

Guidelines 2005/02



Guidelines for the Development of Comprehensive Stormwater Consent Applications and Catchment Management Plans

Working with our communities for a better environment

Executive Summary

These guidelines outline Environment Bay of Plenty's suggested approach to applying for resource consents for the discharge of urban stormwater along with other activities identified through the Catchment Management Planning process that require consents. The guidelines are directly applicable to the needs of the Territorial Authorities within the Bay of Plenty region who are involved in the management of stormwater.

Urban stormwater reticulation systems are constructed to provide benefits to communities in terms of protection of property, flood control and for health and safety purposes. However, stormwater runoff from urban areas has the potential to adversely affect the water quality and habitats of receiving waters, stability of stream channels, and cause flooding of downstream properties.

The primary aim of these guidelines is to set out the issues, planning concepts, technical methods and other matters that need to be considered in the preparation of urban stormwater discharge consent applications and any accompanying Catchment Management Plans.

In particular, these guidelines identify a process that includes:

- The identification of stormwater management issues at the catchment level;
- An assessment of the 'actual' and 'potential' effects of stormwater on receiving environments;
- The identification and consideration of a range of options and techniques for the management of stormwater;
- A logical progression for determining preferred stormwater management solutions to the issues identified;
- Identifying consent requirements, other than those required for the discharge of stormwater, and applying for these consent requirements based on a preliminary-design level of information; and
- The establishment of Catchment Management Plans that detail the various stormwater management initiatives and controls to be implemented in the catchments identified.

Environment Bay of Plenty Stormwater Strategy

The stormwater management strategies for the Bay of Plenty Region are contained in the Environment Bay of Plenty Stormwater Strategy (SS). The strategy outlines the issues facing stormwater managers in the region, and includes methods to effectively manage these issues given the wide range of often conflicting constraints that stormwater managers operate within.

Catchment-based Approach to Stormwater Management

There is a need to manage urban catchment activities to minimise the risk to public health and safety and effects on the environment. The crucial factor in stormwater management is integrating land-use, stormwater, and infrastructure management. The stormwater management approach that Environment Bay of Plenty promotes through these guidelines is aimed at the catchment level and obtaining resource consents for individual or multiple catchments. It applies a variety of management tools to address stormwater management issues and achieve defined stormwater management objectives.

Stormwater Catchment Management Planning

For stormwater management activities to be effective, it is important that they are guided by strategies or plans. A 'Catchment Management Plan' is the basic planning and management tool for stormwater at the individual catchment level. It links strategic level policies and the implementation of stormwater management initiatives and controls.

Catchment Management Planning is the key theme in these guidelines. The establishment and implementation of a Catchment Management Plan is a fundamental part of the urban stormwater discharge consent process. It is required for all consents that authorise multiple discharges of stormwater from urban catchments. It is also the principal way that remedial and improvement programmes are to be established and stormwater management objectives set for the catchments identified. It is an important source of information for long-term asset management planning and financial programming.

Issues for Consideration in Consent Applications and Catchment Management Plans

The matters listed in these guidelines that should be considered with all consent applications fall within the four general categories of:

- General Information and Catchment Land Use;
- Water Quantity;
- Water Quality; and,
- Receiving Environment.

Applying for wide ranging consents is encouraged. This minimises duplication of effort and provides certainty to the TA and Regional Council of the works required to manage stormwater on a catchment by catchment basis. It is likely that detailed design information will not be available at this early stage, however preliminary design may be appropriate to base decisions on, subject to further consultation and detailed design if necessary in the future.

These guidelines are not a prescriptive list of items that must accompany every consent application. They present a range of issues that may be present in a catchment, and identify the type of information that should be considered in understanding and resolving those issues. The actual information to accompany an application is determined following identification of the specific catchment issues and is particularly aimed at resolving those issues.

Implementing these guidelines will ensure that a consistent approach is taken in the preparation of urban stormwater discharge consent applications and in addressing urban stormwater issues across the Bay of Plenty Region.

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Chapter 1: Introduction

The aim of these guidelines is to set out for the region's territorial authorities, those matters that require consideration before seeking consents for catchment stormwater discharges. The objectives of the guidelines are:

- (i) Streamlining consent processing by outlining in detail to applicants the type and level of information required to support the applications so that the time and expenses incurred throughout the consent processing phase are minimised for all parties involved;
- (ii) To provide certainty to the applicants by encouraging comprehensive consenting by approving resource consents with supporting Catchment Management Plans (CMPs) that give the applicant the understanding that works and installations will be able to be constructed in the future with minimal further regulatory processing costs;
- (iii) To provide Environment Bay of Plenty with the assurance that the catchment threats will be managed to protect property and receiving environment values; and,
- (iv) To ensure that iwi, the public and other potentially affected parties are able to have the opportunity to take part in an open and meaningful consultation process with regard to any specific aspects on the applications that may affect them.

These guidelines outline Environment Bay of Plenty's suggested approach to applying for resource consents for the discharge of urban stormwater and associated consents. These guidelines are complementary to the Environment Bay of Plenty Stormwater Strategy (SS) that has been prepared to identify the stormwater management issues facing the region. The strategy also sets out, among other things, the regulatory framework for stormwater management across the Bay of Plenty and outlines regional and local responsibilities. The strategy is detailed further below.

Whilst these guidelines are primarily directed towards the needs of the Territorial Authorities (TA's), the principles also apply to other utility organisations and sites that have their own separate stormwater systems. Implementing these guidelines will ensure a consistent approach is taken when addressing urban stormwater issues during the preparation of urban stormwater discharge consent applications in the Bay of Plenty Region.

In particular, these guidelines:

- Detail application requirements for the management of both the existing and potential catchment resources that Environment Bay of Plenty consider need to be addressed.
- Detail existing and potential issues relating to the management of stormwater that may be present in a catchment and methods of identifying such issues.
- Identify issues that need to be addressed for the future management of the catchment. This can include financing, implementation and monitoring the achievement of objectives.

- Require that a range of options and techniques for the management of stormwater within the catchment be considered in achieving the objectives identified.
- Require a logical progression for identifying the preferred option for the management of the collection and discharge of stormwater from the identified catchment.
- Identify the information that should be included in any application for resource consent for the comprehensive discharge of stormwater and associated works for the subject catchment.

1.1 Bay of Plenty Stormwater Strategy

The Stormwater Strategy outlines the stormwater issues for the Bay of Plenty region. It assists the regions TA's by providing a framework from which to devise their own localised stormwater strategies and action plans. The strategy promotes application of the outlined principles to ensure that stormwater is managed consistently across the region, and that the effects of stormwater discharges are dealt with adequately. The strategy recognises the various statutory responsibilities the regional and local authorities have, as well as the benefits of addressing stormwater management on a comprehensive basis across the Bay of Plenty.

1.2 Statutory Framework

1.2.1 Policy and Planning Provisions

(a) Regional Council Functions, Duties and Responsibilities

A key function of Regional Councils under section 30 of the Resource Management Act (RMA) is – “the establishment, implementation and review of objectives, policies, and methods to achieve the integrated management of the natural and physical resources of the region.” These objectives, policies and methods are set out in the Bay of Plenty Regional Policy Statement (RPS). The RPS recognises that urban stormwater runoff is a significant resource management issue and that urban stormwater can be a significant point source discharge of contaminants.

To manage the effects of the discharge of stormwater in an effective and integrated manner, Environment Bay of Plenty supports a catchment-based approach for existing urban areas, and for areas that may be urbanised in the future.

1.3 Territorial Authorities

TA functions under section 31 of the RMA include:

“The establishment, implementation and review of objectives, policies, and methods to achieve integrated management of the effects of the use, development and protection of land and associated natural and physical resources of the district;

The control of any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards and the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances on land;

The control of subdivision of land.”

Under sections 124 to 129 of the Local Government Act 2002, TAs are required to carry out a water and sanitary services assessment. In particular, Section 126 requires that:

- (1) an assessment of water services must contain the following information
 - (a) a description of the means by which –
 - (iii) stormwater is disposed of within the district, including the extent to which drainage works are provided within the district by the territorial authority and any other person; ...

There is no statutory requirement, therefore, for TAs to provide public stormwater drainage works but in practice the service is provided as a ‘public good’. All discharge activities relating to stormwater drainage are subject to the provisions of the RMA and the relevant regional policy and planning instruments.

1.4 Comprehensive Stormwater Consents

These guidelines assist in the preparation of applications for Comprehensive Stormwater Consents (CSC). A CSC enables a consent and catchment management planning process for multiple stormwater discharges in urban catchments¹. The process provides the framework for integrating the management of resources: land, ecological, biological, water, infrastructure, human and economic resources at the catchment level. Environment Bay of Plenty encourages the preparation of CSC applications as an aid to effective and efficient management where multiple urban stormwater discharges require consent.

Urban catchment activities need to be managed to minimise the disruption to natural systems (including native flora and fauna), the benefits they provide, and the risk to public health and safety. The crucial factor in stormwater management is integrating land-use, stormwater, and infrastructure management at the catchment level. A CSC should be viewed as a process that achieves this integration through catchment management planning and the use of the different approaches and tools available, including:

- Planning;
- Education;
- Regulation;
- Implementation;
- Monitoring; and,
- Enforcement.

These methods of implementing stormwater management initiatives are outlined in more detail in the strategy.

¹ In the context of these guidelines, an ‘urban catchment’ is considered to be a defined urban area for which a CSC is sought. The defined urban catchment may be the entire urban area from which rainfall is collected and consist of many hydrological sub-catchments. It is likely to have multiple stormwater discharge points to receiving water that are located both within and beyond its boundaries.

Establishing a consistent management approach is important for stormwater management in the foreseeable future, for its ability to adapt if circumstances and/or assumptions about the future were to change significantly. It is important that a CSC enables a catchment management planning process that ensures this flexibility and evolution of the process is taken into account and open to improvement if the circumstances warrant it. A CSC will therefore be granted on the basis that CMPs are established and implemented as a condition of consent and are reviewed and updated on a defined basis.

Historically stormwater management has focused on flooding issues. Today stormwater quality and receiving environment effects are being better understood. A CMP should set out the relevant issues for a catchment and then develop and/or use existing appropriate tools to plan and manage the variety of stormwater issues present. These relate to 'water quantity', 'water quality' and 'receiving environment' issues.

1.5 What a CSC Authorises

Environment Bay of Plenty approval of a CSC authorises all stormwater related activities for the entire catchment or group of catchments for which the application was made.

It is expected that catchment management planning will identify a number of stormwater management measures necessary to allow development while providing protection from a number of likely effects. Such effects include flooding, stream channel erosion and effects on aquatic values within the receiving environment from scouring and accumulation of toxic contaminants. The CMP and the CSC application should identify specific works and activities required for stormwater management within the catchment. Examples are identified in the following table.

Table 1.1 Examples of Stormwater Related Activities to be considered for Inclusion in Comprehensive Stormwater Consents

Activity	Examples
Discharges	<ul style="list-style-type: none"> • Stormwater from roofs, driveways, yards, carparks, • Stormwater from roads, streets, highways • Contaminated stormwater from commercial and industrial premises • Contaminated stormwater from small scale earthworks sites • Stormwater discharges authorised by existing consents. • Existing stormwater discharges covered by permitted activity rules.
Maintenance Activities	<ul style="list-style-type: none"> • Maintenance of stormwater treatment devices and systems • Maintenance of stormwater infrastructure • Repairs to structures, reinstatement of flood damaged works or structures • Litter/debris removal
Stormwater related Activities in the Beds of Rivers, Lakes, Watercourses and in the Coastal Marine Area.	<ul style="list-style-type: none"> • Outfall structures • Treatment devices/swales • Piping of watercourses/artificial lining, widening and channelling • Debris deflectors • Diversions • Detention structures and dams • Floodgates, pump stations • Stopbanks • Vegetation removal • Vegetation planting • Pipeline crossings of streams/watercourses • Flood ways/secondary flow paths • Weirs/measurement stations • Mitigation works in streams and watercourses • Earthworks associated with installation of stormwater infrastructure including detention dams, swale construction, protection works, mitigation works, flood ways

Environment Bay of Plenty promotes undertaking preliminary design for such installations that will provide a level of information sufficient to make a decision on its appropriateness given the local circumstances. There may be constraints to achieving this, however, Environment Bay of Plenty strongly encourages that all necessary consents are applied for. This will reduce duplication in the future and, providing the consents are obtained, allow the TAs to undertake their role with reduced involvement from the regional council.

One important aspect of allowing CSC applications to include a number of other consents related to the overall catchment management, is to give the TA the certainty that development may progress within the catchment under certain restrictions, while not being impeded by ongoing time consuming consenting procedures. However, there will still need to be a robust and thorough assessment process undertaken by Environment Bay of Plenty prior to construction of individual work to consider the potential effects of those works, including the effect on any potentially affected party. This may require further consultation with affected parties when detailed design occurs, if works (for example to construct a stormwater detention dam) are based on preliminary design only.

It should be noted that a CSC does not authorise either:

- bulk earthworks for subdivisional development and land contouring and associated sediment contaminated discharge that does not comply with the rules for permitted activities specified in relevant Regional Plans; or
- discharges from industries and/or activities specifically excluded from each CSC.

1.1 **Catchment Prioritisation**

Environment Bay of Plenty and the relevant TAs have undertaken the prioritisation of catchments across the Region. This prioritisation is detailed in the Environment Bay of Plenty SS, which includes ranking of the catchments that require assessments and CMPs to be developed to support the CSC applications.

Refer to Section 6 in the strategy

Chapter 2: Catchment-Wide Approach to Stormwater Management

2.1 Introduction

The approach that Environment Bay of Plenty promotes for catchment-wide stormwater management in urban catchments is set out below:

2.1.1 Values

Identify the catchment and receiving environment values, including those that should be protected and enhanced. Catchment values have been considered on a summary basis during the prioritisation process, however, further detailed investigation into such values may be needed;

2.1.2 Issues

Identify actual and potential stormwater management issues (further details are contained in the strategy) such as:

- Flooding
- Land stability
- Pollution from urban stormwater and other contaminant sources
- Industrial sites
- Hazardous substances management
- Contaminated site and high risk facility management
- Urban development
- Effects of stormwater runoff on receiving environments;

Historical records will provide guidance on many of these matters.

Objectives: Set stormwater management objectives for the catchment that relate to the catchment and receiving environment values, and identified stormwater management issues;

Options: Present alternative stormwater management options and describe their consequences in terms of providing catchment-based management solutions to the issues identified, and achieving the set stormwater management objectives;

Methods: Propose the preferred means for addressing stormwater management issues and implementing the preferred stormwater management solutions. Include the principal reasons for adopting the approach and the environmental results anticipated;

Implementation: Implement the various catchment-based stormwater management initiatives and controls, as detailed in the CMP;

Monitoring: Following implementation of the various catchment-based stormwater management initiatives and controls, carry out monitoring to confirm that the anticipated environmental benefits are realised.

2.2 Cumulative Impacts

Many stormwater effects are only significant when considered cumulatively. Small contributions of contaminants or gradual increases in flow through development may not be noticeable on a day-to-day basis. Over time these small increases in flow or contaminants collectively combine to give a noticeable and significant effect. The need to consider effects collectively necessitates the catchment-based approach, and requires potential urban development scenarios to consider the maximum credible development of a whole catchment.

Chapter 3: Scope of Comprehensive Stormwater Consent

3.1 Scope of consent

A CSC authorises the discharge of stormwater for the entire urban catchment as well as other activities identified as necessary through the Catchment management planning process. This may include consents pursuant to sections 9, 12, 13, 14 and 15 of the RMA. Section 1.5 of these guidelines notes that should other activities be identified that require consents, then it is encouraged that these activities also be included with the overall CSC application. In addition, the checklist contained in Annex 1 should be completed for each CSC application and all likely consents identified.

3.2 Term of Consent

The CSC will be granted for a maximum period of up to 35 years, unless circumstances are such to warrant lesser terms. Understanding of stormwater management issues has dramatically changed over the past 35 years and our knowledge of the effects of stormwater discharges and how management of these discharges may be improved will continue to increase. Where the effects of stormwater on the receiving environment are not fully understood, or the proposed stormwater management solutions are only able to partially mitigate the effects, it is likely that consents will be granted for a shorter duration. Longer term consents may be granted with review conditions that allow reviews to take place on a 5 or 10 yearly basis depending on the catchment circumstances.

The consent will only authorise the discharge of stormwater relative to the proposed development scenario and intensity detailed in the application. Changes to such variables throughout the term of consent are likely to require a change to the existing consent, or a new consent.

3.3 Flooding Issues

Stormwater reticulation systems in conjunction with urban land-use can adversely affect flood potential by:

- (v) Limiting the rate at which stormwater leaves a catchment (i.e. depending on the reticulation pipe sizes and the presence of obstructions to natural stormwater flow paths);
- (vi) Increasing the rate of stormwater discharge to downstream catchments (i.e. by collecting, aggregating and discharging stormwater).

In many cases it is difficult to separate the natural ponding of stormwater in urban areas from effects of stormwater reticulation. For example, to what extent is urban ponding a result of decisions about reticulation pipe sizes and locations, and to what extent is it natural phenomena resulting from a combination of rainfall and topography? Further to this, in some instances ponding is the direct result of the deliberate design of the stormwater system to reduce peak flows down stream during high intensity rainfall events.

In terms of the CSC process, the matters that Environment Bay of Plenty seeks to control are those relating to points 1 and 2 above. These are considered to be the direct potential effects of the discharge of urban stormwater in terms of catchment flooding. Specific information is therefore required to enable an appropriate assessment of these effects, as detailed in section 7 of these guidelines.

The effects of 'natural' ponding on urban properties will not be directly controlled via CSCs. However, due to the grey area between 'natural' ponding, and ponding exacerbated by decisions about pipe sizes and locations, Environment Bay of Plenty will require information about the extent of existing flooding problems in urban catchments (i.e. where is flooding a regular problem within urban catchments?).

3.4 Stormwater Contamination

The passage of stormwater runoff over impervious surfaces to watercourses, aquifers or the marine environment provides an effective pathway for contaminants to be entrained and discharged to receiving waters. Accumulation of these contaminants (primarily sediment, heavy metals, nutrients, pathogens and hydrocarbons) in deposition zones can cause the concentrations of the contaminants to reach levels that are toxic to freshwater and marine life (acute effects). Chronic long-term effects may occur where the build up of contaminants in deposition zones is detrimental to animals that live in the sediment which provide the basis of the biotic assemblage within an estuarine or freshwater system.

It is for this reason, that stormwater quality measures are incorporated as integral components of any Catchment Management Planning process, where there are activities within the catchment identified as contaminant contributors (industry and highly utilised roads for example) and receiving environment resources that require protection (surface water contact recreation, stock watering, amenity values, fish spawning areas etc).

For the CSC process, Environment Bay of Plenty proposes that stormwater quality or contamination issues should be considered to the following level of detail for existing and future development scenarios in urban areas.

- (vii) Identification of catchment land use and undertake mass loading calculations for the discharge of contaminants (based on Table 1, Environment Bay of Plenty SS);
- (viii) Identify down stream and receiving environment resources that may be affected by any ongoing discharge of contaminants; and
- (ix) Assess if methods need to be employed to address ongoing contaminant discharge.

This is addressed in further detail in Section 5.4

3.5 **Wastewater Issues**

Stormwater reticulation systems provide a conduit for a wide range of contaminants, including those derived from wastewater sources (e.g. human pathogens, oxygen demanding substances and heavy metals derived from wastewater system overflows and illegal wastewater system connections to the stormwater system). Wastewater discharges are reportedly not a common occurrence in the Bay of Plenty, however, such contaminants can significantly impact upon catchments and receiving environments. A key approach of these guidelines is the identification of catchment-based issues to be evaluated and resolved. It is important, therefore, that wastewater related contaminant sources are identified, their effect on catchment and receiving environment values assessed, and an appropriate management approach developed through the CSC and Catchment Management Planning process.

It is expected that the identification of wastewater issues will identify the extent that wastewater contributes contaminants to the catchment, and whether further specific wastewater investigation and assessment is required.

Chapter 4: Stakeholders and Affected Parties

In development of a CSC application, it is necessary to identify those parties who may be affected by the management of stormwater in the identified catchment.

Stakeholders have a vital role to play in determining the specific values and objectives that apply to the catchment being considered. General guidance to determine values is available from the results of the catchment prioritisation process as well as a number of district and regional statutory planning documents; these include the Regional Policy Statement, the Bay of Plenty Regional Coastal Environment Plan, the Bay of Plenty Regional Air Plan and the Proposed Regional Water and Land Plan.

Environment Bay of Plenty, as a stakeholder, also has specific interest in the values considered for a catchment. Further to the information contained in the catchment prioritisation process, Environment Bay of Plenty is willing to assist in further determination of values for a specific catchment in conjunction with other stakeholders.

It is important to identify the potentially adversely affected parties early on in the process of developing a CMP and identify what activities may be necessary in order to ensure that consultation is undertaken with appropriate parties through the process of developing the CSCs and other consent applications. Roles and responsibilities of those involved in stormwater management shall be considered in developing a long-term management strategy for any particular catchment. The roles and responsibilities of individual stakeholders will vary locally.

Chapter 5: Issue Identification

5.1 General

When preparing CSC applications, it is necessary to identify all issues and concerns related to the management of stormwater within the specific urban catchments. The nature, location, extent and severity of the issues will vary between catchments and over time with changing levels of development and land-use.

It is critical that catchment specific issues are clearly determined so that reasonable objectives and management solutions are developed during the CSC and Catchment Management Planning process. Identification of catchment-based issues requires careful review and analysis of available documentation, discussions with key stakeholders and affected parties, and land-use and receiving environment assessments.

For greenfield catchments earmarked for development, the overall goal of the CSC is protection or enhancement of existing values in the receiving environment. There are often natural stream channels that have aquatic resource values or potential values that should be protected (or enhanced where appropriate). Protection of stream channels cannot be achieved unless stormwater is controlled close to source. Therefore the focus should be toward on-site stormwater management considerations as opposed to consideration to only off-site catchment wide approaches. Low impact or conservative design developments will be encouraged as will off-line stormwater treatment measures.

For developed catchments, the overall goal of stormwater management should be to improve existing values within the receiving systems. There will be potential for improvement in such catchments, however, it is acknowledged that the same level of improvement is not expected when compared to greenfield catchments.

5.2 Overview of Urban Stormwater Management Issues

In accordance with the RMA and the RPS, the management of the adverse effects of urban stormwater runoff across the region is the responsibility of Environment Bay of Plenty and the TAs. In addition to the details covered in the strategy, the following discussion provides an overview of the potential adverse effects that may arise from the discharge of stormwater from urbanised catchments.

The traditional approach to stormwater management has been to consider stormwater on an individual site basis, not accounting for wider management issues. Consequently, individual site analysis has not traditionally considered downstream impacts on a chronic or cumulative basis. The negative effects of this 'piecemeal' approach can include:

- Depending on location, it only partially solves flooding issues, e.g. it may solve flooding issues in an upper part of a catchment but may increase flooding issues downstream, by discharging flows downstream more quickly;

- Issues related to aquatic resource protection or enhancement cannot be considered or are ineffectual;
- Significant capital and operation/maintenance expenditure may be incurred on numerous individual stormwater facilities;
- Remedial structural solutions may cost more than implementing integrated site management measures in the first instance.

On the other hand, catchment management approaches give clear goals for the overall programme and should result in the following benefits:

- Consideration, from a holistic perspective, of how natural resource systems are to be protected or enhanced;
- Setting priorities for a long-term integrated approach to resource and public protection;
- Encouraging public and stakeholder participation so that all parties contribute to catchment-based stormwater management solutions;
- Integrating all appropriate tools and resources into a co-ordinated, cost-effective, co-operative approach (e.g. low impact designs, risk management, pollution prevention programmes, stormwater treatment, receiving environment protection and enhancement);
- Determining the funding sources for the implementation of stormwater management solutions, monitoring, and maintenance;
- Identifying opportunities for preventative non-structural source controls (such as education initiatives, management systems and policy directions) in addition to structural controls (such as primary, secondary and tertiary treatment technologies) to better manage the effects of urban stormwater,
- Designing comprehensive systems for the long term needs of communities.

The following sections outline stormwater management issues that should be considered when determining the specific issues present in urban catchments.

5.3 Stormwater Quantity Issues

5.3.1 Land-use Activities and the Effects on the Quantity of Stormwater Discharged

Impervious surfaces created as a result of urban development such as roofs, driveways and carparks intercept rainfall and prevent infiltration directly to ground. The resultant runoff flows at much higher rates and in larger quantities than corresponding 'natural' or 'undeveloped' catchments and alters the hydrological regime of the catchment. Reduced infiltration reduces recharge of groundwater aquifers and subsequent supply of base-flow to streams.

The effects of the alterations to the hydrological cycle may include:

- Increased flooding hazard - through the increased rate and volume of runoff from impervious surfaces, flood elevations can be increased;

- Increased stream bank erosion - through increased peak flows and more frequent high flows causing instability of stream banks;
- Increased erosion on land and in the vicinity of stormwater outlets through the concentration of flows;
- Diminished receiving environment health and diversity - brought about by alterations in the hydrological regime, such as reduced minimum flow rates reducing aquatic ecosystem viability, habitat availability and downstream sedimentation effects;
- Reduced ground water resource and stream base-flows.

5.3.2 Values Potentially Affected by Changes to the Hydrological Regime

Risks of flooding on people, property and the environment – Increased runoff increases the risk of flooding in urban catchments and will impose a greater risk to human safety, property and the environment.

Ecological and Habitat Values – Increased uncontrolled runoff will result in increased erosion. Increases in streambank erosion can be grouped as 'instream' (channel widening and undercutting of streambanks) and 'out of stream' (slumping as a result of sheet flows and saturation of sloping land). Increased erosion on land may also occur from changes to the hydrological regime. All types of erosion raise sediment loads within watercourses, potentially smothering aquatic flora and fauna, while instream erosion may result in the removal or modification of suitable habitat for aquatic flora and fauna. Reduced low flows also potentially affect aquatic resources.

Amenity Values - The public's use and enjoyment of natural waterbodies may be adversely affected by the physical changes brought about from flooding, erosion and sedimentation. The resultant degradation can potentially affect recreational use and the aesthetic qualities of the waterbody.

Tangata Whenua Values - The significance of discharges to Tangata Whenua is that the contamination or degradation of water has the effect of diminishing the 'Mauri' or life force of receiving waters.

Public Use – During periods of low flows the water resource available to downstream water abstraction users can be degraded through the assimilative capacity of the receiving water being reduced.

5.3.3 Values Potentially Affected by Works to Manage the Effects of Flooding

The receiving waters of urban catchments may be modified by piping and/or the construction of engineered channels for scour protection to improve drainage efficiency and reduce localised flood flows. These modifications can alter the ecological and habitat values of receiving waters by introducing barriers to instream fish migration, and by reducing or fragmenting suitable stream habitat. They will also potentially affect other values such as those detailed in section 5.3.2. The loss of these values can often be avoided or mitigated through the careful design of stormwater management facilities.

5.4 Stormwater Quality Issues

5.4.1 Land-use Activities and the Effects on the Quality of Stormwater Discharged

Many urban land uses can generate contaminants that enter stormwater reticulation systems and discharge to receiving waters. These include:

- Transportation, storage, use and disposal of toxic and hazardous substances;
- Vehicle use and emissions;
- Earthworks during construction and urban development;
- Poor industrial and commercial site management practices;
- Poor domestic, commercial and industrial waste disposal practices;
- Runoff from roads, car parks, roofs and other paved surfaces.

Typical contaminants found in urban runoff include:

- Sediment;
- Metals (including zinc, copper, and lead);
- Oils and grease;
- Oxygen demanding substances (decomposition of organic debris);
- Nutrients (predominantly nitrogen and phosphorus);
- Pathogens (human and animal wastes);
- Litter;
- Others (e.g. pesticides, herbicides, waste paint, solvent and oils).

The resultant effects of contaminated stormwater entering receiving waters can include:

- Reduction in dissolved oxygen levels;
- Bacterial/pathological contamination of bathing waters and shellfish resources;
- A range of thermal impacts resulting from runoff discharges at elevated temperature levels;
- Smothering of bottom dwelling animals;
- Acute and chronic toxic impacts on sensitive species;
- Eutrophication;
- Aesthetic degradation;

- Scouring of habitats associated with increased flows.

5.4.2 **Values Potentially Affected by Contaminated Stormwater Entering Receiving Waters**

Ecological and Habitat Values - Stormwater contaminants attached to particulates tend to settle out in 'depositional areas' where the turbulence and energy in the water column is insufficient to keep sediments mobile. Accumulated contaminants in some of the receiving waters in the region are at levels where adverse effects on aquatic flora and fauna may be observed.

Amenity Values - The public's use and enjoyment of natural water bodies may be adversely affected due to the physiochemical changes brought about by contaminated stormwater entering these water bodies. The resultant degradation of water quality can potentially affect recreational use and the aesthetic qualities of the water body.

Tangata Whenua Values - The significance of discharges to Tangata Whenua relate to the contamination and degradation of water that has the effect of diminishing the 'Mauri' or life force of receiving waters.

Public Health/Use – Stormwater contamination has potential public health risks for contact recreation activities, drinking water supplies, and fish consumption. The development of conveyance infrastructure may pose sale issues for the surrounding community.

Chapter 6: Catchment Management Planning

To achieve comprehensive and integrated stormwater management it is important that stormwater management activities are guided by strategies or plans. A CMP is the basic planning and management tool for stormwater at the individual catchment level. It provides the link between the strategic level policies and the implementation of stormwater management initiatives and controls. A CMP is required for all CSCs. It is the principal means by which remedial and improvement programmes are to be established and stormwater management objectives set.

A CMP should only be as detailed as necessary for the specific situation. While the following guidelines list the issues and matters that need to be considered, a number of catchments will not require an extensive investigation into all aspects noted. The nature of the catchment and receiving environment should reflect in the level of detail contained in any CMP. For catchments that include significant potential sources of contaminants or high levels of imperviousness and/or with highly valued receiving systems then more detailed CMP to support a discharge consent application should be developed. More straightforward CMPs are expected where catchment and receiving system conditions are less complicated.

CMPs will assist TAs in recognising the stormwater related impacts of land-use activities within urban catchments, and to develop 'best practice' management strategies and programmes to address those impacts at the catchment level.

The level of detail required for consent activities, other than the discharge, over and above the CSC that is identified as necessary is contained in Annex 1. It is expected that a preliminary design level of information will be reflected in these applications, and consideration of any likely effects and potentially affected parties and any consultation entered into as a result. As consultation with affected parties will be required for the overall CSC, consultation requirements may be streamlined by considering all affected parties up front. Environment Bay of Plenty may request, via conditions of consent, that further consultation take place as design of any stormwater treatment measure proceeds and the potential effects are defined in detail.

6.1 Risk Management

Risk management is based on assessing the risk or likelihood of losing significant values of receiving environments due to the impacts of urban stormwater. Stormwater flows (quantity) and stormwater pollution (quality) pose a threat to environmental, tangata whenua, amenity, and public health/use values. The risk of those values being impaired or lost depends on two factors:

- The scale or severity of the stormwater threat; and
- The sensitivity of the receiving environment to that threat.

The process of identifying catchment-specific stormwater management issues should therefore be risk-based to assist the development and prioritisation of appropriate stormwater management objectives at the catchment level.

6.2 Stormwater Management Objectives

Having identified and assessed the issues relating to stormwater management, under existing and likely future conditions within the catchment, consideration should be given to the measures required to achieve these environmental outcomes. Environmental outcomes are described as the Stormwater Management objectives, within the identified catchment.

When assessing any application for a resource consent, Section 104 of the RMA outlines the matters to be considered by Environment Bay of Plenty, subject to the provisions in Part II of the RMA, while having regard to any relevant objectives, policies and rules in any relevant policy statements and plans. Furthermore, Environment Bay of Plenty may only grant a resource consent for the discharge of stormwater in accordance with the provisions of Section 105, 107 and 108 of the RMA.

In setting objectives relating to resource management issues within a catchment regard needs to be had to the relevant statutory requirements and policy provisions in the relevant policy documents and plans. Reference should be made to the Regional Policy Statement, the Bay of Plenty Regional Coastal Environment Plan, the Bay of Plenty Regional Air Plan and the Proposed Regional Water and Land Plan. These requirements and provisions set out the framework from which any objectives for the management of the stormwater system should be developed.

In setting objectives for the management of stormwater within a catchment, matters other than resource management issues need to be considered. These might include the TA's asset management planning issues such as the day-to-day management functions and the costs of constructing new or upgrading existing infrastructure as well as ongoing maintenance costs. These should form part of the objective setting process for the management of stormwater within the catchment.

6.3 Option Analysis

Options for achieving stormwater management objectives should consider the range of point source and non-point source discharges within urban catchments. This will help develop stormwater management solutions that promote the integrated management of natural and physical resources. It is important that stakeholders and affected parties are actively encouraged to participate during this stage of the planning process.

The consideration of stormwater management options requires a wide range of traditional and non-traditional stormwater management practices to be identified and evaluated. Environment Bay of Plenty considers that CMPs are broad planning instruments that may include a range of initiatives and controls to manage the effects of catchment discharges. Therefore initiatives and controls considered for inclusion in CMPs should not be restricted to traditional 'structural' practices to fix or mitigate stormwater effects, but include longer term solutions such as land-use policy and planning controls, non-structural source initiatives and controls, and the application of the broad range of available primary, secondary, and tertiary treatment technologies. By considering this range of initiatives and controls, innovative and integrated catchment specific solutions can be developed.

The scope of practices recommended must be practical and effective. Method 8.3.1(c)(xvi) of the Regional Policy Statement states that district councils are encouraged to “have regard to the maintenance and enhancement of water quality in considering resource consent applications and in district plans”. This should include the use of longer-term tools in the suite of practices that are recommended to meet the adopted Stormwater Management objectives.

In terms of determining ‘options’, section 2 of the RMA provides a definition of ‘Best Practicable Option’, i.e.

“Best Practicable Option ... means the best method for preventing or minimizing the adverse effects on the environment having regard, among other things, to

- (a) the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and*
- (b) the financial implications, and the effects on the environment, of that option compared with other options; and*
- (c) the current state of technical knowledge and the likelihood that the option can be successfully applied.”*

6.4 Implementing Initiatives and Controls

The implementation of ‘best practice’ stormwater management solutions is a critical consideration for Environment Bay of Plenty and the TAs. When issuing a CSC, Environment Bay of Plenty requires certainty that the catchment-specific stormwater management issues are addressed, and the stormwater management objectives met.

An implementation programme, detailing the timing or at least the staging for the various stormwater management initiatives and controls to be implemented within the catchment, should therefore be developed as part of the Catchment Management Planning process.

However, it is understood that in many cases this may not be possible because of the lack of specific information. There may even be situations where there is insufficient data to enable any robust decisions to be made on the scale or magnitude of the perceived issues, let alone on the best stormwater management solutions to be implemented. In such cases a CMP should be prepared regardless. Although there will be limited initial information, the planning process should concentrate on providing:

- An assessment of the existing information gaps;
- A plan of action to improve available information to facilitate future review of the CMP;
- An assessment of the likely stormwater management issues and the likely range of possible solutions;
- An assessment of the risk associated with the likely issues and problems within the catchment; and
- A timetable for the programme of investigation needed to complete the CMP in accordance with these guidelines.

As more data becomes available, or the stormwater priorities for the catchment change, the CMP can be updated and reviewed and where works are identified, further consent applications and supporting information lodged. Each urban catchment should be considered in its entirety with sub-catchments used to characterise the issues (i.e. each sub-catchment and its various land uses is likely to present significantly different issues).

Chapter 7: Matters to be Included In CSCs and CMPs

The matters listed below must be included in CSC applications lodged with Environment Bay of Plenty. Information to be submitted can be classified in four broad categories; general information, water quantity, water quality, and aquatic ecosystems.

Applications for CSCs should include an Assessment of Environmental Effects (AEE) with consideration of all the matters detailed in the Fourth Schedule of the RMA. The scale and complexity of the AEE should also be in proportion to the receiving environment sensitivity, the scale of discharge effects and the complexity of the issues. These guidelines are provided as an indication of the issues that may be present in a catchment and the work Environment Bay of Plenty considers necessary to adequately analyse and comprehensively plan for their management. However, any given catchment may require additional investigation to understand and resolve specific issues.

It may not be necessary in every case to provide a detailed analysis and management options associated with the Water Quantity, Water Quality and Aquatic Ecosystem sections. However, it is important to provide information for each of the topics and explain why it may not be appropriate to go into greater detail on any individual aspects. It is expected that water quantity and quality will be addressed in each CSC. The inclusion of aquatic ecosystem objectives and requirements will depend on the individual catchment that a CSC is being applied for.

7.1 General Information

Information requirements include the following:

7.1.1 Inputs

- (d) Identification of the Stormwater Management objectives to assist in managing the effects of the discharge of stormwater in the catchment taking into account any relevant statutory requirements and policy directions.
- (e) Outline of regulatory framework and policy directions. Consideration should be given to the Regional Policy Statement, Proposed Regional Water and Land Plan, Bay of Plenty Regional Coastal Environment Plan and the appropriate Environment Bay of Plenty technical publications.
- (f) The limits of the catchment for which CSC is sought.
- (g) Map references of the overall catchment discharge points including each pipe outlet that discharges to “land” or “water” as defined by the Resource Management Act.

- (h) An aerial photograph of the catchment, if available.
- (i) Maps or plans of the catchment showing the following information:
- Catchment boundaries and principal subcatchments,
 - Catchment topography, particularly receiving water locations,
 - Pipe and 'open drain' discharge points to receiving waters,
 - Reticulation infrastructure, including the main pipe systems, open drain systems, and any wastewater system overflow points, including existing consents (public and private),
 - Existing information on secondary flow paths,
 - Existing land-use based on existing District Plan zoning,
 - Soil and geological information.
- (j) A description of groundwater / surface water interaction in the catchment, where relevant.
- (k) An inventory and map showing the location of:
- Significant natural resources (e.g. green network features and natural receiving waters), including an identification of vegetation and species habitat for both aquatic and terrestrial systems is required. As a guideline, reference should be made to the classifications and values that are outlined in the statutory and relevant planning documents,
 - Key industrial sites and their potential hazard,
 - Sites of cultural, historical, archaeological and geological significance.
- (l) A description of all existing water-related consents in the catchment (assistance will be required from Environment Bay of Plenty to obtain this information).
- (m) Identification of any geological, topographical or any other constraints that may influence or limit stormwater management options.
- (n) Identification of stakeholders and parties affected by the management of stormwater in the catchment, any consultation undertaken and the results of that consultation.
- (o) A description of the receiving environments. Relevant data should be compiled (e.g. photographs, maps) describing the receiving waters in the catchment. The character of each receiving water should be described, including such details as size, flow characteristics, general water quality characteristics, stream channel modifications, and ecosystem health, i.e. habitat quality and the abundance and diversity of biological communities present.
- (p) An assessment of the extent to which the existing land-use within the catchment is developed to capacity against District Plan zonings.

- (q) An assessment of the likely development scenarios of the catchment, using a projection period greater than or equal to the sought consent duration. In determining the likely future development scenarios, an estimate must be made of the likely area of impervious surfaces to be created in the catchment, and the anticipated future land uses which may lead to an increase in the quantity of runoff volumes and the concentration of contaminants entering receiving waters. Likely development scenarios for a catchment should be determined by analysis of the statutory and relevant planning documents that relate to the catchment.

7.1.2 Outputs

- (a) The options and proposed management solutions to catchment-based issues should be assessed against the identified stormwater management objectives, as well as the provisions of the statutory and relevant planning documents to determine the appropriate stormwater management approach.
- (b) Identification of the catchment / receiving environment values, stormwater management issues, and stormwater management objectives. Emphasis should be placed on identifying and evaluating 'best practice' solutions to managing priority stormwater risks.
- (c) Preparation of a Catchment Management Plan (CMP). The proposed stormwater management approach that details recommended 'best practice' stormwater management initiatives and controls to be implemented in order to achieve the determined stormwater management objectives. These should include a variety of land-use policy and planning controls (e.g. impervious area limits), non-structural source initiatives and controls, and the various primary, secondary and tertiary treatment technologies available for application, including:
- Recommendations, where appropriate, for changes to the provisions of statutory and relevant planning documents (e.g. District Plan, Asset Management Plan, design standards for urban development and other municipal works) to achieve the planning consistency required to meet the stormwater management objectives and implement the preferred stormwater management solutions;
 - Identification of performance standards that will apply for both quality and quantity (this may be a reference to TA Codes of Practice, or to national / industry standards or guidelines);
 - A prioritised schedule of the stormwater management initiatives and controls to be implemented and noting any further resource consents required and whether they have been applied for;
 - A methodology to ensure certainty of the implementation and timing of stormwater management initiatives and controls;
 - An 'operations and maintenance plan' including inspection procedures for stormwater management initiatives and controls;
 - A 'monitoring strategy' to assess whether CMP implementation is achieving the stated stormwater management goals and objectives;

- A schedule of the management procedures to ensure adherence to the CMP across functional areas of the TA, and the other agencies responsible for stormwater management;
 - Any educational initiatives (existing and planned);
 - Any other initiatives, incentives or disincentives to encourage improved environmental outcomes (e.g. stream restoration programmes, subsidies, development fee rebates),
 - Any financial or resourcing requirements for the effective implementation of the CMP.
- (d) Preparation of an assessment of the environmental effects (AEE) for the proposed stormwater management regime and associated discharges. The receiving environments will include all receiving waters in the catchment and downstream coastal waters.

7.2 Stormwater Quantity

Information requirements include the following:

7.2.1 Inputs

- (a) Stormwater runoff calculations for the catchment under existing and likely future development conditions. Runoff calculations should use methods that are appropriate for the Bay of Plenty region. That determination shall be based on analysis and verification of information provided from gauged catchments within the Bay of Plenty, or use design guidelines prepared by Environment Bay of Plenty and/or by the TA.
- (b) Identification of the existing stormwater reticulation system, and the capacity of each section. Also identify where parts of the reticulation system do not meet the TA design standard.
- (c) An inventory and map of historic flood damage sites, and an estimation / account of the frequency and severity of the flood damage. Areas where flooding has historically occurred downstream of stormwater discharge points should also be identified.
- (d) An inventory and map of existing and potential future erosion and sedimentation sites within the catchment and receiving environment. Erosion sites should include both terrestrial and stream channel erosion.
- (e) An assessment of existing and potential future base-flow fluctuations in receiving waters and their effects on habitat quality, the abundance and diversity of biological communities present, and any downstream water abstraction uses.
- (f) An assessment of groundwater levels and groundwater / surface water interaction in the catchment. This should include consideration of discharges to groundwater and the implications for water abstraction uses.

7.2.2 Outputs

- (a) A risk assessment of high velocity flows and receiving water base-flow fluctuations which pose key threats to receiving environment values.
- (b) Identification and consideration of alternative stormwater management solutions to address existing and future stormwater quantity issues, including:
- (c) Urban land-use development in relation to increased runoff volumes and receiving water capacity,
 - Stormwater reticulation capacity,
 - Secondary flow paths,
 - Potential to use low impact design techniques,
 - Velocity controls to manage erosion potential and habitat values in receiving waters,
 - Flow controls to reduce the volume of runoff discharged to surface waters, and the magnitude of base flow fluctuations in receiving waters,
 - Streambank erosion protection,
 - Preservation and enhancement of natural stream channels and other types of receiving waters,
 - Stormwater management structures in receiving waters, and
 - Monitoring programmes.
- (d) The options and proposed management solutions to stormwater quantity issues should be assessed against the identified stormwater management objectives, as well as the provisions of the statutory and relevant planning documents to determine the appropriate stormwater management approach.

7.3 Stormwater Quality

Information requirements include the following:

- An inventory of existing water and sediment quality data that exists in the catchment.
- Land use activities in the catchment and their potential to generate contaminants under the present and likely development scenarios should be analysed. Unit loadings shall be used to determine the expected magnitudes of long-term contaminant levels. At a minimum, calculate loads from total suspended solids, indicative heavy metals, total petroleum hydrocarbons (TPH), total nitrogen, and total phosphorus. This should include an estimation of the proportion of impervious area cover and identification of high-risk hazardous facilities which have the potential to discharge contaminants into the waterbodies of the catchment.
- Identification of catchment 'hot spots' from the land uses and unit contaminant loadings.
- Identification of specific site activities with a high contamination risk.

- A methodology to review contaminant loadings and identify new contaminant sources over the consent period.
- Identification of existing formal and informal sewage overflow points and data showing the frequency, volume and duration of existing sewage overflows and the net infiltration/exfiltration rates of the sewerage system.
- Alternatives analysis to address existing and future water quality problems including:
 - stormwater quality management structures,
 - source control efforts including impervious surface considerations,
 - pollution prevention,
 - identification of illegal or inappropriate connections, and
 - erosion and sediment control on small sites.

Once the objectives of the management of stormwater in the catchment have been determined and options and methods available to achieve the objectives identified defined and an assessment should be made of the effectiveness of the options identified in terms of satisfying water quality goals or objectives.

It is noted that there may be opportunities to combine stormwater quality and quantity measures into multi-purpose devices and therefore reduce overall costs.

7.4 **Receiving Environment Considerations**

Aquatic ecosystem considerations are closely linked with both water quantity and quality considerations. An example of this is the water quantity issue of stream channel erosion. The total volume, peak rate of discharge, frequency of discharge, and duration of discharge have a significant impact on the physical structure of a stream, and are therefore a component of aquatic ecosystem analysis. This assessment should be undertaken in accordance with the scale of the activity and the nature of the proposed discharge. This should include:

- An assessment of the streams within the catchment including:
 - identification of all perennial streams,
 - an evaluation of the stream's potential for channel erosion or sediment deposition,
 - stream side vegetation type and density,
 - stream morphology discussion (channel shape, meander, etc.), and
 - assessment of the low flow regime.
- An assessment of aquatic health within the streams including:
 - fisheries diversity and abundance,
 - abundance and diversity of macroinvertebrates,

- estimated percent cover of periphyton or macrophytes,
 - documentation of any fish kills,
 - barriers to fish passage, and
 - presence of nuisance algae, vegetation.
- An assessment of aquatic health within the downstream (estuarine/coastal) receiving environment.
 - Identification of receiving environments or parts of receiving environments that are degraded. This may require assistance from Environment Bay of Plenty.
 - Identification of opportunities to improve the quality of receiving environments, including but not limited to measures identified under sections 7.2 and 7.3.

Annex 1 – Checklist for CSC Associated Consent Activities

Environment Bay of Plenty seeks to streamline the overall consenting process for stormwater management. An overall “Project Consent” incorporating all necessary activities for each catchment is to be considered on its merits and approved as appropriate. The objective of the CSC is to consent as many stormwater management activities within the catchment as is practicable.

The following sets out a number of points to consider when completing the CMP and associated CSC application. This is for the express purpose of identifying any and all works and other activities that may need to be consented within the CSC.

- (i) What, if any physical works have been identified in the Catchment Management Plan supporting the CSC application?
- (ii) Do any of these works require dam and/or diversion consents (Section 14)?
- (iii) Are there any outfalls to be constructed?
- (iv) Are these outfalls contained in a watercourse or lake (Section 13)?
- (v) Are any outfalls within the Coastal Marine Area that require coastal disturbance and/or occupation consents (Section 12)?
- (vi) Are there any works that may affect wetlands, streams or lakes or coastal margins, either requiring construction or modification of these features?
- (vii) Are there any earthworks required for the construction of stormwater treatment devices (Section 9)?
- (viii) Are these land disturbing works in excess of the criteria that trigger the need for resource consents, and will these works lead to a temporary discharge of sediment (Section 15)?
- (ix) During the investigation into the CSC application, were there any maintenance activities identified that may require resource consent from Environment Bay of Plenty (e.g. streamworks, discharge of contaminants to land etc)?

This information should be incorporated into the CMP documentation and an indicative methodology identified. This will allow consenting officers the ability to undertake an initial assessment of each activity and consider whether a consent, combined with the CSC can be approved for the activities interrelated with the CSC. It is recommended that when consultation with potentially affected parties takes place, that all potential works are detailed and discussed. In addition, any potential effects need consideration.

Level of Supporting Information

The following sets out a number of matters to consider and include in information supporting consent applications required to meet the outcomes of the CMP. The level of detail supplied should reflect the nature of the proposal and the likely scale of effects. The following lists provide a summary of the matters that should be considered for each consent. Further information and guidance in this regard can be obtained from the consent applications contained on the Environment Bay of Plenty web site (www.envbop.govt.nz).

Section 9 – Land Disturbing Activities (and associated s.15 discharge activities)

- The nature and scale of the activity (dimensions, purpose, performance materials to be used, etc) and a description of the site.
- Timing and duration of the activity.
- Preliminary construction methodology including design plans if appropriate.
- Receiving environment description, as contained in CMP.
- Assessment of effects given the likely sediment generation, the values identified in the receiving environment and the measures utilized on site to minimise sediment generation and discharge.
- The identification of potentially affected parties and any consultation undertaken.

Section 12 – Works and Structures within the Coastal Marine Area

- Type of permit sought (disturbing foreshore, structures, occupation etc).
- The nature and scale of the activity (dimensions, purpose, materials to be used, etc) and a description of the site.
- Timing and duration of the activity.
- Preliminary construction methodology including design plans if appropriate.
- Receiving environment description, as contained in CMP, including recreational, ecological, wildlife, landscape and cultural aspects.
- Assessment of effects (water quality, visual, effects of marine life, cultural effects) given the construction activities, the values identified in the receiving environment and the measures utilised on site to minimise construction effects and any ongoing potential for effects.
- The identification of potentially affected parties and any consultation undertaken.

Section 13 – Works in a Watercourse, Modification of Wetlands, Structures in a Waterbody

- Timing and duration of the works.
- Description of the proposed activity (dimensions, purpose, materials to be used, etc) and a description of the site.
- Preliminary design plans, including cross sections of the watercourse where appropriate and preliminary design details and calculations.
- Construction methodology.
- Receiving environment description, as contained in CMP.
- Assessment of effects – actual or potential effects that the proposed operation/activity could have on the environment including:
 - construction effects,
 - effects on watercourse hydrology and hydraulics,
 - fish passage (construction and operation phases),
 - potentially affected parties and any consultation undertaken.

Section 14 – Dam/Diversion of Surface Water

- Timing and duration of the works.
- Description of the proposed activity (dimensions, purpose, materials to be used, etc) and a description of the site where the damming/diversion is to occur.
- Preliminary design plans, including cross sections of the watercourse where appropriate and preliminary design details and calculations.
- Construction methodology.
- Receiving environment description, as contained in CMP.
- Assessment of effects – actual or potential effects that the proposed operation/activity could have on the environment including: construction effects, effects on watercourse hydrology and hydraulics, fish passage, downstream users.
- Potentially affected parties and any consultation undertaken.

Annex 2 – Suggested CMP Format

To help streamline preparation and evaluation of CMPs, the following draft Table of Contents is provided:

- 1.0 Introduction**
 - 1.1 Scope
 - 1.2 Objective
 - 1.3 Legislative Background
 - 1.4 Consultation

- 2.0 Description of Extent of Catchment**
 - 2.1 Study Area (Tabulate discharge locations with detail, flow, location etc)
 - 2.2 Geology and Soil
 - 2.3 Land Use

- 3.0 Existing Information**
 - 3.1 Hydrological Modelling
 - 3.2 Assessment of Flows by Guidelines
 - 3.3 Determination of 1% AEP Flood Levels
 - 3.4 Existing Consents within the Catchment(s)

- 4.0 Identification of Stormwater Management Issues**
 - 4.1 Stormwater Quantity
 - 4.1.1 Flood Hazard Maps
 - 4.1.2 Secondary Flow Paths
 - 4.1.3 Development within 1% AEP Area
 - 4.1.4 Streambank Erosion
 - 4.1.5 Methods for Improvement
 - 4.2 Stormwater Quality
 - 4.2.1 Current Stormwater Quality Management
 - 4.2.2 Potential Sources of Contamination
 - 4.2.3 Stormwater Treatment Requirements
 - 4.2.4 Methods for Improvement

- 5.0 Assessment of Environmental Effects**
 - 5.1 Identification of Resources within the Catchment and Receiving Waters
 - 5.2 Summary of Potential Threats to Resource Values
 - 5.3 Recommended Methods to Protect Catchment Resources

6.0 Recommendations

- 6.1 Combined Quantity and Quality Measures
- 6.2 Capital Works (Refer to Project Data Sheets contained in Annex 2. Tabulate physical works with reference number, location size, performance (flows, volumes etc), cost, and timing.)
- 6.3 Resource Consent Requirements (Tabulate all consents to be covered under the umbrella of the CSC. Include relevant supporting data and itemise in Table of Works)
- 6.4 Other Recommended Methods (education strategies, source control etc)
- 6.5 Monitoring Procedures and Performance Review (including frequency of review and update of CMP)

Appendix Project Datasheets (see example on following page)

Example Project Summary Sheet

Date: XX/XX/2003 **Catchment:** Famous Landmark **District:** Western Bay of Plenty

Project Address: No.1 Downthe Street.

Project Description: Source control/pipe upgrade/stabilisation works/stormwater detention etc

Site plan/map

Problem Description: Existing catchpits block frequently.

Solution Required: Replace existing catchpits with splay pits.

CMP Y/N: Y

CMP Works Item No: X

Capital Estimate \$10,000

Maintenance Estimate -

Estimate Accuracy: Conceptual

Project Confidence: Reliable

Solution Confidence: Limited

Comments:

These individual projects need a ranking process to be developed whereby the catchment threats are ranked in relation to the frequency of any effects occurring (flooding of property, flooding of buildings, stream bank erosion, impact on aquatic values etc), and the severity of the occurrence (minor health and safety risk to significant health and safety risk, both for people and property as well as aquatic resources).

Annex 3 – Bibliography

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