

# A COLLABORATIVE APPROACH TO STORMWATER MANAGEMENT – A CANTERBURY TALE

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## ABSTRACT

There are many challenges associated with achieving stormwater management outcomes for both District and Regional Councils. In Canterbury, these challenges include new regional plan requirements for stormwater network consents, the lack of best practice guidelines specifically designed for the unique Canterbury environment and achieving affordable yet environmentally sustainable outcomes. The Canterbury Stormwater Forum has been established to improve urban stormwater network consenting processes, stormwater management and associated environmental outcomes throughout the Canterbury region. The Forum includes representatives from the Canterbury Regional Council and district councils and also includes representation from our key cultural regional partner, Ngāi Tahu. The Forum has established collaborative working groups to identify and promote best practice, share resources and achieve stormwater management solutions that are affordable for the community, environmentally sustainable and culturally acceptable. This paper discusses the development of the Forum, the lessons learnt and the success of adopting this collaborative approach to resolving stormwater management issues across a region.

## KEYWORDS

**Stormwater, integrated management, reticulated networks, NRRP, pLWRP, Canterbury Water Management Strategy, Environment Canterbury**

## PRESENTER PROFILE

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## 1 INTRODUCTION

Territorial authorities (TAs) face challenges to manage urban water quality within the national and regional planning context. There is an inherent tension between community expectations around improving amenity values, cultural values and water quality of urban waterways against the financial and physical constraints faced by TAs. The National Policy Statement for Freshwater Management requires regional and district councils to manage water quality, and the Resource Management Act, through regional plans, requires councils to obtain authorisations for discharges of contaminants to land and to water.

Managing the effects of discharges from existing developments where opportunities and funding for retrofitting water quality and quantity mitigation is a challenge TAs and Regional councils need to find pragmatic and durable solutions to ensure progressive improvements can be made in the context of regulatory requirements. Canterbury Regional Council (Environment Canterbury/ ECan) and the Canterbury TAs have entered

into a collaborative partnership to work through the issues and develop solutions for the region.

Environment Canterbury is also taking a collaborative community-based approach to water management more generally through the Canterbury Water Management Strategy (CWMS).

Previous stormwater network discharge consenting in Canterbury has been an expensive, adversarial and protracted process for TAs. Environment Canterbury is attempting to take a more collaborative and adaptive approach to ensure costs for TAs can be focused on monitoring and mitigation rather than the consenting process itself. The approach is also intended to provide more certainty for councils and developers to ensure that the supply of land for property is streamlined while ensuring environmental and cultural outcomes are met.

This paper describes the specific issues for stormwater management in Canterbury, the approach being taken regionally and with individual TAs, and the challenges that remain.

## **2 STORMWATER MANAGEMENT IN CANTERBURY**

Canterbury comprises of 10 districts, covering a wide range of urban and rural areas and small townships. A map of the Canterbury TA boundaries is shown in Figure 1. Urban waterways in Canterbury are typically highly modified, being channelised and receiving stormwater and wastewater overflows. Some urban rivers are highly degraded through urban and historic industrial inputs, and may be highly sedimented from erosion and development activities in the catchment.

Figure 1. "Map of Canterbury Territorial Authority boundaries"

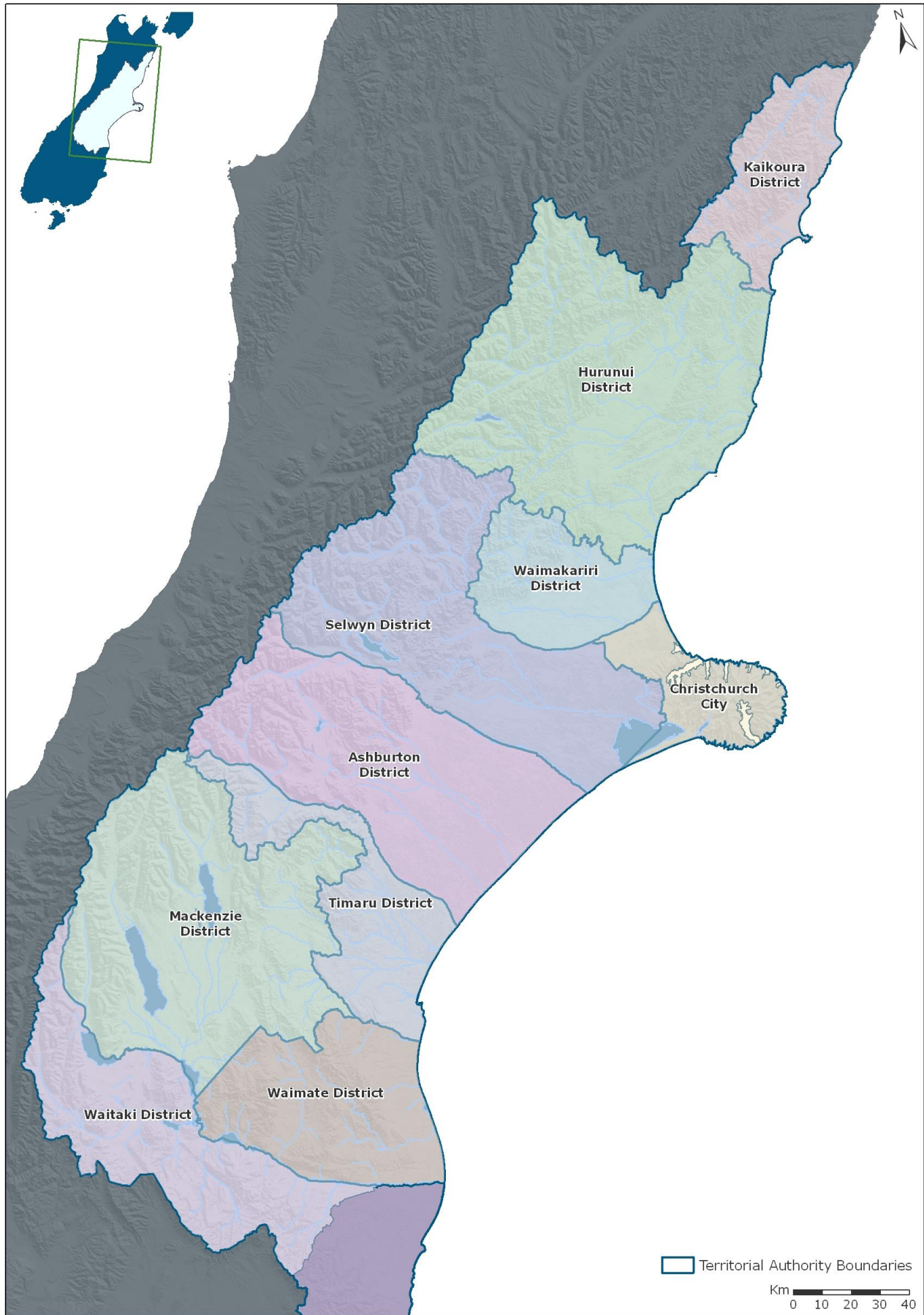
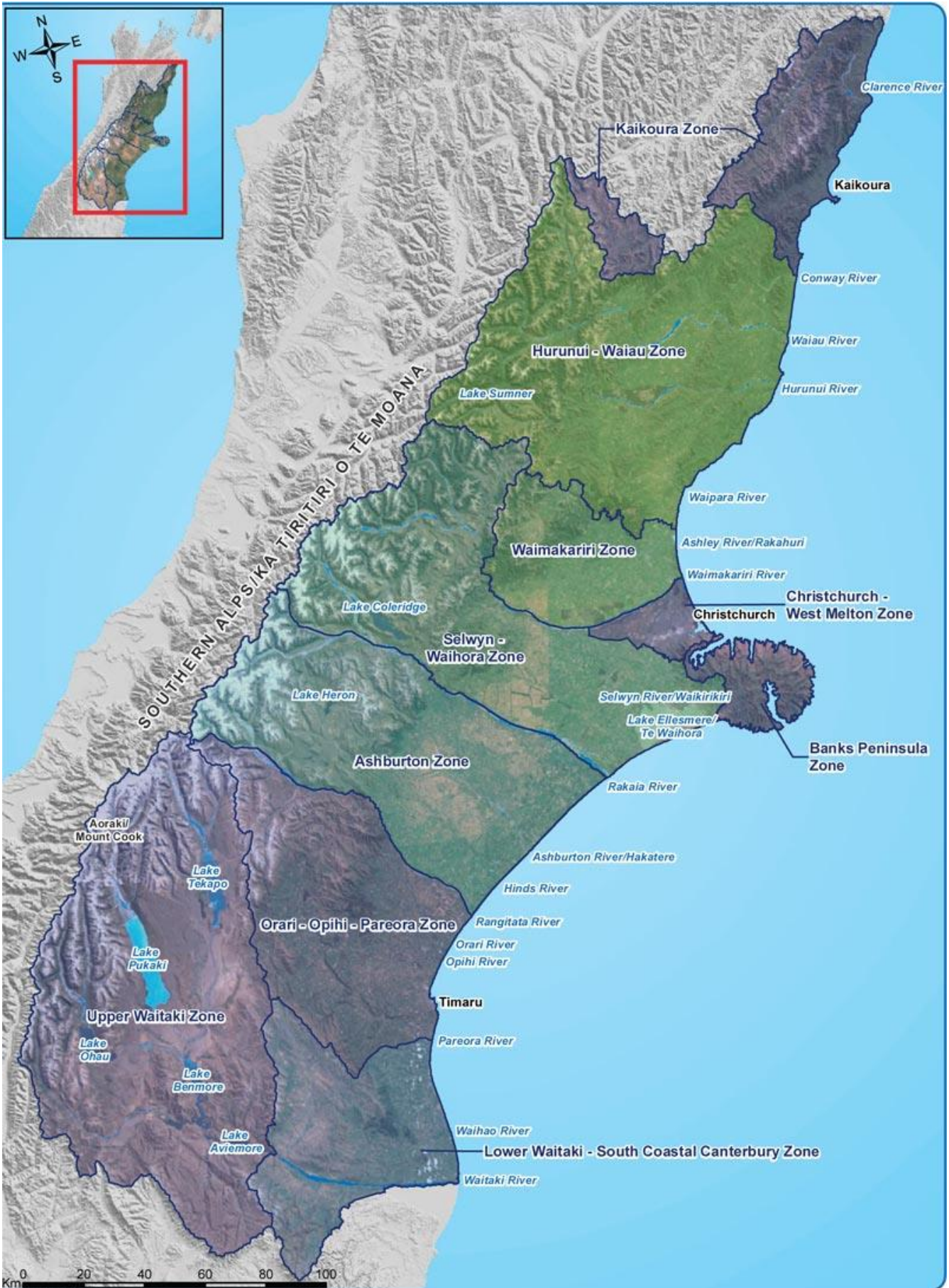


Figure 2: "Canterbury Water Management Strategy zones"



The Canterbury Plains are characterised by unconfined aquifers overlain by deep, free-draining alluvial gravels and sands. Groundwater is derived from alpine rivers and water quality is vulnerable to contamination through the free-draining strata. This is demonstrated by the reduction in water quality down-plains, caused by increasing nitrate nitrogen inputs from farming activities. Effects of stormwater discharges on groundwater quality have not been demonstrated but the cumulative risk to groundwater needs to be managed, since it provides the source of water for spring-fed streams, drinking water for rural communities and for Christchurch city.

The coastal plains area is characterised by interbedded estuarine and marine sediments (clays and peat) and confined terrestrial gravel layers. Groundwater levels in the coastal confined aquifer system are typically artesian in this area. Opportunity for stormwater discharge to land in the confined aquifer system is limited and discharges are typically to surface water.

In Christchurch, the major rivers and tributaries are spring fed and their reaches are almost entirely within the urban confines, with continued expansion of the urban limits. Christchurch is undergoing further expansion to the west with further encroachment into currently rural parts of the Port Hills. The Port Hills and Banks Peninsula comprise steep hill catchments made up of deep layers of highly dispersive loess soils overlaying volcanic basalts. These soils are highly erosive, and if developments are poorly managed, construction phase discharges in these areas contribute high turbidity and sediment loads to streams and to the coastal environment.

The September 2010 and February 2011 Canterbury earthquakes caused severe damage particularly in central and eastern Christchurch. Significant liquefaction affected the eastern suburbs, bringing around 400,000 tonnes of silt to the surface.

The earthquakes caused significant damage to infrastructure, with CCC and the Government entering into a cost sharing agreement for the estimated \$2.9 billion dollar costs of horizontal infrastructure repair (roads, wastewater and stormwater networks and water supply). A summary of the infrastructure damage includes:

- Approximately 52%, or 1,021 kilometers of Christchurch's urban sealed roads were damaged,
- 30 bridges needed repair
- Over 600 retaining walls needed to be replaced or repaired
- 51 kms of water supply mains were damaged
- 22 of 175 fresh water wells were damaged
- 528 km of the wastewater and stormwater network were damaged
- 100 plus sewer pumping stations had to be replaced or repaired

The stormwater infrastructure suffered damage through cracked, deformed, and disintegrated roadside guttering. Roadside drains were damaged, leaving them unable to channel the required volume of water. Some large sections of Victorian-style brick drains still in use in central Christchurch and in Lyttelton collapsed. Liquefaction left deposits in some storm water systems after it dried up, causing blockage. The earthquakes cracked

pipe walls, allowing groundwater and liquefaction silt to enter the pipes, reducing capacity. Pipe joints separated due to ground movements, and liquefaction pushed some pipes up, which reduced the gradient over a widespread area. Drains and waterways also suffered lateral spreading and siltation, reducing carrying capacity.

The reconstruction of Christchurch's horizontal infrastructure (roads, drinking water, wastewater and stormwater) is being managed by SCIRT (Stronger Christchurch Infrastructure Rebuild Team). The wastewater and stormwater systems are being rebuilt to the pre-earthquake level of service, with limited opportunity for improvements to stormwater treatment or retrofit of stormwater treatment devices. The financial costs to Christchurch City Council (CCC) in particular, resulting from earthquake damage provide an additional challenge to resourcing to meet water quality targets. CCC has developed design guidelines for low cost raingardens and treepits and intend to install these where possible to treat stormwater discharges from the city roading network.

The Canterbury earthquakes have accelerated the rate of development to the north and west of Christchurch, and much of the Christchurch CBD is undergoing reconstruction. The rebuild provides opportunities for retrofitting stormwater treatment and a requirement for new greenfield and brownfield developments to use best-practice stormwater treatment which may result in improved stormwater quality compared with the pre-earthquake situation.

Selwyn and Waimakariri District Councils have seen a huge change in population post-earthquake, as Christchurch residents and new migrants populate developments to the west and north of Christchurch. Selwyn District in particular has seen populations greatly exceed predicted growth, and this has led to challenges for Councils in providing infrastructure and services far in advance of predicted asset spending.

In common with the rest of New Zealand, Canterbury faces future challenges in managing and maintaining assets as demographics change. TAs face challenges in delivering customer's expectations on performance, and a need for councils to use money for infrastructure effectively and efficiently and plan for long term asset renewals.

### **3 PLANS AND LEGISLATIVE CHALLENGES**

#### **3.1 CANTERBURY LAND AND WATER REGIONAL PLAN**

The proposed Canterbury Land and Water Regional Plan (pLWRP) was notified in August 2012, only a short time after the previous plan (Canterbury Natural Resources Regional Plan) became operative.

The pLWRP requires stormwater reticulated network operators (generally TAs) to apply for resource consents for discharges from networks by June 2018 and for water quality objectives to be met by 2025. The intention is that TAs manage all discharges within the reticulated network area under their consent to ensure discharges from the network to the receiving environment meet water quality objectives. The rules require network operators to develop a stormwater management plan in order to implement stormwater infrastructure to improve water quality and quantity measures and to implement other initiatives such as educational programs and pollution prevention activities.

The pLWRP sets water quality objectives for the regions groundwater and surface water, aligning with the NPS for Freshwater Management, which requires, among other things, that the overall quality of fresh water within a region is maintained or improved.

Few councils have applied for network discharge consents to date. The process of obtaining consents has historically been difficult, with high costs to TAs in preparing studies and application documents, publicly notified and adversarial consent processes and a lack of certainty over expectations. One significant challenge is the lack of an up-to-date and comprehensive Canterbury-specific best-practice guidelines for stormwater management that deals with the specific challenges for stormwater and freshwater management in the Canterbury region. Guidelines typically referred to are the Auckland Regional Council's TP10 document, the CCC Waterways Wetlands and Drainage Guide (2003) and ECan's Erosion and Sediment Control Guide (2007).

Christchurch City Council hold a consent for all of greater Christchurch and specific consents for the Styx and south west Christchurch areas. Network consents are also held by Selwyn District Council (Rolleston and Lincoln), Kaikōura District Council (Kaikōura), MacKenzie District Council (Twizel, Tekapo) and Hurunui District Council (Amberley). The benefits of holding network discharge consents has been evident however, since they allow TAs to manage development and integrate infrastructure in the consented areas without requiring separate consents to be obtained from ECan for stormwater discharges.

### **3.2 CANTERBURY WATER MANAGEMENT STRATEGY (CWMS)**

The pLWRP seeks to take a more integrated approach to land and water quality management. It establishes the mechanisms to enable all the key outcomes of the Canterbury Water Management Strategy (CWMS) – community's aspirations relating to water management in Canterbury including environmental restoration, kaitiakitanga, more reliable water through infrastructure, and improved land and water management within collaboratively agreed limits. The CWMS is the first time that the quality of water from various sources has been comprehensively addressed in Canterbury – in both urban and rural areas.

The CWMS was developed to address water issues in Canterbury, including the declining quality of both surface water and groundwater, an ongoing loss of cultural values and recreational opportunities, as well as the declining availability and reliability of water for agricultural and energy users.

The CWMS establishes a collaborative framework for sustainably addressing these issues to enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from Canterbury's water resources within a sustainable framework. This includes improving agency and stakeholder understanding of Ngāi Tahu values.

The CWMS provided for the creation of ten zone committees and a regional committee tasked with working with the community to develop recommendations to deliver the goals and targets outlined in the strategy. Overall leadership of the CWMS lies with the Canterbury Mayoral Forum. Figure 2 shows the location of the CWMS zones.

Working together, ECan and TAs can most effectively manage the interface of land uses and fresh water resources. The establishment of the ten Water Management Zone Committees under the CWMS, as joint committees of the Regional Council and the relevant TA, is a significant step to facilitate closer liaison. Key stakeholders include representatives from community and environmental groups, relevant industry groups including farmers and those in hydro-generation. The Regional Policy Statement 2012 (RPS 2012) emphasises integrated management of land uses and water quality and quantity between the Regional Council and territorial local authorities.

### **3.2.1 CWMS TARGETS**

Zone committees have developed, or are developing Zone Implementation Programs (ZIPs) which are non-statutory documents containing zone-specific recommendations for water management to achieve CWMS targets. Zone committees have worked with stakeholders and the community to develop these recommendations. Environment Canterbury and the zone committees have a timetable for development of sub-regional plans to be included in the regional plans over the next ten years. The first sub regional plans have already been notified for the Selwyn-Te Waihora catchment, and others are at various stages of development, from initial science and project planning to plan drafting.

Much of the focus of CWMS zone committees is on rural activities with the exception of Christchurch West Melton which is predominantly an urban catchment. However, zone committees are increasingly turning their attention to urban water quality and the impact of stormwater discharges.

### **3.3 PARTNERSHIP WITH NGĀI TAHU**

Ngā Papatipu Rūnanga and Environment Canterbury signed a relationship agreement for the programme known as Tuia (working together in partnership) to mark a new era of collaboration between the organisations.

A formal co-governance agreement is in place for the Te Waihora/ Lake Ellesmere catchment, recognising and providing for kaitiakitanga.

Ngāi Tahu are a partner in each CWMS zone and there are targets towards ensuring the exercise of mana, including kaitiakitanga within the Ngāi Tahu rohe, are implemented. Key objectives of CWMS are to formally recognise Te Rūnanga o Ngāi Tahu Freshwater Policy and, in each zone, work towards resolving issues related to Ngāi Tahu policies on:

- Environmental flows that afford protection to instream values,
- Direct discharge to point source contaminants to water,
- The unnatural mixing of water sourced from different water bodies,
- Addressing non-point source pollution through a range of measures including regulatory control.

The partnership approach also aims to increase understanding in each zone of the customary values and uses associated with specific water-bodies or parts of water-bodies. The strategy also aims to involve Papatipu Rūnanga in restoration programmes.

## **4 CANTERBURY REGIONAL STORMWATER FORUM**

Under the Resource Management Act 1991 (RMA), the Local Government Act 2002 (LGA) and the Ngāi Tahu Claims Settlement Act 1998 (NTCSA), Environment Canterbury, territorial authorities (TA's) and Ngāi Tahu all have responsibilities and opportunities associated with managing effects of stormwater discharges from urban settlements on communities and the environment.

For the agencies working within this framework, varied issues have been experienced over many years in obtaining stormwater network consents required by regional plans



prepared in accordance with the RMA. One of the key issues identified is the affordability of urban network consenting and compliance. These unresolved issues led to a request by the Canterbury Chief Executives for Environment Canterbury to convene a forum to determine a pathway forward.

That forum, held on 2nd April 2014, resolved that greater, ongoing collaboration among the agencies with responsibility for stormwater management is required to address the issues. It recommended further work streams be scoped to determine solutions. The overall programme of work required to address the issues is being led by a newly established Canterbury Stormwater Steering Group, chaired Waimakariri District Council.

A collaborative inter-agency approach was established to resolving these issues in the form of the Steering Group, with individual Working Groups set up to progress particular work streams. This requires a closer working relationship between Environment Canterbury, Ngāi Tahu and TAs. The Steering Group is tasked with bringing together the agencies and individuals needed to identify and promote best practice, share resources and achieve Ngāi Tahu culturally acceptable and affordable management solutions and an improved understanding of Ngāi Tahu values.

The programme will be developed and implemented in a way that will assist the region achieve its environmental, cultural, safety and affordability outcomes associated with stormwater management.

Initial discussions aimed to:

- identify common issues relating to stormwater management planning and consenting
- build a common understanding of current and future policy and planning frameworks
- identify practicable ways to improve stormwater management planning and consenting in order to reduce unnecessary costs to ratepayers, clarify responsibilities and manage risks.

A subsequent workshop was held to establish workstreams for working groups to prepare high priority tasks on costs and affordability, regulatory requirements and technical and design best practice. The creation of these groups also offers a real opportunity to develop a closer technical working relationship with zone committees.

Within these overall categories, the programme scope includes specific tasks such as improving understanding of surface and groundwater interactions, achieving a more strategic, streamlined approach to consent monitoring, and resolving responsibility for new development infrastructure approvals.

Each of the working groups aims to unite technical experts from stakeholders across the region (around the three issues listed above) that can develop solutions in relation to the zone committees' outcomes and targets. The working groups are empowered to map out the challenges and some potential pathways forward and will rely upon engagement with zone committees to support and inform decision-making.

The 'Technical Design and Best Practice' working group will be guided by the sub-regional plans, and the 'Cost and Affordability' working group will be looking at pursuing the connection between community understanding of stormwater quality and flood management with support for funding infrastructure investment. The 'Regulatory and

Process' working group will work through the regulatory responsibilities of TAs and regional council.

The topics to be covered by the working groups is summarised below and the relationships between the Forum in informing the planning and consenting process is summarised in Figure 3.

#### **4.1 COST AND AFFORDABILITY WORKING GROUP**

The 'Cost and Affordability' working group will prepare a regional agreement to outline future undertakings and approaches to managing costs, with reference to community endorsement of agreed stormwater management enhancements and service levels as determined through LTP consultation.

Workstreams identified by the group include:

- Seek opportunities to share surveying, data collection, modelling, consent negotiation, consultation and monitoring expertise to maximise efficiency and shift expenditure to implementation (e.g. shared service model);
- Benchmark stormwater capacity and treatment funding approaches and advise the Chief Executives Forum & Ngāi Tahu of differing approaches and associated costs and benefits;
- Provide guidance about potential staging of upgrades using best practice examples from each territorial authority;
- Achieve realistic timeframes for preparing stormwater management plans, whilst maintaining momentum for projects currently underway (noting the proposed LWRP currently requires all territorial authorities to have their network consents lodged by 2018);
- Provide guidance about how to ensure Ngāi Tahu cultural values are provided for in differing designs and the associated costs and benefits;
- Document how the processes for LTP consultation should place greater emphasis on stormwater so that Ngāi Tahu and residents can respond, at a local and strategic level, about the pace at which flooding of dwellings on property can be reduced and water quality standards achieved.

#### **4.2 REGULATION AND PROCESS WORKING GROUP**

The 'Regulation and Best practice' working group is working towards developing a regional planning document outlining the policy framework in the proposed Land and Water Regional Plan and other regional and national planning documents.

Workstreams identified by the group include:

- Investigate the effectiveness of the regulatory framework for stormwater management in Canterbury;
- Oversee & monitor consistent application of the policies and rules in the proposed Land and Water Regional Plan (LWRP) relating to stormwater management;

- Develop standardised consent conditions for use in stormwater network consents;
- Benchmark bylaw provisions for pre-network management of contaminants from industrial and other hazardous site activities and share approaches to align bylaws with the requirements of the proposed LWRP;
- Resolve responsibility for approvals for developer funded infrastructure proposals, and monitoring and enforcement, once constructed (e.g. transfer of consent conditions);
- Resolve and/or provide guidance on which activities should come under a stormwater network consent and which should require separate approval (e.g. discharge of dewatering water into a network);
- Resolve responsibility for ongoing compliance, monitoring and enforcement for all activities managed through network consents;
- Consider merits of individual Stormwater Management Protocols between local councils and Environment Canterbury (as in place with CCC), for the purposes of committing staff at all levels within respective councils to achieve integrated management of stormwater. This would include processes for resolution of key issues before they become matters for legal action;
- Outline how the proposed works under a SMP feed into the consultation to be undertaken for the National Policy Statement for Freshwater Management on setting freshwater objectives.

### **4.3 TECHNICAL DESIGN AND BEST PRACTICE WORKING GROUP**

The 'Technical design and Best Practice' working group is tasked with providing an update to current best practice guidance for stormwater management in Canterbury. The group will also establish workshops to share best practice outcomes with practitioners and stakeholders.

Workstreams identified by the group include:

- Confirm existing useful best practice guidance documents for stormwater management (e.g. Christchurch Waterways and Wetlands Drainage Guide, other NZ & international guidance);
- Undertake a gap analysis to identify further best practice documentation/protocols required in the following areas:
  - Stormwater Management Plan preparation guidance;
  - Treatment options at source;
  - Reducing contaminants at source e.g. use of inert building materials, low impact design, protecting materials used in construction (e.g. coating copper);
  - New technology;

- Research gaps in addressing difficult urban contaminants;
  - Identify effective public education including industry guidance on approved products (e.g. promotion of coloursteel paint);
  - What plan standards, process and other design aspects required;
  - How effects on Ngāi Tahu cultural values can be avoided or mitigated (e.g. opportunities to reduce direct discharges to water);
  - Public/private drain ownership issues and responsibilities;
  - How effects of temporary and construction site discharges are taken into account;
  - Identify best practice methodology to assess network run off impacts on groundwater affecting downstream private drinking wells;
  - Benchmark existing monitoring programmes to provide direction for a regional, strategic approach;
- Establish what other regions in New Zealand are doing to collate, develop and standardise stormwater best practice guidance.

There is a substantial amount of work required to complete the tasks of these working groups, requiring commitment of time and resources from TAs, ECan and Ngāi Tahu. The outputs from these working groups will provide guidance and consistency across the Canterbury Region and drive improvements in stormwater management practice.

## **5 CONSENTING APPROACH TAKEN WITH CANTERBURY TERRITORIAL AUTHORITIES**

Since the pLWRP requires TAs to apply for consents for existing network discharges by June 2018, ECan Consents staff are actively involved in providing TAs with pre-application advice in parallel with the work of the Regional Stormwater forum. The aim of the pre-application advice is to assist TA's to prepare their resource consent applications to ensure that the process is as streamlined and cost-effective as possible and that the desired environmental outcomes set out in the national and regional planning documents are applied consistently across the region.

Previous consents for Christchurch City Council (Styx and South West Christchurch consents) have been expensive, protracted and adversarial, with tension between the expectations of the regional and district councils and iwi. We have worked with CCC staff to try and improve the process for their next resource consent application.

We have also sought to learn from experiences of successful consenting processes elsewhere in NZ, taking a more collaborative approach to developing network discharge consents with TAs. We are attempting to focus on monitoring and adaptive management post-consent to simplify the consenting process and ensure effort and costs are placed where water quality and quantity issues are identified.

As a result of the above work, a new approach is proposed by Christchurch City Council. Previously CCC were obtaining network consents on a catchment by catchment basis, with two catchments consented so far, and another eight still to be applied for. However, after reflecting on the process and experiences from other regions, eg Tauranga and Dunedin, CCC and ECan agreed that a new approach whereby they apply for one consent for the whole district would be a much more effective process. Going through one consent process should reduce consent processing costs considerably and allow for a more holistic and consistent approach to stormwater management in the district.

In addition, CCC are undertaking consultation with a number of parties, including Ngāi Tahu and the CWMS zone committee, prior to lodging the application to try and ensure that their concerns and goals are taken into account at an early stage. We are encouraging all TAs to address consultation and issue identification upfront, rather than being given consideration later through the hearing process which can be adversarial and may not result in satisfactory outcomes for any party. The development of Cultural Impact Assessments (CIA) is being recommended as good practice for all major discharge applications.

Discussions have also occurred about ways in which the ECan can assist in the implementation of the network consents to ensure that consent conditions and associated environmental outcomes are achieved. For example, assisting with management of erosion and sediment control and pollution prevention, both areas in which ECan has existing resourcing and expertise.

The approach currently being taken by CCC is being used as an exemplar for network discharge consenting. CCC are taking a comprehensive approach to managing stormwater and looking to increase their ability to better manage discharges into their network and management of their consent, particularly around erosion and sediment control from roading, earthworks and pollution prevention.

Finally, to ensure that the network consents are implemented effectively, CCC and ECan have established working groups which may form a template for similar collaborative processes with other councils. CCC and ECan have a joint stormwater management protocol that sets out how the councils will work together on stormwater issues. A senior management level stormwater issues management group (SWiM) has been established to share information and resolve stormwater-related matters. A Stormwater Alliance Team (SWAT) has also been established as a working group of SWiM. This collaborative operational level group undertakes joint action between ECan and CCC, particularly around pollution prevention activities eg truck wash and car hire site management to avoid discharges of washwater to the stormwater system and other industrial and commercial sites. A version of the joint stormwater protocol and working groups between ECan and CCC might be considered to manage relationships with other councils.

## **6 CONCLUSIONS AND LESSONS LEARNT**

The Regional Stormwater Forum is in its infancy, however the establishment of the Steering group and working groups represents a great step forward in taking a collaborative approach to stormwater management across the region.

The continued involvement of Ngāi Tahu in the forum is critical for reinforcing the partnership approach mandated by CWMS. The natural synergy between consideration of cultural matters and water quality issues will ensure increased understanding in each

zone of the customary values and uses associated with specific water-bodies or parts of water-bodies.

The need for a working group on regulatory matters has demonstrated the complexity of legislation around freshwater management and lack of understanding of statutory frameworks, delegations and responsibilities among all councils. The opportunity to reach collective agreement on roles and responsibilities will improve clarity and ease relationships between councils.

Bringing all Canterbury TAs together to share information and expertise is also a very positive step, as it is clear that councils can learn from one another on how to make best use of district plans and bylaws. Further collaboration between TAs and sharing of resources is to be encouraged to improve consistency across the region and best value for rate payers.

TAs still face challenges in funding and prioritization of asset management projects to ensure water quality and quantity objectives are met, given national and regional drivers. It is hoped that the relationships developed via the Regional forum and linkages with CWMS will allow councils and the community to better understand the challenges and develop collaborative solutions.

## **7 NEXT STEPS**

With the establishment of the three working groups under the regional stormwater forum it is clear that there are inherent linkages between topics, and with the work of the CWMS zone committees. It is hoped that these linkages can be developed to provide cost-effective solutions for TAs and consistent approaches to improving stormwater management across Canterbury.

One of the most important benefits already seen from establishing the regional forum is the discussion occurring between councils in the use of bylaws and methods for managing assets and discharges. The forum will allow TAs to share experience and expertise for a more consistent approach to asset management across the region.

## **ACKNOWLEDGEMENTS**

I would like to acknowledge the support and advice of my colleagues Jacqui Todd and Steve Gibling (Environment Canterbury) and the continued contribution of the members of the Regional Stormwater Forum.

**FIGURE 3. RELATIONSHIPS BETWEEN REGIONAL FORUM AND PLANNING PROCESS FOR STORMWATER NETWORK DISCHARGES**

