Contents

Table of Abbreviations

Abbreviation	Explanation
BCC	Banyule City Council
BPEMGs	Best Practice Environmental Management Guidelines
DCMC	Darebin Creek Management Committee
EPA	Environment Protection Authority (Victoria)
GPT	Gross Pollutant Trap
LPPF	Local Planning Policy Framework
MSS	Municipal Strategic Statement
MWC	Melbourne Water Corporation
NRE	Department of Natural Resources and Environment
SKM	Sinclair Knight Merz
SPPF	State Planning Policy Framework
SWMP	Stormwater Quality Management Plan
YVW	Yarra Valley Water

Melbourne Water has provided 50% funding contribution to the development of this Stormwater Management Plan for the improvement of urban stormwater quality and the protection of waterways and bays.

Melbourne Water

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1. Introduction

Urban drainage systems have been developed to meet the community's need to minimise the threat from flooding. The main focus of development has been on hydraulic and transport capacity. Urbanisation leads to changes in both the quantity and quality of stormwater that is delivered to urban receiving waters but traditionally, little attention or resources have been allocated to considering the environmental impacts of stormwater (VSC, 1999).

The State Government of Victoria, through the Environment Protection Authority Victoria (EPA), Melbourne Water Corporation (MWC) and other agencies, is supporting local Councils in the development of stormwater quality management plans (SWMP) for urban areas in their municipalities. The SWMP process is designed to:

- Generate commitment to a best practice approach;
- Identify priorities based on risk assessment;
- Develop management strategies and actions; and
- Establish a basis for ongoing cooperation and coordination between agencies.

Sinclair Knight Merz (SKM) was contracted by the Banyule City Council (BCC) to assist with the development of a SWMP, which will guide the Council in improving environmental management and quality of stormwater runoff from urban areas throughout the municipality. This document reports on the outcomes of this plan-known as the Stormwater Quality Management Plan.

The SWMP has been developed in a number of stages, as guided by the requirements of the Urban Stormwater: Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999), and involved close consultation with Council and other stakeholders. The outcomes from this process have been compiled into a number of reports:

- **Discussion Paper no. 1 – Threats and Values.** This report provided details of the values of environments that receive urban stormwater runoff and the threats to those values from urban stormwater runoff.
- **Discussion Paper no. 2 – Risk Assessment.** This report described the risk assessment and prioritisation process necessary to determine the priority management issues that would become the focus of actions aimed at improving the quality of urban stormwater runoff.
- **Discussion Paper no. 3 – Priority Management Issues Paper**. A summary of the priority management issues, a description of the process followed to determine management actions and the identification of the priority management actions required to address both priority management issues and Council's management framework issues.

The Discussion Papers summarised above have been revised and compiled into two separate volumes that form the final Stormwater Quality Management Plan for the Banyule City Council:

- **Volume I: Executive Summary** (this report) provides an overview of why and how the plan was developed and details management strategies and recommendations that Council can use to improve stormwater management.

- **Volume II: Background** provides detailed background information that clearly describes the methodology followed and detail on the assessment of threats, values and strategy development and includes all appendices.

1.1 Why develop a Stormwater Management Plan?

Stormwater runoff has been identified as a major contributor to degradation in many urban environments. As such, the State Government of Victoria, through the Victorian Stormwater Committee (VSC) is supporting local Councils in the development of stormwater management plans for urban areas across Melbourne. The Victorian Stormwater Committee is comprised of EPA, MWC, the Municipal Association of Victoria (MAV) and the Department of Natural Resources and Environment (NRE). The Committee is responsible for the establishment of the Stormwater Agreement (draft), Urban Stormwater Best Practice Environmental Management Guidelines (VSC, 1999) and assisting Councils with the development of stormwater management plans.

The Stormwater Agreement is part of a dynamic process of improving stormwater quality that will continue to evolve with changing understanding and circumstances. The primary purpose of the Stormwater Agreement is to obtain commitment by all of the participants in achieving better outcomes for stormwater quality by:

- Working with common principles of stormwater management;
- Establishment of performance objectives to guide planning and design of stormwater systems;
- Identification of best practice environmental management practices to form a toolkit for stormwater management;
- Strategic application of these tools, in the context of agreed principles and performance objectives, through stormwater management planning; and
- Review and refinement of financial and administrative arrangements to deliver the required outcomes in the most cost effective manner; and resolve problems before they become impediments to improved environmental outcomes.

To assist in the development of strategies for stormwater management, the VSC produced the Urban Stormwater: Best Practice Environmental Management Guidelines (VSC, 1999). The guidelines provide guidance in five key areas:

- Environmental performance objectives: defining environmental performance objectives for managing urban stormwater;
- Tools review: describing a range of tools that can reduce sources of stormwater pollution or remove pollutants from stormwater;
- Tools selection: guiding the selection and application of these tools to suit particular situations;
- Best practices: raising awareness of best practices for environmental management of stormwater; and
- Stormwater management plans: providing guidance for developing stormwater management plans.

The objectives of a Stormwater Quality Management Plan are to:

Identify strategies to improve the environmental management of urban stormwater and protect the environmental values and beneficial uses of receiving environments.

1.2 Legislation and Key Organisations

There are a number of regulations and strategies that are important in the context of stormwater management and similarly, a number of organisations have a role in the management of the region's waterways and stormwater. A summary of the key relevant legislation and agencies responsible for stormwater management in the Banyule municipality is provided below.

Legislation

State Environment Protection Policies
State Environment Protection Policies provide a comprehensive policy framework for environmental protection in Victoria. In addition to provisions that apply statewide, the policy includes a number of regional schedules that set out more detailed provisions for the protection of regional environments.

Policy provisions specifically relevant to the City of Banyule are Schedule F6 (Waters of Port Phillip Bay) and Schedule F7 (Waters of the Yarra Catchment).

Port Phillip and Westernport Regional Catchment Strategy
The regional strategy sets key objectives for catchment and land protection in the Port Phillip and Westernport region.

State Planning Policy Framework (SPPF)
The State Planning Policy Framework sets out general principles for land use and development in Victoria, with specific policies under a series of headings. All planning authorities must heed these State policies. In relation to water quality, the SPPF emphasises the need for a co-operative approach with key stakeholders. Specific policies relevant to stormwater are contained within Section 15 Environment and Section 18 Infrastructure.

Local Planning Policy Framework (LPPF)
In the Local Planning Policy Framework, the planning authority (BCC) brings together its strategic framework in relation to land use and development for the municipality in the Municipal Strategic Statement (MSS) and local policies. Banyule's MSS includes objectives in relation to water quality and stormwater management.

Key Organisations

Banyule City Council (BCC) is responsible for managing stormwater at a local level and is also the key organisation for implementing the Banyule Planning Scheme. Council's day to day activities can have a significant effect on stormwater quality outcomes as a result of the numerous local activities it undertakes.

Melbourne Water Corporation (MWC) is the regional drainage authority responsible for the management of all major drains and waterways, generally in catchments greater than 60 hectares in area.

Environment Protection Authority Victoria (EPA) is responsible for the protection of the quality of Victoria's environment by application of the statutory powers described in the Environment Protection Act (1971).

Port Phillip Catchment and Land Protection Board (CaLP) co-ordinates catchment management activities at a regional level to ensure protection of receiving environments.

2. The Stormwater Planning Process

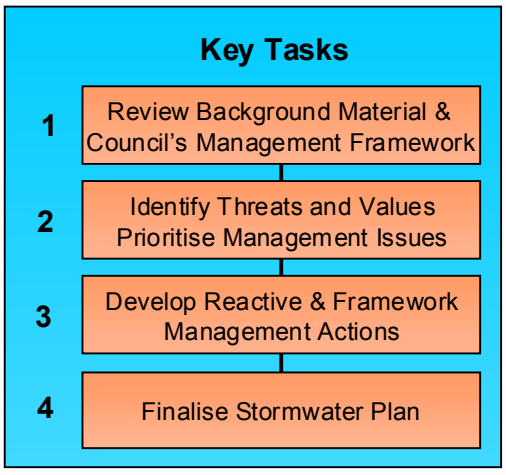
The methodology for developing stormwater management plans has been established by the Victorian Stormwater Committee (EPA, MWC, MAV, NRE) and is defined in Chapter Three of the Urban Stormwater Best Practice Environmental Management Guidelines (VSC, 1999). These Guidelines are being followed in the development of the Banyule City Council SWMP.

The key tasks followed in the development of this SWMP consisted of the:

1) identification and review of background issues;
2) review of local government management and operations as it relates to stormwater management;
3) identification of values of environments receiving urban stormwater;
4) identification of threats to receiving environments from stormwater inputs;
5) risk assessment and prioritisation process to determine the priority stormwater management issues;
6) development of reactive management strategies for managing stormwater that addressed the priority management issue;
7) development of Council management strategies that will lead to an improvement in the ability of Banyule City Council to better manage stormwater quality; and,
8) provision of indicative costings, responsibilities and timelines for implementation of the strategies identified in the SWMP.

These tasks were conducted in four stages as outlined in Figure 2.1. All stages in the process involved stakeholder input with four workshops conducted to discuss each stage of the plan and overseen by a Steering Committee.

■ Figure 2.1. The stormwater planning process



The final SWMP is a document that BCC can use to better manage urban stormwater quality and improve the health of the region's waterways. To be most effective, the plan must:

- Have Council-wide commitment to the plan and its implementation;
- Set priorities for the Council's management of urban stormwater;
- Include clearly stated strategic objectives;
- Incorporate a risk-based assessment of issues and threats;
- Include clear strategies that address priority risks, together with measurable environmental outcomes wherever possible;
- Follow the principle of continuous improvement; and
- Encourage all stakeholders.

This report is **Volume I: Executive Summary** of a *Management Plan for the Improvement of Urban Stormwater Quality for Banyule City Council.* It provides a summary of the key tasks involved in the preparation of management strategies. In particular, this report presents a summary of the values of waterways and wetlands that receive urban stormwater runoff in the Banyule area, a summary of the threats to those values from stormwater runoff and a risk assessment to prioritise the key management issues in the region.

The priority management issues are the focus of the strategies required to improve stormwater management and water quality and to protect and enhance the values of the receiving environs in the region. In addition, a review of Council's management framework has been conducted and strategies aimed at improving Council's operations and management with respect to stormwater are also identified.

More detail describing the process of the plan development can be found in **Volume II: Background.**

3. Banyule City Council Background

The municipality of Banyule is located between 7 and 22 kilometres north-east of central Melbourne. It includes all or parts of the suburbs of Bundoora, Greensborough, St Helena, Eltham North, Watsonia, Watsonia North, Yallambie, Montmorency, Briar Hill, Lower Plenty, Macleod, Rosanna, Viewbank, Heidelberg West, Heidelberg Heights, Bellfield, Ivanhoe, Heidelberg, Ivanhoe East and Eaglemont.

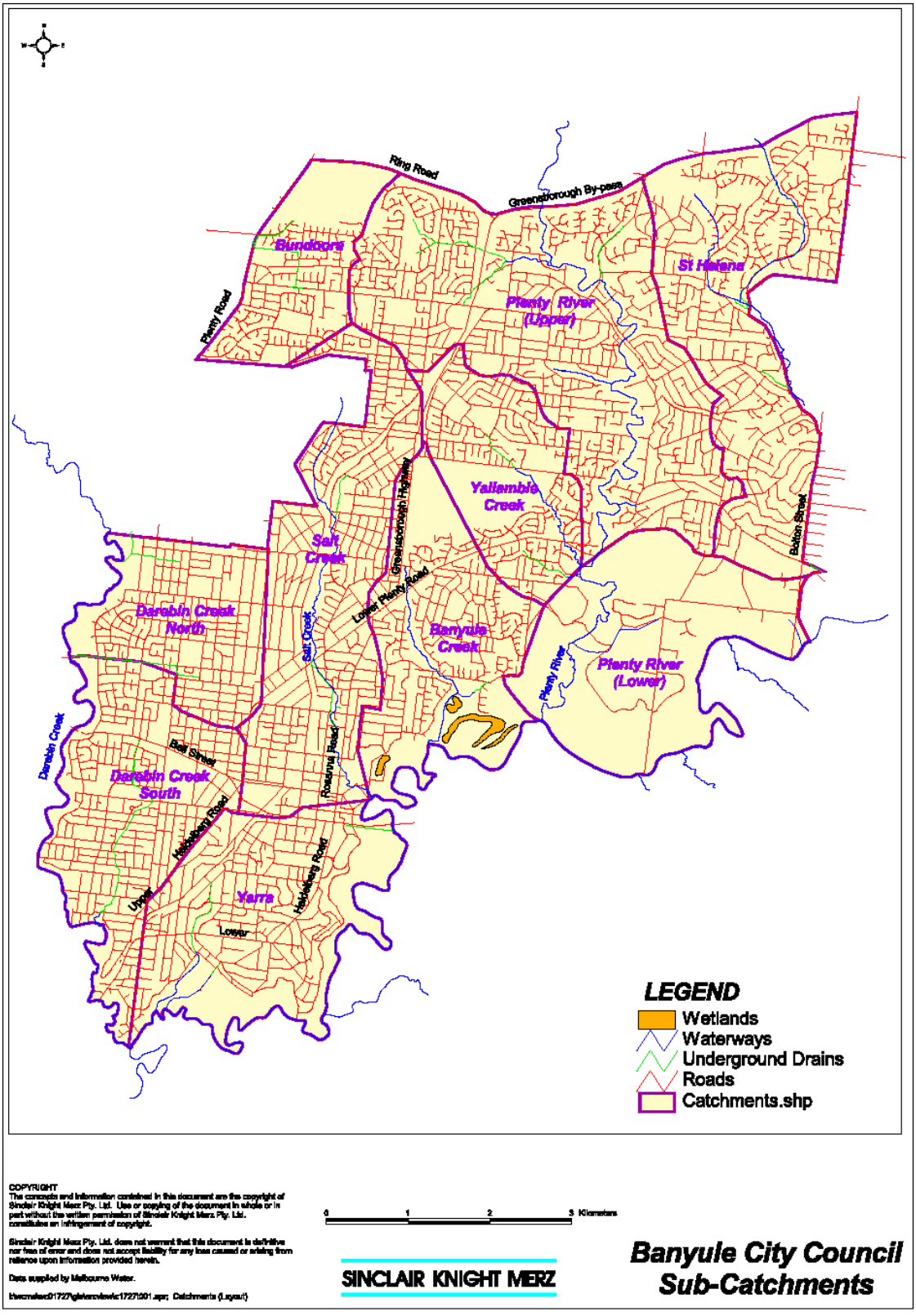
The Banyule municipality covers an area of approximately 63 square kilometres. The Yarra River and Darebin Creek clearly define its southern and western boundary respectively, and the Plenty River meanders through the municipality from north to south. With the exception of relatively flat land in the Heidelberg West area and the flat alluvial floodplains adjacent to the Yarra and Plenty Rivers, the majority of the municipality's quite strongly dissected topography ranges from gently to steeply undulating (BCC 1998a).

Urban stormwater from Banyule is ultimately discharged to the Yarra River either directly from stormwater runoff via minor tributaries and drains or indirectly from stormwater runoff first entering the Plenty River and Darebin Creek, which subsequently then discharge into the Yarra River.

As part of the development of the SWMP the municipality was divided, based on landform as well as land use, into ten sub-catchments for a more detailed analysis as shown in Figure 3.1 and described in Table 3.1. Detailed descriptions of each of the sub-catchments are located in **Volume II: Background**.

Table 3.1. Urban stormwater receiving environments in the study area

Urban area / subcatchment	Main land use activity	Receiving environment
Bundoora	Residential, commercial, industrial, recreational and new development	Darebin Creek
Plenty River (Upper)	Residential, commercial, recreational and industrial	Binnak Park wetlands, Kalparrin Lake, Plenty River
St Helena	Residential, new development and commercial	Diamond Creek via West Eltham Drain
Yallambie Creek	Residential and new development	Yallambie Creek and Plenty River
Plenty River (Lower)	Residential, new development, agricultural and recreational	Plenty River and Yarra River
Banyule Creek	Residential and recreational	Banyule Creek, Banyule Wetlands and Yarra River
Salt Creek	Residential, new development and commercial	Salt Creek
Darebin North	Industrial, residential and recreational	Darebin Creek
Darebin South	Residential, industrial, commercial and recreational	Darebin Creek and Donaldsons Creek
Yarra	Residential, commercial and recreational	Yarra River and billabongs



■ **Figure 3.1 Map of Banyule City Council and its sub-catchments.**

4. Values of receiving environments

Environments that receive stormwater runoff are valued for a wide range of reasons. They have intrinsic environmental and ecological values but also have other characteristics valued by the community. The values of receiving environments have been identified based on the following categories:

- Environmental (Instream and riparian habitat, flora and fauna);
- Cultural and Heritage (Indigenous and non-indigenous);
- Amenity (Active and passive recreation, visual landscape); and
- Economic (Tourism).

For all sub-catchments and for all values, a qualitative ranking of Low, Moderate, High or Very high has been assigned. This ranking is based on knowledge of the systems, the types of plant and animal species present, the presence of cultural and heritage sites, opportunities for recreation and tourism and economic benefits. This determination has been based on an extensive review of the literature including journal articles, technical reports and water quality data, field work, consultation with stakeholders and other relevant experts, and consultation and discussion with the Project Working Groups.

These rankings are shown in Table 4.1 and further detail can be found in **Volume II: Background** along with SKM's criteria for determining values associated with environments that receive urban stormwater runoff.

Table 4.1. Values of receiving environments.

Receiving Environment	Sub-catchment	Value type	Characteristics	Ranking
Darebin Creek 	Bundoora	Environmental	• Moderate quality habitat • Wetland	High
		Cultural	• Some historical buildings • Non-indigenous connections from the early 1800s	Low
		Amenity	• High visual amenity • High recreational opportunities	Moderate
		Economic	• Residential value • Recreational • Flood protection	Low
Plenty River Kalparrin Lake Binnak Park wetlands 	Plenty River (Upper)	Environmental	• High quality habitat • Significant vegetation communities • Rare and threatened flora and fauna	Very high
		Cultural	• Record of connections with indigenous people. • Non-indigenous connections from the early 1800s • Significant bridges and buildings	High
		Amenity	• High visual amenity • High active and passive recreational amenity	High
		Economic	• Tourism • Flood protection	High
Diamond Creek	St. Helena	Environmental	• High quality habitat • Rare and threatened flora and fauna	High
		Cultural	• Record of connections with indigenous people. • Non-indigenous connections from the early 1800s	Moderate
		Amenity	• Active and passive recreational amenity • High visual amenity	Moderate
		Economic	• Tourism • Flood protection	Low

Receiving Environment	Sub-catchment	Value type	Characteristics	Ranking
Yallambie Creek Plenty River 	Yallambie Creek	Environmental	• High quality habitat • Significant vegetation communities • Rare and threatened flora and fauna	Very High
		Cultural	• Record of connections with indigenous people. • Non-indigenous connections from the early 1800s	Moderate
		Amenity	• Active and passive recreational amenity • High visual amenity	High
		Economic	• Tourism • Flood protection	Moderate
Plenty River Yarra River	Plenty River (Lower)	Environmental	• High quality habitat • Significant vegetation communities • Significant wetlands • Rare and threatened flora and fauna	Very High
		Cultural	• Significant record of connections with indigenous people • Non-indigenous connections from the early 1800s	Very High
		Amenity	• Active and passive recreational amenity • High visual amenity	Very High
		Economic	• Tourism • Flood protection	Moderate
Banyule Creek Banyule Wetlands Yarra River	Banyule Creek	Environmental	• High quality habitat • Significant vegetation communities • Significant wetlands • Rare and threatened flora and fauna	Very high
		Cultural	• Record of connections with indigenous people. • Significant non-indigenous connections from the early 1800s	Very High
		Amenity	• Active and passive recreational amenity • High visual amenity	Very High
		Economic	• Tourism • Flood protection	High
Salt Creek	Salt Creek	Environmental	• Limited habitat values	Moderate
		Cultural	• Record of connections with indigenous people. • Non-indigenous connections from the early 1800s	Moderate
		Amenity	• Active and passive recreational amenity	Moderate
		Economic	• Tourism • Flood protection	Low
Darebin Creek	Darebin Creek North	Environmental	• Instream habitat value • Significant vegetation communities • Rare and threatened flora and fauna	High
		Cultural	• Many records of connections with indigenous people. • Non-indigenous connections from the early 1800s	Very High
		Amenity	• Active and passive recreational amenity • High visual amenity	High
		Economic	• Tourism • Flood protection	Moderate
Darebin Creek Donaldsons Creek	Darebin Creek South	Environmental	• Instream habitat value	High
		Cultural	• Record of connections with indigenous people. • Significant non-indigenous connections from the early 1800s	High
		Amenity	• Active and passive recreational amenity • High visual amenity	High
		Economic	• Tourism • Flood protection	Moderate
Yarra River Billabongs	Yarra	Environmental	• Instream habitat value • Significant vegetation communities • Significant wetlands • Rare and threatened flora and fauna	Very high
		Cultural	• Record of connections with indigenous people. • Significant non-indigenous connections from the early 1800s	High
		Amenity	• Active and passive recreational amenity • High visual amenity	Very High
		Economic	• Tourism • Flood protection	High

5. Threats to Stormwater

There is a range of threats and impacts to receiving environments as a result of stormwater quality. These are described in detail in Section 5.1 and summarised in Table 5.1 of **Volume II: Background**. The specific stormwater threats within the Banyule municipality were investigated through field inspections and confirmed throughout the workshops.

These threats were then grouped according to landuse and particular catchment activities. Threats have been assigned a rating according to their significance (ie. very high, high, moderate, low). This rating is based on the potential pollutants or impacts on the values of receiving environments. These ratings are summarised in the following table.

■ **Table 5.1 Ratings of threats to stormwater quality on the receiving sub-catchments.**

Sub-Catchment	Residential	Industrial	Commercial	Construction	Roads	Unstable & degraded waterways	Sullage & septic tanks	Sewer overflows	Open spaces
Bundoora	H	M	L	VH	VH	L	L	L	L
Plenty River (Upper)	H	M	VH	M	VH	M	L	L	H
St. Helena	H	L	M	VH	M	L	L	L	M
Yallambie Creek	VH	L	L	VH	L	M	L	L	M
Plenty River (Lower)	H	L	L	H	L	M	H	L	H
Banyule Creek	H	L	L	M	H	L	L	L	L
Salt Creek	H	L	H	H	H	H	L	VH	M
Darebin Creek North	H	VH	M	M	M	H	L	L	M
Darebin Creek South	H	M	H	M	M	H	L	H	M
Yarra	M	L	M	H	M	L	L	H	H

VH (Very High), H (High), M (Moderate) and L (Low).

The greatest threats to stormwater in the study area are due to:

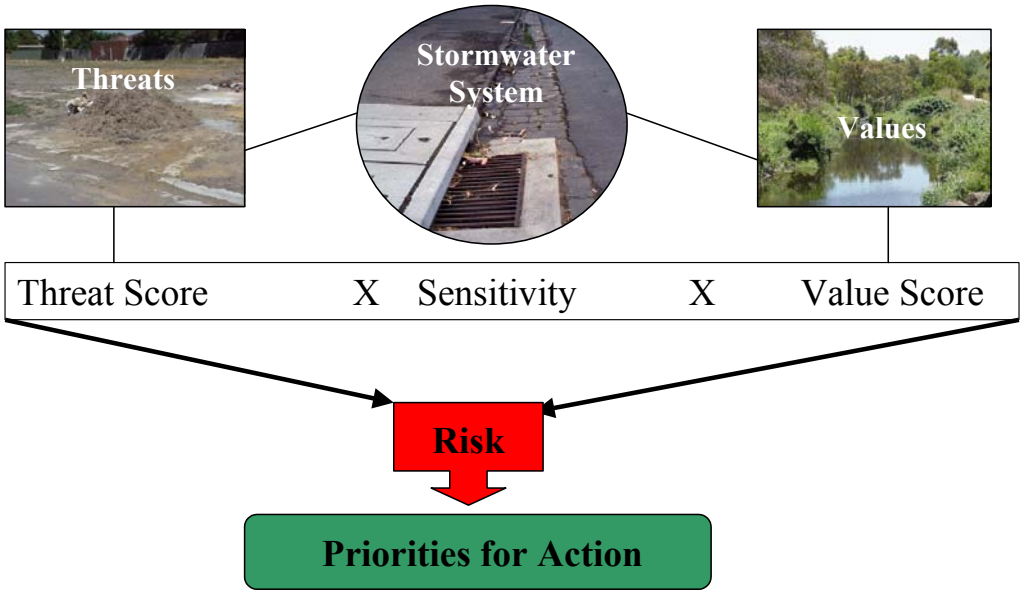
- **sediment inputs from construction sites and degraded waterways.** Poor management practices can be responsible for high sediment loads during wet weather events. Examples of locations which currently or could in the future pose high threat from development in Banyule include the Cascades Development in Yallambie, the College Views development in Bundoora, Cleveland Development in Lower Plenty, and general subdivision of existing lots throughout the catchment, but especially towards the inner city. Examples of degraded waterways include bank slumping along Darebin Creek and erosion along the Lower Plenty River;
- **litter in stormwater runoff**, especially from commercial areas but also other venues such as sporting grounds, major roads and recycling depots. Examples of key trouble spots include the Greensborough shopping centre, Heidelberg shops and Donaldsons Creek;
- **industrial wastes being illegally discharged into stormwater drainage and industrial runoff during wet weather events.** Key locations for problems are various drains draining the West Heidleberg industrial area such as Dougharty Road, Southern Road and DC42 Sparks Reserve Drains. (MWC 2000) identifies that Melbourne Water should, as a high priority, investigate a range of measures to manage stormwater and pollution events from the West Heidelberg industrial area

including point source investigation, silt, sediment, gross pollutant and oil trapping at or near source and treatment ponds at end of pipe to assist in the management of industrial wastes;

- **runoff from major roads.** A number of major roads could be potential pollution sources during wet weather events, including the Metropolitan Ring Road, Greensborough Highway and Bell/Banksia Street;
- **potential for organic wastes from parks, golf courses and autumn leaf fall**. A number of parks and golf courses exist within Banyule, examples include Kalparrin Gardens, Heidelberg Park, Heidelberg Private Golf Course and Ivanhoe Public Golf course. Nutrient runoff from fertilisers and leachates from old tip sites which have golf courses constructed on them (eg: Ivanhoe and Heidelberg) are a concern;
- **nutrient inputs from residential, new urban developments and open spaces** such as golf courses and sporting ovals. Medium density housing is an increasing feature of Banyule, especially in the inner city suburbs of Ivanhoe and Heidelberg. There are numerous parks and sporting facilities such as ovals and golf courses that may pose a threat ; and
- **damage to cultural sites, river banks, riparian vegetation and wetland areas** through degradation by changed flow, erosion and rubbish dumping. Erosion and bank slumping of stream banks and drains are a problem at a number of locations including the Darebin Creek near Bell Street, Salt Creek and the lower Yallambie Creek.

6. Risk Assessment and Priority Management Issues

The Victorian Stormwater Committee has prescribed a risk assessment process that must be followed when prioritising management issues for SWMP development. The risk assessment is based on a formula that takes into account the value of the receiving environment, the stormwater threat and a sensitivity factor of the receiving environment to specific threats:



As presented in the previous sections, values and threats have been ranked on a 1 to 4 scale with 1 being low, 2 medium, 3 high and 4 very high. The sensitivity rating is also based on a 1 to 4 scale with 1 being low sensitivity through to 4 being very high sensitivity. The sensitivity factor allows for the fact that some stormwater threats may be high and the value of the receiving environment also high, however the true impact, or sensitivity is low.

The sensitivity factor is determined individually for each receiving waterway based on expert opinion and knowledge of the specific values and threats for that environment. Guidelines to assist in the determination of the sensitivity factor are summarised in Appendix A in **Volune II: Background**.

The risk assessment produces an overall risk score from 1 to 64 for individual threat/value combinations. The higher the risk score, the greater the management priority thus the risk scores are used to identify the highest priority management issues. In addition, individual risk scores can be summed for each threat and value to produce a total score that identifies the greatest overall threat for a particular receiving environment and the value most threatened.

Priority risks as determined by the risk assessment process are presented Table 6.1. The 17 priority risks, ranked in order of importance, are highlighted by shading. Ranking was achieved firstly through the risk score obtained for each value and threat scenario (ranging up to 64) (see column 1). For those values with equal risk scores, the

total overall threat score (see column 3) was then used as a further discriminator to prioritise key threats. Only the threat and value combinations scoring 36 or greater are illustrated in Table 6.1 because of the desire to target priority issues only. Threat and value combinations with scores less than 36 are provided in Appendix B of **Volume II: Background** for future consideration by Council.

Table 6.1 Priority risks for the Banyule Stormwater Management Plan.

Score	Rank	Catchment	Threat	Value	Other values
64	1	Plenty River (Upper)	Commercial (litter) (Greensborough Shops, Watsonia Shops, Were St. Shops)	Visual Amenity	Tourism, Environmental (instream and riparian)
64	2	Plenty River (Upper)	Road Runoff (Metropolitan Ring Road, Greensborough Bypass)	Environmental (instream)	Visual Amenity, Recreational amenity, Tourism
64	3	Yallambie Creek	Construction (Cascades Development)	Environmental (instream)	Visual Amenity, Environmental (riparian), Recreational amenity
48	4	Yarra	Construction (General subdivision)	Environmental (instream)	Visual Amenity, Recreational amenity, Tourism
48	5	Plenty River (Lower)	Construction (Cleveland St., Lakeside Drive, new developments?)	Environmental (instream)	Visual Amenity, Recreational amenity, Environmental (riparian)
48	6	Darebin Creek (North)	Industrial (various)	Environmental (instream)	Visual Amenity, Recreational amenity, Tourism
48	7	Yarra	Sewer (see notes on YVW)	Recreational amenity	Environmental (instream), Visual Amenity, Tourism
48		*Plenty River (Upper)*	*Commercial (litter) (Greensborough Shops, Watsonia Shops, Were St. Shops)*	*Tourism*	*Visual amenity, Environmental (instream and riparian)*
48		*Yarra*	*Construction (General subdivision)*	*Visual Amenity*	*Environmental (instream), Recreational amenity, Tourism*
48		*Darebin Creek (North)*	*Industrial (various)*	*Visual Amenity*	*Environmental (instream), Recreational amenity, Tourism*
36	8	Darebin Creek (South)	Degraded Waterways (east bank slumping)	Environmental (instream)	Visual amenity, Recreational amenity
36	9	Darebin Creek (North)	Degraded Waterways (east bank slumping)	Environmental (instream)	Visual Amenity, Recreational amenity
36	10	Plenty River (Lower)	Residential (all areas)	Environmental (instream)	Visual Amenity, Recreational amenity
36	11	Banyule Creek	Residential (all areas)	Environmental (instream)	Visual Amenity, Recreational amenity
36	12	Plenty River (Upper)	Residential (all areas)	Environmental (instream)	Visual amenity
36	13	Banyule Creek	Road Runoff	Environmental (instream)	Recreational amenity
36	14	Salt Creek	Degraded Waterways (Various)	Environmental (instream)	Visual Amenity
36	15	Bundoora	Construction (Parade College Development)	Environmental (instream)	Visual amenity
36	16	Salt Creek	Sewer (see notes on YVW)	Environmental (instream)	Visual amenity
36	17	Salt Creek	Construction (General subdivision)	Environmental (instream)	-
36		*Yarra*	*Construction (General subdivision)*	Recreational amenity	*Environmental (instream), Visual Amenity, Recreational amenity, Tourism*
36		*Plenty River (Lower)*	*Construction (Cleveland St., Lakeside Drive, new developments?)*	*Visual Amenity*	*Environmental (instream), Recreational amenity, Environmental (riparian)*
36		*Plenty River (Lower)*	*Construction (Cleveland St., Lakeside Drive, new developments?)*	*Recreational Amenity*	*Environmental (instream),Visual amenity, Environmental (riparian)*
36		*Darebin Creek (North)*	*Industrial (various)*	*Recreational amenity*	*Environmental (instream), Visual Amenity, Tourism*
36		*Yallambie Creek*	*Construction (Cascades Development)*	*Visual Amenity*	*Environmental (instream), Environmental (riparian), Recreational amenity*
36		*Yarra*	*Sewer (see notes on YVW)*	*Environmental (instream)*	*Recreational amenity, Visual Amenity, Tourism*
36		*Yarra*	*Sewer (see notes on YVW)*	*Visual Amenity*	*Recreational amenity, Environmental (instream), Tourism*
36		*Darebin Creek (South)*	*Degraded Waterways (east bank slumping)*	*Visual Amenity*	*Environmental (instream), Recreational amenity*
36		*Darebin Creek (North)*	*Degraded Waterways (east bank slumping)*	*Visual Amenity*	*Environmental (instream), Recreational amenity*
36		*Plenty River (Lower)*	*Residential (all areas)*	*Visual Amenity (36)*	*Environmental (instream), Recreational amenity*
36		*Plenty River (Lower)*	*Residential (all areas)*	*Recreational amenity (36)*	*Environmental (instream), Visual Amenity*
36		*Banyule Creek*	*Residential (all areas)*	*Visual Amenity*	*Environmental (instream), Recreational amenity*

Priority Risks

Issues addressed by priority risks

■ **Table 6.2 Description of key issues associated with each priority risk.**

Catchment	Threat	Key Value Threatened	Issues
Plenty River (Upper)	Commercial (litter)	Visual Amenity	The Greensborough Shopping Centre and to a lesser degree smaller shopping strips such as Watsonia shops and Were Street shops are a source of litter that is highly visible along the length of the Plenty River. Most of the litter appears to originate from the shopping centres and enter the Plenty River from discharge drains at Kalparrin Avenue, Pope Place and Kempston Street via Kalparrin Lake. Whilst generally not harmful to the environment, such visible litter impacts on the visual amenity and public perception of the 'health' of waterways.
Plenty River (Upper)	Road Runoff	Environmental (instream)	The Metropolitan Ring Road and Greensborough Bypass are major transport arterials, which travel either along the northern (upstream) edge or pass through the Plenty River Upper sub-catchment. Roads can be a source of a range of pollutants such as litter, heavy metals, volatile organics (such as oils and fuel) etc. In addition, roads can lead to sudden and severe impacts as a result of spills of any number of contaminants as a result of accidents. The main identified value potentially impacted by roads is the instream environment. Road contaminants can impact all levels of ecosystem structures to varying degrees and duration, for example the long term effect of exposure to pollutants such as heavy metals to the dramatic and far reaching impact of chemical spills.
Yallambie Creek	Construction (New Development)	Environmental (instream)	The housing construction at Yallambie currently poses significant risks to Yallambie Creek (and subsequently the Yarra River) as a result of sedimentation resulting from stormwater runoff. Minimal controls to prevent erosion and sediment transport are in place, disturbance of the stream bed, soil disturbance and stock piling of soil currently occur. Vehicle movement off the site and lack of wash down facilities may further risk sediment movement into waterways. Construction sites in general may also pose other threats for example as a result of litter, inappropriate storage of chemicals or fuels, human wastes and nutrient inputs. Further development within the Yallambie catchment, such as 'The Grange', may pose future risks unless preventative measures are in place.
Yarra	Construction (General subdivision)	Environmental (instream)	Construction activities associated with the subdivision of existing homes within the Yarra sub-catchment poses stormwater risk to the instream environmental values of the Yarra River and wetlands of the Yarra floodplain. Such construction activities cannot be identified to any specific location but should be considered as a catchment wide issue. Construction itself can cause sedimentation problems as a result of poor practice and other risks such as litter and nutrient inputs. Other impacts of subdivision may result following construction, such as increased stormwater runoff, as a result of greater impervious surfaces and increased potential associated with population growth for poor practices such as littering and washing cars and paints near drainage systems.
Plenty River (Lower)	Construction (New Development)	Environmental (instream)	Existing housing construction at Cleveland Avenue and Lakeside Drive, and the potential for additional housing estates in the future, pose significant risks to the instream environmental values of the Yarra River and Yarra floodplain wetlands as a result of sedimentation resulting from stormwater runoff, and other threats such as litter, inappropriate storage of chemicals or fuels, human wastes and nutrient inputs. Some existing controls such as wetlands are in place but monitoring the effectiveness of these structures and other practices are warranted and the implementation of additional management actions could be justified.
Darebin Creek (North)	Industrial (various)	Environmental (instream)	The Industrial area of West Heidelberg is a recognised problem area for discharge of pollutants into Darebin Creek. A variety of pollutant types may originate in the catchment, but include paints, oils and dyes amongst others. Identifying the exact source of pollutants has been difficult to date because of the sporadic nature of pollution events and the complexity of the drainage systems. Industrial pollutants in particular can affect the instream environmental values of Darebin Creek due to their high toxicity.
Yarra	Sewer	Recreational amenity	Sewerage systems have built in structures called Emergency Relief Structures (ERS) which aim to prevent damage to sewerage systems and 'back flooding' of sewage during wet weather events. Whilst sewerage systems are separate from stormwater systems, infiltration, illegal stormwater connections and other sources of stormwater usually mean that during periods of extreme wet weather (depending on the sewerage system's capacity) ERS are triggered, releasing semi-diluted sewage into stormwater systems and waterways. Within the Yarra Catchment, relatively high frequencies of ERS have been activated in the past ten years. Yarra Valley Water has a program aiming to upgrade these sewerage systems over the next 5 years to address the problem.
Darebin Creek (South)	Degraded Waterways (east bank slumping)	Environmental (instream)	Bank slumping and tunnel erosion high on the eastern bank of Darebin Creek poses a sediment threat and resulting impact to the instream environment of Darebin Creek. The cause of the erosion is likely to be multifaceted but includes a history of infilling, poorly functioning drainage systems, increased surface runoff and loss of vegetation cover. Whilst the problem may be relatively restricted to key areas, the risk of greater immobilisation (and subsequent cost of remediation) is high.

Catchment	Threat	Key Value Threatened	Issues
Darebin Creek (North)	Degraded Waterways (east bank slumping)	Environmental (instream)	Bank slumping and tunnel erosion high on the eastern bank of Darebin Creek poses a sediment threat and resulting impact to the instream environment of Darebin Creek. The cause of the erosion is likely to be multifaceted but includes a history of infilling, poorly functioning drainage systems, increased surface runoff and loss of vegetation cover. Whilst the problem may be relatively restricted to key areas, the risk of greater immobilisation (and subsequent cost of remediation) is high.
Plenty River (Lower)	Residential (all areas)	Environmental (instream)	Residential areas can provide a threat to stormwater quality in a multitude of ways through the day to day activities of the community. Poor practices such as washing cars in gutters, over fertilising lawns, poor garbage management, the application of pesticides and washing paints in drains are but a few of the potential actions residents can do which affect stormwater, and ultimately the downstream environment. Although the Plenty River Lower sub-catchment may not have the population density of other locations within Banyule, the high value of the Yarra River and its associated wetlands increase the impact potential of residential stormwater threats.
Banyule Creek	Residential (all areas)	Environmental (instream)	See above. The Banyule Creek sub-catchment is relatively densely populated, and may be expected to grow with increasing sub-division. Subsequently, the opportunity for residential impacts to stormwater increases. At threat, are the regionally significant Banyule wetlands.
Plenty River (Upper)	Residential (all areas)	Environmental (instream)	See above. The Plenty River upper sub-catchment is relatively densely populated, and may be expected to grow with increasing sub-division. Subsequently, the opportunity for residential impacts to stormwater increases. At threat are the environmental values of Plenty River and wetlands such as Kalparrin Gardens
Banyule Creek	Road Runoff	Environmental (instream)	See above. At threat are the regionally significant Banyule wetlands.
Salt Creek	Degraded Waterways (Various)	Environmental (instream)	See above. Instream bed and bank erosion is a problem in some sections of Salt Creek especially in the upper reaches in the vicinity of Mont Park.
Bundoora	Construction (Parade College Development)	Environmental (instream)	See above. The College Views development is a proposed residential development. Ensuring the development adopts water sensitive designs and best practice stormwater management techniques are important to ensure impacts from sedimentation and other issues are prevented. The Parade College wetland and the upper Darebin Creek are instream environments at risk.
Salt Creek	Sewer (see notes on YVW)	Environmental (instream)	See above.
Salt Creek	Construction (General subdivision)	Environmental (instream)	See above. Instream environmental values of Salt Creek, the Yarra River and Yarra floodplain wetlands are at risk.

7. Council Management Framework Review

Council's day-to-day planning and management activities can have a significant effect on stormwater quality. A review of Council's planning scheme, development approvals, operational and management procedures was undertaken in order to:

- provide a foundation for good stormwater management which will reduce reliance on reactive management issues in the future; and
- identify areas within Council's Management Framework where improvements can be made that will have a beneficial impact on stormwater management and quality, thus reducing impacts on receiving waterways.

The review also highlighted barriers for BCC in achieving some of its stormwater management goals.

This process involved a review of the:

- Banyule Planning Scheme and other key Council documents including Council's Environmental Policy and its City Plan 2000 - 2003;
- development approval processes and issues within planning, building, environment and engineering departments;
- resourcing, coordination and communication (internal and external);
- infrastructure management;
- waste management and levels of service;
- local laws, enforcement and regulation; and
- draft drainage and detention systems policy.

The review highlighted various issues that require addressing as part of the implementation of BCC's SWMP and are summarised in Table 7.1.

Detailed discussions of the Council Management Framework Review can be found in Sections 7.1 to 7.5 of **Volume II: Background**.

Table 7.1 Overview of Council Framework Issues

Function	Management Issues
Planning and Building	❑ There is a lack of stormwater awareness amongst relevant Council staff. Education of Council staff on stormwater quality issues and development of internal referral process checklist is required. ❑ Sediment control for construction sites is required as part of planning permit conditions. Incorporate in process checklist. Note that the Darebin Creek Management Committee (DCMC) is in the process of developing earthworks guidelines for Erosion and Sediment Control within the Darebin Creek Catchment. ❑ There is a need to develop standard conditions relating to sediment, run-off and litter control for subdivision and construction permits. ❑ There is a need to review MSS with respect to stormwater quality management issues in light of the preparation of the Banyule SWMP. ❑ There is a requirement to develop a suitable protocol to ensure that drainage/detention designs be submitted to Council. ❑ There is a need to investigate the possibility of an introduction of an 'Environmental Bond' to deter bad practices.
Strategic Planning	❑ Development of monitoring protocols for non-structural measures for stormwater management initiatives is required (statewide project).
Municipal Laws	❑ Develop a local law for all construction sites which have an impact on stormwater quality (see pilot project between MWC and six councils which is scheduled for completion by March 2003).

Function	Management Issues
	❑ Develop a local law for stockpiling on nature strips. ❑ Review penalty framework, for example municipal laws in NSW have fines of $1500 for failing to adhere to erosion and sediment control practices.
Infrastructure Services (Development and Maintenance)	❑ Need to ensure Council's internal workforce is aware of its requirements in relation to stormwater quality when carrying out Council works. ❑ Review litter basket design and maintenance performance. ❑ Review contract specifications to ensure stormwater quality measures are included in external works. ❑ Need education programs for builders relating to building site management (seek ideas and advice from other councils etc). As part of the VSAP construction sites project and education kit and guidelines will be developed which should be utilised by BCC. ❑ Need to educate commercial traders about not dumping wastes in street bins. ❑ Need to review ownership of waterways with Melbourne Water.
Environment & Cultural Planning	❑ Discuss standards of cleaning of litter within waterways with Melbourne Water. ❑ Review lease conditions on Council owned land to ensure herbicide use is appropriately controlled.
Environmental Health	❑ Advocate for provision of sewerage to areas which are currently serviced by septic tanks (eg Lower Plenty & Montmorency).
General	❑ Incorporate a regular forum between strategic/design/construction/maintenance departments to ensure handover of assets is managed more effectively. ❑ Review resourcing capabilities in relation to enforcement for planning, engineering and construction by-laws. There is a need to move from a reactive to a proactive mode and assist with education.

Many of the issues identified in the risk assessment process and the Council management review are closely linked. Council management can directly influence some of the activities that are creating threats to receiving environment values. For example, tighter controls on planning permit conditions that reduce sediment inputs to the stormwater system will have a major beneficial impact upon the quality of stormwater entering receiving environments. It is important that the linkages between the priority risks and Council management are acknowledged so that strategies within Council will have a direct improvement on stormwater management at the source rather than solely through reactive measures.

Table 7.2 illustrates the link between Council management activities and priority risks.

■ **Table 7.2 Link between council management and priority risks.**

Priority Issues	Stormwater Management Strategies			
	Planning Controls	Council Operations and Management	Education and Awareness	Infrastructure Solutions
Construction - New Development - Re-development	X		X	X
Commercial		X	X	X
Roads		X		X
Industrial	X			X
Sewer	X			X
Degraded Waterways	X	X		X
Residential	X	X	X	

8. Reactive Stormwater Management Strategies

There are two types of stormwater management strategies, **Reactive Management Strategies** (this section) that are developed in response to current threats that relate to priority management issues, and **Management Framework Strategies** (Section 9) that are developed in response to deficiencies identified in the review of Council's management framework.

Reactive Management Strategies can be broadly grouped into the following categories:

- education and awareness;
- structural treatment measures;
- non-structural treatment measures;
- source controls;
- site specific strategies and plans;
- information and data collection; and
- regulation and enforcement.

Management Framework Strategies typically address areas of Council operation related to:

- strategic planning activities;
- planning and local approvals processes;
- service delivery levels and improved operations and management activities;
- opportunities for improved coordination and communication; and,
- training and education programs.

The following sections summarise the Reactive Management Strategies developed to address each priority management issue. For each priority management issue a number of strategies have been developed. Strategies have been categorised according to the following themes:

- planning controls (P);
- operations and management (O);
- regulation and enforcement (R);
- education and training (E);
- coordination and communication (C); and,
- infrastructure solutions and structural control measures (I).

Some of the strategies identified in these categories will be effective at addressing a range of issues or threats in a number of locations across the municipality (eg. education and training, monitoring, regulation and enforcement) while others are specific strategies aimed at addressing specific issues (eg. structural control measures). Some structural measures, for example wetlands and gross pollutant traps, will be effective at addressing a number of threats in the one catchment.

For each of the priority management issues, recommended strategies are summarised in the Table 8.1. Provided with each action is an indication of capital and ongoing cost, the authority responsible for implementation and other participating stakeholders, and suggested timeframe for implementation. Where a previously described action

addresses a new strategy, linkages are indicated and the costs have not been included as costs only apply once.

Costs may be significantly reduced if Council staff undertake some of the tasks or by modifying current procedures within Council. The lead agency assigned to each action is not necessarily responsible for the cost, it is just an indication of the agency in the best position to initiate the action.

The establishment of a suitable monitoring program to assess the effectiveness of strategies at improving stormwater quality is required as part of the implementation strategies identified in this SWMP.

■ **Table 8.1. Reactive Management Strategies to address the priority management risks listed in Table 6.1.**

Table legend

- **Theme**:
  - P, Planning
  - O, Operations and management
  - E, Education and training
  - C, Coordination and communication
  - R, Regulation and enforcement
  - I, Infrastructure and structural control measures
- **Business Unit**:
  - PB, Parks and Buildings
  - HA, Health and Aged Services
  - AL, Administration and Law
  - Con, Construction
  - DS, Development Services
  - OP, Operations
  - SED, Strategic and Economic Development
- **Time**: The time (year) from commencement of the plan by which each particular action should be implemented

cc	Action	Action	Theme	Time	Cost		Business Unit	Participating stakeholders
					Capital	Ongoing		
64	**A1**	**Commercial Litter, Plenty River (Upper)**						
	A1.1	Invite Friends Groups to cooperate in monitoring of any GPT and release net rubbish. Groups would contact BCC when rubbish requires removal or other actions such as repairs are required	O, I	1	$0	$0	OP	Friends groups
	A1.2	BCC to encourage 'policing' operations by the EPA and Police under the Victorian Litter Act (1987) towards the public. Warnings instead of fines could be advocated as part of an education campaign	O	1	$2000	$1,000	SED	EPA Police
	A1.3	Annual workshops for waste management and street cleaning personnel, parks, gardens and maintenance staff to ensure their activities are being performed efficiently and effectively	E,O	1	$2000	$2,000	OP	Other Councils
	A1.4	Signage for drain outlets indicating drain number and EPA hotline to highlight link between catchment and litter (see drain inventory for locations). Could be trialed at key locations (eg: Binnak Park, Plenty River near Greensborough Shops etc) prior to expanding	E	1	$5,000	$1,000	OP	EPA MWC
	A1.5	Community education through the production of brochures/advertising etc. highlighting the link between littering and litter entering the waterways	E	1	$10,000	$3,000	SED	MWC /EPA Other Councils

cc	Action	Action	Theme	Time	Cost		Business Unit	Participating stakeholders
					Capital	Ongoing		
	A1.6	Gross Pollutant Trap (GPT) on Kalparrin Street drain at Plenty River (20J1). Right Bank. (PR/13, diameter 1350) or within Whatmough Park to avoid high flow redispursement of litter and ease of access	I	1	$55,000	$2,000	SED	MWC
	A1.7	GPT at Kempston Street drain before Kalparrin Gardens (vacant area u/s). (M10G12). (Diameter Est. 600mm)	I	1	$60,000	$2,000	SED	MWC
	A1.8	GPT on Joyce Avenue Outfall at Plenty River (M21A1). Right Bank. (PR/22, diameter 675). Access Issue. May be able to be installed in Greensborough carpark	I	2	$45,000	$2,000	SED	MWC
	A1.9	Increase cleaning frequency of litter baskets in side entry pits around Greensborough CBD, Were Street and Watsonia Shops	O	3-5	$0	$4,000	OP	
	A1.10	Release net on Poulter Avenue drain (M21A2). (Diameter Est. 525mm)	I	3-5	$9,400	$1,000	SED	MWC
	A1.11	Release net on Kempston Street drain before Kalparrin Gardens (vacant area u/s). (M10G12). (Diameter Est. 600mm).ONLY if funds limited for a GPT (see A1.9)	I	3-5	$10,200	$1,000	SED	MWC
	A1.12	Release net on Patterson Crescent drain (M21A3). (Diameter Est. 750mm)	I	3-5	$12,000	$1,000	SED	MWC
64	**A2**	**Road Runoff (Metropolitan Ring Road, Greensborough Bypass) Plenty River (Upper)**						
	A2.1	Liaise with Vic Roads & ensure water sensitive road design for any upgrades (eg: Wong *et al*, 2000)	O	1	$1,000	$1,000	SED	Vic Roads
	A2.2	Annual workshops for emergency and operations staff regarding management practices etc. for spillage events or other pollution generating road incidents. Use of MWC Standard Work Procedure for Responding to Pollution Incidents and other industry protocols.	E	1	$2,000	$2,000	OP	Industry groups,MWC, EPA, emergency services
	A2.3	Investigate options for retro fitting major highways with grass swales and detention structures designed to isolate spills to improve stormwater quality prior to waterways	I	2-3	$4,000	$0	SED	Vic Roads
	A2.4	Provide signage along major roads highlighting that litter and other runoff ultimately enters the regions waterways	E	2	$3,000	$1,000	SED	Vic Roads
	A2.5	Conduct litter collection activities along freeway, for example as part of a Clean Up Australia Day activity	O	2	$0	$10,000	OP	Vic Roads
	A2.6	Request VicRoads to provide updated emergency response planning and ensure council staff are familiar with any procedures	P	2	$0	$0	OP	Vic Roads
	A2.7	GPT at Kempston Street drain before Kalparrin Gardens (vacant area u/s). (M10G12). (Diameter Est. 600mm)	See Action A1.2					
	A2.8	Provide literature and guidelines to the transport and freight industry highlighting importance of covering loads etc. in order to minimise litter and other pollutants being washed into waterways	P	3	$5,000	$0	SED/OP	Vic Roads
64	**A3**	**Yallambie Creek (Construction)(Cascades Development)**						
	A3.1	Increase fines for developers contravening planning/environmental guidelines and implement where appropriate	O	1	$3,000	$0	AL	
	A3.2	Develop developers referrals checklist indicating the organisations, which are required to review and/or approve any construction activity, in order of sequence	P,O	1	$2,000	$0	DS	
	A3.3	Develop Council referrals check list checklist indicating the council departments, which are required to review and/or approve any construction activity, in order of sequence	P,O	1	$2,000	$0	DS	
	A3.4	Require stream bank silt fences and in-stream bales ASAP (immediate action) at the Cascades Development	I	1	$0	$0	OP	
	A3.5	Workshops for council planning and engineering staff to educate staff on approval process and best management practice	E,O	1	$5,000	$0	DS	
	A3.6	Information workshops for developers, builders, contractors and consultants. Cover aspects such as the approval process, best practice management etc.	E,O	2	$5,000	$0	DS	
	A3.7	Investigate and implement if feasible, retrofit of the Yallambie retarding basin in Simpson Barracks into a wetland for stormwater treatment	I	2	$50,000	$2,000	SED	MWC
	A3.8	Determine applicability of different Water Sensitive Urban Design principles	O	2	$2,000	$1,000	SED	
	A3.9	Distribute guidelines for and require sediment and erosion control plans for all new developments to ensure developers are aware of problems caused by stormwater and management options (see section 9.1)	P,O	2	$5,000	$0	DS	
	A3.10	Increased frequency of audits and inspections of development sites	O	2		$5,000	DS	

cc	Action	Action	Theme	Time	Cost		Business Unit	Participating stakeholders
					Capital	Ongoing		
	A3.11	Investigate implementation of the code of practice for protection of council assets and control of building sites	E	3	$5,000		Con.	
48	**A4**	**Yarra Construction (General subdivision)**						
	A4.1	Develop developers referrals checklist indicating the organisations which are required to review and/or approve any construction activity, in order of sequence	See Action A3.2					
	A4.2	Develop Council referrals checklist indicating the council departments, which are required to review and/or approve any construction activity, in order of sequence	See Action A3.3					
	A4.3	Review local laws for applicability for stormwater enforcement	O	2	$5,000	$0	AL	
	A4.4	Workshops for council planning and engineering staff to educate staff on approval process and best management practice	See Action A3.5					
	A4.5	Information workshops for developers, builders, contractors and consultants. Cover aspects such as the approval process, best practice management etc.	See Action A3.6					
	A4.6	Require developers to clean drainage system & not connect to system until land is stabilised. Council should have a policy or requirement in place so developers bear cost	E,O	2	$3,000	$5,000	Con.	
	A4.7	Infringement notification and enforcement of planning permit conditions	O	2	$2,000	$5,000	DS	
	A4.8	Increased frequency of audits and inspections of development site	See Action A3.10					
	A4.9	Determine applicability of different Water Sensitive Urban Design principles	See Action A3.8					
	A4.10	Distribute guidelines for and require sediment and erosion control plans for all new developments to ensure developers are aware of problems caused by stormwater and management options (see section 9.1)	See Action A3.9					
	A4.11	GPT on Hartland Road Outfall. (M32A9). (YR/13, diameter 825).	I	3	$37,500	$2,000	SED	MWC
	A4.12	GPT on The Boulevard Outfall. (M32B6). (YR/16, diameter 825).	I	3	$37,500	$2,000	SED	MWC
	A4.13	Remediate wetlands near Banksia Street (which have been described as in poor condition due to limited water input and sedimentation) by altering drainage system and installing GPT on Banksia Street Outfall prior to wetlands. (M32C5) (YR/18, diameter 1350)	I	5	$80,000	$2,000	SED	MWC /DNRE
48	**A5**	**Plenty River (Lower) Construction (Cleveland Ave, Lakeside Drive, new developments)**						
	A5.1	Increase fines for developers contravening planning/environmental guidelines	See Action A3.1					
	A5.2	Develop developers referrals checklist indicating the organisations, which are required to review and/or approve any construction activity, in order of sequence.	See Action A3.2					
	A5.3	Develop Council referrals checklist indicating the council departments, which are required to review and/or approve any construction activity, in order of sequence.	See Action A3.3					
	A5.4	Construct wetlands within estates where appropriate	I	5	$0	$3,000	DS	MWC/Devel.
	A5.5	Increased frequency of audits and inspections of development site	See Action A3.10					
	A5.6	Workshops for council planning and engineering staff to educate staff on approval process and best management practice	See Action A3.5					
	A5.7	Information workshops for developers, builders, contractors and consultants using the site as an example	See Action A3.6					
	A5.8	Determine applicability of different Water Sensitive Urban Design principles, especially in relation to open spaces which use herbicides	See Action A3.8					
	A5.9	Require developers to clean drainage system & not connect to system until land is stabilised. Council should have a policy or requirement in place so developers bear cost	See Action A4.6					
	A5.10	Install temporary sediment traps at appropriate drainage outlets if/when new developments are being constructed. Council should have a policy or requirement in place so developers bear cost	E	Ongoing			DS/Con.	Develop.
	A5.11	Develop guidelines for and require sediment and erosion control plans for all new developments	See Action A3.9					
	A5.12	Infringement notification and enforcement of planning permit conditions	See Action A4.7					
48	**A6**	**Darebin Creek (North) Industrial (various)**						
	A6.1	Consult with individual industries on Stormwater Management Issues to ensure implementation of best practice	P	1	$5,000	$0	SED	Industry DCMC
	A6.2	Mark drains in the catchment with identifying codes and EPA hotline numbers to contact so that the public can report on incidences	See Action A1.4					

cc	Action	Action	Theme	Time	Cost		Business Unit	Participating stakeholders
					Capital	Ongoing		
	A6.3	Workshops for emergency and operations staff regarding emergency procedures, management practices etc.	See Action A2.2					
	A6.4	Workshops on Stormwater Management for Industry representatives. Cover aspects such as the impact of stormwater pollution, best practice management etc.	E,O	1	$3,000	$0	SED	Industry groups DCMC
	A6.5	Require environmental management plans for large industries	P,O	2	$2,000	$0	DS	Industry groups
	A6.6	Encourage better storage practices for waste chemicals etc.	E	2	$2,000	$0	HA	Industry groups
	A6.7	Long term consultation in partnership with EPA/MW/regional waste management groups to target industrial operations		2	$0	$0	OP	EPA MWC DCMC
	A6.8	Site audits and inspections to determine if industry are complying with any regulations and are implementing environmental management plans		2	$3,000	$5,000	SED/Con	
	A6.9	Review environmental management plans		2	$1,000	$5,000	DS	DCMC
	A6.10	Monitor effectiveness of GPT at the West Heidelberg Drain (Dougharty Rd)	I	2	$0	$3,000	SED	DCMC
	A6.11	Update emergency response planning and ensure council staff are familiar with any procedures	E	3			BCC	
	A6.12	Treatment device for industrial pollution at DC/1. MWC ASSET (Lillimur Ave). LaTrobe Uni Outfall (M19E9). (Diameter 2100)	I	1	$85,000	$3,000	MWC	BCC DCMC
	A6.13	GPT or other pollutant trap at the Southern Road drain (DC/12, M19D12). 1875mm. X	I	3	$165,000	$3,000	MWC	BCC DCMC
	A6.14	GPT at Lae Street (M31D2). (DC/15, diameter 1050). Note drainage outlet inventory recommendation for diversion, seek MW funding options	I	3	$37,500	$3,000	Con	MW
48	**A7**	**Yarra Sewer**						
	A7.1	Liaison with YVW to identify when and where sewerage upgrade works will be undertaken and where discharge enters waterways	O	1	$0	$0	HA	YVW
48	**A8**	**Darebin Creek (South) Degraded Waterways (east bank slumping)**						
	A8.1	Seek Community involvement in works	O	1	$1,000		SED	MWC DCMC
	A8.2	Seek Melbourne Water Funding	O	1	$1,000		SED	MWC
	A8.3	Revegetate and fence off key erosion locations	I	3	$20,000	$2,000	MWC	BCC
	A8.4	Install new drainage outlets or provide erosion protection at drainage outlets where appropriate as identified in the Inventory of Drainage Outlets	I	3	$50,000		SED	MWC
	A8.5	Undertake waterway management works on the east bank to prevent further bank erosion and bank slumping	I	5	$100,000	$5,000	MWC	BCC
48	**A9**	**Darebin Creek (North) Degraded Waterways (east bank slumping)**						
	A9.1	Seek Community involvement in works	See Action A8.1					
	A9.2	Seek Melbourne Water Funding	See Action A8.2					
	A9.3	Revegetate and fence off key erosion locations	See Action A8.3					
	A9.4	Install new drainage outlets or provide erosion protection at drainage outlets where appropriate as identified in the Inventory of Drainage Outlets	See Action A8.4					
	A9.5	Undertake waterway management works on the east bank to prevent further bank erosion and bank slumping	See Action A8.5					
48	**A10**	**Plenty River (Lower) Residential (all areas)**						
	A10.1	Provide identifying markers on drains to indicate the catchment and EPA hotline	See Action A1.4					
	A10.2	Workshops for waste management and street cleaning personnel, parks, gardens and maintenance staff re: stormwater quality protection	See Action A1.3					
	A10.3	Provide incentive for car washing at centres by providing vouchers etc	E	2	$15,000		OP	
	A10.4	Development educational materials for residents that promote best practice management and encourage waste reduction	P,O	2	$5,000	$2,000	OP	
	A10.5	Promote Waterwatch and Ecorecycle programs through local schools	E	2	$0	$5,000	DS	MW
	A10.6	Revision and enforcement of local laws to highlight stormwater management	See Action A4.3					
	A10.7	Review & assess the types of recycling bins used and potential for litter	O,P	2	$5,000		OP	

cc	Action	Action	Theme	Time	Cost		Business Unit	Participating stakeholders
					Capital	Ongoing		
		escape						
	A10.8	Media releases to highlight stormwater management issues to the general community	E	3	$0	$1,000	SED	MW
48	**A11**	**Banyule Creek Residential (all areas)**						
	A11.1	Investigate reasons for and against redirecting drainage channels into Banyule Swamp and implementing if found desirable	I	1	$10,000	$1,000	DS	DNRE
	A11.2	Workshops for waste management and street cleaning personnel, parks, gardens and maintenance staff. re: stormwater quality protection	See Action A10.2					
	A11.3	Provide identifying markers on drains to indicate the catchment and EPA hotline	See Action A10.1					
	A11.4	Provide incentive for car washing at centres by providing vouchers etc	See Action A10.3					
	A11.5	Development educational material for residents that promote best practice management and encourage waste reduction	See Action A10.4					
	A11.6	Promote Waterwatch and Ecorecycle programs through local schools	See Action A10.5					
	A11.7	Revision and enforcement of local laws to highlight stormwater management	See Action A10.6					
	A11.8	Review & assess the types of recycling bins used and potential for litter escape	See Action A10.7					
	A11.9	Media releases to highlight stormwater management issues to the general community	See Action A10.8					
48	**A12**	**Plenty River (Upper) Residential (all areas)**						
	A12.1	Workshops for waste management and street cleaning personnel, parks, gardens and maintenance staff	See Action A10.2					
	A12.2	Review & assess the types of recycling bins used and potential for litter escape	See Action A10.7					
	A12.3	Provide identifying markers on drains to indicate the catchment and EPA hotline	See Action A10.1					
	A12.4	Provide incentive for car washing at centres by providing vouchers etc	See Action A10.3					
	A12.5	Educate residents about over fertilising and fertilising alternatives such as slow release	P,O	2	$2,000	$2,000	DS	
	A12.6	Promote Waterwatch and Ecorecycle programs through local schools	See Action A10.5					
	A12.7	Revision and enforcement of local laws to highlight stormwater management	See Action A10.6					
	A12.8	Alter the design of Kalparrin Gardens wetland to increase nutrient assimilation efficiency and habitat quality	I	2	$20,000	$3,000	OP	
	A12.9	Media releases to highlight stormwater management issues to the general community	See Action A10.8					
	A12.10	Educational material for residents for car washing, garden practices, encourage waste reduction	E	3	$0	$2,000	SED	
48	**A13**	**Banyule Creek Road Runoff**						
	A13.1	Liaise with Vic Roads & ensure water sensitive road design for any upgrades (eg: Wong *et al*, 2000)	See Action A2.1					
	A13.2	Annual workshops for emergency and operations staff regarding management practices etc.	See Action A2.2					
	A13.3	Investigate options for retro fitting major highways with grass swales and detention structures designed to isolate spills to improve stormwater quality prior to waterways.	See Action A2.3					
	A13.4	Provide signage indicating that litter and other runoff enters the Yarra River catchment	See Action A2.4					
	A13.5	Conduct litter collection activities along roads, for example as part of clean up Australia Days	See Action A2.5					
	A13.6	Request VicRoads to provide updated emergency response planning and ensure council staff are familiar with any procedures	See Action A2.6					
	A13.7	Provide literature and guidelines to the transport and freight industry highlighting importance of covering loads etc. in order to minimise litter and other pollutants being washed into waterways.	See Action A2.8					
48	**A14**	**Salt Creek Degraded Waterways (Various)**						
	A14.1	Seek Community involvement in works	See Action A8.1					
	A14.2	Seek Melbourne Water Funding	See Action A8.2					
	A14.3	Revegetate and fence off key erosion locations	See Action A8.3					
	A14.4	Install new drainage outlets or provide erosion protection at drainage outlets where appropriate as identified in the Inventory of Drainage Outlets.	See Action A8.4					

cc	Action	Action	Theme	Time	Cost		Business Unit	Participating stakeholders
					Capital	Ongoing		
	A14.5	Identify and undertake waterway management works at erosion locations	See Action A8.5					
36	**A15**	**Bundoora Construction (College View Development)**						
	A15.1	Develop developers referrals checklist indicating the organisations, which are required to review and/or approve any construction activity, in order of sequence.	See Action A3.2					
	A15.2	Develop Council referrals checklist indicating the council departments, which are required to review and/or approve any construction activity, in order of sequence.	See Action A3.3					
	A15.3	Increased frequency of audits and inspections of development sites	See Action A3.10					
	A15.4	Workshops for Council planning and engineering staff to educate staff on approval process and best management practice.	See Action A3.5					
	A15.5	Information workshops for developers, builders, contractors and consultants. Cover aspects such as the approval process, best practice management etc.	See Action A3.6					
	A15.6	Require developers to clean drainage system & not connect to system until land is stabilised. Council should have a policy or requirement in place so developers bear cost.	See Action A4.6					
	A15.7	Develop guidelines for and require sediment and erosion control plans for all new developments	See Action A5.11					
	A15.8	Ensure that College View wetland is developed appropriately for stormwater treatment, for example sediment trap and design	O	2	$0	$2,000	DS	Construction Industry
	A15.9	Infringement notification and enforcement of planning permit conditions	See Action A4.7					
	A15.10	Determine applicability of different Water Sensitive Urban Design principles	See Action A4.9					
36	**A16**	**Salt Creek Sewer**						
	A16.1	Liaison with YVW to identify when and where sewerage upgrade works will be undertaken and where discharge enters waterways	See Action A7.1					
36	**A17**	**Salt Creek Construction (General subdivision)**						
	A17.1	Develop developers referrals checklist indicating the organisations, which are required to review and/or approve any construction activity, in order of sequence.	See Action A3.2					
	A17.2	Develop Council referrals checklist indicating the council departments, which are required to review and/or approve any construction activity, in order of sequence.	See Action A3.3					
	A17.3	Increased frequency of audits and inspections of development sites	See Action A3.10					
	A17.4	Workshops for council planning and engineering staff to educate staff on approval process and best management practice.	See Action A3.5					
	A17.5	Information workshops for developers, builders, contractors and consultants. Cover aspects such as the approval process, best practice management etc.	See Action A3.6					
	A17.6	Require developers to clean drainage system & not connect to system until land is stabilised (cost is borne as part of improved audit and inspections process)	See Action A4.6					
	A17.7	Develop guidelines for and require sediment and erosion control plans for all new developments	See Action A5.1					
	A17.8	Infringement notification and enforcement of planning permit conditions	See Action A4.7					
	A17.9	Determine applicability of different Water Sensitive Urban Design principles	See Action A4.9					

A summary of Council's costings for budgeting purposes over the next 5 years is provided in Table 8.2 below.

■ **Table 8.2 Summary of Reactive Management Strategies Costings for Council over a five year period.**

Strategy	Capital	Ongoing
A1 – Commercial litter, Plenty River Upper	$220,600	$20,000
A2 – Road Runoff (Metropolitan Ring Road, Greensborough Bypass) Plenty River (Upper)	$15,000	$14,000
A3 - Yallambie Creek (Construction)(Cascades Development)	$79,000	$8,000
A4 - Yarra Construction (General subdivision)	$165,000	$16,000
A5 - Plenty River (Lower) Construction (Cleveland Ave, Lakeside Drive, new developments)	$0	$3,000
A6 - Darebin Creek (North) Industrial (various)	$303,500	$22,000
A7 - Yarra Sewer	$0	$0
A8 - Darebin Creek (South) Degraded Waterways (east bank slumping)	$52,000	$7.,000
A9 - Darebin Creek (North) Degraded Waterways (east bank slumping)	$0	$0
A10 - Plenty River (Lower) Residential (all areas)	$25,000	$8,000
A11 - Banyule Creek Residential (all areas)	$10,000	$1,000
A 12- Plenty River (Upper) Residential (all areas)	$22,000	$7,000
A13 - Banyule Creek Road Runoff	$0	$0
A14 - Salt Creek Degraded Waterways (Various)	$0	$0
A15 - Bundoora Construction (College ViewDevelopment)	$0	$2,000
A16 - Salt Creek Sewer	$0	$0
A17 - Salt Creek Construction (General subdivision)	$0	$0
TOTAL	**$892,100**	**$108,000**

9. Management Framework Strategies

Based on the review of Council's management framework, a number of recommendations have been made to incorporate Best Practice Stormwater Management into Council's planning and management activities and these are summarised in Table 9.1. Many of these recommendations can be implemented by modifying or improving existing Council planning and management practices. Where recommendations require changes to Council documents (eg the MSS or Planning Scheme) these changes can be made when opportunities arise as part of scheduled regular revisions.

■ **Table 9.1 Council management framework strategies.**

Purpose	Strategy No.	Action	Priority
Strategy B1 - Assign Accountability for Stormwater Management			
Assign accountability and establish implementation structures	**B1.1**	Council should assign responsibility for implementation of *the Banyule Stormwater Quality Management Plan* to the appropriate Council manager. The area of responsibility nominated by the Steering Committee was Strategic and Economic Unit.	Very High
	B1.2	A *Banyule Stormwater Quality Management Plan* Implementation Committee should be established with representation across Council functions: • The Chair should be the project leader from Strategic and economic Unit. • The group should have high level management support with attendance by appropriate managers as required. • The group should be charged with detailed implementation of the *Banyule Stormwater Management Plan*.	Very High
Ensure that stormwater management plan implementation is taken up across the Council organisation	**B1.3**	The responsible officer and *Banyule Stormwater Quality Management Plan* Implementation Committee should: • Clarify stormwater management roles both internal and external to Council for inclusion in the Corporate Plan. • Assign or confirm and monitor responsibility for implementation tasks. • Refine and monitor task priorities and costings for departments of Council (with managers), allowing for ongoing review. • Review Council practices for best practice. • Seek updated information on external stormwater programs and share this information. • Sponsor forums, education and training programs for Council staff. • Report committee activities and implementation progress on a regular basis, eg. quarterly, to senior management and Council. • Report longer term success of the plan.	Very High
Continue ownership and contribution by Stormwater Initiative partners and other non-Council stakeholders	**B1.4**	Council should initiate cross-catchment accountability for municipal stormwater management plans with other Councils in the relevant catchments.	High
	B1.5	Council should initiate liaison and co-ordination with waterway Friends groups.	High
Design a monitoring program to evaluate the longer term success of the Banyule Stormwater Management Plan	**B1.6**	The responsible officer and *Banyule Stormwater Quality Management Plan* Implementation Committee should monitor waterway quality through the use of existing monitoring data and locally designed methods: • Use Melbourne Water annual reporting for waterways. • Use Melbourne Water incident logs. • Use Waterwatch data • Use EPA via the Pollution Watchline • Use annual clean up records, although these are not specific to waterways. • Visually monitor waterways and water bodies for signs of change, eg. blue-green algae, streambank stability, etc. (by Council or Friends groups). • Identify 'hot spots', priorities and areas where improvements have been made.	Very High
Make the best use of in-house	**B1.7**	Council should undertake a skills audit of staff and make best use of relevant skills in the implementation of the *Banyule Stormwater Management Plan*:	High

Purpose	Strategy No.	Action	Priority
environmental understanding and expertise		• In addition to pre-existing skills, use skills and understanding development through attendance at the Stormwater Management Plan Project Working Group. • Assign roles and responsibilities to Council departments and staff, eg. as a point of contact for developers. • Prepare a directory of staff skills. • Identify knowledge gaps and use this information to enhance skills, prepare staff development programs and support multi-tasking of staff.	
Strategy B2 - Strategic Planning			
Place stormwater management plan actions in their broader strategic context	**B2.1**	Council should incorporate stormwater management plan actions in the Banyule Corporate Plan and other strategic documents as relevant.	Very High
	B2.2	Council should publicise the achievement of environmental improvements including the implementation of stormwater management plan actions: • Raise the profile of the *Banyule Stormwater Quality Management Plan* and related planning efforts, eg catchment management plans, waterway management plans, etc. • Publicise to the organisation, amongst Councillors and in the community.	Very High
Incorporate best practice stormwater management into strategic planning documents	**B2.3**	Council should incorporate relevant information from the *Urban Stormwater Best Practice Environmental Management Guidelines (VSC,1999)* and the *Banyule Stormwater Quality Management Plan* where appropriate. Focus on: • Project design and layout. • Use of public open space buffers along waterways. • Protection of waterway values and flood areas. • Sediment and erosion control structures. • Site development and construction practices. • Use of landscaping species. • Management of ongoing land use operations and activities.	Very High
Use other organisations' expertise in addressing strategic initiatives	**B2.4**	Council should use available resources at NRE, MWC, EPA, Darebin Creek Management Committee, VicRoads, Department of Infrastructure, etc. through referral, co-ordination and partnership.	Very High
Strategy B3 - Integration with Council Projects and Processes			
Council should provide an advocacy and leadership role for best practice implementation	**B3.1**	Council should improve stormwater management outcomes (and by extension the treatment of waterways) in Council's own designs and operations.	Very High
	B3.2	Council should require the use of environmental specifications or formal Environmental Management Plans as appropriate for Council leases, contracts and program activities.	Very High
	B3.3	Council should amend the regular practices of its operations where these can contribute to improved stormwater management outcomes. Eg. Washdown of hard standing areas of maintenance depots, road construction	Very High
Council should instigate a more effective handover of assets procedures	**B3.4**	Council should instigate quarterly meetings between the strategic, design, construction and operations groups to facilitate a more effective handover of both developer and Council constructed assets.	Very High
Strategy B4 - Landuse Management, Planning Scheme and Approvals			
Integrate the stormwater management plan into Council's planning scheme to give it legal status	**B4.1**	Council should amend the Banyule Planning Scheme to give statutory effect to the *Banyule Stormwater Quality Management Plan.*	High – with next Planning Scheme review
Integrate the detention systems policy and guidelines into Council's planning scheme to give it legal status	**B4.2**	Council should formalise the draft *Detention Systems Policy and Guidelines* document and include it into the Banyule Planning Scheme and local planning policies to give it statutory effect.	High – with next Planning Scheme review

Purpose	Strategy No.	Action	Priority
Use the Banyule Stormwater Quality Management Plan to improve the environmental performance of new developments	**B4.3**	Council should establish environmental performance standards for stormwater management as part of the Banyule planning approvals process: • Consider use of an internal checklist. • Focus on both site establishment and the ongoing management of site activities: • Set policy to require a site management plan. This will reduce workload of council staff. Require plan to be endorsed by an independent and registered environmental auditor, • Provide consistency in the approach to be achieved, eg. set policy requirements, use standard assessment forms, use existing information about environmental values, etc.	Very High
	B4.4	Council should co-ordinate this assessment with other council and non-Council statutory approvals, eg. State planning policy requirements, local infrastructure works, Melbourne Water approvals, etc.	Very High
	B4.5	Following the assessment, Council should use best practice stormwater management as a basis for negotiating improved proposals.	Very High
	B4.6	Council should translate best practice stormwater management into standard or tailored conditions on planning approvals.	Very High
	B4.7	Council should modify its engineering or infrastructure specifications to improve subdivision and works design for developments in accordance with best practice stormwater management, eg. requirements of the Urban *Stormwater Best Practice Environmental Management Guidelines (VSC,1999)* and the *Banyule Stormwater Quality Management Plan*.	Very High
Assist developers to understand stormwater management and to achieve best practice solutions	**B4.8**	Council should develop standards for Environmental Management Plans and other plans submitted for planning approval where these are required.	Very High
	B4.9	Council should provide assistance on its other requirements intended to improve the stormwater performance of projects.	Very High
Strategy B5 - Application of Local Laws			
Use a local law where possible to assist local environmental requirements and the Council's enforcement of these	**B5.1**	Council should use a local law to require an Environmental Management Plan to cover all forms of the site construction management, including building locations where no planning approval is required. For example, the Environmental Management Plan would address: • Site landforming and vegetation removal. • Materials delivery, handling and storage. • Sediment and erosion control structures. • Waste products. • Transport vehicles. • Site dewatering.	High
	B5.2	Council should actively support State Government regulation of site development and building construction to reduce off site impacts. Council should fill any gaps in what is regulated or required with a local law. Council should also tap into work already undertaken by the City of Casey under a VSAP funded project on site management plans and subdivisional controls.	High
Use a local law in conjunction with education programs for ongoing land use activities	**B5.3**	Council should use a local law preferably tied to an Environmental Management Plan to cover business and industry site operations. For example: • Materials storage. • Waste management and litter control. • Use of water and fertilisers.	High
	B5.4	Council should use a local law to cover littering across the municipality.	High
	B5.5	During scheduled reviews of Council's local laws, Council should maximise opportunities to integrate stormwater management plan options.	Medium
Assist other parties to understand stormwater management and to achieve best practice solutions	**B5.6**	Council should develop standards for Environmental Management Plans submitted under local laws.	High
Strategy B6 - Council Management Infrastructure/Program Operations			
Incorporate best practice stormwater management into Council projects and processes	**B6.1**	Council to utilise existing environmental expertise in the organisation, or external resources where needed, to improve stormwater management outcomes (and by extension the treatment of waterways) in Council's own designs and operations.	Very High
	B6.2	Council to require use of environmental specifications or formal site specific management plans as appropriate for Council contracts and program activities.	Very High

Purpose	Strategy No.	Action	Priority
	B6.3	Council to amend the regular practice of its operations where these can contribute to improved stormwater management outcomes. Eg. Washdown of hard standing areas of maintenance depots, road construction	Very High
Strategy B7 - Education and Enforcement			
Target actions of business, industry, developers and residents to improve stormwater quality	**B7.1**	Council to create or extend current education and enforcement activities and to target activities identified as high-risk threats in the stormwater management plan. Co-ordinate Council programs.	High
	B7.2	Council to use its inspection and enforcement resources more effectively to improve stormwater management outcomes. Council to review available formal or informal inspection and enforcement resources. Council to reallocate as required to further *Banyule Stormwater Management Plan* Implementation.	Very High
	B7.3	Council to co-ordinate its education and enforcement programs with those of other authorities and organisations.	High
Strategy B8 - Build on Partnerships with other organisations			
Expand alliances with other partners in the Stormwater Initiative	**B8.1**	Council should continue its working relationship with Melbourne Water, the EPA, Darebin Creek Management Committee, neighbouring municipalities and the Municipal Association of Victoria.	Very High
Use co-ordination to secure plan implementation and assistance with any problems	**B8.2**	Council should build on other State Government and community partnership opportunities to implement the *Banyule Stormwater Management Plan.*	Very High
Improve co-ordination across the catchments	**B8.3**	Council should develop cross-catchment opportunities for implementation of the *Banyule Stormwater Management Plan*, eg. co-ordination with adjoining municipalities (especially Darebin)	Very High
Improve co-ordination of development outcomes	**B8.4**	Council should enhance the use of Planning Scheme referral and notice provisions to other authorities and organisations in order to obtain more co-ordinated project outcomes and utilise their skills when requiring better outcomes for stormwater management. This could be achieved by developing a 'map' of the referral process	Very High

A range of best practice guidelines and documents are available to the Council, other stakeholders and people involved in the development and construction industry to aid in best practice management. There are also organisations that provide regular information on stormwater management issues, seminars and technological advances and these are detailed in Volume II: Background of the SWMP.

10. Implementation and Review

The effectiveness of the SWMP is dependent upon Council's ability to implement the recommendations of the plan.

Implementation of the SWMP should follow the recommended strategies identified. In order to effectively co-ordinate the implementation of these strategies Council must assign a staff member with responsibility for co-ordinating implementation.

To assist the co-ordinator, an Implementation Committee should also be established. This committee would ideally consist of representatives from all sections of Council relevant to stormwater management including, planning, engineering and infrastructure, parks and gardens, waste management services and health services. Relevant personnel from outside agencies, such as Melbourne Water and the EPA could also be included in the Implementation Committee on an as needed basis where their assistance is required, for say joint programs. The Implementation Committee's role would be to oversee and co-ordinate the progressive implementation of the plan's strategies or actions at a bi-yearly review.

A suggested time frame for implementation has been provided for each of the strategies identified in the Reactive Management Strategies. Typically, low cost strategies have been recommended for immediate implementation while higher costs strategies are recommended for implementation over a longer period of time, depending upon funding availability.

The implementation of strategies can be flexible depending upon funding availability, however it is recommended that a schedule for implementation be established, according to each year's budget constraints, to assist in determining funding requirements over the implementation stages of the plan. This schedule should be reviewed annually and as different funding sources become available.

The effectiveness of the Stormwater Quality Management Plan should be measured with a comprehensive monitoring and review program. There are two levels to this program:

- Monitoring of the implementation of strategies and progress against the plan objectives; and
- Monitoring of the effectiveness of strategies at improving the quality of stormwater runoff and protection and enhancement of the values of receiving environments.

The Implementation-Monitoring Program should establish milestones for implementation progress and should be reviewed on an annual basis. The Project Steering Group can provide a review role for determining the effectiveness of implementation.

Reporting should be conducted to inform the community and other stakeholders of the effectiveness of the strategies in the Stormwater Management Plan. Initially, reporting could be conducted 6-monthly as the plan is implemented and then annually once strategies have been implemented, to report on progress and effectiveness of strategies at addressing stormwater issues.

The full implementation of all strategies identified in the SWMP requires a significant funding commitment. Many of the strategies may be implemented at a cost much reduced from that indicated through modification to current Council procedures and the use of in-house resources.

There is a range of funding options outside of Council's own budget. The Victorian Government through the Victorian Stormwater Action Program (VSAP) is providing grants to local Councils for the implementation of strategies identified in Stormwater Management Plans. This SWMP has been prepared according to VSAP guidelines such that funding can be requested for strategies identified. Funding under the VSAP grants program is available for strategies such as education programs, structural treatment measures, assistance with Planning Scheme amendments, feasibility studies and monitoring programs with up to 50% of the eligible cost available. Funding is not available for providing salaries to Council staff, however salaries are considered an 'in-kind' contribution.

Many of the activities proposed may provide mutual benefit to waterways and assets managed by Melbourne Water. Additional funding or assistance through technical input should be sought from Melbourne Water on projects considered of relevance, for example the construction of pollutant traps and public education material.

New funding opportunities arise from time to time and the designated stormwater coordinator should ensure they are familiar with all funding options.

11. Summary

The development of Banyule City Council's *Stormwater Quality Management Plan* provides Council with the strategic basis for improved stormwater management and hence improved environmental condition for waterways and wetlands in the Banyule area. The plan has been developed according to the requirements of the Victorian Stormwater Committee and in close consultation with Council officers, Melbourne Water, Environment Protection Authority and other key stakeholders through a rigorous consultative process, which included regular meetings and workshops. This has ensured that the strategies identified in the plan are considered by Council and stakeholders to be the most relevant for addressing urban stormwater issues in the Banyule region. Adherence to the requirements of the Victorian Stormwater Committee also ensures that the plan provides the appropriate support necessary for successful funding for strategies identified in the plan.

The success of the initiatives identified in the plan is dependent on Council's commitment to establish the recommended framework for implementation. The ultimate success of the plan will be evident when stormwater management is fully integrated into Council's management framework.

12. References

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