerns in relation to drainage systems are discussed in detail.
- Chapter 4** Describes the characteristics of five integrated catchment areas which are the underlying management units of the drainage system. It sets out the framework for the management and maintenance of the system components described in Chapter 3.
- Chapter 5** Describes the discharges, especially the types and sources of contamination in the stormwater, an assessment of the amount of stormwater generated within each integrated catchment area and the overall quality of the discharges.
- Chapter 6** Describes the human environment of Auckland City, including reference to its current and likely future population, business and industry locations, transport and travel patterns, archaeology, recreation patterns of Auckland residents and future levels of population growth.
- Chapter 7** Describes the physical and biological environment of Auckland City, in particular the freshwater and marine environment within each of the five integrated catchment areas for which resource consents are sought. The information has been derived from extensive previous studies and reviews. Particular attention is paid to the coastal environment, as this is the ultimate receiving environment for the discharges from the drainage system. The likely future climate of Auckland City is described.
- Chapter 8** Describes the environmental effects arising from the operation of the stormwater system, including environmental effects on water quality, sediment quality, aquatic freshwater and marine ecology. The effects in terms of erosion, human use of waterways and harbours, cultural issues and archaeological matters are described in this chapter.
- Chapter 9** Describes Auckland *City's* and Metrowater's commitment to improving environmental quality through short and long term works. The chapter describes recent works that have significant environmental benefits and identifies priority short term works Auckland *City* and Metrowater have committed to. Integrated catchment studies, supported by the development of models of the drainage system will form the basis of the longer term stormwater system management strategy and are detailed in this chapter. These, along with the monitoring and environmental modelling described in the chapter, will provide essential inputs into the development of long term integrated catchment management plans for the five integrated catchment areas.

- Chapter 10** Briefly discusses the framework under the RMA for processing resource consents and outlines the regulatory status of activities requiring resource consent. This chapter discusses the specific consent requirements for the drainage system. Relevant legislation and policies from national and local planning documents are described in the remainder of this chapter.
- Chapter 11** Sets out the approach taken to consultation, and details the consultation initiatives developed by Auckland *City* and Metrowater. This chapter also addresses the ongoing nature of the consultation process.
- Chapter 12** Presents a summary of the AEE in relation to the requirements of the Fourth Schedule of the RMA.

A **Glossary** of terms used follows the Table of Contents and a list of **References** used in the report is provided as Chapter 13.

1.2 Auckland *City*

Auckland *City* is a corporation governed by a Mayor and 19 elected Councillors. It is responsible under legislation to provide and maintain a wide range of essential services and to ensure the health and safety of its residents.

The Mayor is elected on a city-wide basis every three years to govern the city. Nineteen Councillors are elected from seven wards throughout the city. Fifty-two Community Board members are elected to represent the seven wards. Each Community Board consists of five or six members and a Councillor(s) allocated to the ward.

Auckland *City* has a number of important functions in relation to water and wastewater. These include the following:

- ⊙ Strategic and district planning. Auckland *City* is responsible for the preparation of plans governing land uses and environmental effects. It also provides input into the plans prepared by other authorities such as the ARC. These plans guide long term growth and the effects of an increasing population. They include the development of environmental strategies, coastal strategies and monitoring.
- ⊙ Providing and maintaining facilities for the collection, treatment and disposal of wastewater via Metrowater and Watercare Services Limited (“**Watercare**”).
- ⊙ Installation and maintenance of drains to dispose of stormwater. Auckland *City* prepares asset management plans and catchment plans for stormwater, as well as managing resource consents and works for stormwater outfalls.
- ⊙ Construction and maintenance of roads, streets, bridges, car parks, wharves and footpaths. This includes the road drainage system. Roads make a major contribution to the contamination of stormwater runoff.
- ⊙ Provision and maintenance of parks, reserves, sports fields, aquatic facilities and other recreation and community services. The quality of Auckland *City*’s coasts and waterways has a significant impact on recreation and community use of open spaces.

- ⊙ The development and marketing of Auckland City.
- ⊙ Regulatory services relating to building, plumbing and drainage, resource management, environmental health, general bylaws and handling of hazardous substances.

The processes and components of the drainage system, owned by Auckland City and managed by Metrowater, are described briefly in section 1.4, as an introduction to the more detailed information contained elsewhere in this AEE.

1.3 Metrowater

Metrowater owns the wastewater network and manages the stormwater and combined stormwater and wastewater networks on behalf of Auckland City.

On 3 July 1997, Auckland City formed Metrowater as a Local Authority Trading Enterprise (“LATE”) to establish a single-minded focus for providing quality water and wastewater services to Auckland consumers. Auckland City maintains a 100% shareholding in Metrowater, which is governed by its own Board of Directors.

The Directors’ role is defined in section 594R of the Local Government Act 1974. Section 594R states:

“(3) All decisions relating to the operation of a local authority trading enterprise shall be made by or pursuant to the authority of the directorate of the local authority trading enterprise in accordance with its statement of corporate intent (if any).”

The Board of Directors is responsible for the preparation of the Statement of Corporate Intent, which must receive approval from Auckland City. In addition to the obligations imposed by being a LATE, Metrowater is required to comply with the Companies Act 1993.

The Statement of Corporate Intent provides the directors with a basis for direction and control of the company’s activities. This includes such areas of stewardship as the identification and control of the company’s business risks, the integrity of management, information systems and reporting to Auckland City.

The control system used by Metrowater is based on written procedures, policies, guidelines and organisational structures that provide an appropriate division of responsibility, a programme of internal audit and careful selection and training of qualified personnel.

The management structure of the company reflects its emphasis on environmental and customer-focused standards. The company’s management is structured into retail functions, asset planning and operations divisions, with a dedicated environmental team.

Metrowater has approximately 345,000 consumers, of which approximately 13,000 are businesses. Metrowater owns the assets for the retail provision of water and wastewater and is responsible for these services in Auckland City. These wastewater assets have an optimised depreciated replacement cost of \$158.4 million and a replacement cost of \$468.9 million as at 1 July 1999 (Metrowater 2000a). Auckland City owns the stormwater assets, including the combined wastewater and stormwater pipes.

Auckland City has contracted the operations and maintenance of the stormwater and combined wastewater and stormwater assets to Metrowater. Auckland City is responsible for maintaining the public stormwater drainage system that serves properties, roads, and reserves, as well as five public watercourses: Oakley Stream, Meola Creek, Motions Creek, Newmarket Stream, and Remuera Stream.

Metrowater has stated as its fundamental objective:

“to be a reliable water and wastewater provider of least cost while meeting prudent quality, environmental and economic standards.”

1.4 Drainage Overview

Drainage is a natural process carrying rainwater that has fallen on land by gravity to ditches, streams and creeks. Eventually the surface runoff from rainwater reaches harbours and oceans or alternatively inland low spots where it may form a wetland or lake. Urbanisation modifies this natural process. As cities develop, the area of impermeable surfaces, such as roads and buildings, increases. The natural drainage pathways that stormwater takes are modified and, in many cases, streams and creeks are replaced with pipes. As urbanisation occurs, pipe systems are constructed to transport wastewater and stormwater from the city. Water that is used in households, businesses and industries is collected and, where possible treated, before being returned to the environment. The present drainage system reflects an amalgamation of different engineering practices and policies that have evolved during the last 140 years.

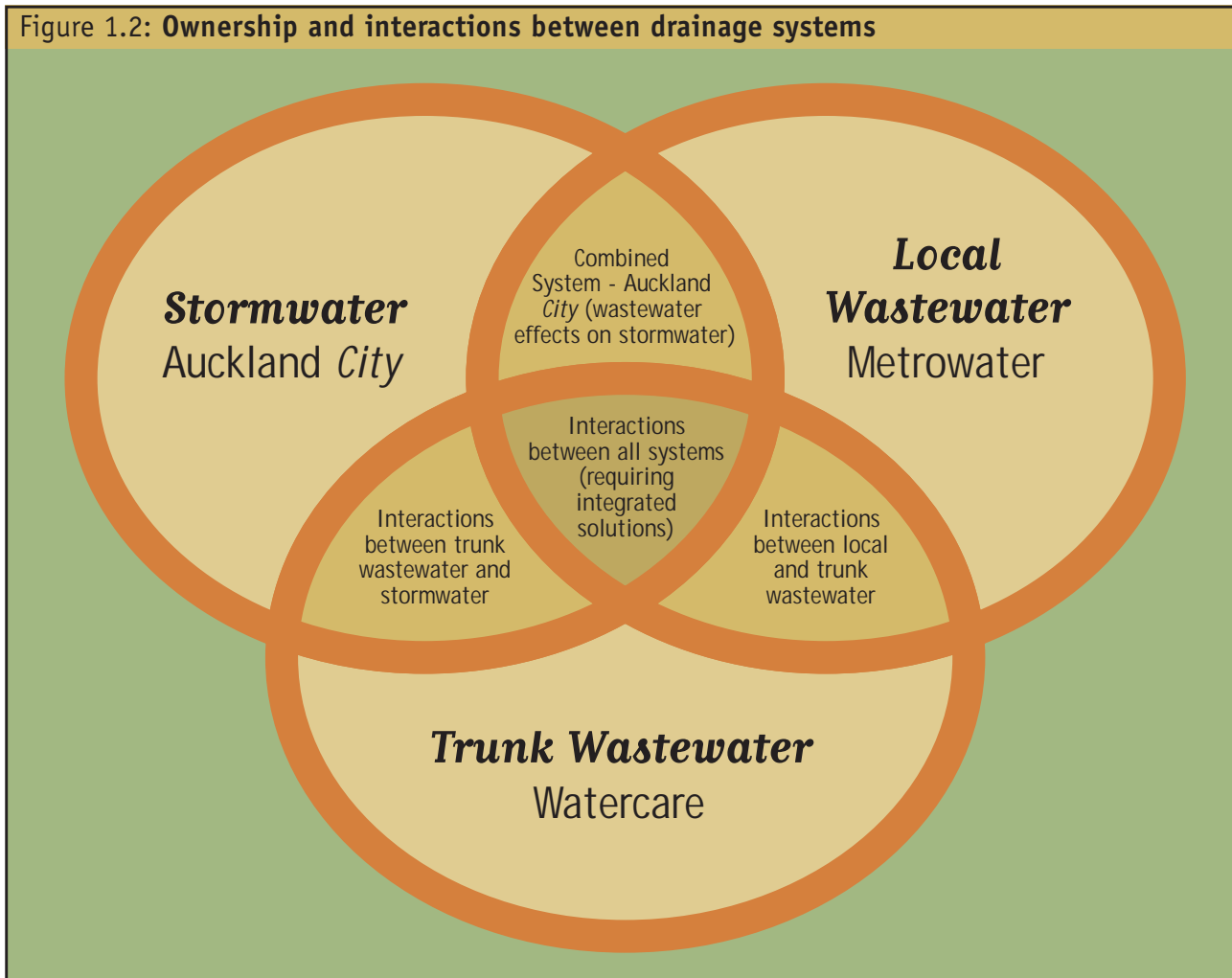
There are three types of piped drainage networks in Auckland City - wastewater, stormwater and combined wastewater and stormwater. These pipe networks are owned by three separate entities: local catchment wastewater pipes are owned by Metrowater, combined pipes carrying wastewater and stormwater, and separate stormwater pipes are owned by Auckland City, and the main trunk wastewater pipes are owned by Watercare. Metrowater manages the wastewater network and, under contract to Auckland City, manages the stormwater and combined pipes. Figure 1.2 depicts the ownership and interactions between the drainage systems.

The drainage assemblage functions as two units: one drainage system that removes stormwater from within Auckland City and discharges to creeks, streams and harbours; and a second drainage system that removes wastewater (including from the combined stormwater and wastewater network) and delivers it to the Mangere Wastewater Treatment Plant, which is owned by Watercare.

The piped stormwater network discharges potentially contaminated water to the receiving environment. Contamination can originate from the following point and non-point sources:

- ⊙ **Point sources** include designed system relief overflow structures in the wastewater and combined stormwater and wastewater networks and leachate from landfills.
- ⊙ **Non-point sources** include contaminants that are contained in rainwater and runoff carried by stormwater and depend on land use and activities.

Figure 1.2: Ownership and interactions between drainage systems



The impact of contamination on the receiving environment is a function of the type, concentration, and loading of the contaminants and the sensitivity of the receiving environment to contamination. Additionally, contamination can adversely affect public recreation, economic activities and health, and adds to the general degradation of the amenity value of watercourses and coastline.

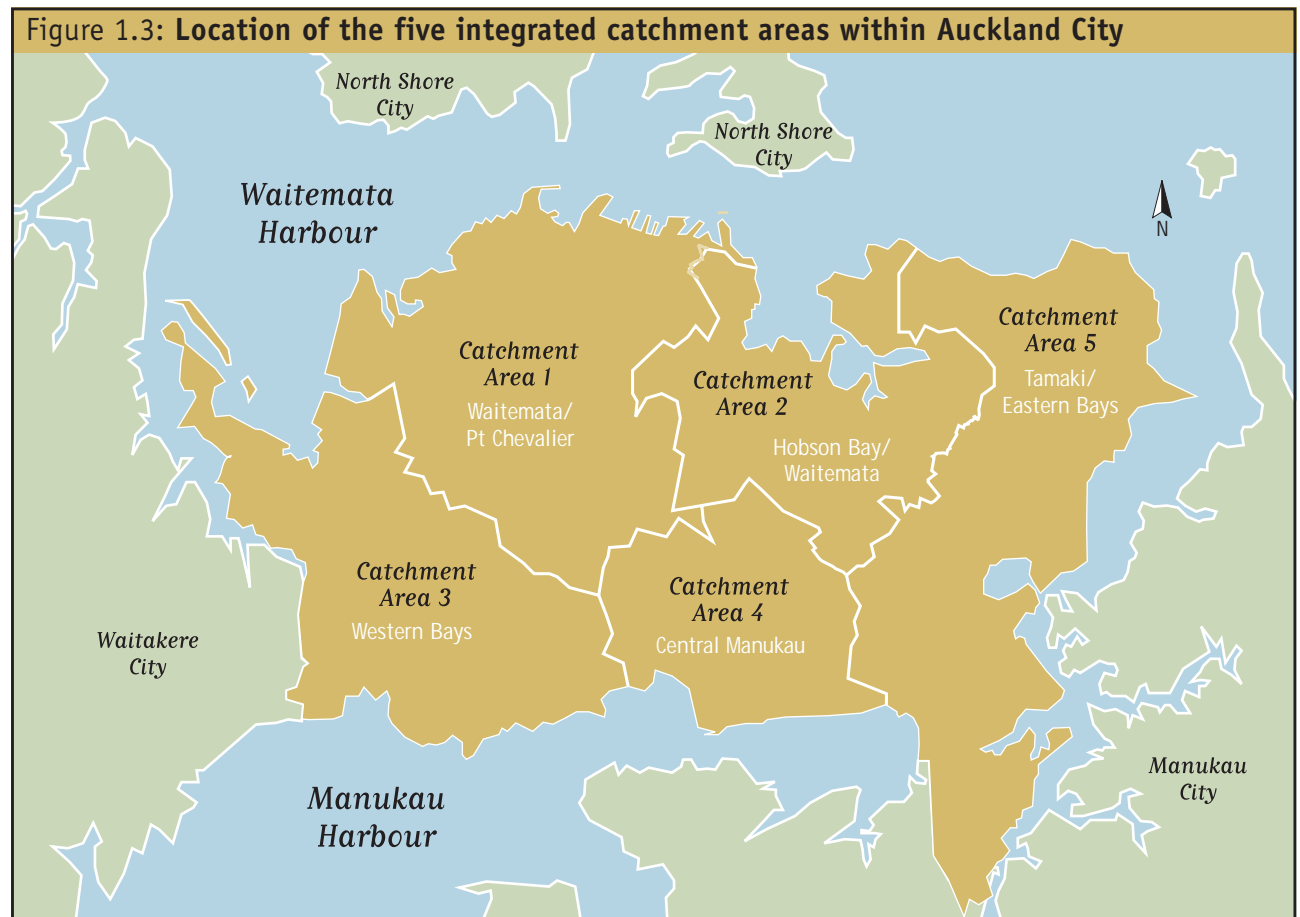
Auckland City, and subsequently Metrowater, have instituted various policies and pursued various efforts to improve the environmental management of the drainage systems in the most cost-effective manner. These overarching policies are complementary to strategic asset and annual planning and to proactive maintenance. Early efforts focused on network separation, which was followed by catchment management studies and plans for prioritised catchments. The present practices and past policies have all contributed to incremental environmental improvements.

For effective management of the city's drainage systems, Auckland City and Metrowater have developed five integrated catchment areas, shown on Figure 1.3, which will form the basis of future study and management, namely:

- ⊙ Integrated catchment area 1: Waitemata – Pt Chevalier.
- ⊙ Integrated catchment area 2: Hobson Bay – Waitemata.

- ⊙ Integrated catchment area 3: Western Bays.
- ⊙ Integrated catchment area 4: Central Manukau.
- ⊙ Integrated catchment area 5: Tamaki – Eastern Bays.

The integrated catchment studies constitute a shift toward a more comprehensive study of Auckland as a whole, and will provide detailed information with which to make better decisions to improve environmental management.



1.5 Plans Underlying the Management of the Drainage System

1.5.1 Strategic Plan and Annual Plan

Auckland City has prepared three strategic plans, in 1993, 1996 and in 2000. The purpose of these plans is to give strategic direction to the many aspects of city management. Consultation forms a major part of setting the strategic plans.

Drainage forms part of the strategic plans for the city. Drainage related matters incorporated in the various strategic plans include the following:

- ⊙ The 1993 Strategic Plan catered for wastewater separation over 35 years. Stormwater quality was to be considered based on technology being developed.

- ⊙ The 1996 Strategic Plan continued with this wastewater separation policy but refined works to the following drainage management areas in the short term.
 - Central Business District (in progress)
 - Freeman’s Bay (complete)
 - Meadowbank or Orakei (in progress)
 - Cox’s Creek (in progress)

Metrowater was formed to meet objectives set in the 1996 Strategic Plan. The recommendations of the Joint Local Authority Study (1995) were to retain a wholesale / retail split in the water and wastewater operations but move the businesses onto a more commercial footing.

The Strategic Plan recognised the need to address flooding of habitable floors.

- ⊙ The 2000 Strategic Plan was prepared after three iterations of Annual Asset Management Plans for Stormwater and Wastewater. Auckland *City* has doubled the amount spent on stormwater as a result of preparing asset management plans to comply with local government act requirements. The policy and objectives from the 2000 Strategic Plan are presented in Figure 1.4.

1.5.2 Asset Management Plans and Annual Plans

Asset Management Plans consider present service levels and costs associated with those service levels. These plans then consider what costs are associated with proposed service levels while considering growth and environmental objectives. Asset Management Plans also consider where investment should occur and are the primary input into the capital investment section of the Annual Plans.

Annual Plans are a consulted statement of how and where Auckland *City* will invest money to improve service levels. Priority objectives put forward in the Annual Plan consider the following:

- ⊙ Strategic Plan objectives.
- ⊙ Statement of Corporate Intent.
- ⊙ Minimising risk to human health and safety.
- ⊙ Minimising environmental impacts.
- ⊙ Optimising aquatic recreation opportunities.
- ⊙ Minimising property damage.



Figure 1.4: Auckland City strategies (text sourced from: First City of the Pacific Strategic Plan 2000)

Unique and Valued Natural	Auckland City Council Strategies		2005 Milestones
<p>Environment Priority 4</p> <p>Community Vision</p> <p>Outcomes</p> <p>In 2020 Auckland will have... Clean and unpolluted water, land and air. Accessible and protected Hauraki Gulf, Waitemata and Manukau Harbours and waterfront. Preserved and improved green and open spaces.</p> <p>Measures</p> <p>Overall people believe Auckland's natural environment is looked after. Water and air quality meets or exceeds internationally accepted standards. People believe the city's coastline and waterfront areas are publicly accessible. People believe there are lots of trees and green spaces in the city.</p> <p>Who can help</p> <p>Department of Conservation, environmental and volunteer groups, Auckland Regional Council, other local authorities in the region, research institutions, Metrowater, WaterCare Services Ltd, landowners, private developers, households and businesses, iwi, government agencies.</p>	<p>1 Develop integrated Wastewater and Stormwater Catchment Plans providing cost-effective ways of overcoming flooding and environmental degradation through:</p> <ul style="list-style-type: none"> ⊙ changing peoples' behaviour by education ⊙ waste minimisation and street sweeping ⊙ infiltration and inflow control, sewer separation ⊙ treatment of stormwater and sewer overflows ⊙ measures to encourage on-site water disposal and reuse. <p>2 Work with business and property owners to achieve higher quality environmental standards through regulation, raising public awareness and effective environmental monitoring.</p> <p>3 Achieve an 80% reduction in business and household waste by:</p> <ul style="list-style-type: none"> ⊙ improving kerbside recycling ⊙ reducing the size of mobile garbage bins to 120 litres and introducing a regular organic collection systems by 2002 ⊙ promoting cleaner production practices to businesses ⊙ reducing the amount of kitchen and garden waste put out for disposal ⊙ advocating for legislation to reduce packaging waste and working with manufacturers and consumers to reduce packaging waste ⊙ working at a regional level and with central government to create innovative long-term programmes that achieve reduction of waste. <p>4 Increase and improve public access to all coastlines through land acquisition and other measures.</p> <p>5 Provide public open space to meet future needs by:</p> <ul style="list-style-type: none"> ⊙ upgrading existing parks to meet increased demand ⊙ acquiring land with significant open space values ⊙ acquiring land to enhance the city's open space network ⊙ selling unusable and unsafe open space or converting it to other uses ⊙ exploring new ways of creating green spaces (eg street parks, and partnerships with schools and sporting organisations) 	<ul style="list-style-type: none"> ⊙ emphasising the provision of significant trees and other plants, including fruit trees, in public spaces and streetscapes ⊙ enhancing the ecological and natural values of the city's green spaces ⊙ increasing the accessibility of the park network. <p>6 Provide added protection for significant natural features, ecological sites and built heritage by:</p> <ul style="list-style-type: none"> ⊙ implementing our bio-diversity strategy ⊙ completing and implementing an integral coastal management strategy for the Isthmus ⊙ recognising the status of the Manukau Harbour ⊙ working with the Department of Conservation (DOC) and the Auckland Regional Council to establish a programme by 2001 for the control or eradication of significant weeds and pests in the Hauraki Gulf ⊙ identifying features in the Hauraki Gulf and protecting them through the District Plan ⊙ providing appropriate incentives and education/advocacy. <p>7 Promote pedestrian access to coastal and other areas of the Hauraki Gulf Islands through:</p> <ul style="list-style-type: none"> ⊙ opening up existing walkways and paper roads ⊙ acquiring land or easements ⊙ rationalising land with the DOC ⊙ identifying and/or developing an open space network that is linked to these walkways. <p>8 Advocate to Government for resources to substantially improve the upkeep of the DOC estate in the Hauraki Gulf.</p> <p>9 Work with the DOC on a co-operative partnership agreement which includes:</p> <ul style="list-style-type: none"> ⊙ public access facilities on DOC estates ⊙ land rationalisation ⊙ operation of the Hauraki Gulf Marine Park ⊙ access to Hauraki Gulf Islands and coastlines ⊙ a visitor strategy for the Hauraki Gulf. 	<ul style="list-style-type: none"> ⊙ Meola, Whau/Kinross, Glenn Innes/Panmure and Orakei Basin Catchments improved ⊙ on track to achieve protection from flooding of 85% of current (1999) flood-prone habitable areas ⊙ wastewater overflow pollution reduced by half, measured against 1996 levels ⊙ on track to achieve a removal of 27% in the amount of suspended sediments in 70% of stormwater catchments ⊙ Western Water Treatment Plant for Waitakere City completed ⊙ 50% reduction in the quantity of waste from businesses and households ⊙ 50% reduction in Council waste disposal ⊙ public open spaces established in the Western Reclamation Area ⊙ 1,000 extra new trees a year in street and public open spaces ⊙ Plan prepared by 2002 to promote pedestrian access to coastal and other areas of the Hauraki Gulf Islands ⊙ Hauraki Gulf Islands walkway system substantially completed.

