Urban Stormwater Program Evaluation

PART A

Evaluation of the Urban Stormwater Program

Summary Report

stormwater TRUST

A NSW Government initiative

August 2001

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This report presents a review of the outcomes of the Urban Stormwater Grants Program component of the Urban Stormwater Program. The report was prepared by Shane Barter and Richard McManus of the NSW Environment Protection Authority (EPA), based on the evaluations of the Stormwater Grants Scheme, stormwater management planning process, and the Urban Stormwater Education Program.

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Executive Summary

Urban stormwater pollution is a major threat to the health and amenity of our urban waterways. It is a critical issue in realising the community's expectations for a healthy and functional environment. In the Sydney Harbour catchment, for example, about one half of the nutrients and effectively all of the litter, sediment and chemical pollution are associated with urban stormwater.

To tackle the problem, the NSW Government set up the Stormwater Trust in 1997. A total of $60 million was allocated to the Trust to implement a three-year Urban Stormwater Program. The program is part of the Government's $3 billion Waterways Package.

The Urban Stormwater Program concludes in June 2001. The Government has linked its decision about future programs to an independent evaluation of the achievements of the current Urban Stormwater Program.

The objective of the Stormwater Trust is to encourage and support better stormwater management practices to improve the condition of the State's urban waterways. The three main elements of the program are:

- a **Stormwater Trust Grants Scheme** , which has allocated $51 million primarily to local councils to undertake 252 stormwater projects throughout the State.
- a **statewide Urban Stormwater Education Program**, which aims to educate the community, industry, local councils and other stakeholders about ways to reduce urban stormwater pollution.
- a **Stormwater Management Planning process**, which requires local councils to prepare stormwater management plans for their urban areas. These plans were prepared jointly on a catchment basis by councils within the Greater Metropolitan Region. Relevant State agencies were required to participate in the preparation of the plans.

This evaluation report describes the achievements of the Urban Stormwater Program over the last three years, based on an independent evaluation of each of the program elements. Many of these achievements have come about through productive partnerships with local councils, which have primary responsibility for urban stormwater management. This report also makes a series of recommendations about the future of urban stormwater management in NSW.

This evaluation report highlights the following points:

1. The program has been delivered very efficiently in cost terms, and has realised significant environmental benefits. The evaluation of the stormwater planning process has identified the need for ongoing guidance and support in the implementation and revision of the plans.
2. The benefits of the Urban Stormwater Program in reducing pollution and raising awareness have been substantial.
3. Institutional arrangements for stormwater management need improvement. However, wholesale changes are not recommended until local councils have had time to implement the existing stormwater management plans.
4. The program has achieved many of its environmental, social and economic objectives. However, a commitment to an extension to the program should be made to secure ongoing benefits and to build on the achievements detailed in this report.
5. The proposed time extension would allow a transition from the current structures to a more sustainable funding framework for the future management of urban stormwater.

Outcomes of the Urban Stormwater Program

Stormwater Trust Grants Scheme

The Stormwater Trust Grants have:

- prevented an estimated 3600 tonnes of pollution from entering NSW waterways each year
- constructed 73 wetlands to reduce level of nutrients and sediment entering waterways
- rehabilitated 54 sites on urban streams, enhancing community amenity and protecting such sensitive sites as Wallis Lakes and Royal and Lane Cove National Parks
- funded 41 projects valued at $10 million to reduce litter and improve Olympic sites, including the Olympic precinct and rowing, sailing, triathlon, cycling and marathon venues
- created 227 jobs - 61 in regional NSW and 166 in the Greater Metropolitan Region
- led to councils spending a further $30 million on projects, in addition to their in-kind contributions and support of volunteer labour
- awarded grants to 87 projects throughout regional NSW, with funding exceeding $14 million. In Western Sydney, 58 projects have been awarded grants of $7.7 million.

Urban Stormwater Education Program

The education program has significantly improved people's behaviour and understanding of stormwater pollution:

- more than 2.1 million people report that they have changed to less polluting behaviours
- nine out of ten people are now able to nominate something they do to reduce stormwater pollution
- nearly three-quarters of the population regard stormwater pollution as extremely or very important to them. This was an increase of over 500,000 people as a result of the program
- more than 100,000 people have been directly involved in education and training activities relating to the program, including projects run by the Ethnic Communities Council
- a dozen prominent Australian companies in the paint, chemicals and hardware industries have given commitments to carry the stormwater message to their customers.

Stormwater management planning

The stormwater management planning process aimed to increase the ability of councils and other key players to address the effects of urban stormwater on the environment. Stormwater management plans have been completed for metropolitan urban areas, most large regional centres and smaller regional centres.

The development of urban stormwater management plans by councils and other stormwater managers has been a significant achievement of the Urban Stormwater Program. These plans map out the future direction of stormwater management at the local or catchment level. While each of the plans has had strengths and weaknesses, a framework has now been established within which the plans, and the stormwater management activities of councils, can be progressively refined and continuously improved.

Council officers and other stakeholders have been surveyed to measure improvements in the capacity of council officers and organisations to manage urban stormwater.

Improving the Ability of Council Officers to Manage Stormwater

Giving local council officers the skills to better manage stormwater pollution has been one of the most important achievements of the planning process. Two-thirds of all the officers surveyed strongly agreed that their urban stormwater management skills had improved as a direct result of participating in the planning process.

Improving the Ability of Councils to Manage Stormwater

At the organisational level, the planning process has also significantly improved the capacity of councils to manage stormwater in NSW. A majority of the officers surveyed strongly agreed that stormwater had a greater profile within their councils because of the planning process. More than half of the metropolitan councils surveyed, and half of the regional councils, have started to implement their stormwater plans. About one-third of the council officers reported that their councils had increased expenditure on urban stormwater management.

Improved Relationships within Catchments

Almost all of the stormwater plans prepared within the Greater Metropolitan Region have been prepared on a catchment basis. This has involved a cooperative process between all significant stormwater managers (State and local) within individual catchments. Council officers identified the development of catchment-based relationships and partnerships as the most significant overall achievement of the program. About two-thirds of metropolitan councils are either implementing or propose to put in place joint projects with other stormwater managers and the local community.

Future Stormwater Management in NSW

A number of common themes have emerged from the independent evaluations of the program components, and from the consultation with stakeholders. The primary message from stakeholders is that the Urban Stormwater Program should be extended into the future.

The Stormwater Trust recommends that the Urban Stormwater Program be renewed to establish a framework for resourcing future stormwater management. The allocation of grants by the State Government, through the Stormwater Trust, should not be seen as the long-term solution for funding councils' stormwater management. Rather, the proposed extension would provide a transition to a more self-sustaining funding and management framework.

The Trust will undertake a review of funding and institutional arrangements for stormwater management. This review would assess the need and options for change in these arrangements, based on the implementation of stormwater management plans under the existing framework.

The enhanced funding would build on the process initiated by the State Government through the Stormwater Trust, and make councils' stormwater plans work. The central theme of the future program would be securing and enhancing the capacity of local councils and the community to successfully implement their stormwater management plans, delivering significant environmental benefits to urban waterways.

The recommended enhancement in funding would provide more effective and comprehensive guidance and support to stormwater managers and the community in addressing stormwater pollution. Enhanced funding for increased grants to local government for stormwater projects, local education programs, stormwater extension officers, and improved controls at new development sites is considered necessary to address the main areas for improvement identified

by this evaluation. Enhanced funding will also provide increased capabilities for smaller regional centres whose plans are due to be completed in April 2001.

It is proposed that the EPA continue to administer the program on behalf of the Stormwater Trust. Stakeholders have expressed support for the EPA's administration of the program, which has been delivered effectively and at low cost. The EPA is well placed to continue this role, with its experience in employing educative, economic and regulatory tools for environmental protection.

Recommendations

Eight major recommendations emerged from the evaluation. These recommendations, listed below, identify the main elements of the proposed extension of the Urban Stormwater Program.

Recommendations - It is recommended that the Government approve:
1. A Grants Scheme supporting local stormwater management activities The majority of program funding would be directed to local councils to assist in a comprehensive stormwater management effort, based on priorities set in the stormwater plans.
2. Enhancement of the Urban Stormwater Education Program The program would build capacity at State and local levels to increase awareness and improve practice in an integrated manner across government and non-government sectors and industry.
3. Commitment to resourcing the second phase of the program Adequate resources are necessary to fully realise the benefits of the proposed future program.
4. Establishment of a framework for sustainable stormwater management The program should help councils revise and improve the stormwater plans, and also develop a more sustainable financial and management framework for urban stormwater beyond 2006.
5. Grants to Regional Organisations of Councils for stormwater extension officers Stormwater extension officers within Regional Organisations of Councils would enhance the role and objectives of the Stormwater Trust in the implementation and revision of the plans.
6. Improved dissemination of information to stormwater managers and stakeholders The Stormwater Trust provides a unique opportunity for collation and dissemination of the knowledge and experience developed by projects and other elements of the program.
7. Improvement of the knowledge base of urban stormwater management Good management is based on good science, and there is a need to enhance the understanding of the issues and develop improved management systems and tools to address those issues.
8. Sustainable new urban developments The adoption of more 'water-sensitive' urban designs for new developments significantly reduces stormwater pollution at source, and creates a more attractive and livable urban form.

1 Introduction

This evaluation report describes the achievements and progress of the Stormwater Trust in improving the management of urban stormwater in NSW. Urban stormwater is being increasingly recognised as an important determinant of the health and amenity of urban waterways throughout the State. The Urban Stormwater Program, implemented by the Stormwater Trust as an initiative of the NSW Government, is the most concerted and integrated 'whole-of-government' program implemented to date to address this problem.

As the Urban Stormwater Program approaches the end of its three-year life, the government has requested that the Stormwater Trust undertake an independent evaluation of the program. Government has reserved any decision regarding an extension of the program until it has considered this evaluation.

1.1 Urban Stormwater – What is the Problem?

Stormwater run-off from urban areas is an increasingly important determinant of the health, ecology and amenity of urban streams, rivers, estuaries and beaches. Urban development has severely affected urban waterways in many ways. Increased areas of impervious surfaces (such as roofs and roads) cause increased volumes and rates of stormwater run-off from urban areas. Many minor urban creek and streams have been replaced with concrete pipes and constructed channels to safely convey this increased run-off to receiving waters without causing major flooding. Streams not destroyed in this way have typically suffered increased erosion, and there has been degradation of stream banks and associated riparian vegetation as a result of the increased flows.

Everyday activities in urban areas, from building houses to maintaining gardens to driving and maintaining motor cars, leads to the deposition of a broad range of pollutants on to the urban landscape; these pollutants are washed away in rainfall events, causing stormwater pollution. Pollutants typically found in urban stormwater run-off are litter, vegetative waste, soil and sediment, nutrients (which contribute to algal blooms), pesticides and herbicides, oils and other hydrocarbons, heavy metals and other toxic substances.

In many urban areas throughout NSW, urban stormwater is a significant source of pollution to the State's waterways. Within the catchment of Sydney Harbour (Parramatta River – Port Jackson catchment) effectively all of the visible litter, most of the sediment and 'chemical' pollution and about half of the nutrient pollution originate from stormwater run-off, with most of the balance coming from overflows and leaks from Sydney Water's sewerage systems. In other parts of Sydney where the sewerage collection system is not as old, the relative significance of stormwater can be expected to be even greater. As the Sydney Water Corporation reduces the impacts of sewer overflows and leaks, through the construction of the Northside Sewage Storage Tunnel and other programs, the importance of improved management of urban stormwater will increase.

Urban stormwater also has significant harmful effects upon areas of urban bushland, including National Parks. Increased rates and frequencies of stormwater flows (from the increase in impervious areas) and increased nutrient levels contribute to erosion and the promotion of weed species, respectively.

1.2 The Stormwater Trust and the NSW Government's Waterways Package

On 1 May 1997, the Premier of New South Wales, the Hon. Bob Carr, MP, announced the NSW Waterways Package. This comprehensive $3 billion program aims to improve the quality of the State's Waterways through:

- upgrading sewerage systems operated by Sydney Water and Hunter Water
- implementing initiatives to reduce the impact of stormwater run-off
- improving rural waterways
- cleaning up Sydney Harbour.

The Waterways Advisory Panel was established to assess a proposal by Sydney Water to improve water quality in Sydney Harbour as a priority. The panel recommended that the proposal to build the Northside Storage Tunnel proceed immediately.

The water quality of Sydney Harbour is determined largely by a combination of stormwater and sewer overflows. Harbour water quality is significantly affected by rainfall events, with effectively all litter, most of the sediment load and about half of the nutrients originating from stormwater run-off from urban areas. Most of the balance of the pollutant load, including most faecal coliform (bacterial) pollution, is sourced from sewer overflows.

Given the relative pollution loads in Sydney Harbour, the Waterways Advisory Panel in 1997 recommended that:

> *…a properly funded and structured program for stormwater management be developed through the Sydney Harbour Catchment to facilitate integrated stormwater planning. This program ... should also apply to other waterways* (Waterways Advisory Panel Report July 1997).

In October 1997, in response to the need for a more concerted and integrated effort to manage urban stormwater, the government committed $60 million to a three-year Urban Stormwater Program to encourage and support better urban stormwater quality management practices to improve the condition of the State's waterways.

1.3 Elements of the Urban Stormwater Program

The main components of the Urban Stormwater Program, as implemented by the Stormwater Trust, are:

- Stormwater Trust Grants Scheme – over three years the Grants Scheme allocated $50 million to 250 grants to improve urban stormwater quality throughout NSW. The funding has been matched by $30 million worth of funding from local councils.
- Urban Stormwater Education Program – aimed at educating the community, industry, local councils and other stakeholders to reduce stormwater pollution through greater awareness and modified practices. Four million dollars are being spent on mass media, schools education, cleaner industry programs, non-English-speaking groups, and public relations.
- stormwater management plans – councils throughout the State were required to prepare catchment-based stormwater management plans identifying local stormwater problems and

proposing cost-effective solutions. Four million dollars were allocated to assist local councils with the costs of preparing these plans.

1.4 About this Evaluation Report

The three-year Urban Stormwater Program is scheduled to end in July 2001. The NSW Government has reserved any decision on extending the program until an independent evaluation of the program has been undertaken by the Stormwater Trust. This evaluation report describes the achievements of the program, and outlines the main elements of a future program, should additional funding be made available.

The evaluation report is presented in four parts. This document, Part A, is a summary report that draws on the main findings of the three separate component reports, which form Parts B, C and D of this package. These component reports provide a more detailed independent evaluation of the three main components of the Stormwater Trust's work, as follows:

- *Evaluation of the Stormwater Trust Grants Scheme – Urban Stormwater Program Evaluation: Part B*
- *Evaluation of the State-wide Urban Stormwater Education Program – Urban Stormwater Program Evaluation: Part C*
- *Evaluation of the Stormwater Management Planning Process – Urban Stormwater Program Evaluation: Part D.*

Section 2 in Part A provides an overview description of the Urban Stormwater Program implemented by the Stormwater Trust. Sections 3, 4 and 5 then present a summary of the findings of evaluations of the Stormwater Trust Grants Scheme, the Urban Stormwater Education Program and the stormwater management planning process, respectively. Each of these sections describes both the achievements and shortcomings of the program elements, and make recommendations regarding possible future actions to extend these achievements and address the identified shortcomings.

Section 6 of Part A identifies the links and synergies between the main elements of the program, and describes the manner in which the grants, education program and the preparation of stormwater management plans have combined to improve stormwater management practice.

Finally, Section 7 of Part A proposes a program for future urban stormwater management in NSW. This section identifies the need for a continuation of the Urban Stormwater Program, and identifies the type of activities that could be undertaken and associated costs should government choose to extend the program.

The Stormwater Trust has sought to ensure the independence of this evaluation by maximising the role of external agencies and stakeholders in the evaluation process. The evaluation of the Stormwater Trust's grants scheme has involved, and has been endorsed by, the Technical Review Group of the State Stormwater Advisory Committee (SSAC). The Technical Review Group includes representatives of the Nature Conservation Council, Sydney Water, the Stormwater Industry Association, the Department of Land and Water Conservation, and the Environment Protection Authority. The group has met five times over the three months to October 2000, and has undertaken out-of-session reviews of papers.

Similarly, the evaluation of the Urban Stormwater Program has involved, and has been endorsed by, an External Reference Group established in 1997 to oversee the implementation of the program. The External Reference Group includes representation from councils, Clean Up Australia, the Hawkesbury Nepean Catchment Management Trust, the Ethnic Communities

Council, the Stormwater Industry Association, Local Government and Shires Associations and the Department of Land and Water Conservation.

The evaluation of the Stormwater Management Planning process was undertaken by a senior academic and senior research scholar at the University of New South Wales. This evaluation has involved extensive consultation with councils, consultants and other stakeholders who have participated in the preparation of stormwater management plans.

Each of these evaluation reports has been considered and endorsed by the broad membership of the State Stormwater Advisory Committee (SSAC). The SSAC has provided the primary mechanism for external oversight and input into the implementation of the Urban Stormwater Program since 1998.

2 Description of the Urban Stormwater Program

The objective of the Stormwater Trust is to encourage and support improved urban stormwater quality management practices to improve the condition of the State's waterways. The Stormwater Trust uses a combination of public education, stormwater management planning, and remedial stormwater projects to achieve this objective.

The allocation of funding to implement these programs is detailed below. Over the three-year life of the Urban Stormwater Program:

- $51 million have been allocated by the Stormwater Trust to fund 252 projects throughout the State aimed at reducing the impact of urban stormwater on the environment. Almost all of this funding has been directed to local councils to undertake innovative and cost-effective solutions to stormwater problems throughout NSW.
- $4 million have been allocated to implement the Urban Stormwater Education Program. This is a state-wide program aimed at educating the community, industry and other stakeholders on the need to reduce stormwater pollution, and the ways in which this can be achieved.
- $4 million have been allocated to help local councils with the cost of preparing stormwater management plans
- $1 million have been allocated for the implementation and administration of the program by the EPA.

The remainder of section 2 provides a background description of the main elements of the Urban Stormwater Program to help the reader interpret the content and findings of Sections 3, 4 and 5, which summarise the findings of evaluations of the grants scheme, education program and stormwater planning process, respectively.

2.1 Stormwater Trust Grants Scheme

Over the three stages of the Stormwater Trust Grants Scheme 252 grants were awarded to local councils to improve urban stormwater quality. This included 56 Stage 1 projects in 1998–99, 86 Stage 2 projects in 1999–2000 and 108 Stage 3 projects in 2000–01.

The objectives of the Stormwater Trust have been reflected in the funding priorities of the three stages of the Stormwater Trust's Grants Scheme. The Trust has given priority to projects that have potential for significant environmental benefit to NSW urban waterways, demonstrate partnership between local government and other public authorities, and have demonstrable community support.

The Stage 1 projects were primarily those that focused providing an opportunity for valuable innovations in stormwater management, by piloting innovative and cost-effective technologies under a range of catchment conditions. This was considered important to provide a greater understanding of the effectiveness of stormwater treatment devices.

A further priority for Stage 1 and 2 projects was the enhancement of water quality within Olympic catchments, such as Farm Cove, Homebush Bay, Centennial Park and Penrith Lakes. Stage 2 and 3 projects have focused on addressing stormwater pollution close to source and more effectively integrating structural and non-structural stormwater solutions. Stages 2 and 3

of the grants scheme have also focused on funding solutions to issues identified in the preparation of stormwater management plans.

Stormwater Trust Grants were made through a competitive application process. Eligibility for the grants scheme was limited to local councils and government agencies for whom stormwater management was not a core responsibility. The Stormwater Trust assessed grant applications on the advice of a Stormwater Project Technical Assessment Panel, made up of technically qualified nominees of the EPA, Department of Land and Water Conservation, Local Government and Shires Associations, NSW Nature Conservation Council and Stormwater Industry Association.

Projects funded by the Trust employ a variety of techniques to reduce the environmental impacts of stormwater discharges. The management techniques can be broadly categorised into three groups:

1. *Stormwater treatment devices* – which remove pollutants from stormwater flows before discharge to waterways.
2. *Remedial projects* – including the rehabilitation or restoration of urban streams to improve the amenity and ecological integrity of those streams, and to reduce the passage of stormwater-borne nutrients and sediments to receiving waters.
3. *Education and 'source control'* – education projects focus on raising community and industry awareness of local stormwater issues and problems. They aim to minimise the levels of urban pollution entering waterways by changing people's behaviour.

Section 3 of this report provides a summary of the Trust's evaluation of the grants scheme. The full evaluation report is presented in Part B of this package.

2.2 State-wide Urban Stormwater Education Program

The State-wide Urban Stormwater Education Program (USEP) employs education to build the community's knowledge, motivation, capacity and willingness to undertake behaviour that has a positive impact on urban stormwater quality. The program has four key objectives:

1 Promote community awareness, knowledge and understanding of the extent and causes of stormwater pollution.

2 Promote new 'norms' of community behaviour that improve stormwater quality.

3 Facilitate behavioural change by promoting simple, practical ways for particular groups and individuals in the community to reduce stormwater pollution.

4 Build the community's capacity to undertake activities that improve stormwater quality. The USEP is being conducted in two phases over a three-year period (1998–99 to 2000–01). In both phases, the main elements of the program are mass media (mainstream and non-English-speaking background), community education (including a schools program), industry education and training, and program facilitation and support.

The mass media component of the Urban Stormwater Education Program was comprised of television, radio and billboard advertising for mainstream audiences, and print and radio advertising for people of non-English-speaking backgrounds. These advertisements drew attention to the fact that 'natural' materials such as soil, leaves and vegetative cuttings can be

significant pollutants, and to the way in which a broad range of pollutants (such as litter and cigarette butts) find their way into the stormwater system and are discharged into urban waterways. Both of these advertisements used the 'tag line' *The drain is just for rain*.

The print and radio advertisements also used the *Drain is just for rain* tag line to provide a link in the minds of community members between the different media. Both the print and radio advertisements highlighted the polluting nature of everyday activities, and provided guidance on better ways of undertaking these activities. Messages targeting people of non-English-speaking background were presented in ethnic newspapers and local community radio stations.

A major component of the USEP targeted industry at three levels. This work:

- resulted in companies extending the messages of the program, via their products
- promoted 'cleaner production' projects within a number of industry associations
- promoted the development and delivery of accredited training courses in a number of industry sectors, including automotive, nursery, and local government operations.

Finally, significant community education projects have been conducted. These include six innovative education projects in local government; training and accreditation of 38 community educators across NSW; a significant community education program with the Ethnic Communities Council; a schools program; and a program to build the capacity of council staff to plan, deliver and evaluate local stormwater education programs.

Section 4 of Part A provides a summary of the Trust's evaluation of the education program. The full evaluation report is presented in Part C of this package.

2.3 Preparation of Urban Stormwater Management Plans

An important component of the Urban Stormwater Program was the requirement for local councils and other stormwater managers to work together to prepare catchment-based stormwater management plans.

This requirement was formalised by the EPA's issue of legal directions to local councils to prepare the plans under section 12 of the *Protection of the Environment Administration Act 1991*. The Sydney Water Corporation, Hunter Water Corporation and Roads and Traffic Authority were issued with similar legal notices requiring those agencies to:

- participate in the preparation of the plans in accordance with their respective stormwater management responsibilities
- submit to the EPA a Stormwater Environment Improvement Program, drawing together the stormwater actions of each agency, as identified in the stormwater planning process.

The stormwater management plans have been developed in a staged process throughout the State. Councils within the Greater Metropolitan Region were required to prepare catchment-based stormwater management plans for each of 40 urban catchments within the region. Importantly, local councils and other stormwater managers were required to work together to prepare catchment-based stormwater management plans, rather than prepare separate plans for individual local government areas. For example, Auburn, Burwood, Concord and Strathfield Councils, together with the Sydney Water Corporation and the Roads and Traffic Authority, were directed to jointly prepare the Homebush Bay Catchment Stormwater Management Plan. Metropolitan Councils were given 15 months to prepare these plans.

A longer time frame was provided to regional and rural councils to prepare stormwater management plans for their urban areas. The 46 councils with local government area populations in excess of 10,000 had two years to prepare their stormwater management plans. Sixty smaller councils with population centres larger than 1000 were given three years to submit their plans to the EPA. Councils with no population centres larger than 1000 were not directed to prepare stormwater management plans.

The primary goal of the stormwater management plans was to facilitate the coordinated management of stormwater within a catchment to maximise ecological sustainability and the social and economic benefits of sound stormwater management practices. The stormwater management plans provide direction to future stormwater management activities within individual catchments. A stormwater management plan is a framework for action, rather than simply a statement of principles.

Important elements of the urban stormwater management plans, as required by the EPA's Section 12 Direction, included:

- a catchment-based approach to stormwater management, rather than adopting local government boundaries as the planning unit. Forty catchment- (or sub-catchment-) based plans, were prepared within the Greater Metropolitan Region
- responsibility for the preparation of the plans being shared between the major stormwater managers of individual catchments
- a requirement to consult with the community and other key stakeholders
- building on the findings or recommendations of earlier catchment plans, such as estuary or floodplain management plans or reports of the Healthy Rivers Commission
- a targeted planning process, moving from locally derived catchment values and stormwater management objectives, to the issues (or problems) that compromised those objectives, and then the management options aimed at addressing these issues. These management options were then evaluating in each plan to identify the most cost-effective stormwater solutions to be implemented.
- mechanisms for monitoring the effectiveness of plan implementation and for reporting that effectiveness to stakeholders (including the community), a program for revising the plan, and a mechanism for linking plan implementation to the council management planning processes required under the *Local Government Act 1993*.

In this way, the Stormwater Management Planning process has required the identification of locally derived solutions to local stormwater issues, within a uniform and consistent framework across the State.

The Stormwater Trust provided funding to help local councils prepare their urban stormwater management plans. The Stormwater Trust matched each council's financial and 'in-kind' contribution to the plan preparation with a grant of up to $30,000 for each Greater Metropolitan and larger regional council, and $15,000 for each smaller rural council.

Section 5 of this report provides a summary of the Trust's evaluation of the planning process. The full evaluation report is presented in Part D of this package.

2.4 Other Activities

Program administration

The implementation of the Urban Stormwater Program is overseen by an independent Stormwater Trust, supported by a four-member team located within the EPA. The independent Trust provided crucial leadership. It established clear priorities and drew linkages to other government programs such Water Reform and councils' management planning. The members of the Stormwater Trust are:

- Director-General, Environment Protection Authority (Chair)
- Director-General, Department of Land and Water Conservation
- Director-General, Department of Local Government
- Executive Director, Resource Allocation – Education, Natural Resources and Property, The Treasury
- President, Local Government and Shires Associations.

Broad stakeholder input into the implementation of the program has been provided through the State Stormwater Advisory Committee (SSAC). The SSAC provides independent advice to the Stormwater Trust and has been instrumental in the progressive implementation and evaluation of program components. The SSAC is well placed to provide advice to the Trust on cross-stakeholder issues.

The SSAC is chaired by the Environment Protection Authority, and includes representatives of the Local Government and Shires Associations, Clean Up Australia, the Nature Conservation Council, the Institute of Public Works Engineers of Australia, the Stormwater Industry Association, the Urban Development Institute of Australia, the Waterways Authority, the Hunter and Sydney Water Corporations, and the Departments of Land and Water Conservation, Urban Affairs and Planning and Local Government.

The four-member Stormwater Team established within the EPA to implement the Urban Stormwater Program has also been active in providing advice to government, industry and the community on technical and other aspects of urban stormwater management. In particular, the urban development industry frequently seeks advice from the EPA regarding compliance with government and council requirements in relation to urban stormwater.

'Managing Urban Stormwater' documents

The EPA has prepared a series of guidance documents to assist local councils and the development industry in meeting the requirements of the Urban Stormwater Program. The following documents have been prepared:

- *Managing Urban Stormwater: Council Handbook* – provides a suggested methodology to local councils for the preparation of stormwater management plans, and also provides technical information on the environmental impacts of urban stormwater discharges.
- *Managing Urban Stormwater: Treatment Techniques* – provides technical information on the suitability and effectiveness of a range of non-proprietary stormwater treatment measures, such as gross pollutant traps, infiltration systems and constructed wetlands.
- *Managing Urban Stormwater: Source Control* – provides guidance to councils and the development industry on the control or prevention of stormwater problems at source. This

document provides guidance on water-sensitive urban design and the development and implementation of targeted stormwater education programs.

- *Managing Urban Stormwater: Soils and Construction* – provide guidance on mitigating the impacts of construction activities on the stormwater environment. This document focuses primarily on erosion and sediment control at subdivisions and construction sites.

NSW Supply Service 'Period Contract' for Supply of Stormwater Treatment Devices

The Stormwater Team has worked with the Department of Public Works and Services to establish a NSW Supply Service 'period contract' for the supply of proprietary stormwater treatment devices. This initiative arose from the difficulty of including commercial products in the EPA's *Managing Urban Stormwater* documents. The *'Period Contract' User Guide*, which has been distributed to all NSW councils, provides valuable advice on those commercial stormwater treatment devices on the market that are considered reasonable value by an expert panel.

Stormwater Trust Website

The EPA Stormwater Team has established a Stormwater Trust website on the EPA's home page. This website has been an important tool in disseminating information on the Urban Stormwater Program, including copies of the legal Directions issued to councils and to State agencies, and lists of stormwater projects funded under the Stormwater Trust Grants Scheme. Lessons learned from early projects have now also been placed on the website to provide better guidance to councils in employing specific stormwater management techniques.

The Stormwater Trust Website - http://www.epa.nsw.gov.au/stormwater/

3 Evaluation of the Stormwater Trust Grants Scheme

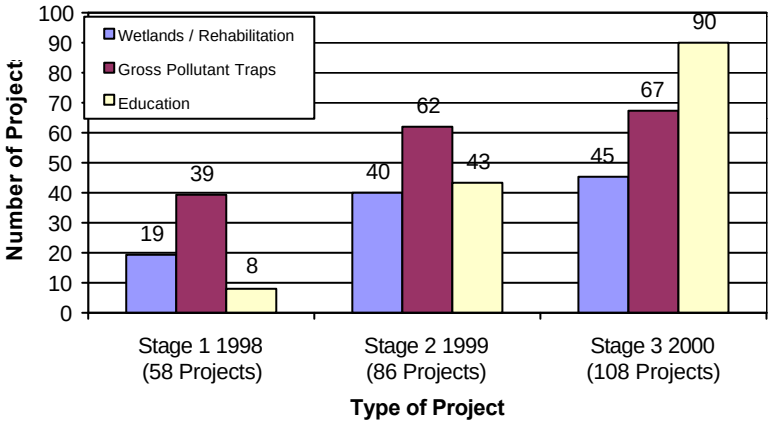
The NSW Government provided $51 million of funding to the three stages of the Stormwater Trust Grants Scheme. Although councils were not required to match Stormwater Trust funding, a further $30 million, with additional in-kind support, has been provided to increase the value of the projects.

The Stormwater Trust Grants demonstrate that the complex problem of urban stormwater quality can be tackled using innovative, cost-effective solutions. The projects are spread throughout the urban areas of NSW and have led to the development of skills and jobs throughout the State. Most interestingly, there has been a significant growth in the newly developing stormwater industry throughout NSW.

Over the three stages of the Stormwater Trust Grants Scheme, 252 grants were awarded to local councils to improve urban stormwater quality. This included 58 Stage 1 projects in 1998, 86 Stage 2 projects in 1999 and 108 Stage 3 projects awarded in July 2000.

The projects employ a variety of techniques to manage stormwater. These techniques relate to the issues within the catchment and the pollutants targeted, and include stormwater treatment devices, wetland construction and rehabilitation, and education. The numbers and types of projects awarded grants in each round are outlined in Figure 1; the numbers of projects of each type are greater than the actual numbers of grants awarded, as some projects employed more than one stormwater management technique.

Figure 1 Types of grants funded through the stormwater grants program



Through the three stages of the grants scheme, projects have increasingly employed more than one stormwater management technique to comprehensively address stormwater pollutants that affect receiving waters. By increasing the integration of stormwater techniques, the Stormwater grants are comprehensively addressing stormwater pollution issues on a catchment basis, a practice in line with the stormwater management plans, best environmental practice and ecologically sustainable development principles.

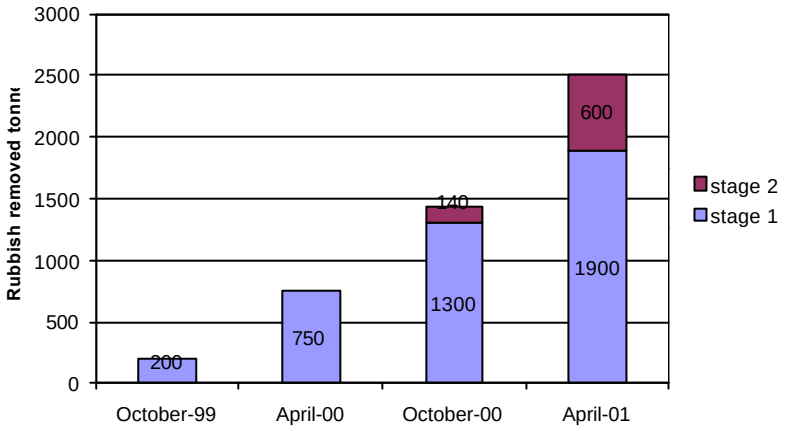
3.1 Environmental Benefits of Stormwater Trust Projects

Through the three stages of the grants scheme, 168 projects have installed 834 stormwater pollutant traps to prevent sediment, litter and organic material from entering urban waterways. These pollutant traps include 471 larger gross pollutant traps on drainage lines and 363 stormwater pit traps to remove pollutants from the stormwater system.

The 165 gross pollutant traps installed in Stage 1 grants have been operating for over one year and had removed over 1300 tonnes by October 2000 (Figure 2). Stage 2 projects are now beginning to have a positive environmental impact and have already prevented 140 tonnes of pollution from entering urban waterways. It is estimated that, together, the Stage 1 and 2 projects will prevent 2400 tonnes of pollution from entering NSW urban waterways every year.

It is projected that Stage 3 projects will include a further 172 pollutant traps to be installed over the next year; these will prevent similar amounts of pollution from entering urban waterways in NSW. When all the stormwater treatment devices are operational it is estimated that they will remove an average of 3600 tonnes a year, enough to fill four Olympic swimming pools.

Figure 2 Rubbish removed from stormwater traps



The significant impact of Stormwater Trust projects in preventing pollution reaching waterways has been enhanced by rehabilitation, works construction of wetlands and restoration of streambank vegetation in 19 Stage 1, 40 Stage 2 and 45 Stage 3 projects. Constructed wetlands are natural stormwater treatment systems that combine biological chemical and physical treatment mechanisms for water quality improvement. Wetlands benefit waterways by removing fine sediments nutrients and other chemical pollutants.

Gross pollutant traps like the one above installed through the Stormwater Trust Grants Program, will stop over 3600 tonnes of pollution entering NSW waterways each year.

Stormwater education programs aim to build the community's knowledge and motivation, as well as their capacity and willingness to undertake behaviour that has a positive impact on urban stormwater quality. Stormwater education projects funded by the grants scheme have, typically, sought to address specific environmental issues and target specific audiences within catchments. These target groups have included industries, community organisations, local government, schools and the broader community. Key stormwater messages have been adapted to the needs, skills and interests of the particular audience. Education has become the most widely adopted stormwater management approach, adopted in 15% of Stage 1, 50% of Stage 2 and 83% of Stage 3 grants.

Auditing is an important extension of education projects, used to target urban stormwater pollution from commercial and industrial activities (for example, oils and greases, or general litter) or building sites (sediments). The Stormwater Trust projects have been very successful in initiating and maintaining stormwater education and auditing projects throughout NSW.

Stormwater Trust Grants in Olympic Catchments

A priority of the Stormwater Trust in Stages 1 and 2 was to help councils improve stormwater quality within catchments hosting Olympic events. Grants totalling $10 million were awarded to 20 Stage 1 and 21 Stage 2 projects to prevent stormwater pollution entering Olympic catchments. Examples of grant projects within Olympic catchments are:

- Auburn Council installed a series of pollution traps to prevent stormwater pollutants entering Haslams Creek, which flows through the Olympic site at Homebush Bay.
- Centennial and Moore Park Trust installed gross pollutant traps at Musgrave Pond and Model Yacht Pond, at Centennial Park.
- Penrith City Council installed a gross pollutant trap and woodlot to trap litter and filter stormwater through soil, before it flows to the International Regatta Centre, Penrith Lakes.
- Bicentennial Park Trust installed several pollutant traps to prevent litter from flowing into Boundary Creek, adjacent to the Olympic Tennis Centre.
- Royal Botanic Gardens installed two pollutant devices to treat all stormwater flowing from the Gardens and the Domain into the triathlon course.
- Mosman Council installed six gross pollutant traps at Mosman Bay and Balmoral to prevent pollution entering Sydney Harbour.

Premier Bob Carr has said that the Urban Stormwater Program and the government's $3 billion waterways package are paying off. 'We've been working hard to solve the problem of urban waste water and stormwater run-off and the proof is now before our eyes', said Mr Carr on 15 September, the opening day of the Sydney 2000 Olympic Games.

The benefits to Sydney Harbour from this program have been evident through the Olympic Games with events such as triathlon and sailing, with Olympians competing in a pollution free environment.

3.2 Economic Benefits of Stormwater Trust Projects

The Stormwater Trust Grant Scheme has funded 252 grants worth a total of $51 million. Councils have spent a further $30 million funding the projects, taking the total value to $80 million, or a further 60% above the original NSW Government commitment. The council contributions do not take into account council in-kind support for the projects, which includes management of the projects and continuing operation and maintenance of the devices; this operation and maintenance can cost up to $20,000 a year for some of the larger stormwater devices.

Significantly, over 80% of Stormwater Trust funding has gone directly to 'on the ground' works, resulting in immediate improvements to many areas and receiving environments, providing clear evidence of the success of the Stormwater Trust Grants scheme.

Council support for the Stormwater Trust projects has grown through the life of the three grant stages, with the total value of the projects being 30% above Stage 1, 60% above Stage 2 and 90% above the Stage 3 grant amount.

Regional Development Generated by the Stormwater Trust Projects

While the focus of the Stormwater Trust Grants was to improve urban stormwater management, a priority of the Trust when awarding grants was to ensure appropriate geographic distribution to regional NSW and Western Sydney.

In both Stages 1 and 2, the bulk of the funding was allocated to threatened catchments in the major urban region of Sydney. In Stage 1 the projects were evenly distributed throughout urban centres of NSW, with 41 metropolitan projects and 17 regional NSW projects (Table 1). Grants of over $5.7 million for 17 projects were awarded in Western Sydney (30% of the grant funds).

Table 1 Regional distribution of projects and funding

Region	**Stage 1 1998**		**Stage 2 1999**		**Stage 3 2000**	
Region	Grants	Funding	Grants	Funding	Grants	Funding
Greater metro areas	41 (70%)	$ 9,655,119 (75%)	68 (79%)	$ 15,304,819 (83%)	56 (52%)	$ 11,090,603 (60%)
Western Sydney	17 (30%)	$ 5,679,437 (70%)	27 (31%)	$ 8,152,280 (45%)	14 (13%)	$ 3,282,720 (18%)
Regional NSW	17 (30%)	$ 3,300,817 (25%)	18 (21%)	$ 2,966,822 (17%)	52 (48%)	$ 7,572,662 (40%)
Total no. of grants	**58**	**$ 12,955,936**	**86**	**$ 18,271,641**	**108**	**$ 18,663,265**

(Western Sydney is a sub-set of Greater Metropolitan Areas)

In Stage 2 a similar distribution of projects occurred, with 79% of the projects and 83% of the funding going to the Newcastle–Sydney–Wollongong Region. Grants of over $8.1 million were awarded to 27 projects in Western Sydney (45% of the grant funds).

In response to requests from regional councils to increase their stormwater knowledge, the EPA ran a series of five regional workshops throughout March 2000, to help councils in the formulation of Stage 3 applications and to foster improved stormwater management practices in regional NSW. The Stage 3 grants resulted in a large increase in the regional distribution of projects, with nearly half of the projects (48%) and 40% of the funds ($7.5 million) being assigned to regional NSW.

Regional councils have embraced the funding provided by the Stormwater Trust by more than doubling the funding, to make the total value of the projects over $16.7 million. It is estimated that over 75% of these funds will be spent locally, increasing the capabilities of the councils and regional industries. Through the Stormwater Trust grants, regional centres of stormwater excellence have been established at Dubbo and Albury, and on the North Coast in Maclean, Tweed and Byron Councils.

Jobs Created by the Stormwater Grants

Stormwater Trust Grant funding has created jobs in local government and the stormwater industry. Two hundred and twenty-seven jobs have been created through the three rounds of stormwater grants and through expansion of the stormwater industry; these jobs are distributed between greater metropolitan and regional NSW. Regionally 61 jobs have been created through the grants, which have helped to raise the profile, knowledge and skills of stormwater managers to deal with stormwater. A significant benefit of this upsurge in jobs over a short period has been the transfer of knowledge and experience between councils and stormwater managers, learning at the same pace and time.

Many councils are developing multidisciplinary stormwater management functions that go beyond the traditional focus on flood control, a trend that needs to be continued through the implementation of the stormwater management plans.

Development of the Stormwater Industry

The Stormwater Trust Grants Scheme has been a catalyst for investment and growth in the stormwater industry. The industry has developed rapidly in NSW over the past three years. Not only is the stormwater industry in NSW increasing its capabilities at a result of the Urban Stormwater Program – it is also leading the way in stormwater management nationally.

In November 1997, 10 new companies operating in the NSW stormwater field registered at the inaugural Stormwater Trust workshop and trade display, demonstrating a range of stormwater treatment technologies. Most of the companies offered single devices delivering a total solution to stormwater pollution. Since that time there has been significant investment in and understanding of the appropriateness of the stormwater devices.

Competition resulting from the grants scheme has increased the need for companies to continually improve their products in order to remain competitive. Hunter Water Corporation suggests that it is evidence of a growing and maturing NSW stormwater industry in that companies are now providing both the equipment and follow-up maintenance required to ensure the success of the devices.

NSW has become a showcase for stormwater companies that are offering devices on the international market, with Sydney being cited as an example of ‘how it should be done’. Victoria, Queensland and the Commonwealth are now adopting the components of the NSW Urban Stormwater Program. The other States have not yet developed stormwater programs but are learning from the experiences of NSW and adopting lessons into the development of stormwater initiatives.

3.3 Outcomes of the Stormwater Grants

The stormwater grants have acted as catalysts for stormwater activities and initiatives in NSW. Over the past three years there has been a growing awareness of stormwater issues in local government, the community and industry as a result of the projects, which have focused on stormwater quality and its impacts on the environment.

The objective of the Stormwater Trust is to encourage and support improved urban stormwater quality management practices to improve the condition of the State's waterways. The Stormwater Trust Grants Scheme has focussed on the pursuit of this objective through the funding priorities of each of the three stages of the scheme.

These priorities have been achieved by:

- preventing an estimated 3600 tonnes of pollution from entering NSW waterways each year. This is equivalent to stopping 144 semi-trailers dumping litter, sediment and vegetative wastes into urban waterways
- funding 41 projects valued at $10 million to reduce litter and improve Olympic sites, including the Olympic Village and rowing, sailing, triathlon and marathon venues
- constructing wetlands and restoring stream banks to reduce nutrient and sediment pollution in Sydney Harbour, Georges River, Warriewood Wetland, Cooks River, Wallis Lake and other waterways
- improving the recreational amenity in the Royal and Lane Cove National Parks, the Royal Botanic Gardens, Centennial Park, Bicentennial Park, and other local parklands
- demonstrating innovative technologies in 15 projects
- fostering partnerships that have developed the relatively young stormwater industry.

The projects have demonstrated:

- the relative cost-effectiveness of stormwater devices, through performance monitoring and 'hands-on' experience. This information will allow the industry to optimise future stormwater expenditure.
- that placing gross pollutant traps closer to pollution sources increases the benefits and decreases the capital costs of projects.

The projects have supported local communities by:

- creating 227 jobs: 61 in regional NSW and 166 in the Greater Metropolitan Region
- councils spending a further $30 million on projects, as well as making in-kind contributions and supporting volunteer labour
- awarding grants to 87 projects throughout regional NSW, with funding exceeding $14 million
- awarding over $7.7 million for 58 projects in Western Sydney (30% of the grant funds)
- local contractors receiving two-thirds of the grant funds paid to regional NSW
- providing funding to support *Bushcare, Streamwatch*, and volunteer projects
- assisting councils by extending the skills learned within the grant projects to identify and repair stormwater problems within their local areas.

4 Evaluation of the Urban Stormwater Education Program

The Urban Stormwater Education Program (USEP) is a $4 million component of the Urban Stormwater Program and is administered by the Education and Community Programs Section of the EPA. The USEP is aimed at improving the quality of waterways through education that has a positive impact on behaviours that affect urban stormwater quality.

Phase 1 of the program was approved by the Stormwater Trust in July 1998 and was implemented during 1998–99. The total budget for Phase 1 was $2 million. Components of Phase 1 that commenced in 1998 were mass media (mainstream and non-English-speaking background (NESB)), program facilitation and support, community education, a schools program, and industry education and training.

Phase 2 is occurring over two financial years (1999–2000 and 2000–2001). Components of Phase 2 are mass media, program facilitation and support, community education (including continuation of the schools program), and industry education and training. Only those activities completed in 1999–2000 have been included in this evaluation.

4.1 Mass Media Campaign

The mass media component of the Urban Stormwater Education Program was comprised of television, radio and billboard advertising for mainstream audiences, and print and radio advertising for people of non-English-speaking backgrounds.

In Phase 1 this component included a television advertisement that drew attention to the fact that ‘natural’ materials such as soil, leaves and vegetative cuttings can be significant pollutants. The campaign achieved a high level of attention, and had a significant impact on the attitudes and beliefs of those that saw it.

The campaign increased awareness of ‘natural’ stormwater pollutants (such as sediments and vegetative material) and increased awareness of simple actions to prevent these pollutants from reaching urban waterways. The association of the girl in the ad with sickness, and the linkage of this to stormwater pollution, introduced an ecological and health perspective to stormwater pollution. The campaign clearly reinforced positive stormwater prevention behaviour.

The Phase 2 television advertisement drew attention to the manner in which a broad range of pollutants (litter and cigarette butts) find their way into the stormwater system and are discharged into urban waterways. The campaign was extremely successful in reinforcing and extending people’s understandings of stormwater pollution problems and the actions they could take. The most significant impact of the new advertising occurred early in the campaign. It appears that the NSW community recognises that stormwater pollution is an important problem. Most people say that they already act in a socially acceptable manner, taking appropriate steps to minimise pollution in stormwater as far as they can. The links to behaviour, ecology and human health were strong take-out messages from this program. People’s willingness to change behaviour was extended by it.

Non–English-speaking-Background Mass Media Campaign

The education of people from a non-English-speaking background (NESB) has been complementary to the mainstream mass media, using a mix of public relations, advertising (including newspaper and radio advertising), media briefings, dissemination of information such as case studies and brochures, and support from campaign advocates and community associations.

The campaign focused on the largest non-English-speaking groups in NSW, initially six language groups – Arabic, Chinese, Greek, Italian, Spanish and Vietnamese – expanding to seven with the addition of Korean speakers in 2000. The campaign has broken new ground in its approach to communicating with and educating ethnic communities, in the way it has integrated advertising and grass roots education activities.

More than 40,000 brochures were printed in seven languages and distributed through the Ethnic Communities Council, local councils and the EPA's Pollution Line. In addition to raising awareness about stormwater pollution in the target groups, the campaign generated over 30 newspaper articles and numerous items on radio. Further, the campaign significantly increased knowledge within communities of what pollutes stormwater and what behaviour can reduce pollution; these communities represented over 65% of the people of NSW from non-English-speaking backgrounds.

The success of the NESB stormwater mass media campaign was highlighted when the campaign won a highly commended award in the Government Agencies Section of the 2000 National Multicultural Media Awards.

Examples of posters directed at non-English-speaking language groups

4.2 Program Facilitation and Support

A significant program facilitation and support component underpinned the mass media campaigns. This resulted in substantial free media for the program, through the use of community announcements and additional placements of outdoor material. It also provided

material on the Stormwater website and in print brochures, and helped councils to develop and deliver local stormwater education activities.

Other program facilitation identified opportunities to further spread the campaign's key messages. From the outset, the aim was to work closely with local government and individual companies to encourage them to take up the *Drain is Just for Rain* message.

Working with Media

Over 140 news releases on the Urban Stormwater Program have been distributed to approximately 1200 media outlets in NSW. The launch of the community education campaign in February 2000 received extensive radio and TV coverage. Reports were broadcast on Channels 2, 7 and 9, as well as on radio stations 2BL, 2UE and 2GB.

Community service announcements prepared for earlier phases of the campaign were re-packaged this year. One hundred CDs were produced and distributed to radio stations with a request to use the announcements.

The Program developed education materials to increase the understanding and awareness of stormwater issues throughout the wider community.

Working with Local Councils

An important outcome was the development of an internet-based resource kit to equip councils with the tools to run a local community education campaign. The kit includes everything from posters and pamphlets to model news releases and tips on running an education campaign, and is being widely used by councils, with over 450 website visitors a month.

All of the billboard posters used in the 2000 advertising campaign were sent out to councils following the campaign, so that they could be re-used locally. In addition, 35,000 fridge magnets, 25,000 brochures, 4000 posters and 200 drain stencils (carrying the words *The Drain is Just for Rain*) were produced and distributed to 33 local councils.

Working with Individual Companies

Working with individual businesses to encourage participation in the campaign opened up the possibility of ensuring that stormwater messages are delivered to consumers at the 'point of use'. This potentially translates into the delivery of the *Drain is Just for Rain* message millions of times – right at the time when consumers are engaging in the sorts of behaviours that threaten stormwater quality. This component of the USEP has resulted in the following initiatives:

- Porters Original Paint has put the *Drain is Just for Rain* logo on the new labelling for its paint tins
- Chroma Acrylics has been provided with the campaign's key messages, logo and editorial for inclusion in 'fact sheets' distributed with its paint products
- Selleys are committed to adding the campaign logo and environmental tips on labelling to their car washing products. The EPA has briefed the company's marketing department on the campaign.
- McDonalds are committed to carrying the *Drain is Just for Rain* logo on store tray mats.

4.3 Community Education

Significant community education projects are being conducted:

- Six innovative education projects in local government were undertaken with individual grants of $17,000. These projects target industrial sites (Gosford and Drummoyne), users of recreational facilities (sporting fields in the Shoalhaven), specific groups (dog owners in northern Sydney), and building and construction contractors (Bankstown). All project information will be available on the Stormwater website at the completion of these projects.
- Thirty-eight community educators have been trained and accredited across NSW. They have given 63 presentations on actions to improve the quality of stormwater.
- A significant community education program was implemented with the help of the Ethnic Communities Council. It delivered education to seven non-English-speaking language groups (Spanish, Italian, Greek, Arabic, Korean, Vietnamese, Chinese).
- A schools program is currently under development.
- A program was set up to increase the capacity of council staff to plan, deliver and evaluate local stormwater education programs.

4.4 Industry Education and Training

As part of the USEP, the EPA's Cleaner Industry Unit has worked with industry to promote cleaner production approaches. These projects identify potential cost savings and environmental improvements through changes in operational practices, such as better housekeeping, water re-use, and process and product substitution. The funding for this component was $210,000.

Building Construction and Demolition

Work was undertaken with Landcom and the Department of Urban Affairs and Planning on stormwater issues in the design of greenfields developments. Landcom launched an *Environmental Management Guide for Project Managers and Civil Contractors* in mid 2000. A short training course with associated learning resources on Stormwater Management for Construction and Demolition Sites was developed by TAFE NSW to be integrated into their mainstream courses for this sector; it received funding and support from the education program.

Motor Vehicle Industry

A significant project was undertaken with the motor vehicle industry associations (Motor Traders' Association, Service Station Association, Institute of Automotive Mechanical Engineers, Auto Parts Recyclers Association and Commercial Vehicle Industry Association). It involved the development of educational material, audits of motor vehicle premises, support for councils that were involved in local motor vehicle education activities, and the conduct of seminars and events for members and the wider community.

Council Operations – Roads, Swimming Pools, Council Depots, Golf Courses and Parks and Gardens

Through a program conducted in conjunction with local government, an information package for councils has been developed by the USEP and is available on the Stormwater website. This

consists of a series of modules to increase the environmental knowledge and skills of local government staff who manage parks and gardens, swimming pools, road maintenance, golf courses and depots. This information was compiled from a pilot project with Lake Macquarie and Bankstown City Councils. The modules highlight barriers to improved practice, examples of best practice and case study examples.

Horticulture

A series of field days organised by the Nursery Industry Association of Australia led to Baulkham Hills and Warringah Councils undertaking environmental audits and implementing an education and training program to address stormwater management issues facing the horticultural industry. Eighty-five nurseries and landscape suppliers received environmental assessments, and approximately 30 have received industry-specific training to date. Over 90% of nurseries that received an initial assessment had made appropriate changes to their works or practices when a follow-up inspection was carried out.

4.5 Achievements of the USEP

The Urban Stormwater Education Program has been shown to be a successful, integrated, state-wide program that has made a significant difference to stormwater quality. It has raised the community's knowledge of stormwater pollution, shown people how to make a difference, and improved the attitudes and changed the behaviour of a vast number of people in NSW.

At a structural level, it has significantly increased the extent of ownership of the problem of stormwater pollution. At the same time, it has improved stormwater management and the capacity of key government, industry and non-government groups to integrate stormwater management into their priorities. The highlights of the program include:

Changing People's Behaviour to Reduce Impact on Stormwater

The mass media stormwater campaigns have heavily influenced people's behaviour.

- Evaluation of the 1999 mass media campaign shows that more than 2.1 million people reported changes in their behaviour to avoid actions that would pollute stormwater.
- Evaluation of the 2000 campaign showed that nine out of 10 people could nominate something that they now do to reduce stormwater pollution.
- One in five people in NSW have recently changed their behaviour to reduce the negative effect on stormwater. Nearly two out of every five people make an effort to keep sand and soil out of the drain by such action as cleaning gutters and drains.
- Across NSW over 300,000 people reported that they were using fewer garden chemicals as a result of the USEP.

Improving People's Knowledge of Stormwater Pollution

The community's understanding of what causes stormwater pollution has improved as a result of the program.

- Forty-nine per cent of NSW people viewed litter as a stormwater problem, compared with 44% before the education program.

- Thirty per cent of NSW residents now know that garden chemicals cause stormwater pollution – an increase of over 450,000 people across NSW as a result of the USEP.
- Nearly three-quarters of NSW people regard stormwater pollution as extremely or very important to them. This was an increase of over 500,000 people as a result of the education program.
- Increased knowledge of the causes of stormwater pollution, and improved behaviours, have been reported within communities representing over 65% of the people of NSW from non-English-speaking backgrounds.

Showing People How to Make a Difference to Stormwater

- More than 100,000 people have been directly involved in education and training activities as part of the state-wide education program. These include activities in the community and within vocational education and training courses, as well as at community events.
- There has been a significant increase in the skills of local government staff and those in key community organisations, such as the Ethnic Communities Council, in the design, implementation and evaluation of education to address stormwater issues.

Improving the Capacity and Ownership in a Range of Sectors

Individual Companies

- A dozen prominent Australian companies in the paint, chemicals and hardware industries have committed themselves to carrying the stormwater message to their customers. For example, thousands of tins of Porters paint are carrying the *Drain is Just for Rain* message to consumers.

Local Government

Councils are important players in managing urban stormwater. The USEP has equipped councils with the skills and tools to use educational interventions more effectively. It has done this by:

- giving councils the practical tools to run a community education campaign, accessed directly over the Internet, to ensure the Drain is Just for Rain message is delivered at the grass roots level. The degree of success can be shown by the 450 visits a month to the web based resource kit for councils
- providing training, networking, mentoring and support for council staff in the use of education to tackle stormwater pollution at the local level. Across the State there is evidence that an increased number of local education projects are being developed, delivered and evaluated more effectively.
- direct training for council operations staff with NSW TAFE. Some 160 council operations staff across five council operations areas (swimming pools, golf courses, depots, parks and gardens, road maintenance) were given training that will make a difference to stormwater quality. Another 48 council managers also received train-the-trainer coaching on how to deliver accredited courses to their staff.

In the past year the EPA has conducted over 20 workshops and 100 interviews with local councils to improve their skills in tackling urban stormwater pollution.

Industry

The USEP has increased the capacity of industry to deal with stormwater pollution and to reduce it. For example:

- Industry associations in the automotive, building and construction and horticulture industries have promoted approaches aimed at reducing stormwater impact to their members.
- Training materials have been supplied and training has been conducted within the automotive, building and construction and horticulture industries, as well as in council operations.
- The Motor Vehicle Repair Industry Council (MVIRC), together with the four industry associations, conducted a major education program, part of which featured education materials and pollution reduction products, at the 23rd National Automotive Trade Fair in May 1999. More than 11,000 visitors came to the stand.
- Articles about reducing stormwater pollution were published in a number of trade association journals and trade magazines, including the NRMA's *Open Road*.

The Community

Community organisations have strongly supported the program. For example:

- Through the work of the Ethnic Communities Council project, 8000 individuals across the Sydney metropolitan area were reached by the project in its first year. During 2000, the educators have been involved in more than 80 events and briefings, including major celebrations such as Chilean Independence Day and activities associated with Clean Up Australia Day, which were attended by well over 12,000 people.
- In the wider community, 38 specialist educators have been trained and accredited to conduct local presentations on stormwater. Over 65 education seminars have been held and 63 community events have been supported.

Cross-sector Leadership

By developing and expanding links between State and local government, industry and the community to achieve improved stormwater pollution reduction, the EPA has established a network of involved agencies to carry forward the stormwater pollution reduction message. In addition, NSW Stormwater advertising campaign materials have been taken up by other States, namely Victoria and the ACT.

4.6 Future Directions for Stormwater Education

The State-wide Urban Stormwater Program has delivered significant outcomes, and has led to a greater understanding of the use of stormwater education as a stormwater management technique. While there has been considerable growth in the use of education there is a need to ensure that the competencies achieved over the three years through the program are not lost.

The Urban Stormwater Education Program will be important in any future stormwater programs, as education of the community is critical to ensuring that people behave in ways that reduce the presence and impact of stormwater pollutants. Key future directions are as follows.

Integration across Sectors

A feature of the Urban Stormwater Program was that it promoted and strengthened the integration of stormwater issues across government and non-government sectors. Future programs need to build on these established links to:

- integrate the stormwater messages into the education activities of other government agencies, including the Department of Education and Training and Sydney Water
- improve upon cross-council collaboration on a catchment basis
- improve the relationship between State and Commonwealth programs
- improve the linkage between state-wide initiatives, for example the Urban Stormwater Education Program and the Litter Reduction Education Program.

Recognition of the Role of Education in Reducing Stormwater Pollution

The education program has undoubtedly increased the level of understanding and the use of education as a significant stormwater pollution reduction tool. There is a need to build on the momentum gained through the program, to improve our understanding of the best mix of techniques and the circumstances in which education/training is best used.

Capacity at State-wide and Local Levels to Develop, Implement and Evaluate Education

Education projects need to improve the monitoring of both behaviour and knowledge changes to determine the impact of the project on the level of pollution. All education programs should be able to measure growth in awareness, knowledge and changes in behaviour. The program has demonstrated that there is more to learn about the planning and delivery of education initiatives.

Community Ownership of the Stormwater Pollution Message

While the available research indicates strong community awareness about stormwater, there is limited uptake of action throughout the broader community. In future programs there need to be broader community messages. Non-English-speaking groups and young people need to be targeted.

Industry Sector Ownership of the Stormwater Pollution Message

There have been strong examples of industry sector activity under the education program. This activity should be built on to improve the way these sectors continue to promote operational change and stormwater pollution reduction messages after the funding of project activity has ceased.

Detailed recommendations for extension and enhancement of the Urban Stormwater Education Program are provided in Section 7 of this report.

5 Evaluation of the Stormwater Management Planning Process

An important component of the Urban Stormwater Program was the requirement upon local councils and other stormwater managers to work together to prepare catchment-based stormwater management plans. The aim of these plans was to facilitate the coordinated management of stormwater within a catchment to maximise ecological sustainability and the social and economic benefits of sound stormwater management practices. The stormwater management plans provide direction to future stormwater management activities within individual catchments.

The plans achieve this by identifying significant local stormwater issues or problems, and by determining a cost-effective suite of management actions to be implemented by councils and other stormwater managers to address those issues. The plans also establish a framework for monitoring plan implementation; for public reporting of the findings of that monitoring; and for periodic revision of the plans.

For a description of the Stormwater Management Planning process see Section 2.3 of this report.

5.1 Evaluation

The Stormwater Management Planning process was evaluated independently of the Stormwater Trust by a senior academic and senior research scholar from the University of New South Wales. The evaluation, presented in full in Part D of this package, incorporates the views of greater metropolitan and regional councils, State agency participants, consultants involved in the planning process, and the community. The evaluation explored the design, process and outcomes of the planning component of the Urban Stormwater Program through a variety of methods, including interviews, focus groups, workshops, written surveys and organisational case studies.

Participants in the evaluation were guaranteed anonymity in the process to ensure that the evaluation could elicit honest and comprehensive information and determine accurate and useful findings.

It is clearly too early to assess the achievements of the Stormwater Management Planning process in terms of the environmental gains, as the plans have been in place for only a short time. The primary goal of the stormwater management plans was to facilitate the coordinated management of stormwater within a catchment to maximise ecological sustainability and the social and economic benefits of sound stormwater management practices. The plans have made a significant step forward in this respect. The stormwater management plans have been successful in providing a direction to future stormwater management activities within individual catchments.

Expected Outcomes

The expected outcomes of the stormwater planning process can be grouped into the following three categories.

Building the Capacity of Council Officers to Manage Stormwater More Effectively

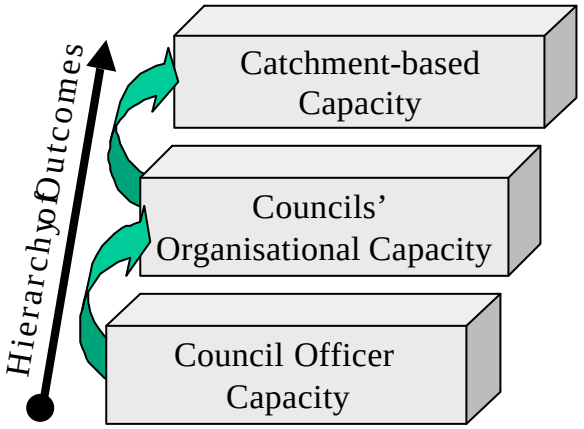
- improve the officers' stormwater knowledge of the catchment and their expertise with at-source and preventive action solutions
- develop officers' skills and commitment to integrated stormwater management planning
- teach officers to communicate stormwater issues and options to the community and council, and to work cooperatively with other stormwater managers in the catchment
- identify the most appropriate responses to the stormwater management issue.

Building the Organisational Capacity of Councils to Manage Stormwater Effectively

- improve the stormwater management capabilities of councils, and increase the use of source-control solutions for improving urban stormwater by councils
- help councils to develop an appropriate mix of local actions to protect ecosystem health and to implement the cost-effective solutions identified in their plans
- raise the awareness and profile of stormwater issues with the senior management of councils
- integrate the management of stormwater across council departments and activities
- increase council expenditure on and financial commitments to stormwater management.

Building the Capacity for More Effective Catchment-based Stormwater Management

- improve the coordination and relations between stormwater managers within the catchment
- develop a partnership between State and local government for managing urban stormwater pollution
- involve the community in stormwater planning and management, and engender community ownership of the planning process
- encourage the coordinated implementation of joint stormwater projects across catchments.



Hierarchy of expected program outcomes

5.2 Evaluation Findings

The Stormwater Management Planning process aimed to increase the ability of councils and other stormwater managers to address the impacts of urban stormwater on the environment. Council officers and other stakeholders have been surveyed to determine this increase in capacity at the level of council officers, council organisations and individual catchments.

Program Successes

This program has been particularly successful in building the skill and competence of individual council officers for more effective urban stormwater management in both greater metropolitan and regional councils. The program has resulted in the following successes:

Improving the Ability of Council Officers to Manage Stormwater

The development of the stormwater management skill and competence, or 'capacity', of local council officers who were responsible for preparing the stormwater plans within the greater metropolitan region was the most successfully achieved outcome.

- Two thirds of all the officers surveyed strongly agreed that their urban stormwater management skills had improved as a direct result of participating in the planning process.
- Most officers agreed that the requirement to prepare the plans was helpful to their work.
- All officers interviewed demonstrated a concern and keenness for the planning process and plan implementation to proceed for their catchment and council.

Council officers participating in a training course on stormwater issues

Improving the Ability of Councils to Manage Stormwater

- A majority of the council officers surveyed strongly agreed that the profile of stormwater quality issues had improved within their council because of the planning process; this was the second most significant overall achievement of the stormwater planning process.
- A majority of the stormwater plans prepared within the Greater Metropolitan Region, and about half of those prepared by regional councils, have been incorporated into council management plans.
- Over half of the greater metropolitan councils surveyed, and half of the regional councils, have started to implement their stormwater plans. One-third of the regional councils surveyed agreed that, subject to funding, there is likely to be sufficient commitment within their councils to implement activities and projects in their plans.
- Almost all of the council officers surveyed reported that source-reduction and education activities are prioritised as implementation activities in their stormwater management plans.
- Approximately one-third of the council officers reported that their councils had increased expenditure on urban stormwater management as a result of the planning process.

- Approximately one-quarter of greater metropolitan council officers and a small number of regional officers believe it is likely that new positions will be created within their councils that will have responsibilities for urban stormwater management.

Improved Relationships within Catchment

Almost all of the stormwater management plans prepared within the Greater Metropolitan Region have been prepared on a catchment basis through a cooperative process involving all significant stormwater managers (State and local) within individual catchments.

- Council officers identified the development of catchment-based relationships and partnerships within catchments as the most significant overall achievement of the program.
- Forty stormwater management plans have been prepared within the Greater Metropolitan Region, most of which have now been 'signed off' by the EPA. A further 40 plans have been prepared by the larger regional councils throughout the State.
- Approximately two-thirds of the metropolitan councils and a smaller number of the regional councils surveyed reported that they are either currently implementing or are proposing to implement joint projects with other stormwater managers and the community in the catchment. These projects are mainly source-reduction and community education projects.

The next stage of the planning process needs to build on these gains by significantly improving the organisational and catchment-based capacity for effective urban stormwater management. Some of the issues identified by the evaluation as requiring attention in the future are outlined below.

Issues Requiring Attention

Council Officer Issues

In both the surveys and interviews, officers identified a clear need for information about the effectiveness of non-structural solutions. This can be addressed in the future program by conducting benchmarking and best-practice research of the broad range of non-structural solutions that have been implemented and funded by the Stormwater Trust Grants.

The officer expertise base for working with communities needs to be broadened. Officers with community-based skills need to take part in the planning process. This can be achieved through the participation of the community services sections of councils. It can also be achieved by council officers gaining an improved understanding of the nature of the community and how to enhance the ability of the community to participate in the planning process. This can be addressed in the future program by providing incentive measures for officers in other departments of councils to get involved, and by councils conducting social research on their communities.

A key recommendation of this evaluation is that the program should focus on maintaining and harnessing the officer expertise that has already been developed. The future program should focus on approaches that facilitate the integration of this skill and knowledge into the horizontal and vertical structures of the council organisation.

Organisational Issues

A majority of the plans have been formally incorporated into councils' management plans and their implementation has begun. However, this implementation is largely limited to projects funded by the Stormwater Trust Grants Scheme and activities that were already in place before the EPA's issuing of a legal Direction to prepare the stormwater management plans, under Section 12 of the *Protection of the Environment Administration Act*, 1991. The lack of new

council resources for plan implementation was a strong and consistent theme throughout the evaluation.

The planning process, and current activities related to stormwater, is currently dominated by the engineering and environmental science disciplines. To enhance at-source pollution control activities and coordination processes a more trans-disciplinary and whole-of-council approach to stormwater management would be beneficial. A range of incentives could be developed to involve other disciplines and council departments in the planning process.

There are currently organisational obstacles to transferring the council officer capacity into the relevant sections of the council organisation. The future program design can be specifically targeted to enable integration of urban stormwater management roles and responsibilities within both the vertical and horizontal structures of local government.

Catchment-based Issues

At present the catchment-based capacity was directly built through the operation of catchment steering committees. Since a significant majority of councils' stormwater plans have been finalised (in the greater metropolitan area), there has been a limited demonstrable need or incentive for these committees to continue. Consequently, many are largely no longer operating.

Attempts to engage the community in the planning process were mostly very unsuccessful across both the greater metropolitan and regional councils. Therefore, the planning process was not reflective of community values and it did not lead to effective community ownership of the process. This has hampered the quality of, and potential effectiveness of, the plans produced.

Program Design Issues

The focus of the program on urban stormwater quality was largely reported as too narrow and needing to be integrated with stormwater quantity, stormwater run-off from rural areas and other environmental planning processes imposed on councils by the State Government. In particular, regional councils believed the program design did not directly address the water quality needs of their catchments.

Council officers highly valued the individual members of the EPA Stormwater Team that administered the program. However, they believed the potential of the program was not realised because of the lack of resources allocated to the Team for effective program facilitation and administration.

The independent evaluation of the Stormwater Management Planning process has yielded a series of recommendations; these are presented in Section 7 of this report.

6 Links between Components of the Urban Stormwater Program

Effective stormwater management requires the integration of a range of stormwater management techniques to comprehensively address all forms of pollution that are causing problems in a catchment.

With the knowledge that no one technique that will solve all stormwater problems, the Urban Stormwater Program was designed with three main components: the grants scheme, the Urban Stormwater Education Program and the stormwater management plans. Each separate component developed complementary initiatives for effectively managing urban stormwater on an integrated catchment basis.

Over the three years of the program, links or synergies between program elements have emerged and have been encouraged. Elements of the program have fed off each other, with knowledge gained or awareness raised by one program allowing other programs to work more effectively.

With the Urban Stormwater Program as the fundamental catalyst for improvements in urban stormwater quality in NSW, many stormwater managers have begun from a low knowledge base, but have adapted and integrated components of the program to more effectively address stormwater issues. The following sections describe the links and synergies that have been encouraged and that have evolved between the three main elements of the Urban Stormwater Program. This forms an important part of the evaluation of the program, as these links and synergies have contributed significantly and positively to enhance the achievements of the grants scheme, the education program and the stormwater management plans.

6.1 Community Education Programs

Urban stormwater quality is affected by many activities within an urban area. A weekend gardener putting lawn clippings in the gutter, a car dripping oil on the road, a cigarette butt put out on the footpath, or an empty drink can left in a park are a few examples of people's actions that influence the quality of stormwater as it travels through gutters and pipes into waterways such as Sydney Harbour.

Equipped with this knowledge, the Urban Stormwater Education Program undertook an extensive mass media and community education campaign that adopted *The Drain is Just for Rain* logo. The program aimed to make people aware of activities that affect stormwater quality, and also to foster behaviour changes in the broader community to minimise their impact on urban stormwater quality. A broad range of strategies and materials has been developed to achieve these aims.

The Drain is Just for Rain logo has been a constant message of the education campaign, with the Stormwater Trust making the resources developed under the program available to all stormwater managers. As a result 35,000 fridge magnets, 25,000 brochures, 4,000 posters and 200 drain stencils (carrying the words *The Drain is Just for Rain*) were produced and distributed free of charge to councils to undertake local stormwater education initiatives. Nine councils

have widely used these materials; Camden Council produced and sent out 6000 postcards to local residents to explain stormwater issues. In this way, local stormwater initiatives have benefited from, and built upon, the State-wide program.

It has been an advantage to have a single message throughout the whole Urban Stormwater Program, a message that has filtered through the grants and local education campaigns and other council stormwater activities. The slogan *The Drain is Just for Rain* has increased the effectiveness of the mass media campaign by repeating and reinforcing the campaign message in the community's mind. Councils and their education officers are able to base their local catchment projects on a concept of which a large proportion of the community is already aware. Significantly, councils or other stormwater managers are able to use or adapt education resources that have already been developed, leaving them free to concentrate on the delivery of their projects.

Throughout the Stormwater Trust Grants Scheme there has been a growing awareness by stormwater managers of the need to adopt education as a strategic response to a greater understanding of the wide range of activities that affect stormwater. It has also become increasingly apparent that the pollution generated by many activities within a catchment can not be adequately controlled by structural techniques, such as gross pollutant traps. While all grants have included general awareness-raising in the form of signage or newspaper releases, there has been an evolution in awareness of the need for education throughout the stages of the grants: 15% of Stage 1, 50% of Stage 2 and 83% of Stage 3 grant recipients have adopted community education as a component of their projects.

As a result, the messages of the State wide education program are being built on by over $10 million in Trust grant funds allocated to local community education initiatives. This repetition and reinforcement adds value to both large and small scale community education projects. Twelve councils along the Cooks River worked together on a Stage 2 grant and integrated The Drain is Just for Rain logo with their own logo, Bringing the Cooks River to Life. Under a separate Stage 2 Grant, Waverley Council adapted and widely distributed a series of postcards based on the Drain is Just for Rain logo.

Stormwater community education projects being carried out by Marrickville council

A senior education officer has been appointed within the EPA to guide and facilitate local councils in adopting education as a stormwater management tool, particularly within the Stage 3 grants. This initiative is also expected to increase councils' ability to design, implement and evaluate stormwater education projects.

The Stormwater Trust has also provided training for council staff in the development and delivery of local education programs. Throughout NSW, 38 specialist educators have been trained and accredited to conduct local presentations on stormwater, with more than 65 education seminars and presentations at over 60 events being conducted to date. Again this initiative will help councils in the implementation of their stormwater management plans.

There have been several projects that have concentrated on designing a project to target communities with non-English-speaking backgrounds, rather than translating existing campaigns. The Ethnic Communities Council of NSW was funded by the Urban Stormwater Program to develop and deliver a community education program for seven ethnic language communities in the Sydney metropolitan area. The skills and campaigns have been used and

altered by councils in projects such as the Cooks River project to provide the best possible result for their communities.

Local community education projects have also been based on the installation of structural stormwater treatment measures. Wingecarribee Council has used the installation of a gross pollutant trap near Lake Alexandra (within the catchment of Sydney's water supply) as a tool to explain how the stormwater system works to local school groups. Many of the grants projects have used a community education project to complement a structural solution, and many councils have used press coverage of the amount of pollution caught in gross pollutant traps to encourage their community to think twice about littering.

The Drain is Just for Rain logo has achieved a threshold of adoption, so that in the future education projects developed by stormwater managers under local stormwater management plans can adopt the logo and build on the positive work undertaken to date.

6.2 Industry Education Programs

Commercial and industrial areas can have significant impacts on stormwater quality. These areas are typically associated with high levels of litter, sediment and chemical pollution. However, there has been little information available to commercial and industrial activities on their impact on the environment and ways to minimise this impact.

Each of the components of the Urban Stormwater Program is contributing to the more effective auditing of industrial and commercial premises. This auditing aims to improve the awareness and practices of the industrial and commercial sectors through targeted eduction and/or regulation. Typically, this has involved site inspections and detailed negotiation with proprietors to secure improved stormwater and environmental outcomes.

The state-wide Urban Stormwater Education Program targeted key industry sectors that have a significant impact on urban stormwater, with the aim of promoting cleaner production approaches. Materials have been developed and training has been conducted within the automotive, building and construction, council operations and horticulture industries, promoting approaches aimed at reducing stormwater impacts. Educational materials targeting council operations and other industries will help councils to implement the stormwater management plans.

The State-wide Urban Stormwater Education Program funded an education officer to work with the motor vehicle industry to help develop educational material, undertake audits of motor vehicle premises, provide support for councils that were involved in local motor vehicle education activities, and conduct seminars and events for members and the wider community. As a result, a directory of environmental services has been produced and distributed by all motor industry associations to their members throughout the State.

Training of 120 TAFE teachers has resulted in practical environmental solutions being taught to students. Material developed through this project will be used in a Stage 3 grant project targeting cleaner production within automotive industries in the Blue Mountains, Penrith and Hawkesbury local government areas.

The building and construction industry has also been highlighted as an activity of concern by councils in the Stormwater Trust grants. In the 'Keep the Soil on the Site' Stage 2 project, the councils within the catchment of South Creek, a tributary of the Hawkesbury Nepean River, developed an audit and education program for construction sites within the catchment. Although this project has been completed, it is now the subject of a Stage 3 grant to distribute the materials and techniques more widely. This project was seen as particularly useful, as it was a

practical on-site demonstration, targeting all workers and contractors. This complemented a short TAFE training course developed on stormwater management for the construction industry.

At a State-wide level, the Urban Stormwater Education Program has been complementing this work by developing an 'Environmental Management Guide for Project Managers and Civil Contractors' with the Department of Urban Affairs and Planning and Landcom, for stormwater management at 'greenfield' subdivisions.

This work complements the Department of Housing's publication of the *Managing Urban Stormwater: Soils and Construction* document in 1998. The document provides detailed guidance on mitigating the impacts of construction activities on the stormwater environment. Each of these initiatives will help councils throughout the State implement the part of their stormwater management plans that deals with the management of new urban developments.

Audits of premises in industrial areas can be a very effective way of spreading the stormwater messages into areas that present a risk. Through the preparation of the Cooks River Stormwater Management Plan 13, councils identified the need for an auditing project to mitigate the impacts of industrial activity on urban stormwater flowing into the Cooks River. This coalition of councils successfully applied for a Stage 2 grant to conduct 1700 assessments of industrial sites throughout the catchment. This project developed auditing and educational materials and protocols, which will help councils throughout NSW to implement the auditing components of their stormwater management plans.

Stormwater management plans have already focused councils' stormwater efforts on problem areas, or 'hot-spots'. Having identified the Girraween industrial area as an area of concern in the Upper Parramatta River Stormwater Management Plan, Holroyd Council developed a spill guide as part of the Stage 2 Stormwater Trust project. Information sheets specifically designed to complement audit programs have been developed by other councils in NSW, including Taree, Maclean and Gosford.

6.3 Improving the Stormwater Management Capacity of Local Councils

Local councils are the main stormwater managers in the urban areas of NSW and therefore have a major role in controlling urban stormwater quality. Their ability to improve stormwater quality through Trust-funded projects and the implementation of stormwater management plans depends on the skills and resources of the staff, and the quality of council's management systems relating to stormwater. Before the Stormwater Trust came into existence, stormwater quality was not seen as a core role of councils, and no resources were devoted to improve its quality.

The three main elements of the Urban Stormwater Program have worked together to improve the capacity of local councils to improve stormwater management practices. As described in Section 4 of this report, several components of the State-wide Urban Stormwater Education Program have aimed to improve the skills and resources of local councils. The program has developed an internet-based council resource kit to equip councils with the tools to develop and run a local stormwater education campaign. This kit will help local councils to implement the educational component of their stormwater management plans.

The implementation of the stormwater management plans will also be assisted by training modules developed by the State-wide education program to improve councils' operational practices in relation to their management of roads, swimming pools, council depots, golf courses and parks and gardens. This course, entitled 'Preventing Stormwater Pollution in Local

Council Operations', was developed and accredited by NSW TAFE, which delivered 15 one-day workshops for a total of 160 council operations staff. The project also delivered five informal professional development (train-the-trainer) sessions to 48 operations managers and environmental staff members.

This increase in skills and resources has been enhanced by the experience of council officers in preparing stormwater management plans. One of the main outcomes of the stormwater planning process, as identified by the independent evaluation, has been improved capacity of council staff in addressing stormwater quality. The evaluation has identified the need to extend these skills throughout council's organisational structures, in accordance with the growing awareness that stormwater management should be a more multi-disciplinary activity within councils. Training of council staff in stormwater issues and techniques is identified as a proposed management action in many of the plans.

The Stormwater Trust grants and Stormwater Management Planning process have worked together to increase council officers' ability to identify an appropriate mix of stormwater management strategies suited to local needs and opportunities.

Networks of people such as the stormwater educators in the Hunter region or stormwater managers within greater metropolitan catchments have fostered discussion of projects and issues. Activities such as the Dubbo City Council's Stage 1 project (which demonstrated a number of gross pollutant traps) or neighbouring regional councils' referral to the Albury Council Stormwater Management Plan for guidance, are consistently nominated as useful by other councils. Many stormwater management plans have actions relating to auditing, community education or vocational training, and councils are now able to draw on materials developed by projects funded by the grants scheme to most effectively implement these actions.

There is scope for the EPA's Stormwater Unit to concentrate more on distribution and development of tools and material concerning stormwater.

6.4 Better New Urban Developments

The design and construction of new urban developments – both 'greenfield' subdivisions and redevelopment of existing urban areas – provides an important opportunity to cost-effectively mitigate the impacts of urban stormwater upon the environment. 'Best practice' design and management of new urban development aims to capture this 'one-off' opportunity of preventing or minimising many stormwater problems at or near their source, thereby reducing reliance on expensive (and frequently unsightly) 'end-of-pipe' stormwater treatment devices. In Melbourne, developers are adopting 'water-sensitive' urban design, not solely with the aim of meeting environmental protection objectives, but due to improved amenity and more 'liveable' urban form that these approaches provide.

The primary focus of the Stormwater Trust has been the remediation of existing stormwater problems in urban catchments. However, specific elements of the grants scheme, the Urban Stormwater Education Program and the stormwater management plans have addressed different aspects of new urban development. As discussed below, there is considerable scope for greater attention to this area should the Urban Stormwater Program be extended.

The most significant component of the Urban Stormwater Program relating to improving stormwater management at new developments was the requirement, in the EPA's Section 12 Direction, for councils to specify stormwater management objectives for new urban development in their stormwater management plans. These objectives define the stormwater outcomes that local councils, as the determining authorities, will require individual developers to achieve in their development or redevelopment of urban land.

The aim of defining outcomes sought, rather than practices to be employed, is to allow developers flexibility in the manner in which they address stormwater issues, thereby encouraging innovation and development of more cost-effective solutions. The planning initiative has, for the first time, led to the setting of consistent stormwater standards for new development across urban catchments that comprise several local councils.

The significance of this requirement is reflected by the fact that half of the greater metropolitan stormwater management plans had to be amended to more effectively meet this requirement before these plans were accepted by the EPA.

The Stormwater Trust Grants Scheme has funded a number of stormwater projects aimed at helping local councils better manage stormwater at new urban developments. The "Keep the Soil on the Site" Stage 2 project was undertaken jointly by the five local councils within the catchment of South Creek, a tributary of the Hawkesbury Nepean River, and was aimed at improving the skills of both builders and council officers in reducing sediment pollution during construction activity.

This project has been extended under Stage 3 of the grants scheme to focus on improving South Creek councils' planning and management of new urban releases in order to reduce stormwater impacts. The 'Keep the Soil on the Site' project has both improved councils' ability to implement the stormwater management objectives for new development (as defined for both the construction phase and post-construction phase in the South Creek Stormwater Management Plan) and provided materials (booklets and video) for circulation to other local councils to do likewise.

Similarly, Lake Macquarie City Council, under a project entitled 'Proactive Erosion and Sediment Control System', has developed educational materials for builders in order to reduce sediment loads from construction sites in that sensitive catchment.

Other projects will help councils' management of new urban development by demonstrating the effectiveness of innovative management practices, thereby providing some confidence to councils and the development industry in adopting such practices. Gosford City Council has received funding to assess the effectiveness of stormwater infiltration devices in the Woy Woy area, and is assessing that effectiveness against conventional stormwater drainage systems.

Similarly, Newcastle City Council received funding to undertake a detailed investigation of the effectiveness of water-sensitive urban design principles (stormwater infiltration and reuse) at a housing development in Newcastle. Both Leichhardt Municipal Council and Holroyd City Council have received Stormwater Trust funding to measure the effectiveness of a range of proprietary stormwater treatment devices.

The Urban Stormwater Education Program has also focused on the issue of new development, with guidelines being prepared for local government and the development industry on the adoption of 'cleaner production' techniques at greenfield development sites.

Councils and developers will be able to draw on the information gathered by these projects to more confidently and effectively incorporate stormwater control measures into new development, in accordance with the stormwater management objectives defined in the stormwater management plans.

The management of stormwater run-off during the construction-phase is slowly improving in many council areas, owing to various initiatives. However, NSW is lagging behind many other States in the adoption of more water-sensitive urban designs at new development sites. There is a need for any future stormwater program to allocate specific funding to the development and monitoring of a small number of demonstration projects that have adopted the principles of water-sensitive urban design. Such funding is considered a good public investment, as the broad adoption of these principles will reduce the costly reliance on major structural measures for stormwater treatment at new developments.

6.5 Structural Stormwater Treatment

When the Urban Stormwater Program began, stormwater quality management was based on the installation of structural management devices including gross pollutant traps. In November 1997, 10 new companies operating in the NSW stormwater field registered at the inaugural Stormwater Trust workshop and trade display, which demonstrated a range of stormwater treatment technologies. Most of the companies offered single devices delivering a total solution to stormwater pollution, based on only a 'broad brush' understanding of the capabilities of each device and its efficiency in removing pollutants.

Since this time there has been significant investment in, and increased understanding of, the appropriateness of stormwater devices. There has also been a more sophisticated response to specific pollutants and needs. A recent survey of technology providers shows that one company has increased the number of units offered from five sizes in 1997 to 11 in 2000, with the range growing in response 'to the demand from councils for more flexibility in treating stormwater'.

Competition resulting from the grants scheme has increased the need for companies to continually improve their products in order to remain competitive. This is shown by the fact that major companies have either introduced new devices or changed their design practices in the past three years. Hunter Water Corporation suggests that there is evidence of a growing and maturing NSW stormwater industry, as companies are now providing both the equipment and follow-up maintenance required to ensure the success of their devices.

The wider application of technologies under different catchment conditions has assisted in understanding how the devices operate, and their ability to capture pollutants, as well as site-specific examples of the devices. Universities have been encouraged to undertake monitoring to assess the effectiveness of devices at Centennial Park, Holroyd, Dubbo, Bankstown, Gosford, Drummoyne, Lake Macquarie, Newcastle, Penrith and Warringah.

To gain further information on the performance of the stormwater treatment devices, the Stormwater Trust commissioned Monash University to undertake a peer review of the data gathered on the performance of 39 Stage 1 stormwater treatment devices and to develop a methodology for assessing the performance of stormwater treatment technology as data from Stages 2 and 3 grant projects become available. This methodology will ultimately further help councils to use structural stormwater treatment systems appropriately as part of their stormwater management effort.

Information gained by the Stormwater Trust is being disseminated to councils to help implement their stormwater management plans. In the Sydney Harbour Catchment, structural treatment measures have been identified as representing 40% of the management effort ($10 million a year) within the implementation strategies of these plans. The implementation strategies for structural solutions, if extrapolated for all councils, represent a commitment of $150 million over the next five years.

The increased emphasis on education through the grants has occurred in response to a greater understanding by stormwater managers of the wide range of activities that affect stormwater, and also in response to the fact that these activities have not been adequately addressed by structural treatment measures. There is also greater appreciation that structural stormwater treatment devices present (often-substantial) ongoing costs to councils.

6.6 Case Study – the Sydney Harbour Catchment

Stormwater run-off from urban areas is a significant source of pollution and degradation of Sydney Harbour and its catchment. Essentially all of the litter, most of the sediment and toxicants, and approximately half of the nutrients discharged to the harbour are derived from urban stormwater. These pollutants significantly affect both the amenity and ecology of the harbour and its tributaries.

Stormwater management within the Sydney Harbour catchment is complex. The ownership of the infrastructure is fragmented among councils and State agencies, and the allocation of resources to stormwater management (both current and proposed) is variable. Despite the success of the recently completed stormwater management plans, institutional and financial considerations remain significant impediments to improved stormwater management practices.

However, the Sydney Harbour Catchment Management Board has recently been established and is considering urban stormwater as one of the key elements of its activities.

The 27 councils within the catchment own the bulk of the stormwater infrastructure, and are responsible for a broad array of planning, development control and operational activities, which are of great significance in the management of stormwater. The Sydney Water Corporation owns some trunk drains in the lower areas of catchments, and the Roads and Traffic Authority is responsible for run-off from the main 'State' roads.

Urban stormwater management in the catchment had focused on flooding issues until the mid-1990s, when water quality monitoring highlighted the significance of stormwater to the pollution loads in the harbour. In March 1996 one of the first pollution control devices was commissioned at Balmoral Beach, marking an initial shift to stormwater quality management.

The Stormwater Trust Grants Program led to a significant increase in stormwater quality management in the catchment. In Stage 1, 20 projects were funded throughout the catchment, with a value of $4.8 million. These projects included the installation of gross pollutant traps in Drummoyne, Mosman Bay, Concord, Bicentennial Park and the Royal Botanic Gardens, as well as important restoration projects in Lane Cove National Park and at Hunters Hill.

In Stage 2, a further 21 projects were funded for a total of $4.2 million, including education projects in Auburn, Leichhardt, Parramatta and the Chatswood CBD. These projects were complemented by structural treatment techniques in Ryde, Woollahra and Balmoral.

In Stage 3, 20 projects were funded to $4.2 million, bringing the total grant funding to $13.2 million in 61 Stormwater Trust projects. The projects focused on building on the linkages established through the stormwater management plans and lessons learnt through the previous grants. As a result, the funded projects will lead to significant environmental benefits, with projects in the Sydney CBD, Blackwattle Bay at the Fish Markets, stormwater reuse in Drummoyne, education in Parramatta, environmental restoration in Ryde, Ku-ring-gai and Lane Cove National Parks, and auditing in North Sydney and Willoughby.

The Stormwater Grants have significantly helped in the development and understanding of stormwater management capabilities in Sydney, from a relatively small base in 1997. The stormwater management plans were completed in 1999. These plans indicate that councils propose to spend a further $6.4 million annually on stormwater management within the catchment over the next three to five years. The main points of stormwater management plans prepared for the nine sub-catchments of the Sydney Harbour catchment are:

- **Port Jackson North:** the plan includes substantial resourcing for education programs, enforcement of erosion and sediment control plans and illegal waste dumping provisions, and auditing of commercial and industrial areas within the catchment.
- **Port Jackson South:** substantial funding of source-control programs, particularly community education, catchment auditing, waste management and enforcement of controls on building sites.
- **Lower Parramatta River:** substantial funding is dedicated to a broad range of source-control activities within the Lower Parramatta River catchment, with limited structural controls proposed within the Drummoyne local government area.
- **Middle Harbour:** a broad range of source-control actions are complemented by a suite of structural controls, including pollution traps at Long Bay, Hunters Bay, Bantry Bay and Rocky Creek.
- **Lane Cove River:** a broad combination of source-control measures, with a relatively low level of structural measures.
- **Homebush Bay:** a range of source-control measures is proposed within the Homebush Bay catchment; a substantially higher level of funding is proposed for structural treatment measures, including various gross pollutant traps.
- **Duck River:** a broad range of source-control measures is proposed, including education campaigns, enforcement of erosion and sediment controls, and the encouragement of water-sensitive urban design for new development.
- **Mid Parramatta River:** a relatively high level of expenditure is nominated in the plan for structural treatment measures, including gross pollutant traps and constructed wetlands.
- **Upper Parramatta River:** the primary focus of the catchment's structural measures is the implementation of litter traps at source in such commercial centres as Carlingford, Seven Hills, Blacktown, Lalor Park, Westmead, South Wentworthville, Greystanes and Pendle Hill shopping centres.

The Stormwater Trust has been a significant starting point for stormwater quality, with councils putting increased resources towards improving the impact of urban stormwater in Sydney Harbour. The annual *Benchmarking Stormwater Quality Management Programs Report* prepared by the Sydney Coastal Councils Group illustrates the value of the Stormwater Trust program. Data are collected from the 16 member councils to assess trends in stormwater quality budget allocations over the four-year reporting period (1996–2000). Overall, there has been an increase in stormwater budget allocations for each of the two survey periods (1996–97 to 1997–98 and 1998–99 to 1999–2000). The establishment of the Stormwater Trust had a particularly obvious effect: overall stormwater expenditure increased for the two reporting periods by 6.2% to 13.6% respectively. There was also an increase in total contributions to stormwater management as a proportion of overall council budgets.

Key areas of change in stormwater spending have primarily included the installation of pollution control measures, implementation of education programs, preparation of planning documents, street sweeping, cleaning and maintenance of devices, and enforcement of conditions of consent. Councils have increased funding for the installation of treatment devices, with an average increase of more than 60% over the reporting periods 1996–97 to 1997–98 (95% increase) and 1998–99 to 1999–2000 (40% increase).

Urban stormwater is also one of the priority projects in the government's Sharing Sydney Harbour program. Improvement of stormwater quality through implementation of the stormwater management plans is recognised in the Sharing Sydney Harbour Regional Action Plan as the next major step of this project.

7 The Future of Urban Stormwater Management

The NSW Government's Urban Stormwater Program, part of the Waterways Package, forms the most concerted initiative yet to improve the health and amenity of the State's urban waterways. Evaluations of each of the main components of the program – the Stormwater Trust Grants Scheme, the Urban Stormwater Education Program and the Stormwater Management Planning process – have identified strong support among all stakeholders for the program, and there has been a unanimous call for its continuation.

The findings of this evaluation have been broadly positive and, together with the recommendations arising from the evaluations, provide a strong basis for the preliminary design of, and commitment of additional resources to, the continuation of the Stormwater Trust's Urban Stormwater Program.

Common themes have emerged from the evaluations of the grants scheme, education program and stormwater planning process, in relation to future programs for improving urban stormwater management. The recommendations from the three component evaluations can be grouped into those themes to identify the main elements of a second phase of the program, should additional funding be provided. The central theme of a future program would be securing and enhancing the capacity of stormwater managers and the community to successfully and effectively implement the stormwater management plans.

7.1 Recommendations for an Extension to the Urban Stormwater Program

The following sections group the individual recommendations of the component evaluation reports into common themes for future action. Each recommendation is annotated to indicate from which evaluation report it originates [*Grants, SMPs (Stormwater Management Plans) or Educ*]. A small number of recommendations are presented in more than one section, as they relate to more than one area of future activity. A brief discussion and response are then provided; they describe how these recommendations would be addressed in a future Urban Stormwater Program should additional funding be provided.

A range of responses has been considered to the major issues raised in the evaluation and consultation process. The following sections give details of the proposed path forward in relation to the main issues identified in the evaluation process.

In relation to institutional arrangements for urban stormwater management, some stakeholders have called for the establishment of a separate drainage authority. The Stormwater Trust believes that the existing stormwater managers should be given an opportunity to improve management regimes through the implementation of the stormwater management plans. Recommendation 4 of this section recognises the need to investigate the need and options for moving to a more sustainable and effective funding model for future urban stormwater management.

Recommendation 1 – a Grants Scheme Supporting Improved Local Stormwater Management Activities

Relevant Recommendations from Independent Evaluation Reports

- Future program design should include consideration of funding the implementation of the stormwater management plans. *[SMPs]*
- The program needs to provide a mix of incentive structures for integrating stormwater management plans in councils' budgetary and management planning processes. *[SMPs]*
- The EPA should collaborate with councils to implement program incentive structures to encourage involvement across council departments, (including the community services, operations and planning sections) for effective urban stormwater planning and management. *[SMPs]*
- The program should provide incentives that will generate local political support for urban stormwater management at a local government level. *[SMPs]*
- The program should strengthen and formalise the role of the catchment steering committees established to prepare the stormwater management plans. *[SMPs]*
- Incentive structures need to be established to keep up the momentum of the catchment steering committees established to prepare the plans. *[SMPs]*
- There is a need to ensure ongoing evaluation of educational techniques to ascertain the achievements of this approach. *[Grants]*
- There is a need to employ strategies to transfer individual council officers' knowledge and skill developed by the Stormwater Management Planning process into the whole council organisation. *[SMPs]*
- Future program funds need be made available to local government to build the ability of the community to participate in activities that improve urban stormwater quality. *[SMPs]*
- There is a need to identify 'hot-spot' areas for grants as a priority to address significant urban stormwater pollution (including evidence-based, catchment-based and outcome-focused projects). *[Grants]*
- The future grants program should not favour applicants on the basis of their resources to develop applications and undertake the projects. *[Grants]*
- We need to ensure that councils take into account the full costs of long-term operation and maintenance of devices when they are selecting techniques. *[Grants]*

Discussion and Response

The large majority of funding would continue to be directed to local councils to undertake practical actions that would more effectively address the environmental impacts of urban stormwater discharges. Future Stormwater Trust grants should be closely linked to the priorities set out in the stormwater management plans. This would both indicate the State's willingness to continue its stormwater partnership with local government, and raise the profile of the stormwater management plans and the catchment steering groups that prepared the plans. This funding could be presented as incentives to encourage local councils to meet their commitments, as described in the plans. This funding could also be used to induce a more comprehensive and multi-disciplinary approach to stormwater management than that adopted to date, or even proposed in the plans.

This funding could be allocated in a number of ways, including:

(a) continuation of a competitive grants scheme, linked to the implementation of the stormwater management plans

(b) a system of non-competitive 'negotiated' grants, whereby funded is allocated equitably to each council or catchment-groups of councils, based on projects (or gaps) identified in the stormwater management plans. This would achieve a more comprehensive (broad-ranging) management effort than that proposed in many SMPs.

(c) a combination of (a) and (b), or

(d) a (perhaps geographically) phased transition from (a) to (b).

Recommendation 2 – Continuation of an Enhanced Urban Stormwater Education Program

Relevant Recommendations from Independent Evaluation Reports

The state-wide urban stormwater education program (USEP) should be continued. The state-wide USEP should be planned to contain the following elements *[Educ]:*

State-wide program elements:

- an extension state-wide mainstream mass media campaign, which leverages and builds upon community concerns to promote the adoption of non-polluting behaviours by all citizens in urban NSW
- an extension of the mass media campaign for people of non-English-speaking backgrounds (NESB), so that four additional language groups are targeted (for example, middle European) and behaviour messages are reinforced within the communities from the seven language groups targeted in the current program.
- a program that provides funding and support for local councils to use the mass media components of the state-wide program and to extend them into their local communities
- an extension of community education activities with targeted communities. This includes people of NESB (an additional four language groups) and school students.
- continuation and extension of activity with industry, including projects with priority industry associations, industry training providers and individual companies. These should target new industry sectors whose operations affect stormwater, and should reinforce and extend activity in previously targeted industry sectors.
- activities that enhance the capacity of local communities to undertake stormwater education projects in priority locations, in collaboration with local government (includes the Stormwater website and print material support for local initiatives)

Supporting local educational activities (linkage integration and quality control elements):

- continue and extend local (and/or catchment) non-point-source stormwater pollution education programs.
- given the high need for capacity building within local councils and support for local initiatives, significant proactive support should be given under the USEP to local government staff from within the EPA. The aim will be to:
  - ❑ establish an evaluation framework for the entire urban stormwater education program
  - ❑ review Stormwater Plans to determine where education is identified as an intervention, the extent to which its use is appropriate, and where council staff might be supported to be able to plan and evaluate it more effectively.
  - ❑ get standards for education programs

- establish monitoring and reporting mechanisms for local education programs
- collate and report on data from local programs concerning the extent and impact of education efforts
- design, identify and promulgate best practice tools for the planning and evaluation of education programs
- design evaluation pro formas and materials for use in local projects
- provide support and mentoring, and develop and deliver training (in education planning, delivery and evaluation) for council officers involved in stormwater education, through established regional structures and staff
- link local projects with the state-wide program
- identify and, where necessary, provide training on strategic, educational and structural approaches to stormwater management for senior staff and elected officials
- promote the use of local community volunteers.

Discussion and Response

The above series of recommendations has been derived from the evaluation of the USEP to date; consideration of the areas for improvement; and consultation with a range of stakeholders. These recommendations are based on the following rationale:

- Educating the community to behave in ways that reduce the presence and impact of 'invisible' pollutants that are not well captured by structural controls is of crucial importance.
- Reduction of pollutants at source will become an even more significant challenge.
- Education and training activity to reduce stormwater pollution at source needs to be conducted in an integrated manner at both a state-wide and a local level
- There is a need to continue and strengthen the public's concern for water quality
- Reinforcement of the message that stormwater is a major source of pollution is important, supported by clear messages about appropriate and achievable alternative behaviours.
- The effectiveness of education is difficult to measure. Significant independent monitoring and evaluation is essential in order to improve understanding of its impact.
- Improving the capacity of council officers to plan, deliver and evaluate education is crucial.
- All stormwater education activities are fully accountable in terms of their expenditure, the products developed, and the identification and monitoring of impacts.

Recommendation 3 – Increased Resourcing for Implementation of the Program

Relevant Recommendations from Independent Evaluation Reports

- The Stormwater Team should be provided with the resources to administer and implement the next phase of the program. *[SMPs]*
- The EPA needs to prioritise overseeing and participation in the Stormwater Management Planning process. It needs to focus on not only the quality of urban stormwater management plans, but, equally importantly, the quality of the catchment relationships. *[SMPs]*

- There is a need to increase the resource base to help councils in the development and application of appropriate stormwater management techniques. *[Grants]*
- There is a need greater management support for councils through institutional agreements, standard protocols, management and facilitation tools and decision-making processes. *[Grants]*
- We should benchmark 'best practice' in the preparation of stormwater management plans and provide feedback to council officers on the first round of the planning process. *[SMPs]*
- A detailed guidance framework for the coordination of plan implementation and revision should be developed prior to the revision of stormwater plans, through the undertaking of case studies. *[SMPs]*
- The EPA should improve its understanding of the organisational issues of local government to ensure that program design and implementation meets the needs of all players in the stormwater planning process. *[SMPs]*
- The EPA should help local government to develop effective community engagement and capacity building strategies for each catchment. This work could be linked and integrated into councils' community consultation obligations, identified in the *Local Government Act* 1993. *[SMPs]*
- Detailed guidance should be provided to stormwater managers on the catchment-coordination processes necessary for preparing stormwater management plans. *[SMPs]*
- A contact forum should be set up for all council officers involved in the Stormwater Management Planning process. The aim of the forum will be to promote the sharing of experience, knowledge and relationship building between agencies of State and local government. *[SMPs]*
- The EPA needs to collaborate further with the Department of Local Government, Local Government and Shires Associations, Regional Waste Boards, Regional Organisations of Councils and other forums that have connections and influence with the elected representative level of local government. *[SMPs]*
- We need to improve linkages to national and interstate stormwater management agencies. *[Grants]*
- The existing *Managing Urban Stormwater* series of guidance documents should be updated and finalised *[SMPs].*
- We need to work with councils to ensure ongoing operation and maintenance of the stormwater infrastructure. *[Grants]*
- It is not recommended that an immediate audit of stormwater plan implementation be undertaken. However, it is highly recommended that the Stormwater Trust conduct an audit of each council's existing stormwater expenditure and capabilities for implementing the stormwater management plans (to provide baseline information) and conduct an audit of the internal activities of councils to ensure that low-cost organisational functions are addressed or implemented. *[SMPs]*

Discussion and Response

There is a clear need, supported by all stakeholders who have participated in the Urban Stormwater Program, for increased resourcing of the Stormwater Team established within the EPA to implement the program. The efforts of the team in implementing the program have been widely applauded by various stakeholders. However, the achievements of both the grants scheme and the stormwater management planning process have been constrained by the limited availability of team staff.

The previous sections have described proposals for significant expansion of the scope of the program. These proposals, if endorsed, will necessitate further allocation of resources for implementation of the program.

Recommendation 4 – Establishing a Framework for Sustainable Stormwater Management

Relevant Recommendations from Independent Evaluation Reports

- Revision of stormwater management plans for the greater metropolitan catchments should be formally required through a mechanism such as a Section 12 direction.
- The EPA should take appropriate action to help councils incorporate a legal requirement for plan revision into their management planning processes. This will ensure adequate resources and time are made available in councils' budgetary processes for such work. *[SMPs]*
- A two- to three-year time frame for the revision of the plans should be provided for both metropolitan and regional councils. *[SMP]*
- Consideration should be given to the design and scope of the planning process applying to regional and rural councils before any legal Directive is issued to those councils to revise their plans. *[SMPs]*
- The EPA should improve the program design to ensure that the stormwater planning process is effectively coordinated with other programs and planning instruments operated by other State agencies. *[SMPs]*
- There is a need to investigate the potential for integrating the stormwater management planning process into total water cycle management. *[SMPs]*
- We ensure that the scope of regional stormwater management plans includes run-off from non-urban land-uses. *[SMPs]*
- The role of the Department of Urban Affairs and Planning (in particular) needs to be formalised into the planning process. *[SMPs]*
- Incentives encouraging councils to use external consultant organisations to prepare future stormwater management plans need to be addressed, as project officers (proxy catchment coordinators) were more successful than consultants in preparing plans that met both EPA and council requirements. *[SMPs]*
- A dedicated external funding model needs to be investigated. *[SMPs]*
- Councils need to benchmark their current positions, according to program design criteria, on such issues as existing financial capacity for stormwater management, specific details of relevant operational activities, lines of organisational communication, and decision-making processes that impact on stormwater management.
- The Stormwater Trust needs to work as a 'common front' in stormwater across government. *[Grants]*

Discussion and Response

It is important to ensure that the momentum generated by the preparation of the stormwater management plans is not lost. In the period since the finalisation of the Greater Metropolitan Region stormwater management plans, there have already been signs that the catchment-based

approach to stormwater management established by the plans is beginning to flag, as evidenced by the lack of recent meeting of the catchment steering committees established by the process.

There is a need to promote the significance of the plans to ensure they remain 'live' documents that are periodically revised and continuously improved. As indicated in Recommendation 1, the primary mechanism for achieving this is to link grant allocation to the stormwater management plans. However, we also propose that grants be made available to help councils with the cost of revising the plans once they enter the proposed five-year extension of the program. Higher levels of funding are proposed for this purpose (compared with those provided for the initial development of the plans), and the system of allocation would be more equitable than that employed in the current program.

A number of the more significant recommendations listed above should be considered by the Stormwater Trust over the first years of any extended program. These include the nature of auditing mechanisms employed to assess implementation of stormwater management plans and the need for legal Directions to councils requiring the revision of the plans within greater metropolitan and regional NSW. In particular, consideration should be given to the scope and design of the planning process as it applies to regional and rural councils.

There is also a need for the Stormwater Trust to investigate the need and options for the development of a dedicated (perhaps external) funding mechanism for urban stormwater management. The allocation of substantial grants by the Stormwater Trust should not be seen as a long-term solution to the funding constraints of most local councils in this area. The proposed extension to this program should be seen as a transition period for the establishment of a sustainable funding model for this activity.

To ensure that these plans are implemented, we propose that the Stormwater Trust work with councils to develop internal capabilities and ensure the plans are integrated into council works budgets. The future of the Stormwater Trust will address long-term resourcing of stormwater management to ensure the development of sustainable funding capabilities for future stormwater activities.

Recommendation 5 – Placement of Stormwater Extension Officers within Regional Organisations of Councils

Relevant Recommendations from Independent Evaluation Reports

- The program should be more appropriately resourced to provide extension workers during the stormwater management planning (implementation and revision) process. These officers would share information across catchments and help councils and State agencies to address concerns and catchment coordination issues *[SMPs]*.
- Councils should be encouraged to incorporate the stormwater program into their political agendas. *[SMPs]*
- The EPA needs to be more involved in the Stormwater Management Planning process as a stormwater stakeholder, and to work collaboratively with local government by providing catchment-based extension workers. *[SMPs]*
- Increased staffing and more extension officers need to be provided to help councils in project development. *[Grants]*
- Regional development of council capabilities must be continued in the future through extension of the program into regional areas. *[Grants]*

- It is important to ensure the continuation and enhancement of links established between stormwater managers and the community. *[Grants]*
- The Trust should work with councils to improve the skills of stormwater managers. *[Grants]*
- There is a need to improve the awareness of councillors and senior managers and executives of councils regarding stormwater issues. *[Grants]*
- A contact forum should be set up for all council officers involved in the Stormwater Management Planning process, to promote the sharing of experience, knowledge and relationship building between agencies of State and local government. *[SMPs]*
- Detailed guidance should be provided on the catchment-coordination processes necessary for preparing stormwater management plans. *[SMPs]*
- Coordinator positions need to be established for each of the greater metropolitan catchments. *[SMPs]*
- There is a need to investigate the potential for the recently established catchment management boards to help coordinate the implementation of stormwater management plans. *[SMPs]*

Discussion and Response

Evaluation of the stormwater planning process has identified the need for the Stormwater Team to be more involved in the preparation of the plans, and to provide greater assistance and guidance to councils in coordinating the implementation and revision of the plans. The recommendations listed above identify the broad range of functions that would benefit from a greater front-line Stormwater Team presence.

It is considered that the most effective way of meeting this demand would be for the Stormwater Trust to provide grants to part-fund 10 stormwater extension officers across the State: five catchment-based officers within the Greater Metropolitan Region, and five region-based officers in regional and rural NSW. These officers, though associated with the Stormwater Trust, would work within the existing framework of the Regional Organisations of Councils (ROCs). The balance of the necessary funding (about $5,000 to $10,000 per council annually) would be required from local councils through the Regional Organisations of Councils.

While the appointment of these extension officers would be reviewed after three years, it is expected that these officers would play a valuable role throughout the proposed program, in both the implementation, evaluation and revision of the stormwater management plans.

Recommendation 6 – Dissemination of Information to Stormwater Managers and Stakeholders

Relevant Recommendations from Independent Evaluation Reports

- Dissemination of information collected by stormwater projects is required to optimise the cost-effective management of stormwater. *[Grants]*
- There is a need to undertake activities that extend stormwater managers' understanding and adoption of successful education approaches to reducing stormwater pollution (for example, conference presentations, workshops and placement of project outlines on the Stormwater website). *[Educ]*
- We need to benchmark 'best practice' in the preparation of stormwater management plans and provide feedback to council officers on the first round of the planning process. *[SMPs]*

Discussion and Response

Dissemination of information has probably been the major shortcoming of the Urban Stormwater Program to date, particularly in relation to the lessons learned from the Stormwater Trust projects. This has resulted primarily from the resource demands of both assessing stormwater management plans and administering the Stormwater Trust grants. Clearly, as projects are increasingly monitored and evaluated in a more rigorous way, useful information will become available for dissemination to stormwater managers throughout the State, with a view to better targeted and more cost-effective stormwater practices in the future.

Recommendation 7 – Improvement of the Knowledge Base for Stormwater Management

Relevant Recommendations from Independent Evaluation Reports

- Good scientific data are needed if we are to have high quality education efforts at the local and state-wide levels. There should be further investigation and analysis to determine what pollutes stormwater. This should include research and analysis of the extent to which sewerage infiltration into stormwater in urban areas is a problem. Education at both the state-wide and local level should then target behaviours that reduce priority pollutants in the target catchments. *[Educ]*
- There is a need to benchmark the impact of stormwater on urban waterways and establish measurable objectives for future urban stormwater management in NSW. *[Grants]*
- Specific investigations of pollutant loads from catchments should be done to allow improved assessment of the effectiveness of stormwater treatment devices. *[Grants]*
- There should be a focus on ecosystem health as an indicator of improved stormwater management. *[Grants]*
- We need to ascertain the effectiveness of stormwater treatment techniques that have not been adequately evaluated. *[Grants]*
- There is a clear need for information about the effectiveness of non-structural approaches (eg, education, industry audits) to stormwater pollution control.
- Funds and assistance should be provided by the Stormwater Trust to undertake social research on strategies for appropriate community engagement and building the community's ability to improve urban stormwater quality. *[SMPs and Grants]*
- Detailed research and advice are needed on the employment of more sophisticated evaluation and ranking methodologies in the Stormwater Management Planning process. *[SMPs]*
- We need to determine the true costs of stormwater management. *[Grants]*

Discussion and Response

While urban stormwater is being increasingly recognised as having a significant deleterious effect on the health and amenity of urban waterways, the specific impacts of different stormwater pollutants in different environments are poorly understood. Good management is based on good science.

Funding would also be directed to developing improved systems for stormwater management, such as improved techniques for engaging the community and better evaluation and ranking methodologies for stormwater management plans.

To ensure that grant funds were appropriately directed, funding would be allocated through expression of interest in relation to specific knowledge gaps, as identified and agreed by an expert panel.

Recommendation 8 – Better New Urban Developments

Relevant Recommendations from Independent Evaluation Reports

- Any future Stormwater Trust program should promote the adoption of 'water-sensitive urban design' at new urban developments and redevelopments. *[Grants]*

Discussion and Response

The design and construction phase of new urban developments provides a unique opportunity to incorporate various pollution-prevention measures into both new release areas and the redevelopment of urban land. Stormwater reuse for non-potable purposes, encouraging infiltration rather than discharge of stormwater, as well as the use of vegetated systems and open ponds for stormwater treatment, minimises the need to rely on expensive 'end-of-pipe' stormwater treatment devices. The adoption of these approaches at new development sites is the main field of stormwater management in which NSW lags behind most other States.

The adoption of these (and other) principles of 'water-sensitive urban design' has been limited in NSW, primarily because the development industry and local councils have been wary of adopting such 'new' strategies. Seed funding is needed to provide a number of demonstration projects that would illustrate the feasibility and effectiveness of these approaches. Interestingly, in Melbourne, where this approach has been encouraged and a number of demonstration projects have been established, developers are beginning to employ these practices for aesthetic reasons rather than environmental protection purposes.

Appendix 1: Terms of Reference for the Urban Stormwater Program

Terms of Reference

The overall review of the Urban Stormwater Program will consider the following issues:

- an evaluation of the total program and each component part of the Urban Stormwater Program (grants, plans, education program and program management) in achieving the objectives and key environmental, social and economic performance indicators. Each component will be assessed up to and including those works undertaken by August 2000.
- an assessment of the cost of delivery of the program, and of those aspects that may be achieved more economically
- identification and assessment of the benefits provided by the Urban Stormwater Program, including:
  - —the extent to which grants have assisted in expanding activity in stormwater management in a positive and cost-effective manner
  - —the environmental, social and economic outcomes and whether the benefits of the program are sustainable
  - —assistance that may be needed to ensure lasting benefits
- an assessment of the planning approach, which was based on council boundaries, and of how this approach was related to the delivery of outcomes at a catchment level
- an assessment of the effectiveness of existing institutional arrangements for stormwater management and program implementation in NSW, including identification of strengths and weaknesses of the approaches used
- an outline of any possible future directions and extension of the Urban Stormwater Program.

Deliverables

The overall review of the Urban Stormwater Program will consider the following issues (as suggested in the timetable at Attachment 1):

1. Separate reviews of the component parts of the program:
   - **grants:** Stage 1 Grant Review (completed); Stage 2 Grant Review (August 2000)
   - **plans:** Great Metropolitan Areas Plan Review (September 2000); Public Authority Review (October 2000)
   - **education:** USEP First Phase Review (September 2000)
2. Overview report to the Stormwater Trust, December 2000.

Appendix 2: Stakeholder Consultation

Stakeholder Submissions

As a component of the evaluation, the Stormwater Trust asked for submissions from stormwater stakeholders, with replies received from:

- Peak Environment Non-Government Organisations – 6 October 2000
- Hawkesbury Nepean Catchment Management Trust – 6 October 2000
- Sydney Coastal Councils Group – 5 October 2000
- Ministry for Utilities and Energy – 6 October 2000
- Sydney Water Corporation – 15 November 2000
- Stormwater Industry Association – 7 October 2000
- Upper Parramatta River Catchment Management Trust – 16 October 2000
- Department of Urban Affairs and Planning – 16 October 2000
- Hunter Water Corporation – 6 October 2000
- Roads and Traffic Authority – 16 October 2000

Stormwater Futures Workshop Attendance

A Stormwater Futures Workshop was held on 13 October 2000 to discuss the outcomes of the Urban Stormwater Program and gain ideas as to the possible future directions and funding for the Urban Stormwater Program. Attendees at the workshop included:

- Environment Protection Authority
- University of New South Wales
- Department of Land And Water Conservation
- Department of Local Government
- Local Government and Shires Associations
- Sydney Water
- Dubbo Council / Institute of Public Works Engineers Australia
- Penrith Council / Stormwater Industry Association
- Nature Conservation Council
- Blue Mountains Urban Run-off Control Program
- Hawkesbury Nepean Catchment Management Trust
- Kogarah, Hornsby, Maclean, Albury, Drummoyne and Blacktown Councils.