

# An Assessment of the Social Impacts of Sustainable Drainage Systems in the UK



**Report SR 622**  
**December 2003**

**dti**

Department of Trade and Industry





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# ***Summary***

An assessment of the social impacts of sustainable drainage systems in the UK

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The report assesses the perception and level of understanding of people living close to seven different SUDS ponds in the UK. The report draws conclusions on the impact of SUDS design and maintenance and of public education in influencing the public's perception of SUDS ponds.



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Storm Water / Urban Runoff  
Public Education Model Program, 2002





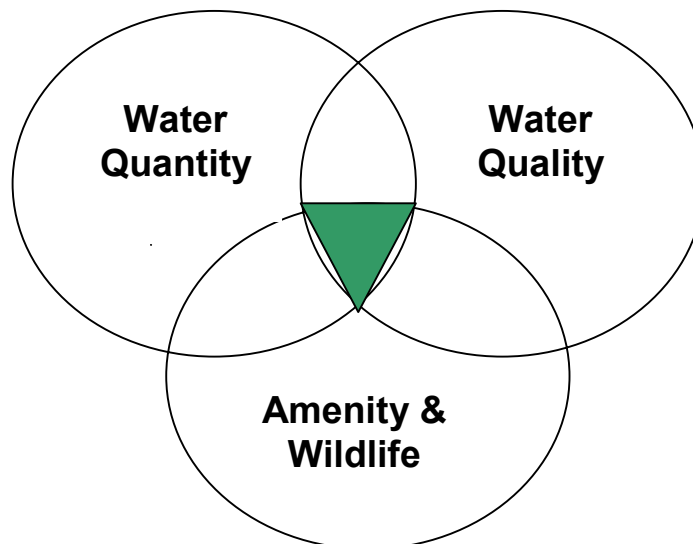
## 1. INTRODUCTION

All new and innovative technologies applied in either housing or commercial developments, besides being economically and environmentally acceptable, must also be accepted by the public. Poor public perception of sustainable drainage systems (SUDS) can be a deterrent for developers in using SUDS at new sites, as it can influence householders' decisions to buy property within the development. In contrast, positive attitudes can attract house-buyers and raise the value of the property in the area.

Although the trend of using SUDS in residential areas is increasing, very little research has been conducted either to assess the various attitudes towards the systems, or to assess the perception of issues directly associated with SUDS such as amenity, landscape restoration and biodiversity. One study investigating the attitudes of stakeholders involved with SUDS, was undertaken in 1998 in Scotland, England, and Wales (McKissock, 2000). Recently another study in the form of a MSc project investigated the public perception of SUDS in Dundee and Dunfermline (Apostolaki, 2001). One of the very important outcomes of both surveys was that the level of general public awareness as well as the site-specific information provided to householders, play a very important role in formulating public opinion on SUDS and in generating positive thinking towards the systems. Similar surveys have taken place in U.S.A. (Watershed Protection Techniques, 2000), and Sweden (Hjerpe M., Krantz H., 2000) and concluded similar results.

The goal of sustainability is increasingly being applied to all sectors of public life and development. Therefore, it is important to promote SUDS as a construction practice that embodies the principals of sustainability and contributes to the development of a more sustainable society.

Unlike conventional drainage, SUD systems are likely to form part of widely used public open spaces. This promotes interaction between communities and their local environment and can lead to amenity benefits. The 'urban drainage triangle' (CIRIA, 2000) illustrates how SUDS aim to contribute to an integrated stormwater management solution that addresses pollutant reduction and flood control while providing habitat and aesthetic amenities.



**Figure 1** The urban drainage triangle – balancing the impact of urban drainage on the environment

In achieving the 'urban drainage triangle', education has a vital role to play in promoting greater understanding of why the schemes are there and how they function, in allaying fears over health and safety issues and in developing engagement in management/maintenance regimes.

## 2. STUDY OBJECTIVES

The study aimed to collect and analyse information on the perception of the people whose homes are served by SUDS ponds, and to use this information to answer the following key questions:

- **Do SUDS ponds influence people's decision to buy a property?**  
Public perception of SUDS components may result in either a motive for, or a deterrent against the acquisition of property close to a scheme.
- **Do people perceive that SUDS ponds impact on property prices?**  
Depending on public attitudes, SUD schemes may have an impact on the value of a development and/or cost of individual properties. Alternatively, SUDS systems may influence the saleability of properties.
- **What are the factors that influence the public's perception of SUDS ponds?**  
It is thought that public perception of SUDS is likely to be linked to several factors-including scheme performance, biodiversity issues, education strategies, aesthetics, perceived health and safety risks, water quality and the socio-economic status of the respondents.
- **How do people perceive the sustainability of SUDS ponds as compared to other sustainable technology?**  
Public perception of SUDS needs to be interpreted in relation to their views of other sustainable development strategies, e.g. wind energy and solar power, sustainable transport schemes, recycling etc.
- **How do people perceive the safety of SUDS ponds?**  
Safety has been proven to be one of the main concerns regarding SUDS application, for both developers and the public.
- **What role does education play in the way people perceive SUDS ponds?**  
Poor commitment to public education in the field of stormwater pollution and management has been identified as an important factor contributing to ambivalent or negative public perception.

### 3. LITERATURE REVIEW

Several public perception surveys have taken place in the U.S.A. with respect to watershed pollution. In these surveys a very poor level of awareness was identified. The vast majority of the urban residents who participated in these surveys were unaware of their personal contribution to watershed pollution and, specifically, on the effects that lawn fertilisers, pesticides, dog excrements, soaps and car fluids can have on the receiving watercourse (Watershed Protection Techniques, 2000).

Very little research has been conducted to assess the various attitudes of stakeholders involved with SUDS. One study, designed by Gaye McKissock (Urban Water Technology Centre, University of Abertay, Dundee, 1999), took place in Scotland, England, and Wales. This was a follow up to an earlier questionnaire and to a number of semi-structured interviews, conducted in 1996. The 1996 questionnaire had identified that there were misunderstandings among developers regarding the application of SUDS, issues that were also highlighted in the 1999 questionnaire.

The main findings of the 1999 survey were:

- The deterrents in using SUDS appeared to be the responsibility for adoption and maintenance, and the increased land take requirements;
- The majority of the respondents believed that either water authorities or a combination of organisations, including water authorities, should bear the responsibility for adoption and maintenance of SUDS;
- Filter drains and infiltration trenches were the most popular SUD components, while swales were considered to be the least reliable and efficient;
- Regulatory requirements were identified as the major factor in the selection of SUDS. Selection of ponds though, was additionally based on the need for high volume runoff control and the creation of new habitat;
- According to participants' estimations, SUDS were thought to have been less cost efficient than their conventional alternatives;
- The majority of respondents were unaware of SUDS maintenance costs, and considered that developers and consultants should not bear the maintenance responsibility. (McKissock G., 1999).

In Scotland, public perception surveys were applied in the year 2000, in areas served by retention and detention pond as well as swales. In general, low levels of awareness of SUDS, and particularly of swales, were identified. The public were unaware of the existence and purpose served by underground SUD systems or of systems that are less visible than ponds. The surveys found a reasonable level of perception that SUD systems provided a source control function, although their use in protection against pollution was less well understood. Roadside swales were tolerated, but not welcomed, and maintenance responsibilities were not understood. It was difficult to determine specific reactions to the introduction of detention basins, although comments received indicated a need for enhanced drainage performance, which ensured avoidance of intermittent ponding, and 'mud baths' in children's play areas. In general, ponds were well received by local residents who clearly understood and welcomed their wildlife and amenity benefits - a pair of swans breeding within a year of the construction of a pond is a very potent wildlife symbol! There appeared to be less enthusiasm where ponds had been built close to existing housing. In general, the benefits appeared to outweigh the clearly expressed concerns about safety, although it was well understood that pond safety could be relatively easily addressed by appropriate fencing and barrier planting. (Apostolaki et.al, 2001).

A study of the assessment of the public perception of stormwater management structures took place in Sweden in the year 2001. In this study, the participants were mainly concerned with aesthetics, with the function of the systems being of secondary importance. Design of the systems, and maintenance were crucial in influencing aesthetics and therefore making the systems more acceptable by the public.

Developers, on the other hand, believed the function of systems to be the critical consideration. Key factors influencing aesthetic value related to how apparently natural, attractive and clean the systems were. Safety concerns with respect to accidents involving children were expressed and the measures mainly proposed by the participants were the introduction of natural barriers and even the construction of fences in some occasions. (Hjerpe M., Krantz H., 2000).

## 4. SITE SELECTION

### 4.1 Site information and selection criteria

Seven sites were selected for the assessment of public perception of SUDS across England. The chosen sites were located in three different geographical areas - Lancashire, the South Coast, and Gloucestershire. These regions were chosen following consultation with a wide range of SUDS stakeholders across the UK. They tended to be in areas where either the Environment Agency or Local Authority was actively promoting the inclusion of SUD schemes within new development. Retention ponds were the predominant SUD component at each site. Alternative SUD components, such as swales, are not common in England, while others, such as permeable pavement, arouse little public interest/concern.

The criteria for the site selection were:

- size of the development served by the system;
- aesthetics;
- function;
- degree of establishment;
- house values;
- degree of interaction between the SUD scheme and the local community.

Sites of different characteristics were selected to allow comparison of the results.

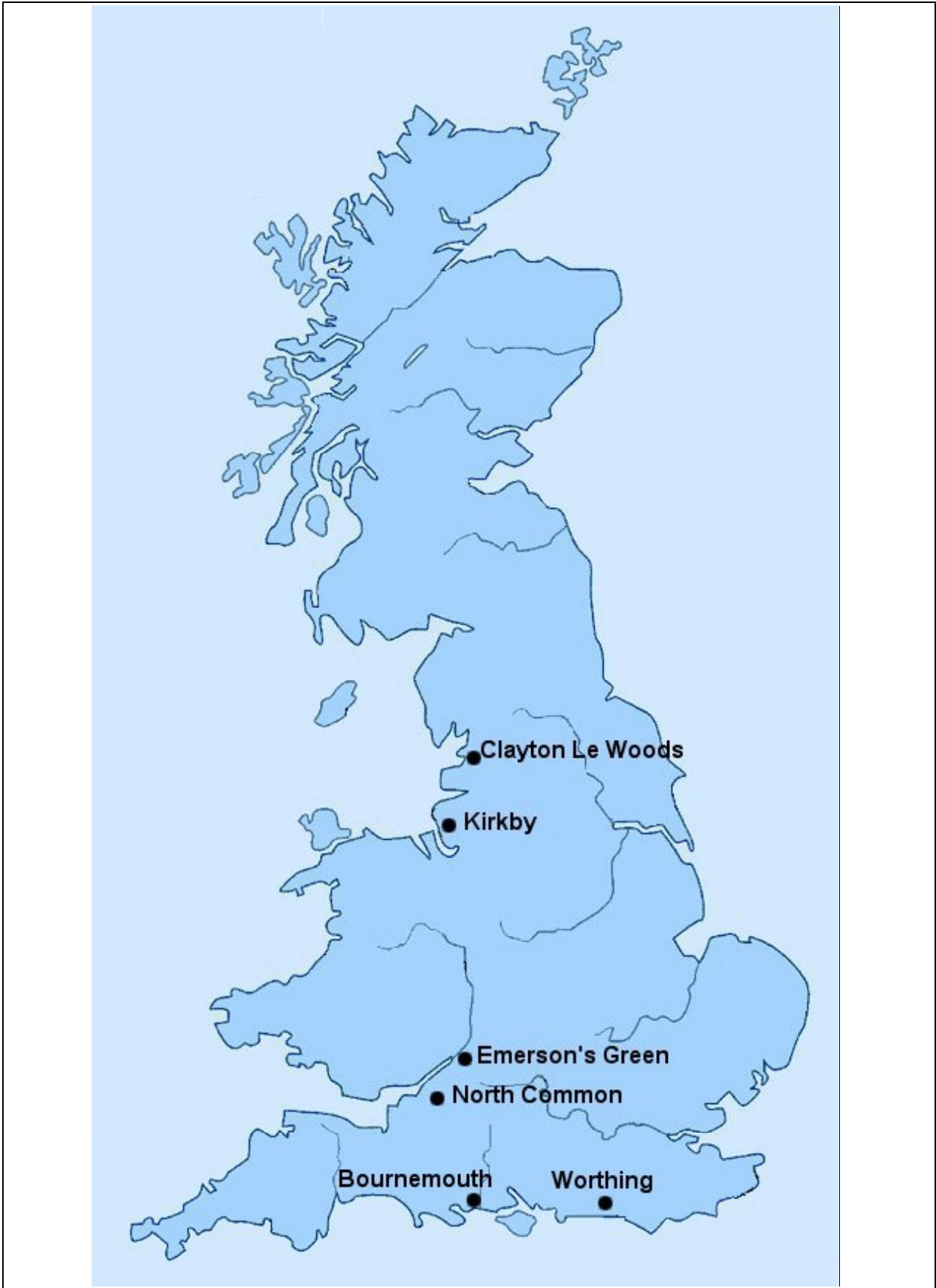
The characteristics of the sites selected are summarised in the following table and are presented analytically later on the text.

**Table 1** Survey sites

Sites	House value	Size of the area served	Sample size	Type of SUDS component	Function	Aesthetics
<b><i>Saxon Way, Kirkby, Lancashire</i></b>	Average	600 Houses	50	Wetland	Attenuation and treatment	Medium
<b><i>Lancaster Lane, Clayton Le Woods, Lancashire</i></b>	Average to above average	200 houses	50	Pond	Attenuation and treatment	Low
<b><i>Brookfields Park, Worthing Road, Rustington, West Sussex</i></b>	Average to above average	360 houses	50	Detention and retention pond	Attenuation and treatment	Medium
<b><i>Coy Pond, Bournemouth</i></b>	Above average	100 houses	50	Retention pond	On-line attenuation and treatment	High
<b><i>Alder Pond, Bournemouth</i></b>	Average	150 houses	50	Retention pond	On-line attenuation and treatment	High
<b><i>North Common, Gloucestershire</i></b>	Average to above average	60 houses	50	Retention pond	Attenuation and treatment	Medium
<b><i>Emerson's Green, Gloucestershire</i></b>	Average to above average	300 houses	50	3 linked retention ponds	Attenuation and treatment	Medium to upper

SUD sites where the houses were of lower than average value were not identified, as SUDS are usually placed in new and modernised housing developments of average to above average value. In previous research undertaken in Scotland, one area of lower socio-economic status served by a retention pond was identified and a survey was applied. A reference to results from this survey is made in Section 7.2, Question 11.

A map showing the site locations is presented as Figure 2.



**Figure 2** Site locations

## 4.2 Lancashire sites

In Lancashire, the survey took place in March 2002. One pond and one wetland were selected. In terms of site characteristics:

1. Saxon Way, Kirkby is a housing development of about 600 houses constructed by Maunders Westbury Ltd. The housing is of average value. The SUD construction is a permanent wetland and it is located at the edge of the development in public open space. There is one inlet and one open outlet, which discharges the water into a stream. The function of the wetland is to attenuate and treat the runoff. There is no vegetation evident on the shore and the water is very shallow. Although it is not of high aesthetic standards, it is an amenity feature for the development as it provides a pet walking area. There are no reports of public complaints from residents.



**Figure 3** Saxon Way wetland





**Figure 4 Saxon Way wetland open outlet**

2. Lancaster Lane, in Clayton Le Woods, is a development of about 100 houses with a proportion of them having direct access to a retention pond. Wainhomes are the developers of the site. The pond is situated at the edge of a public open space. The reed bed vegetation that was in place had died out due to poor maintenance. The housing is of average to above average value. Several complaints from the residents have arisen regarding safety.



**Figure 5 Lancaster Lane pond**

### 4.3 South coast sites

Along the South Coast, three sites were selected for the assessment of public perception. All three sites were served by ponds. One of them was located in Worthing and the other two in Bournemouth. In terms of site characteristics:

1. Brookfields Park, Worthing Road in Rustington, West Sussex, is located within a development of about 360 average to above average value houses, where various developers are active. It comprises one retention pond and one detention pond for attenuation of excessive water volumes. It has one inlet and two outlets, one connected to a local stream and the other to the detention basin. The pond, which is located in a public open space close to the development, is situated very close to a playground and adjacent to the motorway and the railway line. It is poorly maintained, and several items of garbage were seen blocking the outlet to the stream. There is also silt deposition evident at both outlets and at the inlet. The biological performance of the pond is poor, with no existent shore vegetation or wildlife. The shores are steep and slippery, and could present a safety hazard for children and pets.



**Figure 6 Brookfields Park retention pond**



**Figure 7 Brookfields Park detention pond**

This site was considered as suitable for application of the public perception survey due to the fact that it could provide interesting feedback on safety concerns. Safety risks related to the pond are obvious in the area. Additionally, the investigative techniques engaged could provide comparative data between the safety risk related to the pond and other types of safety risks, e.g. risks related to the motorway traffic and the railway line.

2. Coy Pond, in Bournemouth is an old pond which, although it is not a drainage pond as such, provides on-line attenuation, mitigating the effects of runoff from local development areas. The pond is located in an area of high value housing. There is direct access to the pond, and the pond is an important amenity feature for the area. It is very well ecologically established, with rich vegetation and a variety of wildlife.





**Figure 8 Coy Pond**



**Figure 9 Shore vegetation in Coy Pond**

The pond is considered to be well accepted by the public. The site was thought to provide a good basis for safety concern comparisons, as it is located close to a railway bridge, and the house values are similar to those at the Brookfield Park site.



3. Alder Pond, in Bournemouth, is another old pond located in an area of average house value. The pond attenuates the water from the local Bourne and works as an on-line storage pond. It is a well-established pond with abundant wildlife and rich marginal vegetation. In general, it is positively perceived by the local residents and it is frequently used as a pet walking area. On one occasion when there was a plan for construction of a new dual carriageway over the pond, the residents protested in order to keep the pond in place.



**Figure 10 Alder Pond**

The survey results from this site were thought to provide a good basis for comparison with the Coy Pond results as both ponds are located in Bournemouth, they are both old, well-established ponds while the house values in the two locations differ.

#### **4.4 Gloucestershire sites**

In Gloucestershire, two sites were selected for the public perception survey, both served by ponds. In terms of site characteristics:

1. North Common, is a new residential area of about 60 houses served by a SUDS pond. The pond is separated from the houses by a small road and it is often used as a playground area. It has two inlets and one outlet, which dispose the water to a local stream. Eutrophication in the pond is evident. Although the pond does not frequently dry out completely, the water level occasionally drops and the pond turns to a mud bath. The house values are from average to above average.



**Figure 11 North Common pond**

2. Emerson's Green is a new residential area situated close to a park of high amenity value for the area. Three retention ponds, with interlinking connections, have been built within the park. In all three ponds the water level is rarely high and the marginal vegetation is not rich. However, as the ponds are situated within an open green space with trees, they are perceived as well established for the area. The results from houses facing the three ponds were analysed together as the ponds' characteristics and the residents' background were very similar and all three ponds form part of the same site. The following photographs were taken during the summer months when the water level is lower than usual.





**Figure 12 Emerson's Green (Pond 1)**



**Figure 13 Emerson's Green (Pond 2)**





**Figure 14 Emerson's Green (Pond 3)**



## 5. METHODOLOGY FOR PUBLIC PERCEPTION ASSESSMENT

Two methods were selected for the assessment of public perception of SUDS:

1. Door-to-door questionnaires;
2. Focus groups.

Unfortunately, it was not possible to undertake focus groups as part of this study, however some detail is given of such activities in Scotland, for comparative purposes.

### 5.1 Door-to-door questionnaires

The collection of quantitative data was undertaken via the application of door-to-door, interviewer-administered questionnaires, mainly consisting of open-ended questions. Questionnaires were modified to take account of the different SUDS components in use at each site. The researcher did not indicate possible responses to the participants but only addressed the questions and recorded the answers. This ensured that the interviewer did not bias the respondent's answers in any way. The interviewer could fully record the respondent's answer, if this was judged to be most appropriate. This method needs good communication skills on the researcher's part and is time consuming, but was chosen for the following advantages over other investigative methods:

- Respondents are more willing to participate in a survey in which they have to answer questions orally rather than fill in and return questionnaires;
- The respondent is not constrained to choose amongst given answers, but can express any opinion, delivering rich results;
- The responses provided are not biased by suggestions made by the researcher;
- The respondent is encouraged to openly express opinions.

#### 5.1.1 Aims of the Questionnaire

The objectives of the questionnaire were:

- To assess the public's overall concerns on global and local environmental issues;
- To assess the public's perception on water pollution issues;
- To assess public awareness of SUDS and to evaluate any information provided to them by developers / local authorities;
- To identify the public's perceptions of advantages and disadvantages of SUDS ponds and wetlands;
- To record the public's suggestions for improvements to the ponds' performance or appearance;
- To evaluate the safety concerns associated with the ponds and to compare these concerns with other kinds of safety risks;
- To understand any potential links between the implementation of SUDS and house prices / property value;
- To identify the public's perception on the contribution of SUDS to sustainability in general;
- To identify the public's need for further information and determine the most appropriate way to inform the public if this was proven to be necessary.

#### 5.1.2 Questionnaire design

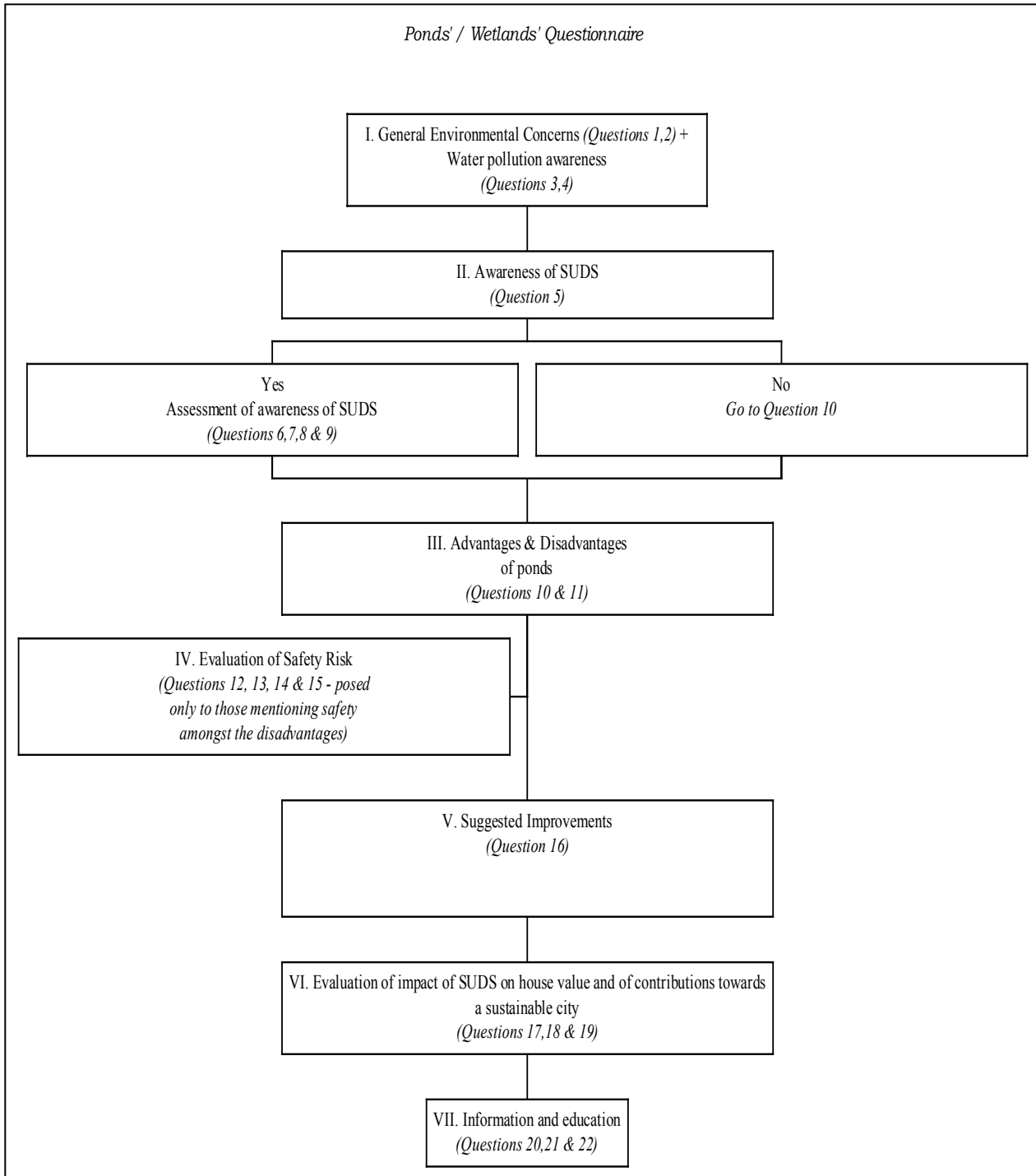
Several factors were taken into account when designing the questionnaire:

- The questionnaires had to be appropriate for application to householders of any occupation and educational level; and had to be as clear and as simple as possible;
- Questions had to be brief but with enough content to allow the researcher to glean as much information as possible without tiring the participants;

- Technical terms or language that could confuse or lead to association of rainwater management with recent flooding in the UK, had to be avoided;
- Care had to be taken not to make people suspicious and raise their concerns about SUDS.

### 5.1.3 Questionnaire structure

The questionnaire was divided into seven groups of questions. A flow diagram showing the structure of the questionnaire follows as Figure 15:



**Figure 15** Flow diagram showing structure of questionnaire

The questions are now described in more detail:

- **Questions 1-4** were aimed at assessing awareness and concerns over global and local environmental issues. The first two tried to identify the public's major environmental concerns (globally) and what their perception of a polluted environment would be, while Questions 3 & 4 referred specifically to water pollution issues.
- **Questions 5-9** were addressed to members of the public who were aware of the term SUDS. Through these questions the researcher tried to assess their level of awareness of SUDS, and their knowledge of the purpose served by them.
- **Questions 10 & 11** tried to identify the public's perception of the advantages and disadvantages of the SUD systems within their community.
- **Questions 12-15** were addressed only to members of the public who mentioned safety amongst the perceived disadvantages of SUD systems. These questions were aimed at specifically evaluating their safety concerns and comparing them to other types of risks present within an urban environment.
- **Question 16** asked the respondents to suggest improvements that may make the systems more easily accepted within their residential area.
- **Questions 17-19** tried to establish any relationship between the SUD system and local house prices. Respondents were also asked to compare SUDS with other sustainable initiatives of which they might be aware.
- **Questions 20-22** tried to identify the need of the participants for further information and education regarding sustainable drainage systems.

A complete copy of the Questionnaire is attached as Appendix I.

## 5.2 Focus Groups

The setting up of focus groups is another useful method for the collection of qualitative data. Such a group was set up during Spring, 2002 in Dunfermline. The group was organised by the Scottish Environmental Protection Agency (SEPA) Diffuse Pollution Group and Catchline Communications Ltd, in co-operation with the Urban Water Technology Centre (UWTC) of the University of Abertay Dundee. The group was mainly aimed at assessing attitudes towards SUDS and at developing ideas on how to run an educational campaign in Dunfermline to educate the public on diffuse pollution issues, with special emphasis on SUDS.

## 5.3 Application of public perception survey

The public perception surveys were applied during the spring and summer of 2002. At each site, there was an attempt to reach every house that either had direct access to the pond, or that was located close enough to ensure that residents were aware of it. Generally, only about one third of the householders in each location took part in the survey. Roughly half of the householders were absent, and some of those who answered their doors were unwilling to participate. Second attempts were made at all sites to question householders who were unreachable in the first instance. In total, in each area, around 60% of the householders who were approached agreed to participate in the surveys, which is a reasonable response rate for surveys of this type.

## 6. RESULTS OF PUBLIC PERCEPTION SURVEYS

### 6.1 Overview

Attitudes towards SUD schemes appear to differ according to site characteristics and scheme performance. Opinions about SUD ponds seem to be formulated according to how well established or not the pond is within the residential area. Consequently, 'average' conclusions for each questionnaire topic area cannot be drawn. Graphs of results for well-established ponds and newly established ponds have been produced and presented separately in the following text for each topic.

In contrast to surveys investigating public attitudes towards catchment pollution applied in the U.S. (Watershed Protection Techniques, 2000), most people asked in these U.K. surveys (92%) were able to link their everyday activities to potential catchment pollution, a fact that indicates a high perception of water quality issues. On the other hand, the research demonstrates a lack of public awareness of SUDS specifically, although most participants in locations where SUDS have been used had formed strong opinions and attitudes about the systems used within their residential zones.

Overall, attitudes to SUD ponds were more positive than attitudes to swales, as evaluated during previous work by the author. Although the flood prevention function of swales was appreciated, the benefits from SUD ponds were more attractive and obvious. The attraction of wildlife to the ponds, the increase in the amenity and recreational value of the surrounding areas, the improvement of the landscape, and the environmental nature of the treatment methods, all played an important role in achieving positive attitudes towards the systems.

A summary and discussion of the responses to each question are presented in the following sections.

### 6.2 Summary of results per question

- **Question 1: Which is/are your major environmental concern/s? Please indicate in descending order from the most to the least important.**

In general, the major environmental concerns as outlined by participants from all sites were:

- (1) Air pollution;
- (2) Water pollution;
- (3) Disposal of solid waste; and
- (4) Global warming.

- **Question 2: Which environment would you consider as more polluted?**

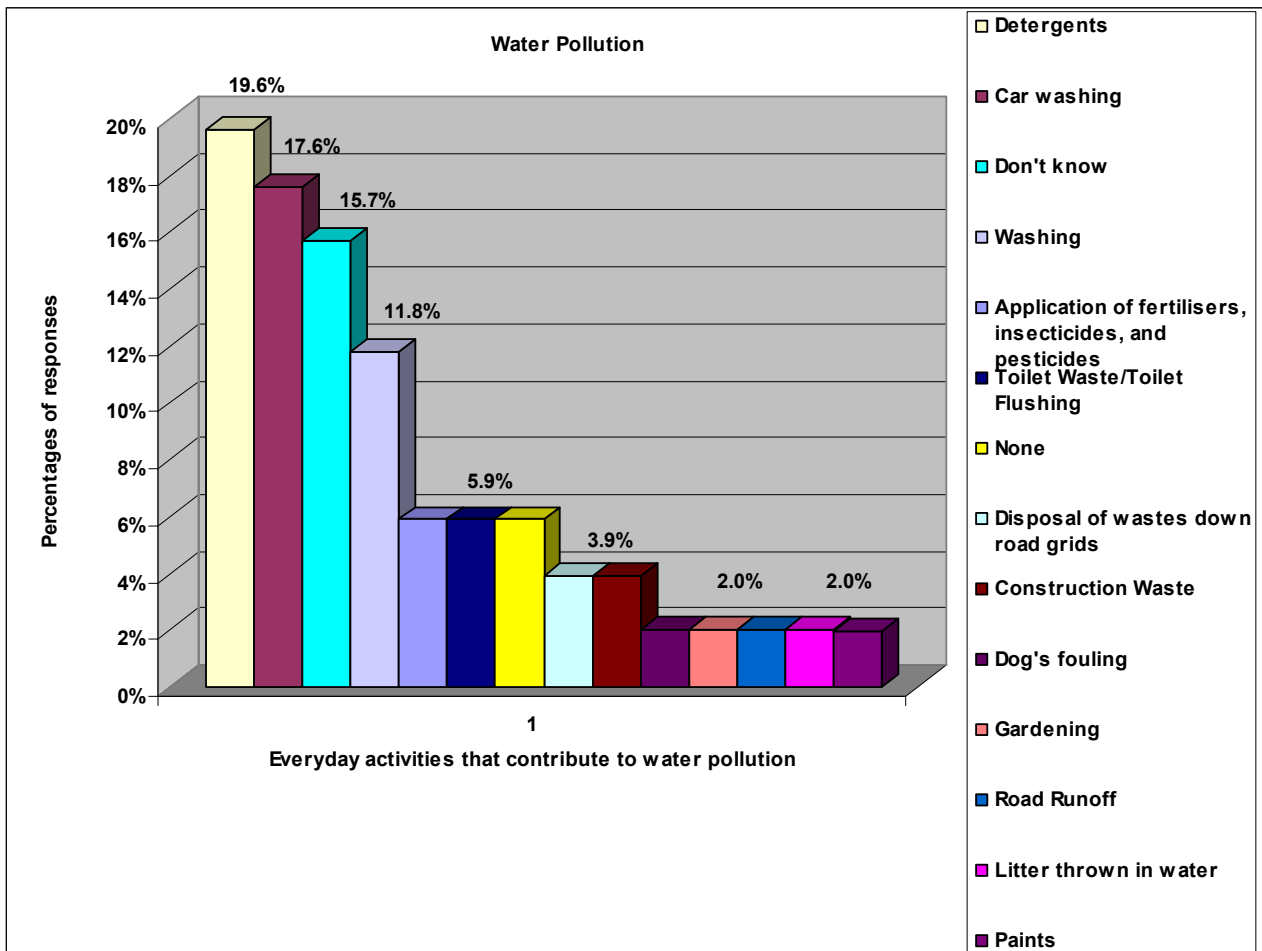
The urban environment was considered to be the most polluted type of environment. Industrial areas were also mentioned for the significance of their contribution.

- **Question 3: Do you know where water entering road gullies or drains goes?**

The level of awareness of the rainwater destination was very low amongst all participants. On average, about 50% of the participants at every site could indicate a possible rainwater destination.

- **Question 4: Which everyday activities do you feel may contribute to water pollution via drains?**

The everyday activities that were considered to be major contributors to watershed pollution via drains were detergents, car washing, domestic washing, and toilet waste. The responses are summarised in Figure 16.



**Figure 16** Everyday activities that are perceived to contribute to water pollution

- Questions 5: Have you ever heard of the term Sustainable Urban Drainage Systems?**  
Overall, very low levels of awareness of SUDS were identified amongst the participants. On average, over 90% of the participants stated that they were unaware of the practices that embody SUDS.
- Question 6: Can you briefly outline what you think the term Sustainable Urban Drainage Systems means?** Overall, very low levels of awareness of SUDS were identified amongst the participants in all areas where the surveys were applied. On average, 93% were unfamiliar with the term SUDS.
- Question 7: Do you know what these (SUDS) are used for?**  
Of the respondents who stated that they were aware of the term SUDS, only 4 % could state what the role of SUDS was.
- Question 8: Are you aware of any Sustainable Urban Drainage Systems in your local area?**  
Less than half of those indicating awareness of sustainable urban drainage techniques could either describe the local system or outline its function. The majority of this group were unable to identify their local pond as a SUD system.
- Question 9: How did you become aware of Sustainable Urban Drainage Systems?**  
The most common way in which the public received information on SUDS was either through the press or by word of mouth.

- **Questions 10: In your opinion what are the advantages, if any, of this pond?**

In the case of ponds, attitudes differed according to site characteristics and were strongly influenced by the aesthetics of the scheme and the amenity benefits that the systems provide. In areas with well-established ponds, the participants tended to be more positive towards the systems. In these areas the perceived scheme advantages, as outlined by the residents, outweighed the disadvantages.

Maintenance and cleaning up of the ponds' water and surroundings was a major issue, which indicates the public desire for a clean, tidy and attractive urban environment. None of the respondents mentioned advantages relating to the water quality function of SUDS. Results for an area with a well-established pond and an area with a newly established pond are presented in Figures 17 & 18.

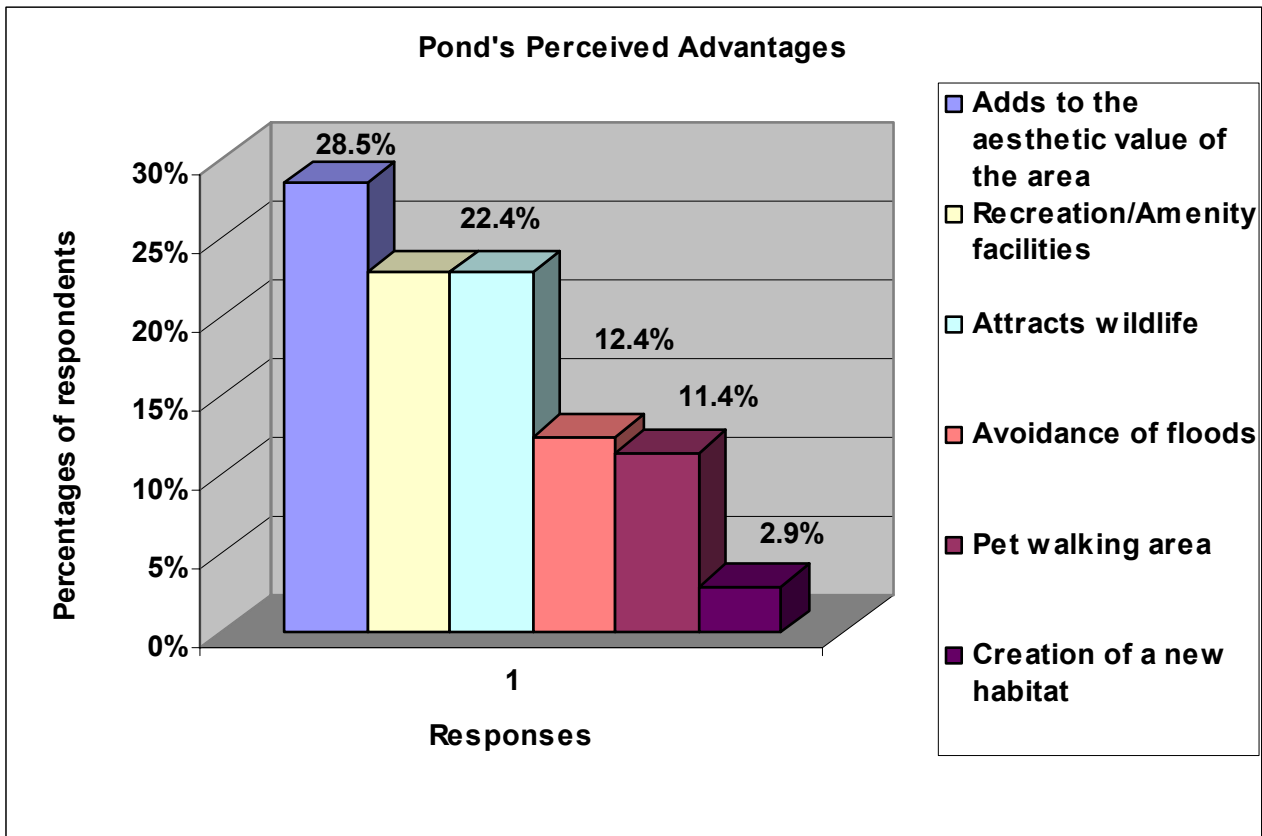
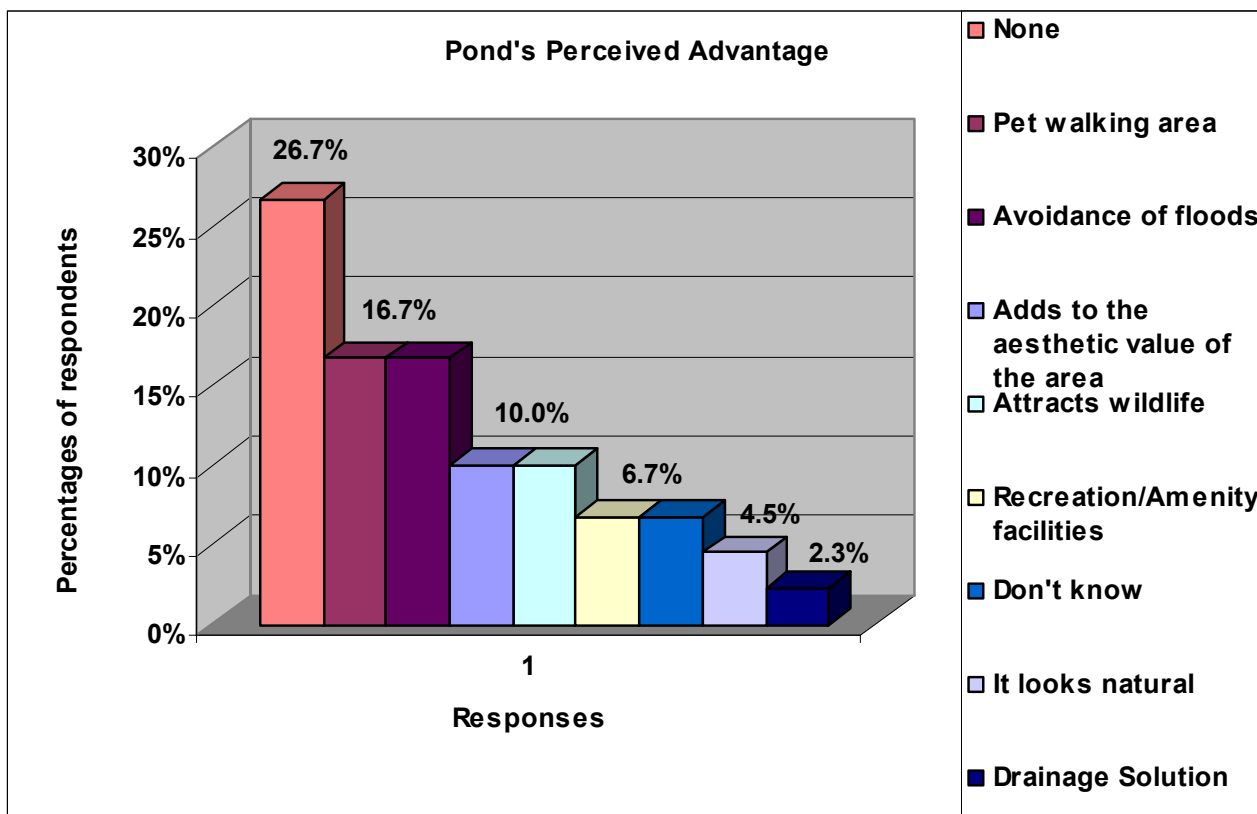


Figure 17 Perceived advantages of a well-established pond (Coy Pond in Bournemouth)



**Figure 18 Perceived advantages of a newly-established pond (Kirkby in Lancashire)**

Amongst the most important perceived advantages of the ponds was the fact that respondents believed that the ponds were helping to re-establish the relationship between urban citizens and nature. Modern urban societies have, to a large degree, lost contact with nature, a fact that occasionally creates increased safety concerns towards natural features, especially water features.

**• Question 11: In your opinion, what are the disadvantages, if any, of this pond?**

Safety, and specifically the potential danger of children drowning, was indicated as the main perceived disadvantage of the ponds. Clarification was sought as to the respondent's relative level of concern. It appeared that the degree of concern was site specific and highly dependent on the site characteristics and appearance of the pond. In areas with well-established ponds, safety was rarely an issue. Aesthetic factors seem to play a crucial role in formulating public opinion, even when matters such as safety are involved. It is worth mentioning however, that in sites with newly established ponds, where there is limited or non-existent marginal vegetation and apparently steeper slopes, there is definite perceived danger. Well-established ponds appear less dangerous to respondents. This is probably due to a number of factors including the restricted access to the open water due to the marginal vegetation. Vegetation, in combination with wildlife, mean the pond looks more natural – a factor that appears to offset the perceived potential danger to a certain extent. Of the 85% of participants who expressed safety concerns, the vast majority still preferred the pond to be located within their residential area, rather than taken out of their local community. The respondents did not specifically comment on design factors such as depth profiles, and the potential implications of these profiles on the amenity, aesthetics and perceived safety risks associated with the pond. The differences in the perceived disadvantages of ponds according to site characteristics is clearly shown in Figures 19 and 20.

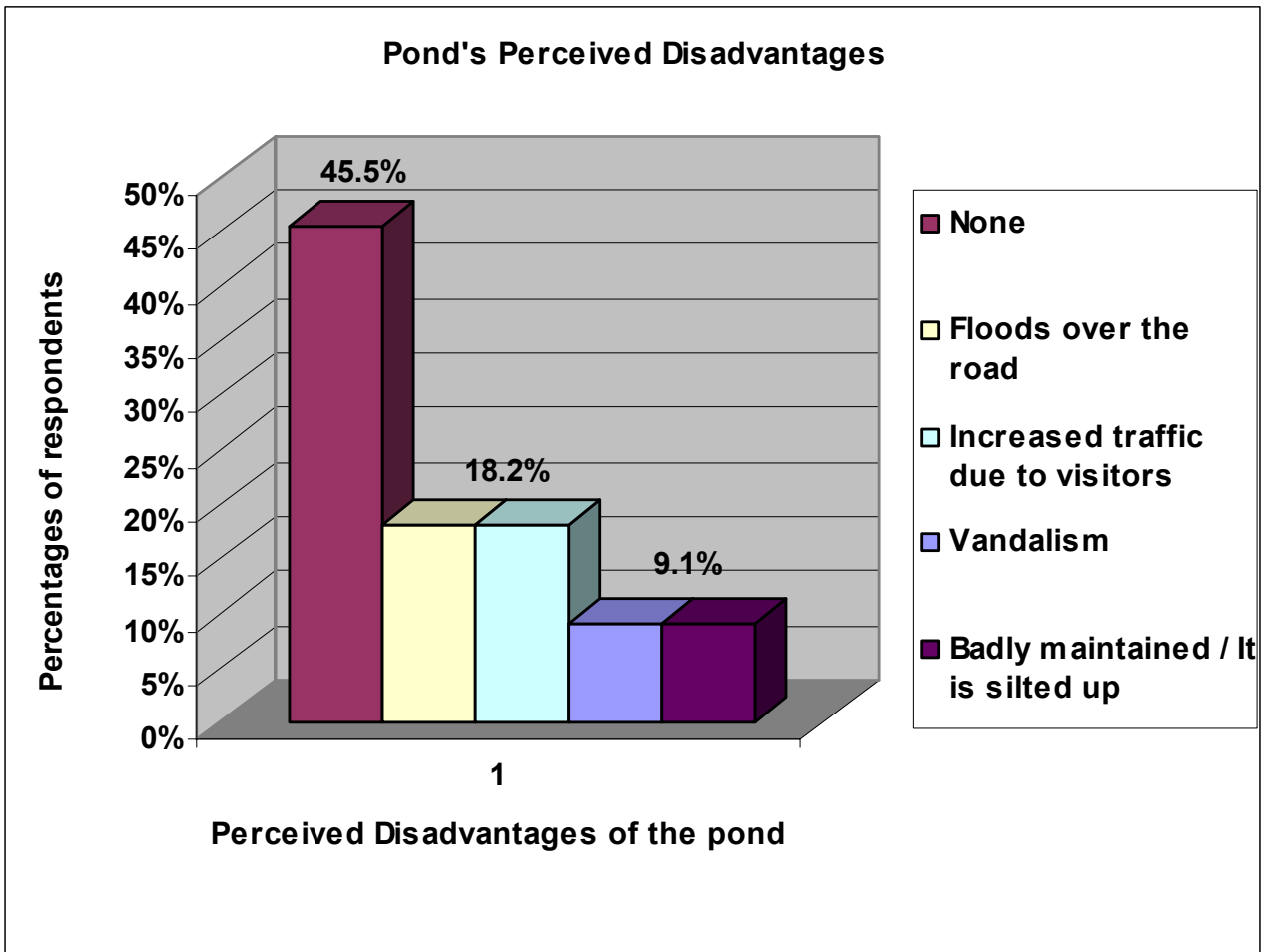
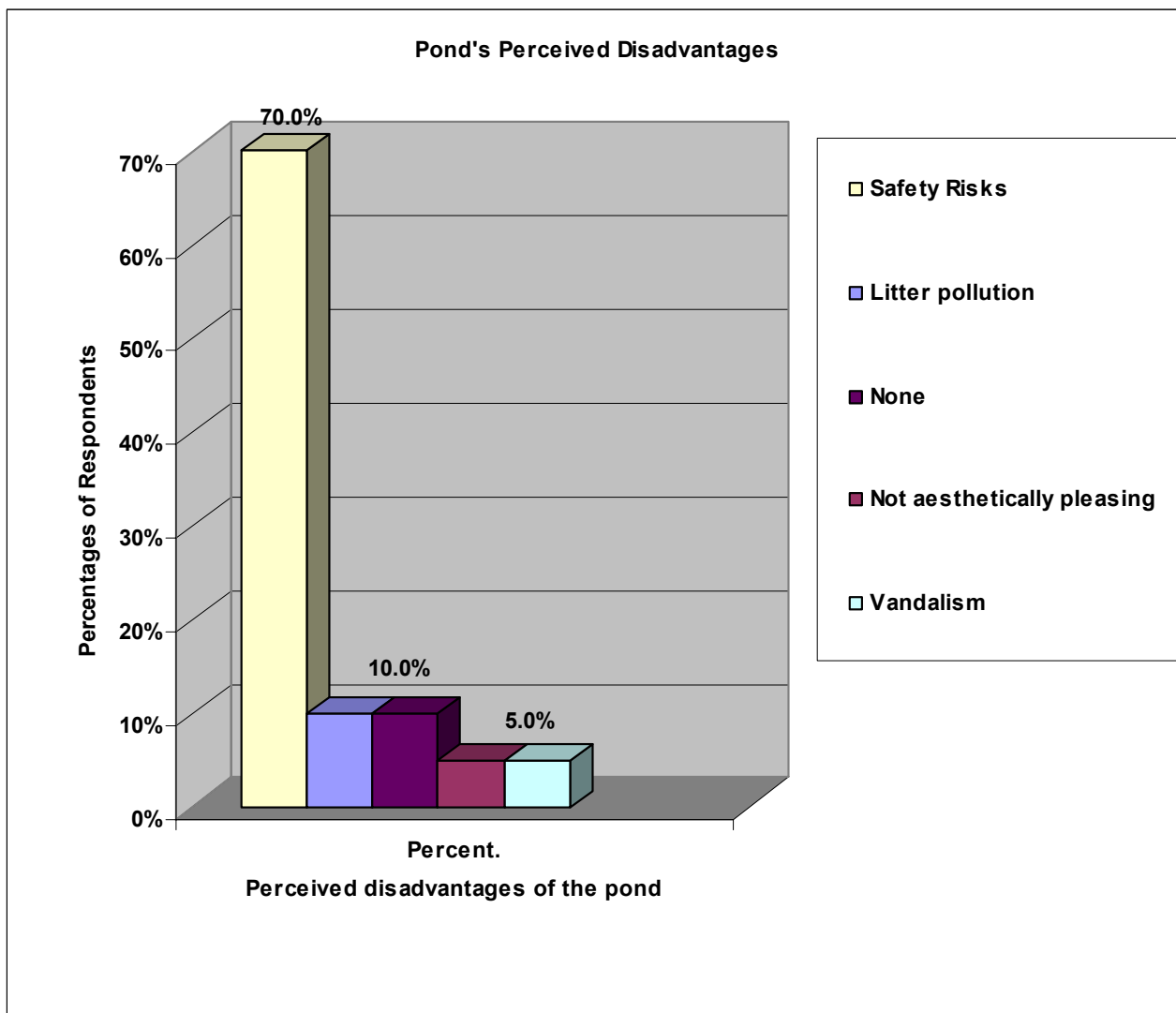


Figure 19 Perceived disadvantages of a well-established pond (Coy Pond in Bournemouth)





**Figure 20 Perceived disadvantages of a newly-established pond (Clayton Le Woods in Lancashire)**

Safety was raised as a primary concern by 70 % of respondents in a newly established residential area with a newly established pond. These results were very similar to those from previous surveys on public perception of SUDS in Scotland, where similar levels of concern were expressed at an old residential area with a newly established pond. It seems that the degree of attractiveness of the pond can influence perceptions of safety. By comparing the sites studied to date, it can be preliminarily concluded that in areas with different house values, respondents respond similarly to the introduction of ponds with similar characteristics.

- Question 12: What is/are your safety concern/concerns related to this pond?**  
 At all sites, those participants concerned over safety stated that this concern was primarily related to children drowning in the pond. However, there were also concerns over pet drowning and the risk of infection from the pond's water.

- **Question 13 & 14**

**How far away from the pond would you prefer your house to have been located?**

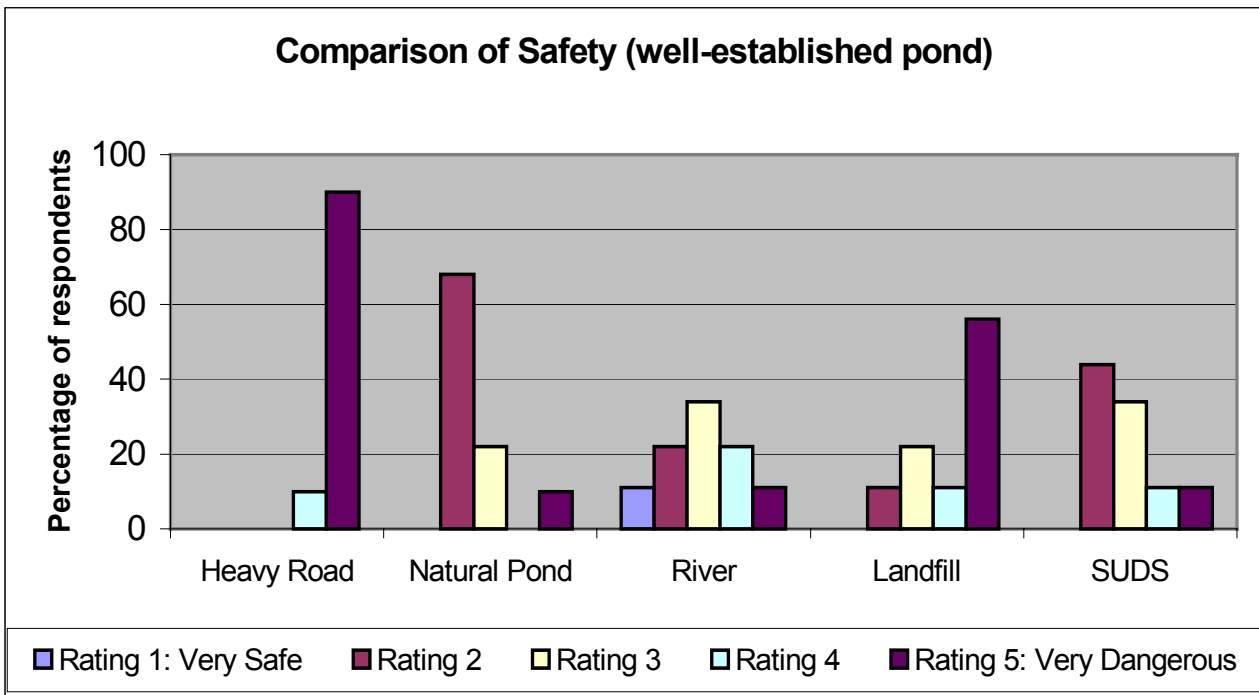
**Would this safety concern be so high as to put you off living close to the pond or you still prefer it despite of the risk?**

Despite safety concerns, the vast majority of the participants answering this group of questions, still preferred to live close to the pond and even face it.

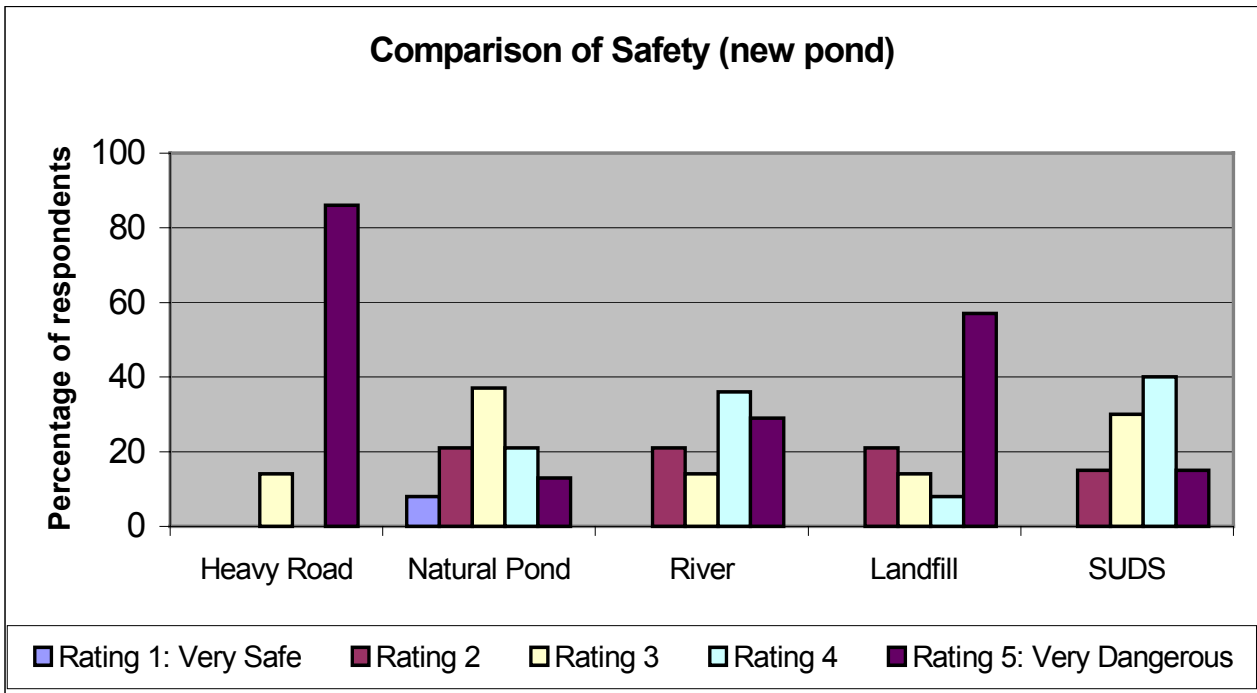
- **Question 15: On a scale of 1-5 could you please indicate how you rate the safety risk involved with the following with 1 being very safe and 5 being very dangerous?**

- (a) Heavy Road Traffic
- (b) Natural Pond
- (c) A river
- (d) Landfill Site
- (e) A SUDS pond

When the participants were asked to compare the perceived safety risk of their local SUD pond with other safety risks present within urban environments, the results were similar for the different areas. Although the ratings given were slightly influenced by the aesthetics and the scheme’s performance, the overall perception did not demonstrate big differences. In all areas, a busy main road was considered to be the most dangerous hazard to live close to, while a natural pond and a SUDS pond were classified as safer features than rivers or landfill sites. Results from two different areas are presented in Figures 21 and 22.

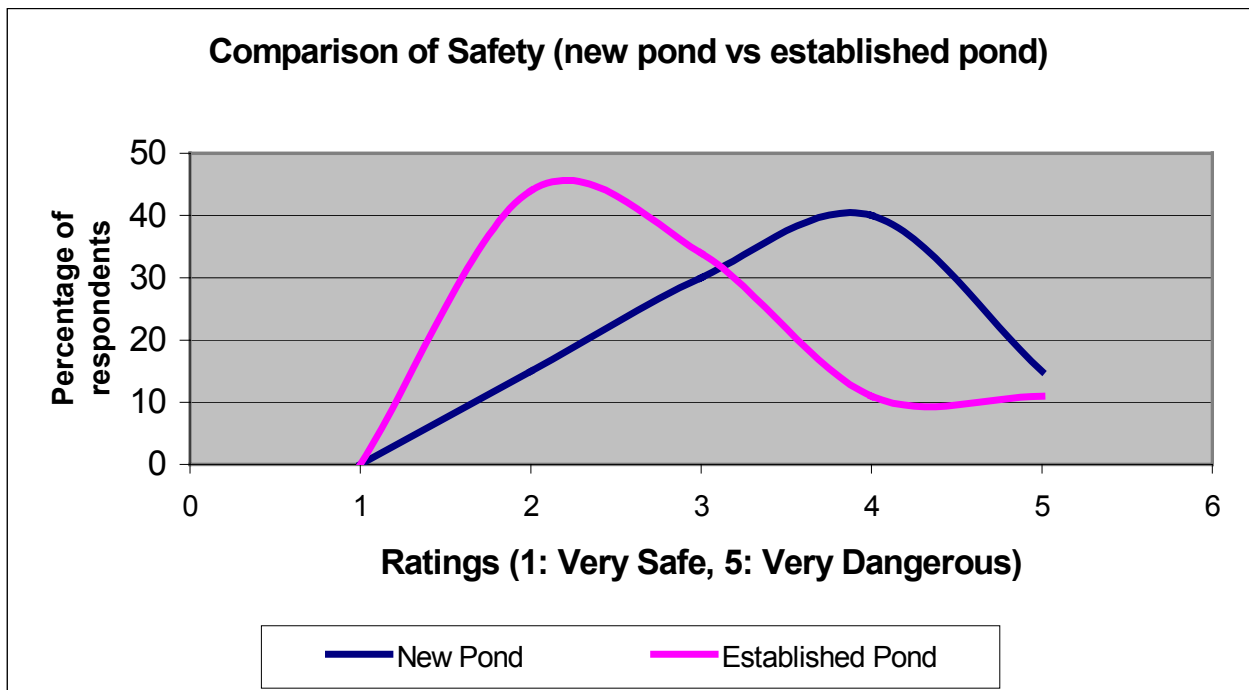


**Figure 21 Comparison of perceived safety risks in an area with a well-established pond (Emmerson’s Green, Gloucestershire)**



**Figure 22 Comparison of perceived safety risks in an area with a newly established pond (Clayton Le Woods, Lancashire)**

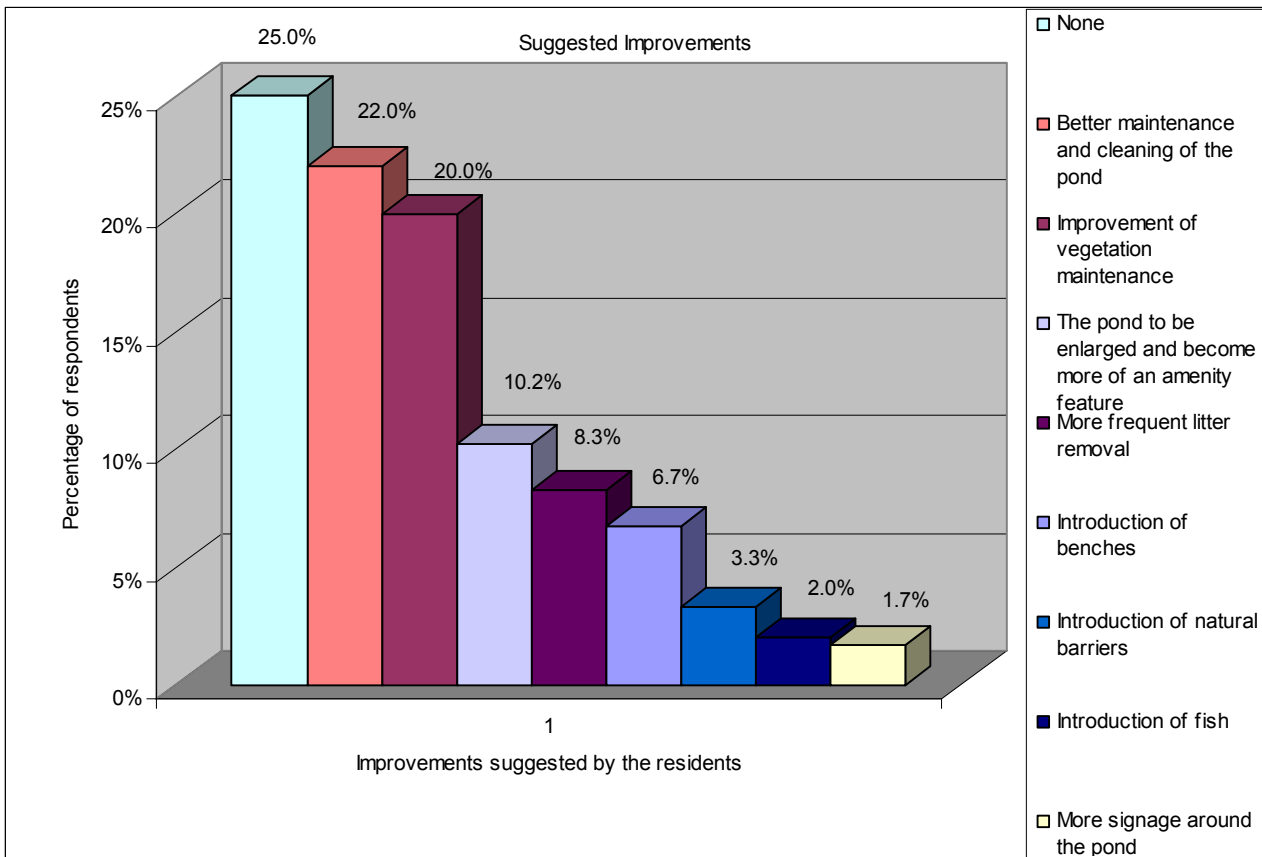
The safety ratings given to the two SUDS ponds are compared in the following figure:



**Figure 23 Comparison of perceived safety risks in an area with a newly established pond vs. a well established pond**

- **Question 16: What improvements, if any, do you feel could be made to this pond?**

The results in this question were highly site specific. However, the cleaning up of SUD ponds and their proper maintenance (including removal of silt and vegetation maintenance) were the main suggested improvements in all cases. In sites where the concern over safety was high, the introduction of natural barriers around the pond was also suggested. Other improvements included the introduction of benches around the ponds, improvement of the pond's surroundings in terms of aesthetics and the creation of walkways to increase the amenity value of the pond. The removal of the pond altogether was suggested at sites currently not aesthetically pleasing. The differences in the suggested improvements according to site are presented in the following Figures 24 and 25.



**Figure 24 Suggested improvements at Emerson’s Green, Gloucestershire**

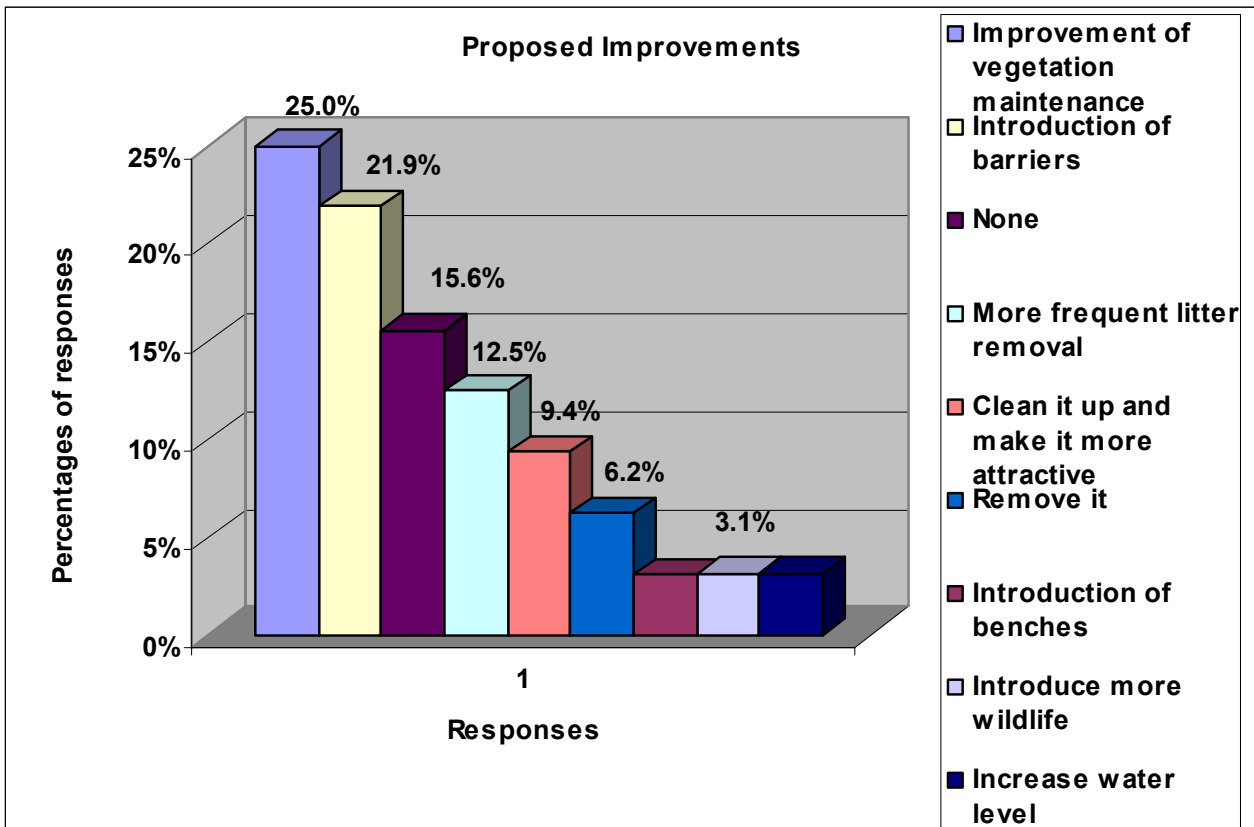


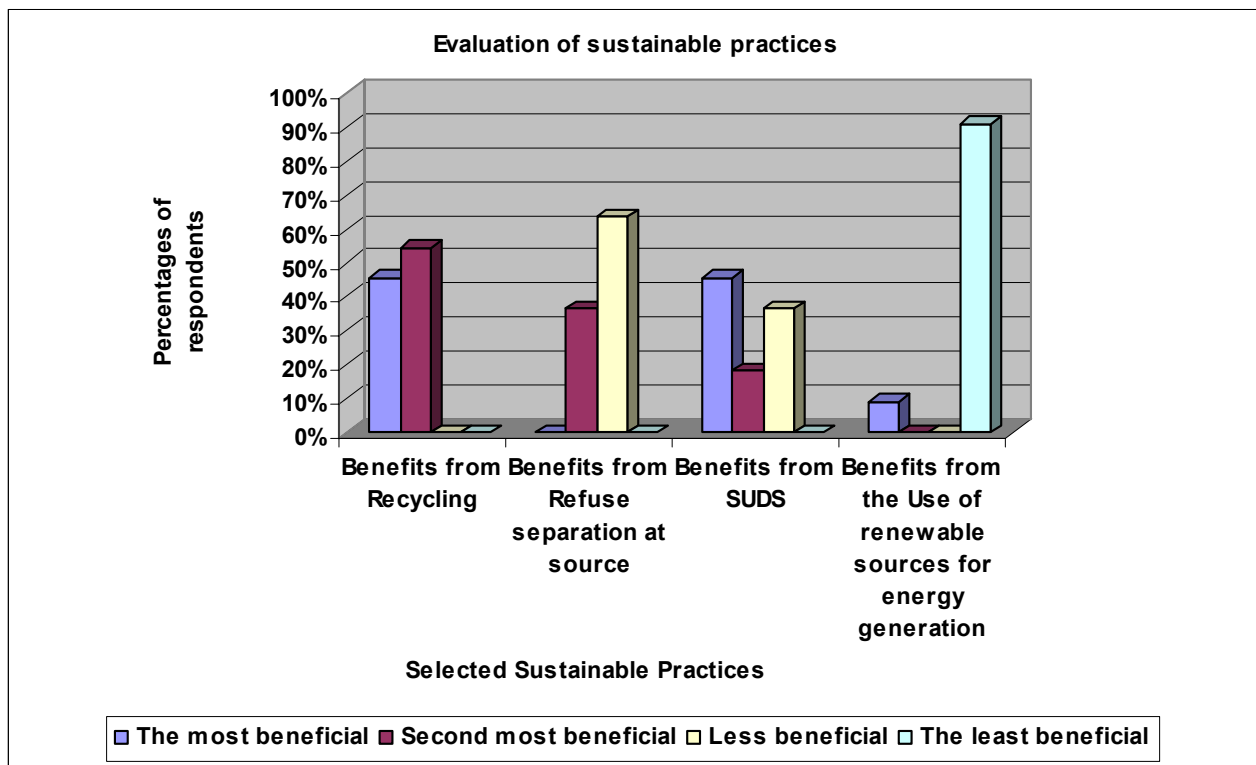
Figure 25 Suggested improvements at Kirkby, Lancashire

- Question 17: Do you believe the economic value of the property increases, decreases, (if so, by what percentage?) or remains the same in an area where SUDS are in place?**  
 SUDS seem to have some affect on the perception of house value. In areas with well-established ponds, it is perceived that property values of houses close to the pond were, on average, 10% higher than those houses with no or little interaction. Although the house prices are not perceived to be affected by the existence of a poorly established pond within a residential area. Further research on the topic is planned, aimed at identifying the actual, rather than perceived, influence on house pricing.
- Question 18: Did the existence of the pond influence your opinion of property purchase in this particular area?**  
 SUDS seem to have some affect on the perception of saleability. In areas with well-established ponds, it is perceived that the systems contribute to an increase in saleability of the properties. Where there is a poorly established pond within a residential area, the house saleability is considered to be lower. In general, householders are more willing to buy a house that overlooks what they perceived to be a well-designed and aesthetically attractive pond.
- Question 19: Which of the following environmentally friendly practices do you believe is/are more beneficial for your city? Please outline the practices from the most beneficial to the least beneficial.**

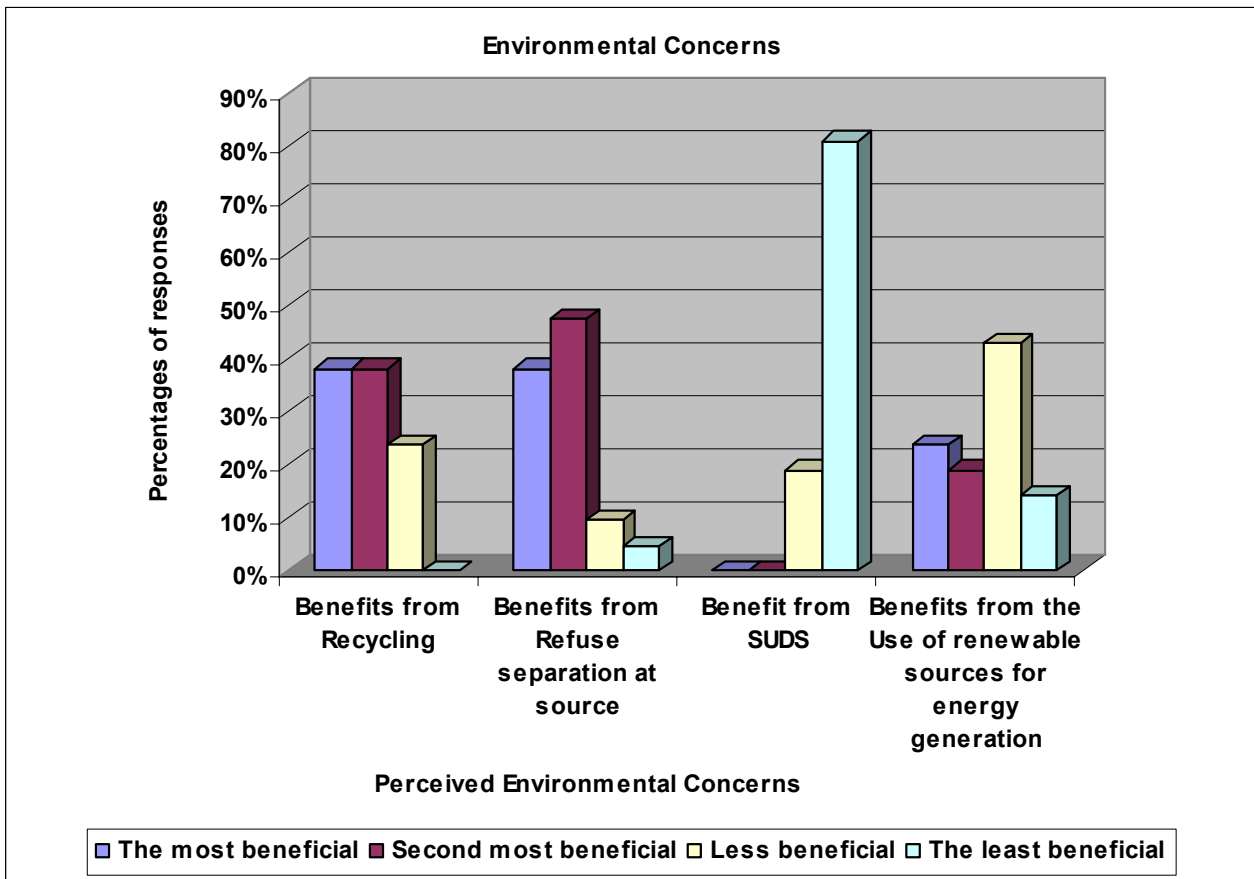
  - SUDS
  - Use of renewable sources of energy generation
  - Refuse separation at source
  - Recycling

The evaluation of SUDS as a sustainable practice also differs according to the site characteristics, as demonstrated in Figures 26 & 27. Where SUD systems are well established, the practice is considered

equally beneficial to that of recycling. Where SUD systems are poorly established and/or unattractive, the practice is perceived as less important in environmental terms.



**Figure 26 Comparison of sustainable practices – Attitudes expressed in an area where a well-established pond is in place (Coy Pond in Bournemouth)**



**Figure 27 Comparison of sustainable practices – Attitudes expressed in an area where a newly established pond is in place (Clayton Le Woods, Lancashire)**

- Question 20: Would you like to get more information about this pond?**  
 The majority of the participants (70%) made a request to receive more information regarding the SUD ponds. They particularly asked for information about the function and efficiency of the systems, the reason for their existence in that particular area, and the flora and fauna present in them. The most appropriate method for receiving this information, as indicated by the respondents, was the distribution of leaflets or newsletters. The participants stated that the developers should bear the responsibility of informing householders about the drainage of the area especially when it involves overground constructions and should keep them updated with any improvements to the schemes. In areas where there are no active developers, the householders suggested that the local authority should take over this responsibility.
- Question 21 & 22: Would you be willing to discuss further about this subject? If yes, can I keep your contact details for future contact?**  
 Despite the considerable request for further information only a small percentage of the participants (30%) seemed willing to be contacted in the future for further discussions on the topic.

## **7. APPROACHES TO PUBLIC EDUCATION RELATING TO STORMWATER MANAGEMENT AND SUDS**

### **7.1 Introduction**

This report has identified that an important factor contributing to the ambivalent or negative public attitudes towards sustainable drainage systems is that of low public awareness and a poor commitment to public education in the field of stormwater pollution and management. There is a need for the public to be informed on water pollution issues in general, for them to be able to fully understand the role of SUDS and then accept the systems into their community.

Stormwater management public education is about informing the public of the impacts of stormwater discharges on water bodies. It is about informing them of the steps that they can take in reducing pollutants in stormwater runoff, such as:

- ensuring proper use and disposal of landscape and garden chemicals (including fertilisers and pesticides);
- protecting and restoring riparian and pond vegetation; and
- properly disposing of used motor oil and household hazardous waste.

It is also about informing them of the importance of local solutions to stormwater management, such as SUD systems, of the function and performance of these systems, and of their vulnerability to concentrated pollution events.

Where appropriate, consideration should be given to targeting some of the education programme at groups of commercial, industrial and institutional entities likely to have significant stormwater impacts. For example, providing information to restaurants on the impact of grease clogging storm drains, and to garages on the impact of oil discharges.

### **7.2 The Outreach Plan**

Stormwater education must start with a well-thought out and well-developed outreach plan. This plan should identify goals and objectives, classify the target audience, identify the message to be conveyed, and explain how the message will be distributed to the audience.

The US EPA recommends that the public be included in developing, implementing, and reviewing the local education program. This provides opportunities for members of the public to participate and serve on, for example, a local stormwater management panel.

### **7.3 Application of a public education programme**

The first step should be to determine who the target audience is or whether there is more than one audience to address. If the latter is the case, then a decision must be made as to whether they can be reached simultaneously or whether they should be prioritised.

### **7.4 Implementation of a public education programme**

Outreach and education can be implemented in several ways. It is not always necessary that the entire audience be reached at once. Therefore, one or more of the following approaches might be useful:

#### **Mail**

This can be the best distribution vehicle if the target audience can be defined geographically, or if a mailing list that encompasses the entire audience is accessible. Lightweight flyers and brochures can be added to general mailings, such as utility bills or notices about local services without raising the cost of postage.



## **Door to Door**

Door to door canvassing can be very effective, but it is resource-intensive.

## **Businesses, Organisations, and Public Places**

Using selected businesses and organisations to deliver the message can increase the likelihood of reaching the target audience and save money on postage. Schools and local organisations with public space are good candidates for the display of materials, especially posters.

## **Presentations**

Presenting the message can be a very effective way to reach the target audience. The audience should be allowed the opportunity to ask questions, and any questions should be responded to immediately.

Presentations can be given at local events, tailored to the audience, such as schools, retirement homes, local clubs, libraries, businesses and associations.

## **Conferences**

Conferences can be an excellent way to distribute messages through presentations, promotional give-aways and displays. However, a conference may not reach all the intended audience, and those who attend may already be familiar with the message and its significance.

## **Media**

The media can be strong supporters of a stormwater pollution prevention campaign, and/or in educating the public about stormwater management issues. Through the media, a program can educate targeted or mass audiences about problems and solutions, build support for remediation and retrofit projects, or generate awareness and interest in stormwater management. Surveys repeatedly show high interest among the public in environmental and especially water quality issues.

## **7.5 Effectiveness of a public education programme**

The effectiveness of distributing stormwater management education materials depends on many factors. These include the costs associated with designing, producing, and distributing materials. The quality of the materials also plays a role in the message's effectiveness. A simple message is likely to be more effective than a flyer that is wordy or complicated.

## **7.6 Public participation stormwater management activities**

In the USA, the following activities have found to be beneficial components of an overall stormwater management plan.

- Storm Drain Stencilling  
This involves labelling storm drains with painted messages warning citizens of the consequences of dumping pollutants directly into the drain, e.g. a simple phrase reminding passers-by that the storm drain connects to a water body;
- Stream / Pond Cleanup and Monitoring;
- Volunteer Monitoring;
- Watershed Committees;
- Stakeholder Meetings;
- Community Hotlines;
- Classroom Education on Stormwater.

## **7.7 Public perception surveys**

Surveys (such as those detailed in this report) of how the public perceives stormwater management, and the local solutions can foster improved designs, and planning and management programmes. The results of these attitude surveys can enlighten both stormwater managers and the public on sources of pollution,

the effects of stormwater on the environment, and improved options for control. Public attitude surveys can bring to light what is important to the stakeholders. Scheme planners can then use this information to determine how best to incorporate the public's needs and desires into the overall goals of any stormwater management programme.

Appendix III presents a flyer developed by SEPA to promote the work of the SUDS working party in Scotland. Although this material would be overly complex for public education, it demonstrates the type of information that could be simplified and targeted for application on new development sites.

Appendix IV presents a Model Public Education Programme developed by the County of Los Angeles Department of Public Works. Such a programme would be unlikely to be implemented in the UK, but it demonstrates a comprehensive approach to stormwater management through public education.

## 8. CONCLUSIONS

### 8.1 General comments

Overall, attitudes to sustainable drainage systems were found to be positive. There is currently a lack of public knowledge regarding the purpose SUDS serve and their efficiency in matters of flood prevention and water treatment. This lack of information is considered one of the main factors contributing to the generation of negative attitudes towards SUD systems. Therefore the perception of SUDS could be improved if more information was provided to the public. Housing developers who use SUDS could take a more active role in providing this information, as could central and local government. Scheme aesthetics are also of critical importance in influencing acceptability of new or innovative practices such as SUDS within residential areas.

### 8.2 Study boundaries

The survey was undertaken in a manner that did not prompt the participants so as not to influence their answers. Therefore the survey can be considered to accurately reflect the views of the public when they are asked 'out of the blue' about a SUDS scheme that they live near to. The survey does not cover topics that did not occur to the respondents, such as the role SUDS can play in the avoidance of watercourse pollution through the reduction in the number of surface water gullies and wrong connections. The answers of the respondents would no doubt be different had they been asked the same questions after a programme of education.

The chosen sites were all served by SUDS ponds. The reason ponds were chosen for the survey is because they are the most visible SUDS element and the one that arouses the most public interest and concern. A similar survey could have been applied to less visible elements such as permeable pavements or less frequently used methods such as swales, but it was judged that public awareness of these elements was likely to be too low to yield useful results.

### 8.3 Key findings

- **Do SUDS ponds influence people's decision to buy property?**

The respondents perceived that well established, aesthetically pleasing ponds would increase house saleability. However they also perceived that houses near a poorly established pond would have reduced saleability.

- **Do people perceive that SUDS ponds impact on property prices?**

The respondents perceived that house values near well established ponds would be approximately 10 % higher. This perception is backed up by anecdotal evidence from Westbury Homes that suggests houses built near attractive ponds can attract a 10% premium. The respondents felt that a poorly established pond would probably not negatively impact on house prices.

- **What are the factors that influence the public's perception of SUDS ponds?**

Aesthetics is the most important factor and influences the way people perceive:

- Risks;
- Property values; and
- Sustainability contributions.

House value was used as a surrogate for socio-economic status in this research. No difference could be found between the views of people living in estates with average or above average house values. No low-value or social housing estates were surveyed. However earlier research in Scotland did survey people in low-value housing, and this survey confirmed that there was no apparent difference between people living in houses of different values. From these results it could be concluded that socio-economic status is not an important factor in influencing peoples perception of SUDS, however due to the potential heterogeneity of socio-economic groups within housing estates, this finding could not be regarded as conclusive.

Education is likely to impact on the way SUDS are perceived, because with more information people would be more aware of the advantages of SUDS. The survey confirmed this with those respondents who knew the function of SUDS being the most positive. Those people who knew about SUDS tended to have gained that knowledge from a number of ad-hoc sources, so the survey could not demonstrate the effectiveness of specific education strategies such as leaflets or interpretation boards in influencing people's opinions.

- **How do people perceive the sustainability of SUDS ponds as compared to other sustainable technology?**

The survey found that perception of sustainability was influenced by the characteristics of the pond. Attractive, well-established ponds were perceived to have a similar contribution to sustainability as recycling, but unattractive ponds were perceived to be less important.

The results could indicate that people's perception of the sustainability of ponds is related to their ecological benefits, which are more apparent in well-established ponds. The hydraulic function of the ponds has less influence on the respondents' perception of sustainability. This is probably related to the relatively low level of knowledge in the community of the actual function of the ponds, leading them to base their opinions of the systems on their most visible characteristics.

- **How do people perceive the safety of SUDS ponds?**

Generally people perceived SUDS ponds to be more dangerous than natural ponds. They perceived established ponds to be safer than new ponds. Established ponds were also perceived to be safer than rivers. The risks for new SUDS ponds were considered to be more comparable to rivers. The greatest risk associated with ponds was perceived to be children drowning, but other risks such as infection from the water were also noted. Despite the safety concerns the vast majority still preferred to live close to a pond.

The surveyed data illustrates the perceived risk from ponds. The statistics below are based on information from the Royal Society for the Prevention of Accidents (ROSPA) and provide an indication of the real risk from drowning in SUDS ponds.

**Table 2          Death by Accidents (Selection of Key Data from ROSPA)**

<b>Accident</b>	<b>Fatalities</b>
Drowning in lakes, reservoirs and garden ponds (2001)	62
Road accidents (2000)	3409
Accidents in the home	4000
Accidents at work	350

**Table 3      Death by Drowning (Key Data from ROSPA, 2001)**

<b>Water body type</b>	<b>Percentage of fatalities</b>
Rivers, streams etc.	41
Coastal	18
Canals	13
Home baths	7
Lakes and reservoirs	12
Docks and Harbours	3
Swimming Pools	2
Garden Ponds	2
Other	2

**Table 4      Drowning by Activity (Key Data from ROSPA, 2001)**

<b>Activity</b>	<b>Percentage of accidents</b>
Alcohol	35
Fell in	18
Swimming	12
In Vehicles	9
Boating	8
Sub-aqua	7
Angling	6
Playing	4
Canoeing	2
Cycling	0.4

The respondents were most concerned about children drowning in ponds. Based on the ROSPA statistics, drowning is the third most common cause of accidental death in under 16 year olds. However the statistics also indicate that the numbers drowning under the influence of alcohol, were greater than those drowning due to falling in, swimming and playing combined. However risk is made up both of the probability of an event occurring and the consequences of that event. Public outrage and grief are important elements of the consequence component of risk.

• **What role does education play in the way people perceive SUDS ponds?**

The level of education about SUDS is an important factor and generally where residents were informed about the function of the pond they were much more positive about the pond than in areas where the level of knowledge about the function of the pond was low.

Possible approaches for educating the public with respect to stormwater management issues and the sustainable drainage systems within their local environment are given in Chapter 7.



## 9. RECOMMENDATIONS

Several recommendations can be made based on the results of the public perception surveys. These recommendations do not address matters of technical design but address public acceptability issues such as scheme appearance, design characteristics, and maintenance issues.

### 9.1 Design characteristics

From the results related to the perception of the ponds' advantages and disadvantages, aesthetics play a very important role in formulating public attitudes. The more aesthetically pleasing a SUDS pond is, the more it is welcomed. Even the perception of sensitive matters such as safety can be influenced by the aesthetics of the schemes. In general, people consider a pond to be aesthetically pleasing when it resembles a natural pond as closely as possible. Shallow slopes around the pond in combination with rich marginal vegetation serve a double purpose; they act as a safety barrier and also improve the appearance of the pond. Steep slopes have been shown to be very dangerous, especially for young children and the elderly. Also, rich marginal vegetation makes the pond less accessible for young children. Many participants who expressed concerns over safety made a request for the introduction of natural barriers around the ponds as a safety precaution that would simultaneously improve the pond's aesthetics. The introduction of warning signs around the pond, mainly signs warning for deep water, was proposed by many householders. However, according to other respondents, the introduction of warning signs would have a drawback as it would underline the unnatural character of the pond.

Where marginal vegetation is included within the design, the introduction of native vegetation for the area is recommended, as it will rapidly naturalise the ponds and at the same time will minimise maintenance requirements. Discussions with landscape architects in Bournemouth, indicated that native plant species become established very quickly and are almost self-maintaining. At the same time they attract various species of wildlife already present in the area and work as a natural habitat or even shelterbelt. Introduction of wildlife and in particular indigenous species, as well as protection of the existing wildlife, is essential. The presence of wildlife and rich plant life in a SUDS pond can be of crucial influence in ensuring positive public opinion. Additionally, plant life is able to provide a degree of self-cleansing of the pond via natural biodegradation procedures. Explanatory boards, providing information on the wildlife and plant life present in the pond, are always welcomed by the public, especially as an educational tool for young children.

A frequent public recommendation was the introduction of benches and picnic tables, overlooking the ponds. The creation of children's playgrounds and walkways close to the pond were also suggested as possible improvements. The transformation of the ponds into amenity features is becoming increasingly important for local communities, and there has been a recent trend amongst planners to encourage "new model villages" or "sustainable communities", which are traditional type housing developments often sited around a pond.

### 9.2 Operation and maintenance

Maintenance appeared to be a major public concern in all areas where SUDS are in place. Litter pollution and silt accumulation in the ponds, are perceived to be the main problems associated with the systems. The public perceives that there is a need for regular cleaning of inlets and outlets of the ponds to avoid blockages as well as for silt removal. Regular care of the surrounding plants is also needed to ensure that they are properly supported and not dying out. Frequent maintenance of the ponds could also reduce the chances of eutrophication that often comprises the main reason that plants and wildlife die out. Such maintenance would help alleviate safety concerns over the pollution risk from the pond's water as dense algal growth may be minimised. The adoption of the maintenance responsibility is a sensitive issue, which it is critical to resolve so as to enhance public acceptability and thus sustainability of these systems.

### 9.3 Education strategies

The research results show that public information and awareness are closely linked to public acceptability. In areas where residents were better informed about the purpose served by SUDS ponds, the reason for their existence in that particular area, the advantages of SUDS compared to traditional drainage as well as their function and performance, the overall perception of the systems was much more positive than in areas where little, if any, information had been provided. According to the majority of participants in all areas, the provision of relevant information is a task that should be undertaken by the developers of the site. Developers should inform the householders about the existence of SUDS as part of the drainage in their local area. There were particular comments that information should be provided before the householders purchase their houses. Additionally, the City Councils could also inform the public on SUDS related issues and promote the application of the systems within residential areas. This could be achieved by educational campaigning which would provide householders with information and would also involve public participation, such as open day activities around the local pond.

Another suggested way of informing the public is the introduction of interpretation boards around the ponds, where information on the purpose served by the pond, the wildlife and plantlife present in the pond, as well as the environmental and amenity benefits of the pond to the local area, could be presented.

It is apparent that the level of awareness of sustainable urban drainage practices amongst the public is very low. Respondents tended to be much better informed on issues such as recycling, refuse separation, and renewable energy schemes as these are widely promoted by both Central Government and Local Authorities.

It is this difference in awareness and understanding which appears to be a major contributory factor towards retaining an ambivalent or negative public attitude towards SUD systems in general.

The recommendations above are summarised in Table 5, below:

**Table 5 Summary of Recommendations**

<p><b>Recommendations for Design Characteristics</b></p>	<ul style="list-style-type: none"> <li>• To make the pond as natural in appearance as possible</li> <li>• Introduction of marginal vegetation</li> <li>• Introduction of adjacent vegetation (native to the area)</li> <li>• Introduction of wildlife and protection of existing species</li> <li>• Shallow bank side slopes</li> <li>• Introduction of natural barriers (e.g. planting)</li> <li>• Introduction of signs warning of deep water</li> <li>• Introduction of benches</li> <li>• Introduction of picnic tables</li> <li>• Creation of children playgrounds</li> <li>• Creation of walkways</li> <li>• Introduction of fish</li> </ul>
<p><b>Recommendations for Operation &amp; Maintenance</b></p>	<ul style="list-style-type: none"> <li>• Frequent litter removal</li> <li>• Removal of silt</li> <li>• Cleaning up of the inlets &amp; outlets of the pond to avoid blockages</li> <li>• Maintenance of marginal vegetation</li> </ul>
<p><b>Recommendations for Education</b></p>	<ul style="list-style-type: none"> <li>• Provision of pre-purchase information to householders</li> <li>• Application of educational campaigns to local communities or other target groups</li> <li>• Introduction of interpretation boards</li> </ul>

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# *Appendices*





# *Appendix 1*

Questionnaire



## Appendix 1 Questionnaire

### Public Perception of SUDS

Site:

Respondents' Address:

Respondents' Sex:                      Male                      Female

Respondents' Age Category: 18-29                      30-44                      45-60                      60+

**1. Which is/are your major environmental concern/s? Please indicate in descending order from the most to the least important.**

- Climate change
- Disposal of solid waste
- Air pollution
- Water pollution
- Other, please specify

**2. Which environment would you consider as more polluted?**

- Urban environment
- Area with intensive agricultural activity
- Airport
- Other

**3. Do you know where water entering road gullies or drains goes?**

- Nearest watercourse/stream or pond
- Public foul sewer for treatment at sewage works
- No
- Other, please specify:

**4. Which everyday activities do you feel may contribute to water pollution via drains?**

- Application of fertilisers, insecticides, and pesticides
- Car washing
- Detergents
- Disposal of wastes down road grids
- Dog's fouling
- Gardening
- Road Runoff
- Oils & Fats
- None
- Don't know
- Other

*Indicate the response by selecting one or more value labels*

**5. Have you ever heard of the term Sustainable Urban Drainage Systems?**

- Yes
- No\*

\* **Go to question 10.**

**6. Can you briefly outline what you think the term Sustainable Urban Drainage Systems means?**

---

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**7. Do you know what these (SUDS) are used for?**

- Attenuate flow
- Create a new habitat
- Create a new recreational area
- Prevent floods
- Provide biological treatment for surface runoff
- Water collection
- Don't know
- Other

*Indicate the response by selecting one or more value labels (7 maximum)*

**8. Are you aware of any Sustainable Urban Drainage Systems in your local area?**

- Yes, if so please specify:
- No

**9. How did you become aware of Sustainable Urban Drainage Systems?**

- Leaflets, if yes, do you know who was responsible for their production?
- Local press
- National press
- Word of mouth
- Other, please specify:

*Indicate the response by selecting one or more value labels*

**10. In your opinion, what are the advantages, if any, of this pond?**

- Adds to the aesthetic value of the area
- Pet walking area
- Recreation/Amenity facilities
- Attracts wildlife
- Creation of a new habitat
- Adds financial value to the area
- Avoidance of floods
- Pollution removal
- None
- Don't know
- Other, please specify:

*Indicate the response by selecting one or more value labels (9 maximum)*

**11. In your opinion, what are the disadvantages, if any, of this pond?**

- Algal growth/Eutrophication
- Attracts Insects
- Attracts Rodents
- Groundwater pollution
- Litter pollution
- Not aesthetically pleasing
- Reduces financial value of the area
- Safety Risks\*
- Smell
- Vandalism
- None
- Don't know
- Other, please specify:"

*Indicate the response by selecting one or more value labels (11 maximum)*

**\* Go to question 12. Otherwise Go to Q 16**

**12. What is/are your safety concern/concerns related to this pond?**

- Danger for children
- Pet drowning
- Risk of infection from water
- Other, please specify

*Indicate the response by selecting one or more value labels*

**13. How far away from the pond would you prefer your house to have been located?**

\_\_\_\_\_

**14. Would this safety concern be so high as to put you off living close to the pond or you still prefer it despite of the risk?**

- Prefer to live close to the pond despite the safety concern
- Would prefer the pond not to exist in the area

**15. On a scale of 1-5 could you please indicate how you rate the safety risk involved with the following with 1 being very safe and 5 being very dangerous?**

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| <input type="radio"/> Heavy Road Traffic | 1 | 2 | 3 | 4 | 5 |
| <input type="radio"/> Natural Pond       | 1 | 2 | 3 | 4 | 5 |
| <input type="radio"/> A river            | 1 | 2 | 3 | 4 | 5 |
| <input type="radio"/> Landfill Site      | 1 | 2 | 3 | 4 | 5 |
| <input type="radio"/> SUDS Pond          | 1 | 2 | 3 | 4 | 5 |

*Indicate the response by selecting one or more value labels*

**16. What improvements, if any, do you feel could be made to this pond?**

- Creation of walkways
- Improvement of vegetation maintenance
- Introduction of benches
- Introduction of barriers
- More frequent litter removal
- More information
- More signage, what kind of information should be displayed on the signs?
- Removal of fences
- None
- Don't know
- Other, please specify

*Indicate the response by selecting one or more value labels (9 maximum)*

**17. Do you believe the economic value of the property increases, decreases, or remains the same in an area where SUDS are in place?**

- Increases, if so, by what percentage?
- Decrease, if so, by what percentage?
- Remains the same

**18. Did the existence of the pond influence your opinion of property purchase in this particular area?**

- Yes
- No



**19. Which of the following environmental friendly practices do you believe is/are more beneficial for your city? Please outline the practices from the most beneficial to the least beneficial.**

- SUDS
- Use of Renewable sources of energy generation
- Refuse separation at source
- Recycling

**20. Would you like to get more information about this pond? (Not to be asked to those that have already made a request for further information)**

- Yes, if so, on what particular subject would you like to be informed and how?
- No

**21. Would you be willing to discuss further about this subject?**

- Yes\*
- No

**\* Go to question 22.**

**22. Can I keep your contact details for future contact?**

\_\_\_\_\_

**THANK YOU**



## ***Appendix 2***

Paper presented at the Fifth Symposium of the International Urban Planning and  
Environmental Association



## Appendix 2 Paper presented at the Fifth Symposium of the International Urban Planning and Environmental Association

### SOCIAL ACCEPTABILITY OF SUSTAINABLE URBAN DRAINAGE SYSTEMS

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#### **Abstract**

The term Sustainable Urban Drainage Systems (SUDS) refers to drainage constructions which comply with the sustainability criteria. They serve multiple purposes such as flow attenuation, flood prevention; they provide recreational facilities, biodiversity and stormwater management benefits, while at the same time they are cost and energy efficient.

SUD systems have become increasingly popular in a number of countries including the U.K. In Scotland, specifically, SUDS must be considered on all new developments. Public acceptability of SUDS can be a deterrent or a motive for householders in buying property in an area where SUDS are in place, and consequently, is of great interest for developers and engineers involved with the construction of SUDS. This paper presents the results of a study of the social impacts of these schemes within urban environments.

#### **1. Introduction**

##### **1.1. The need for SUDS**

The United Nations and the World Bank as well as a series of environmental organisations worldwide, such as the EPA, consider the necessity of collection and treatment of runoff for environmental and hygienic reasons as a step towards sustainability. According to the Water Framework Directive, which requires biodiversity objectives to be set, a sustainable way of treating runoff with environmental, social, and financial benefits, is the application of Sustainable Urban Drainage Systems (SUDS). The word “*Sustainable*” itself declares the importance and the multipurpose of stormwater management, the limited maintenance requirement, as well as the importance of public acceptance of the systems.

All new and innovative technologies applied in housing areas, besides being economically and environmentally acceptable must also be accepted by the public. Public perception of SUDS can be a deterrent or alternatively a motive for developers in using SUDS in their new sites, as it can influence householders’ property purchasing decisions within the development. As a result, interest has been expressed by developers active in Scotland for studies to be undertaken into the perception of SUDS by members of the public. A first survey was carried out in November & December 2000, the results of which were presented in the First National Conference on SUDS, held on 18-19 June 2001 in Coventry University. This paper stimulated an extensive debate.

Following up the initial survey, further research is currently being undertaken by the Urban Water Technology Centre of the University of Abertay Dundee. This research is aimed at assessing the perception of the public and their understanding of SUDS in different locations within the U.K., and to understand the acceptability of the systems by both the public and the stakeholders. Additionally, there is major interest in evaluating the impact in house pricing in areas where SUDS are in place.

## 1.2. SUDS in use

SUDS were initially designed and constructed for urban runoff treatment in the U.S.A where they are known by the term Best Management Practices (BMPs). Recently they have also been introduced to other countries facing similar problems with water runoff, such as Sweden, Japan, Britain, Switzerland, Germany, France, Australia, and South Africa. SUDS are now widely adopted for runoff collection and treatment in Scotland and their use is now extending to some areas of England and Wales.

<b>SUDS Type</b>	<b>Brief Description</b>
Detention Basin	<b>Storage facility without permanent water</b>
Retention Pond	Storage facility with permanent water
Wetland	A retention pond with significant numbers of water purifying plants
Infiltration Trench	Trench filled with a media having a large void ratio allowing water storage
Infiltration Basin	Similar to a pond but all water stored is exfiltrated from the basin into the underlying soil
Porous Surfaces	High porosity pavements, generally car parks, with storage below surface. This type of system can either infiltrate or attenuate flows
Swale	Shallow, grassed ditch allowing limited amount of storage typically 2 year return period events
Filter Drain	Perforated pipe in gravel surround allowing exfiltration and some removal of coarse solids.

**Table 1 Description of systems in use**

Similar information on SUDS can be found in CIRIA (2000) manual and in the EPA website.

## 1.3. The Role of the Public

The role of the public in causing water pollution is of major importance. Individuals pollute urban runoff through a series of everyday activities, such as: Lawn fertilisation, Pesticide application, Dog walking, Car washing, Fluid changing, Septic system maintenance.

Several studies in the U.S. (Watershed Protection Techniques 2000) have shown that the majority of urban residents are unaware of the effect that lawn fertilisers, pesticides, dog excrement, soaps and car fluid, have on stream quality. Around 900 tonnes of dog excrement is deposited in Britain alone every day (D’Arcy et. al. 2000).

The awareness of individuals and their adoption of environmentally friendly practices is crucial in delivering improved watercourses. The degree of pollution of natural waters by individuals is affected by population density, personal income, education, and public awareness. Strangely enough, it has been noticed that the wealthy, well-educated, and environmentally aware members of western society, are the most polluting. This behaviour is based on the need of the rich to have a clean and tidy urban environment (Watershed Protection Techniques 2000).



The public's perception of environmental friendly constructions and practices is influenced by a range of factors including the schemes' characteristics, such as aesthetics, appearance and surroundings, by the biological/ecological performance, attenuation (flood abatement) and water quality. Other issues related to the systems such as safety, amenity, biodiversity and concepts such as urban restoration and best "space management" are of great concern to developers. An influence in the property value and cost is also expected in areas where SUDS have been implemented, and they have a direct effect on the saleability of properties.

## **2. Previous Work on Attitudes to SUDS**

### **2.1. Stakeholders Perception**

Very little research has been conducted to assess the various attitudes of stakeholders involved with SUDS. In 1996, questionnaires were distributed to developers, consultants, water authorities, landscape architects, and local authorities, to find out their knowledge and experience of the stakeholders in respect to SUDS.

The main findings of this survey (McKissock et. al.1999) were:

- The deterrents to using SUDS appeared to be the responsibility for adoption and maintenance, and the land take.
- Filter drains and infiltration trenches are the most popular SUDS constructions in Scotland.
- Regulatory requirements were identified as the major factor in the selection of SUDS. Selection of ponds though, was additionally based on the need of high volume runoff control and the creation of a new habitat.
- Some developers expressed concerns over cost.

### **2.2. Public Perception in Scotland**

In order to assess the public perception of SUDS in Scotland, three separate but closely linked questionnaires were designed and applied at selected sites. The door-to-door, interviewer-administered questionnaires were addressed to householders served by in- garden and roadside swales, as well as householders with access to retention ponds.

The surveys found a reasonable level of perception that SUD systems provided a source control function, although their use in protection against pollution was less understood. Roadside swales were tolerated, but not welcomed and maintenance responsibilities were not understood. It was difficult to determine specific reaction to the introduction of detention basins, although comments received indicated a need for enhanced drainage performance, which will ensure avoidance of intermittent ponding, and 'mud baths' in children's play areas.

In general, ponds were well received by local residents who clearly understood and welcomed their wildlife and amenity benefits - a pair of swans breeding within a year of the construction of a pond is a very potent wildlife symbol! There appeared to be less enthusiasm where ponds have been built close to existing housing. The benefits appeared to outweigh the clearly expressed concerns about safety, although it was well understood that pond safety can be relatively easily addressed by appropriate fencing and barrier planting. (Apostolaki et.al, 2001)

## **3. Current Work on Attitudes to SUDS**

Social perception surveys were applied in several areas within the U.K. in spring 2002, specifically in Lancashire, on the South Coast, and in Gloucestershire. All the selected sites within these areas were served by retention ponds, but they differed in the pond's characteristics and the socio-economic background of the local householders. To evaluate

the role that aesthetics and amenity play in formulating public opinion, sites served by both well-established and newly established SUD ponds were chosen.

### 3.1. Awareness of SUDS

Very low levels of awareness of SUDS were found amongst the participants in all areas where the survey was applied. The vast majority of participants (about 90% on average) were found to be completely unaware of the term (even 100% lack of awareness at some sites) and the function of their local SUDS. Although there were some participants who stated that they were aware of SUDS, they could not indicate the purpose of the systems.

### 3.2. Likes and dislikes of SUDS

The increase in the aesthetics of the area, the attraction of wildlife, and the creation of a new habitat, were the main perceived advantages of the ponds. Additionally, the increase in the amenity value of the area and the avoidance of flooding, were included amongst the advantages of the ponds. However, the perceived advantages differed according to the site characteristics. The aesthetics of a scheme is the factor which most influences public attitudes. These differences in attitudes are demonstrated in figures 1 and 2, where results from an area with a well-established pond and from a newly established pond are presented separately.

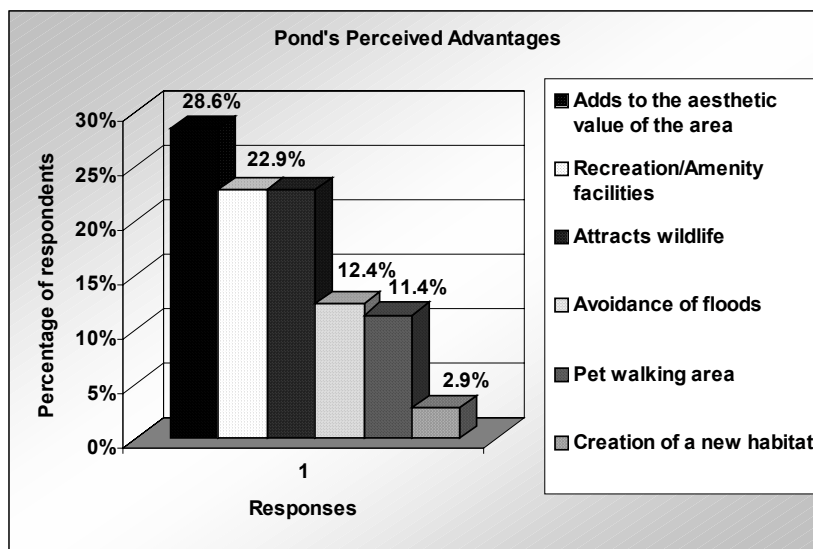


Figure 1: Perceived Advantages of a well-established pond (Coy Pond in Bournemouth)

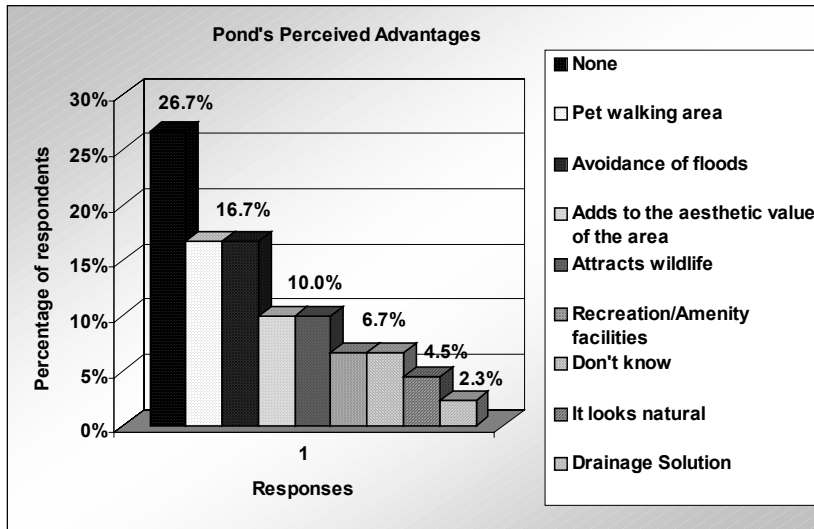


Figure 2: Perceived Advantages of a newly established pond (Kirkby Pond in Lancashire)

The main concern expressed was over safety and specifically over the potential danger of children drowning in the ponds. Again the results were site specific and highly dependent on the aesthetics of the scheme and its amenity value for the area. In areas of high aesthetic value with rich marginal vegetation, a high percentage of the residents (45%) shared the opinion that no disadvantages for their area were caused by the pond, while in areas with less attractive ponds, safety concerns were expressed by 70% of the participants. Poor maintenance of ponds, and litter pollution were also regarded as disadvantages. Differences in attitudes are demonstrated in figures 3 and 4.

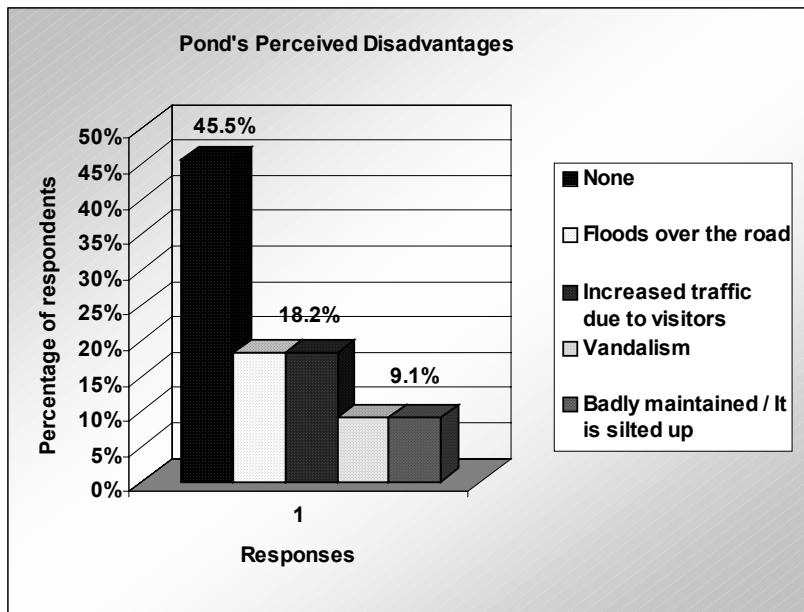


Figure 3: Perceived disadvantages of a well-established pond (Coy Pond in Bournemouth)

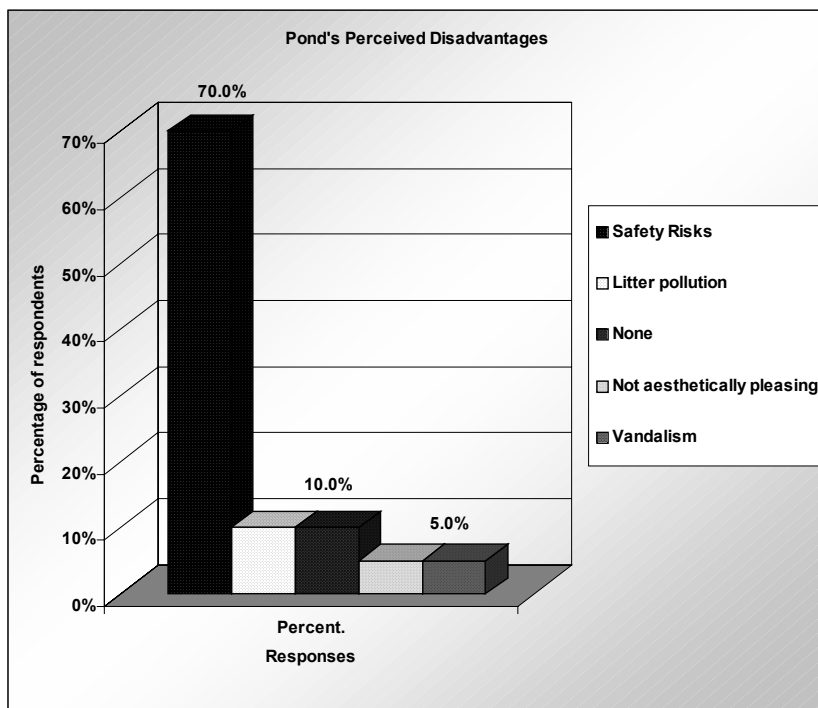


Figure 4: Perceived disadvantages of a newly established pond (Clayton Le Woods in Lancashire)

### 3.3. Safety Concerns

As mentioned above, the biggest perceived safety concern was over children drowning in the ponds. However, the vast majority of those expressing these concerns (80% on average) still preferred to live close to the schemes. By comparison, living close to a SUD pond was considered to be less dangerous than living close to heavy road traffic or to a river, but slightly more dangerous than living close to a natural pond. This again points to the pond being more likely to be acceptable, the more natural it is.

From analysis of data gathered to date, evidence indicates that the advantages of the ponds outweigh the disadvantages in spite of the safety concerns. This is especially true for ponds of high aesthetic value.

### 3.4. Improvements to the ponds suggested by the public

There were two principal suggestions outlined by the public to increase acceptability of the SUD ponds by communities. These were i) the introduction of natural barriers which would serve both aesthetic and safety purposes around the newly established ponds, and ii) the improvement of all aspects of pond maintenance. The request for natural barriers was indicated by 24% of those respondents who expressed concerns over safety. Maintenance was a major issue at all ponds surveyed.

### 3.5. Impact on house pricing, saleability and evaluation of sustainable practices

Public attitudes towards the effect of SUDS on house prices again varied according to the site's characteristics. Respondents believed that there was an estimated increase of around 10% in house values and a definite increase in saleability of houses close to SUD ponds of high amenity value. In less aesthetically attractive sites it is estimated that, although there is no effect on house pricing, it is believed that there is a decrease of saleability.

When compared to other sustainable practices, SUDS in most sites were deemed as less beneficial than refuse separation at source or recycling but were thought to be more beneficial than the use of renewable energy sources (again the results were site specific – see figures 5 and 6).

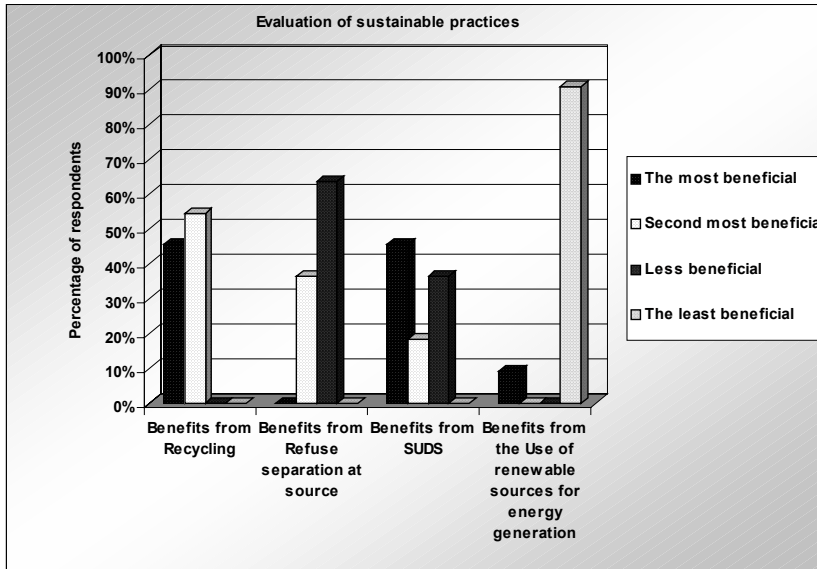


Figure 5: Evaluation of Sustainable Practices in an area with a well-established pond

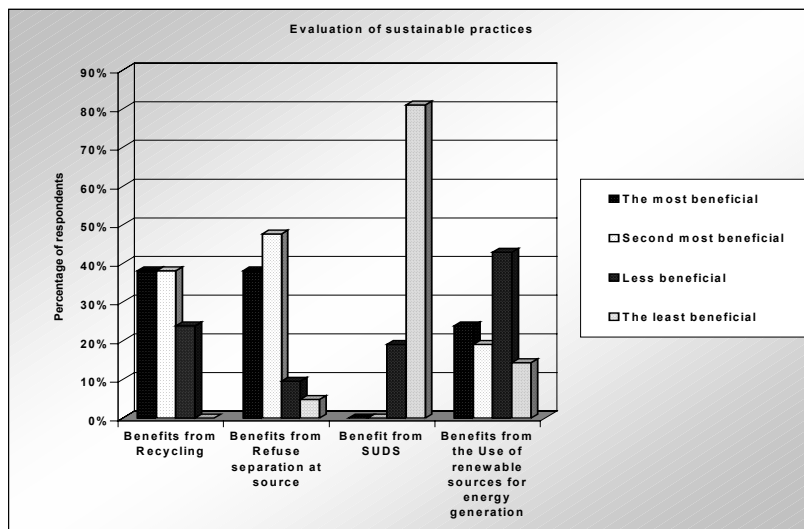


Figure 6: Evaluation of Sustainable Practices in an area with a newly established pond

### 3.6. Request for further information

The majority of the participants in all sites (around 70% on average) made a request to receive more information regarding the SUD ponds, a fact which underlines the lack of awareness amongst the public. There were particular requests for information about the function and efficiency of the systems, reasons for their existence in that particular area, and about the flora and fauna present in them. The participants stated that developers should bear the responsibility of informing householders about the drainage of the area especially when it involves overground

constructions. They should also keep house purchasers updated with any future developments in the schemes. In areas where there are no active developers, householders indicated that the City Council should hold this responsibility.

#### **4. Discussion**

In contrast to surveys of public attitudes towards catchment pollution applied in the U.S., most people asked in the U.K. surveys (92%) were able to link their everyday activities to potential catchment pollution. On the other hand, the research undertaken demonstrated a lack of public awareness of SUDS as a whole, although most participants in locations where SUDS have been used had formed strong opinions and attitudes about the specific systems used within their residential area.

Overall, attitudes to SUD ponds were more positive than to swales as indicated by previous work by the author. Although the flood prevention function of swales was appreciated, the benefits from SUD ponds were more obvious. The attraction of wildlife to the ponds, the increase in the amenity and recreational value of the surrounding areas, the improvement of the landscape, and the environmental way of treating runoff, all played an important role in formulating public opinion.

However, in the case of ponds attitudes differ according to site characteristics and they are strongly influenced by the aesthetics of the schemes and the amenity benefits the systems provide within the area. In areas with well-established ponds the participants tended to be more positive towards the systems. In these areas the perceived scheme advantages, as outlined by the residents, outweighed the disadvantages. However, maintenance and cleaning up of the ponds' water and surroundings, was a major issue, which indicates the public need for a clean, tidy and attractive urban environment.

Safety, and specifically the potential danger of children drowning, was indicated as the main perceived disadvantage of the ponds. Although safety was the main concern expressed, the degree of concern was also site specific and highly dependent on site characteristics and the appearance of the pond. In areas where well established ponds are in place safety was rarely an issue. Aesthetic factors seem to play a crucial role in formulating public opinion, even when matters such as safety are involved. It is worth mentioning however, that in sites with newly established ponds where limited or non-existent marginal vegetation and steeper slopes exist, there is definite potential danger. On the contrary, normally the access into water is restricted in well-established ponds with rich marginal vegetation. Native vegetation in combination with the wildlife present in the pond, make it appear natural, and this outweighs the potential danger. It is also worth mentioning that the vast majority of participants who expressed safety concerns still preferred the pond to be located within their residential area.

The general public attitude to SUD ponds becomes more positive as they become increasingly established. The ecological benefits are highly appreciated; wildlife and plantlife are very much welcomed by local communities and are considered as a source of education for children by many individuals.

Amongst the most important perceived advantages of the ponds is the fact that the ponds help to re-establish the relationship between urban citizens and nature. Modern urban societies have lost contact with nature, a fact that occasionally creates increased safety concerns towards several natural features and especially water catchments. The



ideas of loss of contact with nature and the loss of wilderness, are ideas that have been widely expressed and analysed by several thinkers of the 20<sup>th</sup> century (Oelschlaeger M.,1992), according to many of which, the reestablishment of modern humanity's relationship with nature is critical for the modern society (Kellert S.R. & Wilson E.O.,1993). Several respondents believed that the ponds have been successful in creating a natural feature within the urban environment and in reminding urban citizens of their lost links with nature.

## **5. Conclusion**

Overall, the perception and attitudes to SUDS were positive. There is a gap in education of the public, especially regarding the purpose SUDS serve and their efficiency in matters of flood prevention and water treatment. This lack of information is considered to be as one of the main factors, generating negativity towards SUD systems. It seems that education and the scheme's aesthetics are of major importance in influencing acceptability of new or innovative practices within residential areas.

## **6. Acknowledgements**

At this point the authors would like to acknowledge the Environment Agency, and in particular Phil Chatfield for his support and contribution in this piece of research. Special thanks go to Alison Duffy for her assistance with the surveys' application.

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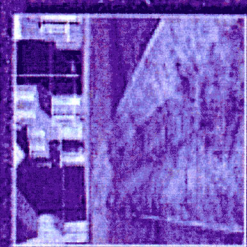
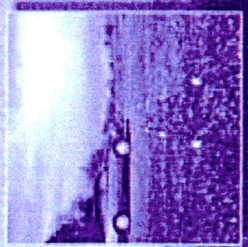
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## ***Appendix 3***

Sustainable Urban Drainage Systems: Setting the Scene in Scotland







WORKING PARTY  
**suds**

SUSTAINABLE URBAN DRAINAGE SYSTEMS

*Setting the Scene in Scotland*



## Contents

1. Introduction.....	3
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## Foreword

The aim of the Sustainable Urban Drainage Scottish Working Party (SUDSWP) is to encourage development that does not adversely affect the aquatic environment. This will be done by developing and promoting policies and solutions for sustainable surface water drainage at all new developments in Scotland.

SUDSWP believes that sustainable solutions for surface water drainage will only be achieved by co-operation between all the organisations involved in urban development. To this end, SUDSWP are promoting a partnership approach to implementing sustainable urban drainage and protecting the aquatic environment. The back cover of this booklet shows all the organisations that are members of SUDSWP.

Sustainable urban drainage systems (SUDS) are already being built in Scotland. The intention of this booklet is to provide some background information on SUDS that is needed by all practitioners involved in making decisions about drainage. However, every practitioner will need to read further around the subject.

This booklet is aimed at practitioners involved in making decisions about drainage of surface water runoff, for instance, developers, drainage engineers, architects, landscape architects, ecologists and hydrologists. Also to all those representing the statutory authorities, namely planners, roads authorities, water authorities, building control and environmental regulators.

The booklet may also be of interest to policy makers, politicians and local community groups who have an interest in drainage issues and want to know about sustainable urban drainage.

Colin Bayes  
Chairman of SUDSWP

Page 2

## 1. Introduction

*"The challenge of sustainable development is to find sustainable methods for servicing new developments in Scotland. SUDS make a direct contribution to putting sustainable development into practice."*

Martin Squibbs, SUDSWP member representing North of Scotland Water Authority.

All developments require to be drained in order to remove rainwater. Providing adequate drainage is one of the many issues that designers and engineers must resolve at every site that is developed. In the 21st century, with increasing demand for new housing, commercial and industrial areas, there is huge pressure to expand urban areas and redevelop brownfield sites across Scotland. Coupled with this development pressure, there is the Government's commitment to sustainable development. The challenge is to turn the concept of sustainable development into reality.

Designing and implementing a drainage system that does not cause flooding or pollution and actively enhances the local environment goes beyond the conventional approach to drainage.

## 2. Problems with conventional drainage systems

*"If the conventional approach to drainage is continued, the urban environment in Scotland will have lifeless and polluted rivers, that flood on a regular basis"*

John Toole, Deputy Chairman SUDSWP, representing West Lothian Council and Society of Chief Officers of Transportation in Scotland (SCOTS).

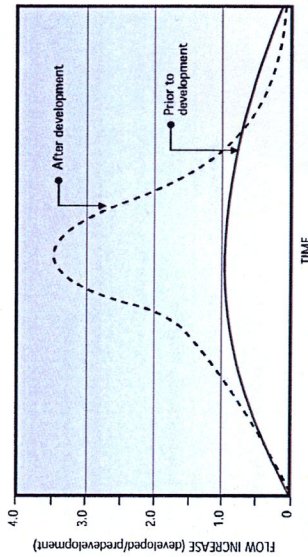
Since the 1950s, the conventional approach to drainage has been to take foul water to a sewage treatment works and to drain rainwater runoff (sometimes called stormwater or surface water runoff) directly to a watercourse, with all the water conveyed in a network of pipes.

The natural hydrological cycle starts with rainwater falling on the ground and seeping into the soil. This process replenishes groundwater supplies and fills rivers. When land is developed, the area of impervious surface is increased due to roofs, roads, car parks and yards that make up the urban landscape. The impervious areas interfere with the natural hydrological cycle and require drainage.

When rainwater is conveyed in pipes to rivers, the time between the rainfall event and water entering the river is reduced, when compared to an undeveloped catchment, and large volumes of water converge on a watercourse in a short time period. In an urbanised catchment, peak flow in the river is higher and happens sooner than in an undeveloped

Page 3





catchment. These events can rapidly lead to flood conditions, especially in small watercourses with a highly urbanised catchment. High flow conditions in rivers also erode the natural banks and bed of a river.

Roofs, car parks and roads all prevent seepage of rainwater into the ground. This means that rivers in urban areas can effectively be in drought (low flow conditions) between rainfall events.

Many rivers in urban areas are now culverted and flow through large pipes below the ground. During high rainfall, some of these culverts have insufficient capacity to take the flow, which in turn may cause, or add, to the problem of flooding.

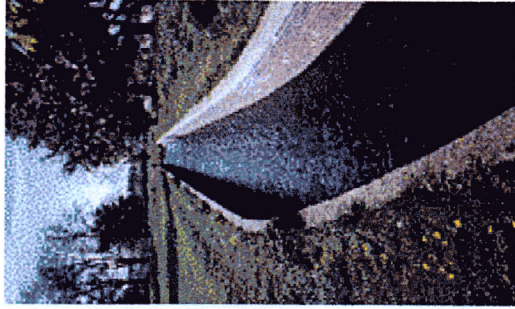
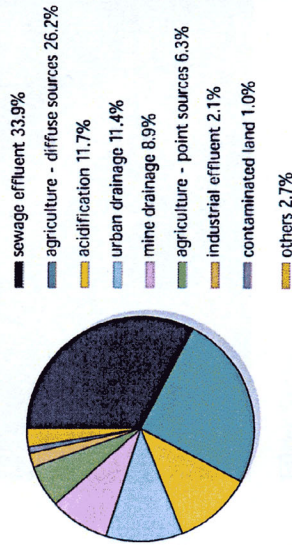
In addition to the flooding, there is the problem of pollution in urban rivers. Much of this pollution is diffuse in nature, which means that the pollution arises from the land use and human activity within the catchment, and does not result from a point discharge of sewage or trade effluent. Rainwater mobilises the pollutants on the surfaces of car parks, roads, from roofs and yard areas, which are then carried into rivers. The pollutant load includes: sediment and grit, hydrocarbons bound to the fine sediments, metals, salts, pathogens and litter.

In addition to diffuse pollution, many urban rivers are affected by sewage effluent either from overflows from the sewerage system or from wrong connections of foul drainage into surface water sewers.

*This picture shows a conventional surface water drain discharging to an urban watercourse. The flow in the river is low between rainfall events, the water is grey and cloudy with litter and debris blocking the flow. The overall appearance is not attractive*



Summary of the main causes of pollution in rivers and the resultant length classified as polluted in 1996.



The Scottish Environment Protection Agency (SEPA) has shown that approximately 500 km of water were downgraded due to urban drainage in Scotland in 1996.

The riparian and riverine habitat associated with urban rivers is often heavily modified. Rivers have been straightened and confined by concrete channels and bankside habitat is often removed. This combination means that rivers in urban areas are unable to support a variety of wildlife and may look unattractive.

### 3. Sustainable Urban Drainage Systems

*"SUDS protect rivers from the effects of accelerated runoff rates and diffuse pollution that arises from the urban environment."*

Graeme Rose SUDSWP member representing SEPA.

Sustainable Urban Drainage (SUD) is concerned primarily with the drainage of rain water from developed or urbanised areas. Some people apply the concept to rainwater re-use.

SUD is a concept that focuses decisions about drainage on the environment and people. When drainage systems take account of water quantity, water quality and amenity, then it is sustainable urban drainage.

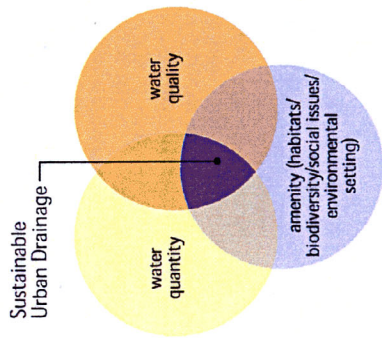
*\*amenity is a general term that incorporates social issues, consideration of biodiversity and habitats in urban areas, environmental setting and aesthetic quality.*



Sustainable Urban Drainage Systems (SUDS) are structures built to manage surface water runoff. There are 4 general methods of control:

- i) filter strips and swales
- ii) filter drains and permeable surfaces
- iii) infiltration devices
- iv) basins, ponds and wetlands.

SUDS work by providing storage or flow attenuation, and by exploiting the natural processes of sedimentation, filtration and biodegradation to remove pollutants. In addition, SUDS can be integrated into their environmental setting and some devices offer the opportunity to improve wildlife habitats in urban areas.



Sustainable Urban Drainage



### Swales

Swales receive rain water at or near the place where it falls (source control), via over-the-edge flow or off-let kerbs placed at regular intervals. Swales work by attenuating the flow and allowing time for filtration and sedimentation. Some breakdown of organic pollutants may occur. In terms of amenity, swales look similar to any grass verge, but have a gentle depression at the centre and gentle incline to give flow direction. Swales are used for conveyance of water. Where foundations, subsoil and groundwater conditions permit, they can be used for infiltration.



### Filter Strips

A filter strip is an area of vegetated land through which surface water runoff is directed. It usually lies between a hard-surfaced area and a receiving stream. Filter strips can be planted with grass and or shrubs. They work by filtering-out pollutants from surface water runoff and by providing flow attenuation. In the picture above, the filter strip divides the settlement forebay from the treatment area of this pond.

### Filter Drain

Filter drains receive rain water near to where it falls, via over-the-edge flow. Filter drains work by providing capacity for attenuation. Water quality is improved by filtration and some biological degradation. They have been widely applied to road drainage in Scotland.





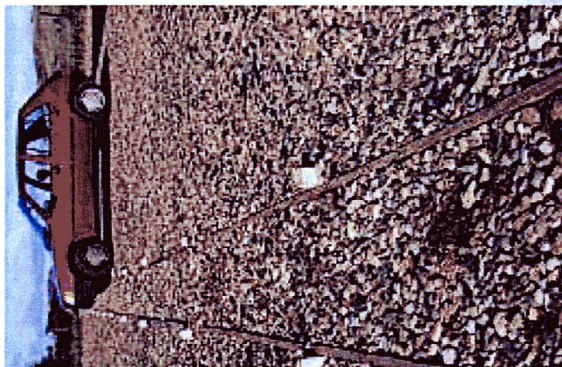
### Permeable Surfaces

Permeable surfaces allow rainwater to pass through the surface layer. They are effective as they provide attenuation of flow. Water treatment is provided by filtration and some biological breakdown of pollutants. They can be designed to fit in with a variety of environmental settings, for instance hard surfaces in car parks in towns, gravel surfaces for lighter traffic load or grasscrete for green cover in rural areas or soft landscape settings. (Permeable surfaces are currently not considered suitable for adoptable roads.)



### Infiltration devices

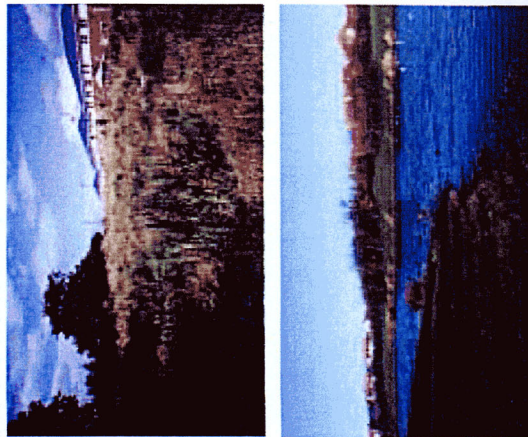
Infiltration devices dispose of surface water runoff into the ground. A prerequisite is that both groundwater and ground conditions are suitable to receive the quality and volume of water generated. Infiltration devices, such as soakaways, provide considerable storage of water. Water quality is improved by filtration, sedimentation and some biological breakdown of pollutants. Infiltration devices can be incorporated into open-space areas e.g. playing fields, as part of a flood management scheme. This picture shows a porous surface where the rainwater infiltrates directly into the ground below.



### Basins, Ponds and Wetlands



These devices collect surface water runoff from a larger drainage catchment via a pipe network or from other SUDS upstream. They provide flow attenuation and storage capacity. Basins are planted with grass and are dry, except after a rainfall event. By contrast, ponds and wetlands retain a body of water and are planted with wetland and aquatic plant species. Basins allow for sedimentation of pollutants to occur, as water is retained for only short periods of time. Ponds and wetlands retain water for 2 or 3 weeks, allowing for all the natural processes of sedimentation, filtration and biological degradation to occur. Ponds and wetlands provide opportunity to create wildlife habitats within urban areas. They can also provide a focus for local people, providing amenity and recreation areas, bringing water back into the urban environment.





#### 4. Partnerships for SUDS

*"SUDS can be incorporated into every new development in Scotland if all those involved in the decisions about drainage work together."*

John Greaves, SUDSWP member representing Highland Council and the Scottish Society of Directors of Planning.

In Scotland there is no single organisation that has all the controls necessary to implement SUDS. A partnership approach between all those involved in the development process will ensure that SUDS are designed to be effective and are implemented consistently at new developments across Scotland.

The list of parties involved in SUDS partnerships includes: developers and their designers (drainage engineers, architects, landscape architects), local authorities, SEPA, the water authorities, local people and certain non-governmental organisations.

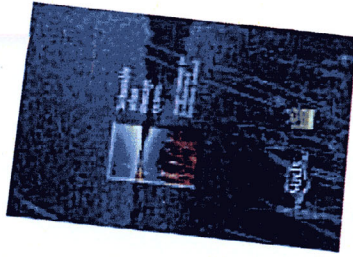
Implementing SUDS follows the same development control procedures that apply to all changes of land use. However, it is important that SUDS are considered at the outset of a development proposal and that there is effective communication between the parties, as this will allow all the necessary factors to be included in the decision-making process.

There are a variety of factors that influence the selection of SUDS at a particular site. In addition there may be design criteria that the drainage system needs to meet in terms of flood control and pollution control. These design criteria must be agreed between the developer and the statutory authorities at the outset of the planning process.

Developers and their designers are encouraged to inform the planning authority of their development proposals as early as possible and certainly before the concept for the development is finalised. SUDS require land and must be accounted for in land purchase negotiations and layout proposals.

The benefits of a partnership approach are:

- SUDS are considered early in the design process, allowing adequate provision for SUDS in the site layout and land purchase negotiations;
- the design of the SUDS can be optimised to satisfy all the relevant design criteria, including amenity considerations, and
- the long-term environmental benefits of flood management, pollution control and habitat enhancement may be realised.
- early discussions between developers and the planning authority will allow planners to co-ordinate consultation between the other statutory authorities – this 'one-stop-shop' approach will facilitate the development process.



#### 5. Background information on the design and maintenance of SUDS

*"A sustainable urban drainage system can be used in isolation to drain a single plot of land, or SUDS can be linked in series to drain a larger catchment or form a strategic drainage network across a city."*

Frank Guz, SUDSWP member representing Dundee City Council and SCOIS.

SUDS need to be designed and built correctly in order to operate effectively. In March 2000, CIRIA published the *Sustainable urban drainage systems design manual for Scotland and Northern Ireland*, which provides authoritative design advice for SUDS. This manual was produced in conjunction with SUDSWP and will assist designers through the process of securing agreement for SUDS and the technical design issues.

There are a range of SUDS devices that can be used separately or in combination to drain a development. SUDS allow flexibility for a designer to select a drainage option that provides the best solution in any particular urban environment. Designers need to consider the requirements of the site and agree design criteria with the statutory authorities; this is an iterative process that needs to occur in conjunction with the development of the design concept for the site.

After surface water runoff has passed through a sustainable urban drainage system, it may be discharged directly to a watercourse or groundwater, or to a surface water sewer.

SUDS do not change any of the existing responsibilities for provision and maintenance of drainage. In Scotland the Roads Authorities have responsibility for maintenance of road drains and the Water Authorities have responsibility to take the surface water drained from within the curtilage of a building i.e. roof water and areas of hardstanding.

There are many opportunities for SUDS to be designed to take both road drainage and curtilage drainage. The Water Authorities and CoSLA have devised a Framework Agreement for the maintenance of shared public SUDS in accordance with provisions in the existing Sewerage (Scotland) Act 1968.

The Framework Agreement applies to maintenance of shared public SUDS:

- Unitary Authorities will maintain above ground assets; and
- Water Authorities will maintain below ground assets.

This Framework Agreement will be reviewed in 2002.

(Details can be found on pages 99 and 100 of Sustainable urban drainage systems design manual for Scotland and Northern Ireland.)



# ***Appendix 4***

County of Los Angeles, Department of Public Works  
Storm Water / Urban Runoff  
Public Education Model Program, 2002





County of Los Angeles

Department of Public Works

Storm Water/Urban Runoff

**Public Education Model Program  
2002**



County of Los Angeles  
Department of Public Works

## Storm Water/Urban Runoff Public Education Program

### Executive Summary

#### Public Education Plan Overview

- Situation Analysis
  - Urban Runoff and Its Impact on the County's Resources
  - Opportunities for the Public Education Plan
  - Our Greatest Challenges
  - Maximizing Public Education Budgets
  - The Public Education Plan -- In A Nutshell
- Overall Goals
- Overarching Approach
  - Benefits of the Overarching Approach -- Los Angeles County
  - Benefits of the Overarching Approach -- Co-permittees
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- General Public/Residents
  - Situation Analysis
    - Overview
    - From Awareness to Behaviour change
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    - Issues of Importance to the General Public
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- School Education
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  - Goals



# EXECUTIVE SUMMARY

## Purpose of the Public Education Plan

Under the 1996 NPDES Los Angeles County Municipal Storm Water Permit, the County was required to develop a comprehensive educational storm water and urban runoff outreach program to reach as many county of Los Angeles residents as possible. The County will continue with a public education and outreach program based on the results of research conducted during the final year of the campaign and in compliance with the 2001 NPDES permit. The County will choose an appropriate combination of educational outreach tools and activities to measurably increase the knowledge of the target audiences about the impacts of storm water pollution and potential solutions to reduce the problems caused; to measurably change the behaviour of target audiences in implementing appropriate solutions; and to involve and engage socio-economic groups and ethnic communities in the County to participate in mitigating the impacts of storm water pollution.

## What Can the County and the Co-permittees Accomplish Through the Plan?

In developing and implementing the second Public Education Plan, the county of Los Angeles and its Co-permittees will meet the requirements outlined in the Permit using methods that are cost-effective and that attempt to change behaviour. Through a unified and co-ordinated effort, the plan can:

- change the mind-set of a large, diverse population while educating target audiences about solutions to storm water pollution;
- create synergy by using an overarching campaign approach, “look” and tone, and by unifying multiple pollution prevention efforts;
- impact more than one audience at a time with a single campaign;
- build bridges and forge partnerships that integrate city and jurisdictional programs; and,
- document whether the education outreach effort resulted in behaviour change that reduced pollution.

## Addressing the Greatest Challenges

Research will continue to play an integral role in the development of the Public Education Plan. Through focus groups, quantitative surveys, school program assessment, behavioural change assessment based on meeting numerical targets for behaviour change, pilot programs to assess pollutant-specific and community-specific outreach efforts, as well as secondary research, the challenges listed below will be addressed.

- Allocating limited budget dollars toward the greatest **polluters most likely to change behaviours**
- Discovering exactly what motivates or influences behaviour change in each target audience
- Addressing the ethnic, cultural, geographical and socio-economic diversity of the County
- Determining which public education efforts have helped to reduce storm water/urban runoff pollution
- Finding the most effective, and cost-effective means of educating the public.

### **The Public Education Plan -- In A Nutshell**

- Founded on research
- Meets the requirements of the NPDES Permit
- Broad-based with an overarching theme
- Flexible, adaptable, cost-efficient
- Provides simple, everyday actions that will make a difference
- Integrated and co-ordinated
- Results-oriented

### **Overarching Approach**

In order to achieve maximum effectiveness, and build on the recognition already gained under the first Plan, the communications program developed for this Public Education Plan will continue to use the overarching Project Pollution Prevention approach developed in 1996. The overarching approach provides a campaign identity, a personalised feel and user-friendly information about how to solve the storm water pollution problem. The approach is defined for the Education Plan as a whole and remains consistent throughout the life of the Plan; however, the components within the phases that roll-out over the next four years will be fluid to reflect the evolving message for each targeted audience.

Research supports the value of a “problem/solution”-oriented approach with strong, impactful visuals and an identifying “signature.” The common elements of the overarching approach include: (1) an identified problem caused by storm water pollution; (2) an identified solution(s) to the particular problem; (3) the campaign theme tagline; (4) 1-888-CLEAN-LA hotline number and [www.888CleanLA.com](http://www.888CleanLA.com) website; and (5) Project Pollution Prevention identifying signature.



## **Advisory Committee**

The Permit requires the County to co-ordinate an Advisory Committee (Committee) to provide input and assistance in meeting the goals and objectives of the Public Education Campaign (Campaign). The Committee is comprised of representatives of the environmental community, Permittee cities, Regional Board staff, and experts in the fields of public education and marketing. The County will ensure that the Committee meets at least once a year.

The Advisory Committee provided comments and advice during the process of preparing a Request for Proposals for a storm water public education contractor, and will be consulted during the process of developing the Campaign. Committee members may participate as part of a working group that evaluates contractor proposals and other tasks as appropriate.

## **General Public/Residents**

Past research shows 63% of the County's population can be reached through an integrated, multi-faceted communications campaign which focuses on a desire to "do the right thing" and provides "how to" information about alternative, anti-polluting behaviours. This population group also will be impacted by credible messages that imply that a change in their behaviour will help protect children, and preserve the environment for the future. An additional 9% -- a harder-to-reach, but high polluting population -- needs a more highly-focused campaign and is not likely to be motivated by doing the right thing, or preserving the environment. However, they will listen to messages that involve protecting children and the beach or other watersport areas.

Mass media has proven to be a key source of pollution prevention information for the general public. Other communications tools -- media relations, public service announcements (PSAs), instructional materials, corporate and entertainment industry tie-ins, community-based education efforts and events, and the 1 (888)CLEAN LA hotline and [www.888CleanLA.com](http://www.888CleanLA.com) web site--are planned to work in-concert with the advertising to achieve the necessary behaviour change.

## **Corporate Outreach**

A Corporate Outreach program to educate and inform managers about storm water regulations will be developed and implemented. The target audiences for this outreach are all gas station and restaurant chain executives in the unincorporated areas of the County. The County may include other target audiences during the Permit. We will make our materials available to Co-permittees upon request.

## **Business Assistance Program**

This is an optional program to provide technical assistance to small businesses regarding BMP implementation to reduce the discharge of pollutants. The target audience for this program is businesses that employ less than 100 employees and lack access to the expertise necessary to understand and comply with storm water regulations. The outreach methods may include:

- On-site technical assistance or consultation by telephone to identify and implement BMPs; and
- Distribution and discussion of applicable BMP and educational materials.

## **School Education**

Given the existence of current and successful school education programs in the County of Los Angeles, an alliance with one or more of these programs is the most effective and cost-efficient method of educating a minimum of 50% of all school children (K-i 2) every two years on storm water issues. For the 945,000 K-6 children, the County's school program and youth events will provide the vehicle to teach children about storm water, source reduction and proper disposal of household hazardous waste. For the County's more than 800,000 middle- and high-school children, the County-sponsored Secondary Student Environmental Education Program presented by TreePeople will create a higher understanding of environmental issues and motivate teenagers to take action.

The assessment methods and tools used to evaluate these programs were accepted by the Regional Water Quality Control Board as meeting Permit requirements. Any Co-permittees wishing to take advantage of these programs is encouraged to contact us. Programs can also be adapted to meet individual permittee needs and address watershed-specific pollutants upon request.

## **Measure of Effectiveness**

### General Public

To assess the overall effectiveness of the Public Education Program, the following types of research will be conducted:

- A comprehensive Countywide survey in the second or third year of the Permit which identifies changes in awareness and waste disposal behaviour.
- Telephone surveys, questionnaires completed by the general public, focus groups, calls to the (888)CLEAN LA hotline web site hits to the [www.888CleanLA.com](http://www.888CleanLA.com) web site, amount of household hazardous waste and used motor oil collected through County sponsored events.

- Develop pilot programs in small areas to reduce the number of variables influencing results as much as possible.
- Determine statistically sound and relevant performance measures and benchmarks for evaluating behavioural change.
- Add numerical targets for behaviour change to our existing survey methods based upon the results of the 1997 baseline research regarding polluting behaviours.

### School Education Programs

To determine the effectiveness of our school programs, the following assessment methods will be implemented:

- Pre- and post-exposure evaluations of student knowledge, comprehension and retention.
- Pre-use evaluation of curriculum and materials utilised for the County's elementary and secondary school programs.
- Focus groups to evaluate teachers' opinions about educational materials and students' knowledge of storm water pollution problems and solutions before and after educational efforts are conducted.
- Evaluation forms completed by elementary school teachers, principals, and administrators.

### **Format of the Public Education Plan**

The Public Education Plan contains two sections:

1. Overview
2. Implementation by Target Audience

Within Section 2, Implementation by Target Audience, the audience subsections detail the situation analysis for each respective audience, goals and overall communications approach, and an idea of the activities to be implemented.

## **SITUATION ANALYSIS**

### **Urban Runoff and Its Impact on the county's Resources**

On a daily basis, millions of gallons of untreated water flush into regional rivers and the Pacific Ocean. On rainy days, it can jump to six billion gallons. These polluted flows cause public health and safety concerns at the beaches, and leave behind hundreds of tons of solid waste to be cleaned up, costing millions of dollars annually.

Even after a generation of fighting water pollution, studies continue to show the danger of illness to people swimming in waters near urban storm drain outfalls. The

urban runoff that drains into the County's storm channels first picks up litter and contaminates from neighbourhood streets and sidewalks. Fertilizers, pesticides, automobile soot and oil drippings, pet waste, and deteriorating leaves and plant debris not only make our communities unattractive, but also are swept untreated down the storm drains into our waterways. In total, the impacts of storm water/urban runoff pollution encompass:

- losses to the County's \$2 billion a year tourism economy
- health risks associated with swimming in areas near storm drain outfalls
- loss of recreational resources
- dramatic cleanup costs
- impaired function and vitality of our natural resources
- losses to Southern California's commercial and sportfishing industry contamination of marine life

### **Opportunities for the Public Education Plan**

In developing and implementing this Public Education Plan, the County of Los Angeles has an important opportunity to meet the basic requirements outlined in the NPDES Permit using methods that are cost-effective and that effectively change behaviour.

Through a unified and co-ordinated effort, the plan can:

- change the mind-set of a large, diverse population and educate target audiences about solutions to storm water pollution;
- create a broad-based model with a long-term vision for pollution prevention in large geographic areas;
- create synergy by unifying multiple pollution prevention efforts (such as recycling and household hazardous waste) rather than conducting individual, splinter programs;
- build bridges and forge partnerships that integrate city and jurisdictional programs, combine educational outreach with technical understanding, and leverage resources; and,
- document whether the education outreach effort resulted in a behaviour change that substantially reduced pollution.

This program will continue to be research-based. It will draw from the experiences and best programs of existing local, state and national programs, as well as create original qualitative and quantitative research to support the development of a comprehensive public education plan. A united effort is the most viable and cost-effective way to achieve success.

Additionally, the County and the Co-permittees are in general agreement about the concept of a campaign overarching approach, "look" and tone that clearly and

concisely identifies the program, breaks through the information clutter and, at the same time, allows tailoring by Co-permittees for specific needs.

Additionally, and of equal importance, the overarching approach should not be exclusive to storm water pollution. Rather, multiple pollution prevention efforts -- solid waste recycling and disposal, household hazardous waste and used oil recycling should be co-ordinated within the overarching approach in their respective efforts and messages.

## **Our Greatest Challenges**

Research served as part of the Plan development process, and on-going monitoring will allow for program adjustments throughout the next five years. Overall challenges are:

- discovering exactly what motivates or influences behaviour change in each target audience;
- deciding the best methods to reach the identified target audiences; Neat Neighbours - affluent, home-owning, family oriented professionals; Fix It Foul-Ups - predominantly male, avid do-it-yourselfers and Rubbish Rebels - mainly single males in their teens and twenties from large families, car enthusiasts.
- addressing the vast ethnic, cultural, geographical and socio-economic diversity of the County; and
- demonstrating whether the education effort has indeed helped to reduce storm water/urban runoff pollution.

## **Maximising Public Education Budgets**

The estimated budget for the Los Angeles County Department of Public Works Storm Water/Urban Runoff Public Education Program is \$7.5 million, with the Co-permittees having individual budgets for local education efforts. While \$7.5 million over five years appears to be a large sum of money, there are almost 10 million people within the County to reach with storm water pollution prevention messages. With an audience of this size, the funds available to the overall effort -- even combined with the Co-permittees' funds -- must be allocated carefully and effectively so that each dollar is directed towards changes in behaviours. Therefore, targeted audiences, and the communications programs aimed at each of these audiences, must be prioritised according to their relative impact on pollution and their willingness to try new behaviours that will reduce the greatest amount of pollutants entering the storm drain system.

## **The Public Education Plan - In A Nutshell**

- Founded on research
- Broad-based with an overarching approach
- Flexible, adaptable, cost-effective
- Provides simple, everyday actions that will make a difference
- Integrated and co-ordinated
- Results-oriented

## **OVERALL GOALS**

- Reduce the amount of storm water pollution in the County of Los Angeles.
- Integrate County, city and jurisdictional programs.
- Appropriately mix educational outreach with technical understanding, and leverage resources.
- Improve general understanding of storm water/urban runoff pollution prevention methods.
- Incorporate storm water activities into other County environmental education programs.

## **OVERARCHING APPROACH**

The overarching approach was defined for the 1996 Public Education Plan and remains consistent. However, the components that roll-out over the next five years will be fluid to reflect the evolving messages for each targeted audience. The overarching will provide a campaign identity, a personalised feel and applicable “how to approach formation on solving the storm water pollution problem.

### **Benefits of the Overarching Approach -- Los Angeles County**

- Builds a distinct and distinguishing identity that is visually impactful
- Sends clear, concise and applicable message to the target audiences
- Sets a consistent tone and feel for the entire communications program
- Provides specific information in a personal manner making it more identifiable to the recipient
- Creates unity between all pollution prevention programs (e.g., recycling, household hazardous waste, water pollution)
- Tailorable to and flexible for specific programs, localities, topics and messages

## Benefits of the Overarching Approach -- Co-permittees

- Increases efficiencies in cost and production
- Enables Co-permittees to tie-in to the County's program without feeling they are losing their own identity
- Raises the synergy and broadens the reach and impact of local campaigns through multiple communications contacts on a variety of levels -- community to countywide -- and through a variety of communications tools

## Common Elements of the Overarching Approach

- An identified problem caused by storm water pollution
- An identified solution(s) to the particular problem
- Campaign theme tagline
- An appeal for personal responsibility to do the right thing
- 1(888)CLEAN LA hotline number and web site (local information can be added for co-permittee tailoring)
- Project Pollution Prevention identifying signature (city logo/name can be included for co-permittee tailoring)

## Campaign Signature

The Plan will continue to use the "signature" developed for advertising, collateral materials, media relations and other campaign components to identify a united alliance in preventing pollution in all communities within the County of Los Angeles.

Potential adaptations/usage in advertising and collateral materials include:

County signature:	County of Los Angeles (seal optional) <b>Project Pollution Prevention</b>
Co-permittee signature: (example only)	City of Long Beach (w/logo, optional) <b>Project Pollution Prevention</b>
STOPP Signature:	East Los Angeles <b>Project Pollution Prevention</b> <i>"Clean Communities for Economic Growth"</i>

# GENERAL PUBLIC/RESIDENTS

## Situation Analysis Overview

Cities within the County of Los Angeles and the unincorporated area encompass nearly 10 million people whose socio-economic levels vary from great wealth to poverty, and who collectively speak more than 90 languages/dialects. It is important that the education program make an impression on as many of these people as possible and that



they understand the actions of each individual person does make a difference.

Unfortunately, there is no simple solution, no single action, no easy “fix” to prevent storm water pollution. A combination of efforts — education, technology, partnerships with business and industry — will be necessary to meet our goals.

The problem is complex from both an action and result standpoint. Storm water carries nonpoint source pollutants from different and unidentified sources and flow rates can fluctuate from thousands to billions of gallons in a short time. The education program and prevention solutions must take into account the impact of these many sources of pollution.

### **From Awareness to Behaviour change**

The ongoing storm water public education programs in the County of Los Angeles have heightened *awareness* of the problem among media, influential businesses and government leaders, and certain segments of the general public. These programs have laid a foundation to make the transition from basic education to a call-to-action that motivates and allows for behavior changes. As outlined in the first section, one of the greatest challenges to the program will be to measure behavior changes that actually reduce storm water pollution.

### **Regional Considerations**

With many issues within the 4,070-square miles of the County of Los Angeles being regional in nature, the Permit defines six Watershed Management Areas (WMAs) and calls for the cities within these WMAs to work collaboratively to address education and outreach efforts countywide as well as in their watershed. Currently, many cities have widely differing goals and resources and it is a challenge to forge the co-operative partnerships necessary for Co-permittees to work collaboratively beyond their jurisdictions for the benefit of the entire watershed, and the entire County.

The term watershed management area” is not part of the general public vocabulary and research has indicated that educating the public about simple everyday actions to enable behaviour changes is a more efficient use of funds than educating them on WMAs. This is even more true for the County of Los Angeles which must address six different WMAs -- many of which are concrete channels, not bucolic creeks or rivers.

Given the need to change specific behaviours in order to improve water quality, the Principal Permittee shall provide guidance to Co-permittees to develop outreach programs that focus on the watershed-specific pollutants listed in the current Permit in

Part 4, Section B1 .d. The Principal Permittee will address region-wide pollutants in mass media outreach efforts.

### **What the General Public Knows or Believes**

Based on the Resident Population Final Evaluation conducted in October 2001 for the County by Pelegrin Research Group, the Campaign that ended in 2001 achieved several important milestones including:

- A significant impact on residents specifically targeted with the campaign messages **Neat Neighbours** found the campaign messages more meaningful, thought-provoking, enlightening and motivating than did other segments. **Fix It Foul-Ups** were more likely to remember that the campaign mentioned fertilisers as a harmful pollutant. **Fix It Foul-Ups** were also more inclined to change their behaviour now than they were five years ago, indicating that the campaign had a significant impact on this group's beliefs and intentions.
- The campaign increased general public concern about water pollution.
- The campaign demonstrated success in educating the public about the connection between pollution of storm water and pollution of the ocean.

### **Issues of Importance to the General Public**

Residents are concerned about the aesthetics associated with storm drains including unsightly garbage, unpleasant smells and the resulting attraction of undesirable pests. Pollutants that offend the senses are universally disliked. Cigarette butts are in this category, not only as a pollutant, but because they are perceived as a sign of uncleanness. Garbage in the gutter is seen as both offensive to the eyes and nose as well as a great threat to the environment.

Toxicity and health are also important issues with residents. However, national research,<sup>1</sup> as well as local focus groups,<sup>2</sup> confirm there is a lack of understanding about how certain substances people consider to be harmless actually hurt the environment. In the research and in the focus groups, people thought of dog droppings as "fertiliser" and not connected to bacteria found in stormwater. Leaves and yard trimmings are "natural" and not understood as causing an imbalance in the supply of oxygen in the water needed by marine plants and animals. Lastly, sediment actually smothers aquatic plants, but the public typically thinks of it in terms of being soil -- a basic component of raising food.<sup>3</sup>

<sup>1</sup>*National Geographic*, "Our Polluted Runoff," February 1996.

<sup>2</sup>*Residents and Industry Storm water Awareness, Practices and Communications Report*, -- Focus Groups, Los Angeles County Department of Public Works, conducted by Pelegrin Research Group, November 1996.

<sup>3</sup>*Residents and Industry Storm ivater Awareness, Practices and Communications Report* -- Focus Groups. Ibid.

Many residents fear gutters because of health reasons ... “all the diseases down there.” Avoidance of floods was discussed in focus groups as another reason to keep storm drains clean; however, the segmentation study research indicated that only 27% of the general population are very concerned about flooding. And while runoff from sprinklers was considered wasteful, it was not seen as a potential carrier of pollutants. A few residents, however, made the connection between water runoff and dissolved chemicals that can seep from lawn fertilising and be carried in flowing water to the storm drain.

### **Themes and Messages Targeted to the General Public/Residents**

During previous focus groups, participants were exposed to a series of test themelines and asked to choose the ones they found most compelling. Because general public/residents were less educated about stormwater pollution prevention than the commercial/industry sector participants, they were more attracted to broader themelines (e.g., “You’re the solution. Prevent pollution.”). Abstract themelines (e.g., “Gone, but not for long.” “Can it. Don’t dump it.”) were seen as confusing and meaningless to residents.

The focus groups revealed common threads that can be of assistance in designing the Public Education Program. In addition, segmentation research provided some additional information about what would motivate key targets to change their behaviour. These recommendations are summarised:

- ***Give action-oriented, specific messages.*** Short, specific “do’s and don’ts” are favoured by many because they are unambiguous, implementable and point to tangible practices that can be adopted or changed.
- ***Emphasise personal responsibility and empowerment.*** Messages that indicate that the individual can make a difference are generally motivating and well received. This type of message is uplifting and diminishes the feeling of powerlessness or despair tied to the perception of a rapidly deteriorating environment.
- ***Build on existing aesthetic concerns for the immediate neighbourhood.*** Since the general public is concerned with the offensive effects of urban pollution within their immediate surroundings and neighbourhoods, messages that address such concerns have a wide appeal. The well being of the ocean and beaches, while theoretically important, is not as compelling, especially for those who live away from the coastline.
- ***Build on concerns for children’s future and welfare.*** The need to protect children from dirt and disease within their immediate surroundings is a powerful incentive to maintain storm drains that are clean and free of pollutants.

- **Build on existing knowledge or existing positive practices.** Messages that amplify and connect to existing positive practices are well received. Messages that connect recycling with urban runoff have the potential to build on an existing momentum as well as increasing awareness of specific pollutants. The well-established fear of motor oil can be expanded to other pollutants by establishing a similarity.
- **Build on guilt or shock.** Messages based on guilt or shock are appealing to those who give pollution a low priority or to those who are cynical about the willingness of others to change behaviours.
- **Minimise differences by adopting an overarching approach.** Since there are significant differences in the degree of knowledge and compliance with good practices within the general public audience and between audiences, an overarching message accompanied by different sub-messages can specifically address such differences and be tailored by audiences.
- **Make information easily accessible for those who want it.** Ease and convenience are keys in getting people to change behaviours. Those individuals who express an initial interest in pollution prevention practices should be able to obtain additional information in an easily accessible manner.

## Communications Approach

There is little disagreement that the general public, as a whole, is concerned about the environment and that most people want to “do the right thing.” Research<sup>4</sup> supports this belief and further concludes that “doing the right thing” messages would be well received by some target audiences. The residents in these groups will be motivated by credible messages related to protecting children and would be inclined to act upon basic information about alternative behaviours.

Other general public communications tools -- media relations, public service announcements (PSAs), instructional materials, corporate and entertainment industry tie-ins, community education efforts and events, and the 1(888)CLEAN LA hotline and [www.888CleanLA.com](http://www.888CleanLA.com) web site -- will be planned to work in-concert with the advertising campaign. A single communications tool should not function as a stand-alone component. Working alone, a single component cannot have the impact that a group of well-timed and integrated activities will have on the target audiences. Messages must be heard repeatedly through a variety of tools and applications in order to make an impression and change behaviour.

<sup>4</sup>Los Angeles County Stormwater Segmentation Study, Resident Population. Ibid.

## Snapshot of Activities

1. Advertising
2. Media Relations
3. Public Service Announcements (radio, cable television, print)
4. Instructional Materials Distributed in a Targeted and Activity-Related Manner
5. Corporate/Entertainment Industry Tie-Ins
6. 1 (888)CLEAN LA and [www.888CleanLA.com](http://www.888CleanLA.com)
7. Events Targeted to Specific Activities and Population Sub-Groups

### **Activity 1 Advertising**

#### **Description -- Overview**

The advertising campaign will be “problem/solution”-oriented and designed to communicate using an overarching approach with strong visuals and “how to” messages throughout all media components. Messages will emphasise each person’s ability to prevent storm drain pollution through simple behaviour changes, and potential consequences if behaviours are not changed. All advertising campaigns will include the 1(888)CLEAN LA hotline and [www.888CleanLA.com](http://www.888CleanLA.com) web site, the theme tagline and the signature **Project Pollution Prevention**.

Advertising buys will be planned on an annual basis, and in conjunction with the buy, free media time and space will always be negotiated to maximise reach and dollars spent. Copermittees can help expand the reach of the campaign by contributing to this annual buy to purchase the most media for the money. They can also play an important role in securing local public service announcements and free media opportunities.

#### County Responsibilities -- Activity 1

- Concept and production of advertising campaign
- Develop a strategy to educate ethnic communities and businesses through culturally effective methods
- Adapt advertising to other languages as needed
- Provide artwork on disk or photostat to Co-permittees for local tailoring and placement; provide hard copy or tape of radio advertising with a spot for local identification; provide video PSAs in VHS or beta format.
- Create a countywide media plan; initiate countywide media buy and negotiate PSA placements
- Provide counsel and information to Co-permittees for localising and placing advertising messages within individual cities for pollutant-specific outreach campaigns
- Enhance the existing outreach efforts to residents and businesses related to the proper disposal of cigarette butts

- Organise public outreach strategy meetings for Co-permittees on a quarterly basis.
- Provide guidance to Co-permittees to augment the countywide outreach and education program.

#### Co-permittee Responsibilities -- Activity 1

- Write endorsement/encouragement letters to local radio stations and newspapers supporting and encouraging them to extend or increase usage of PSAs
- Co-ordinate regional and local outreach education to reduce duplication of efforts.
- Follow the media guidelines above to take advantage of the research already conducted with County residents.

### **Activity 2    Media Relations**

#### **Description**

A successful education and outreach program will require the support of print and electronic media to report on the activities of the program and communicate “how to” messages to residents. Components of a comprehensive media relations program that will ensure the media receives accurate, timely information include:

- media kit
- media releases and advisories
- fact sheets, issue papers, update reports, feature articles, case studies
- editorial board meetings and press briefings
- community/public affairs talk shows
- on-line reporting

Many of the collateral materials developed for the General Public/Residents, School Programs, and Corporate Outreach will be included in media information kits along with specific, localised information from the Co-permittees.

Reporters will be approached with relevant stories timed to coincide with the advertising campaign, seasonal activities and other events planned within the Public Education Campaign. For example, media releases and advisories update the media on new information, specific program elements, upcoming meetings and activities, and are normally followed by a telephone call to pitch the story. Issue papers will be used to highlight and analyse a specific aspect or topic, provide an expert opinion, and/or propose solutional measures. Update reports are results, successes and/or failures of certain programs, pollution monitoring, regulatory measures enacted; in essence, the “State of Storm Water.”

## **Description -- “Guide to Local Media Relations”**

Each Co-permittee will receive an updated “Guide to Local Media Relations” that provides the following “how to” information for working with media in their individual communities:

- tips for working with local print and electronic media
- tips for communicating/pitching stories and the types of stories/opportunities to be on the lookout for
- format and examples of media releases, advisories, fact sheets
- distribution practices/policies
- protocol for media interviews
- how to place public service announcements

## **County Responsibilities--Activity 2**

- Create and produce overarching media kit cover and enclosure information. Media kit cover available for Co-permittee purchase through “group printing” system
- Update a countywide media contact/outlet database
- Update media lists, information, case studies; main source of countywide media information
- Develop and implement annual countywide media relations plan
- Distribute “Guide to Local Media Relations”
- Produce appropriate artwork photostats

## **Co-permittee Responsibilities -- Activity 2**

- Provide local media contacts/outlets for database
- Use the “Guide to Local Media Relations” to implement local media relations

## **Description**

A Public Service Announcement (PSA) is defined by its message, not whether it is free or paid. In reality, a PSA can be either a paid spot or a free spot, and its definition reflects the fact that the message is not based on a product sale, but is a service or information provided in the public interest.

While the ultimate goal of a PSA is to have it placed pro bono (free), it is sometimes necessary to pay for the spot, possibly at a reduced rate, to ensure a strong air time or specific newspaper section targeted to the primary audiences. Advertising media negotiated for PSAs will be based on the results of the research and supported by budgetary parameters.



### **County Responsibilities -- Activity 3**

- Development and production of PSAs
- Distribute PSA templates, copy, tape to Co-permittees for local placement
- Negotiate countywide PSA time and placement
- Track and evaluate PSA placement

### **Co-permittee Responsibilities -- Activity 3**

- Play broadcast PSA on city news outlets or cable station and place print PSA in city newsletter
- Provide information about PSA placements or local ads to County for reporting to the Regional Board

#### *Optional*

- Negotiate PSA time and space in the local market

### **Activity 4 “How To” Instructional Materials Distributed in a Targeted and Activity-Related Manner**

#### **Description**

In the focus groups, general information brochures were rated very low by the general public, mainly due to the time it takes to read them. However, in keeping with the “problem/solution” communications approach, “how to” instructional materials can prove valuable if the information is simple -- stating the problem and a personal, easy solution - -and is distributed in a manner that makes the material meaningful and increases the probability that the recipient will actually read the piece.

“How to” instructional materials should be produced to correspond with the advertising campaign and seasonal activities. For example, during the Spring and Summer, lawncare tip cards can be distributed through nursery/garden stores, garden and horticultural clubs, botanical gardens, lawncare services and homeowners associations.

The basis of the information for the tip cards should be the BMP fact sheets and the many excellent brochures that already exist, having been prepared by the County program or by individual Co-permittees. Technical information and other educational materials will be adapted for general public understanding and relevance.

### **County Responsibilities --Activity 4**

- Determine ‘how to’ materials to be developed and develop format of each
- Write copy for materials and obtain technical and information approvals

- Design and produce materials. Ensure availability of materials to Co-permittees through “group printing” system
- Develop and implement countywide distribution plan

#### **Co-permittee Responsibilities -- Activity 4**

- Obtain materials through the “group printing” system and distribute through local channels
- Provide input on “how to” materials needed, preferred formats, or distribution methods.
- Provide data about materials distributed to County for reporting to the Regional Board

#### **Activity 5 Corporate, Community Association, Environmental Organisation and Entertainment Industry Tie-ins**

##### **Description**

Partnerships with corporations and businesses, environmental organisations and the entertainment industry are essential to reach audiences on a variety of levels. In many cases, messages tied-in to these types of organisations have more credibility and therefore more potential to be effective. Relationships and partnerships with corporations, environmental organisations and the entertainment industry can expand the message distribution avenues and activities, and supplement program budgets through the following:

- Personal and business endorsements
- Cooperative traditional and non-traditional advertising in the consumer marketplace
- Information distribution through POP displays, product neck-hangers, mailings, tip cards
- Sponsorship of community events and special activities
- Celebrity spokespersons to media and at events
- Special messages on established product packages (e.g., Northern California Coca-Cola and Sprite cans carrying a storm water awareness message and a 1-800 information number, Spring/Summer 1997)

##### **County Responsibilities -- Activity 5**

- Identify countywide corporations, environmental and entertainment industry organisations. Develop and maintain database
- Solicit and implement countywide partnerships
- Provide materials (i.e., advertising, POP display materials, tips cards) as needed for mailings, information counters, ad placement, etc.
- Develop specific materials co-sponsored with corporations and organisations

### **Co-permittee Responsibilities -- Activity 5**

- Identify and pursue any appropriate local partnerships with corporations, and community and environmental organisations to assist in distribution of stormwater education materials. Templates for local tailoring or materials for purchase are available through the County's "group printing" system.
- Utilise the "Guide to Local Partnerships"
- Support the countywide efforts with a local "thank you" to stores/partners in the local community. Have a telephone conversation with and send a letter to the participating store manager/partner.

### **Activity 6 1(888)CLEAN LA and www.CleanLA.com**

#### **Description**

The County of Los Angeles currently advertises and operates 1(888)CLEAN LA and 888CleanLA.com to disseminate information about programs throughout the County. Although some of the Co-permittees have their own hotline numbers, the 888Clean LA resources will continue to list programs available to all residents. Providing one number to call instead of a different one for each jurisdiction is what makes it possible to do mass media advertising and include a number as a call to action. The County's 24-hour hotline number allows callers to find out about household hazardous waste roundups and used oil recycling, as well as serving as the general public reporting contact for reporting clogged catch basins and dumping and illicit discharge violations as required by the Permit. The County has placed this phone number in all appropriate telephone directories.

The County infrastructure capability and capacity of the 1 (888)CLEAN LA phone number makes it able to handle thousands of calls per day. Co-ordination between the County and the Co-permittees with individual hotline numbers is important for dissemination of consistent information and call handling. Many cities use the 888 number and www.888CleanLA.com web site to provide information for their residents.

#### **County Responsibilities -- Activity 6**

- Operate effectively and continue to expand the information provided by the 1 (888)CLEAN LA hotline and www.888CleanLA.com web site
- Promote 1 (888)CLEAN LA through as many vehicles as possible
- Provide a list of reporting contacts from all Co-permittees to the general public through the www.888CleanLA.com web site.

## Co-permittee Responsibilities -- Activity 6

- If a Co-permittee hotline already is in operation, it should be reviewed and updated once annually to ensure that it is easy for the public to use and contains accurate information
- Provide contact information for staff responsible for storm water public education activities to the County and notify the County of changes to contact information no later than 30 days after a change occurs.
- Provide hotline and website data to County for reporting to the Regional Board
- Coordinate the listing of the County's hotline number or city hotline number in public information, and the government pages of any local telephone books as they are developed or published.

## Activity 7 Events Targeted to Specific Activities and Population Sub-Groups

Events can serve as focal points for the diverse communities within the County of Los Angeles and they bring added dimension to the Public Education Plan when incorporated with other communications components. Events provide an opportunity for people with similar interests and a positive inclination to do the right thing to gather and gain "how to" information about preventing storm water/urban runoff pollution.

Samples of potential events include:

Event	Pre-Qualified Population
<ul style="list-style-type: none"><li>• Already-scheduled County and local household hazardous waste round-ups</li></ul>	Attending residents are already doing the right thing by recycling HHW, and most are likely to take another step in pollution prevention if handed simple "how to" information as they drive through the round-up.
<ul style="list-style-type: none"><li>• Cleanup/beautification campaigns (i.e. Coastal Cleanup, neighbourhood cleanups, tree-planting)</li></ul>	Residents are already demonstrating their willingness to do the right thing by volunteering to make a community beautiful. If given information in conjunction with this type of event about simple things to do at home or work, these people are most likely to take another step in pollution prevention.
<ul style="list-style-type: none"><li>• Community fairs and festivals</li></ul>	Fairs and festivals targeted to neighbourhoods where specific issues have been identified and can be addressed.
<ul style="list-style-type: none"><li>• Large events (e.g., Earth Day Celebrations, LA Times Festival of Books, LA County Fair)</li></ul>	These events normally attract people who either are already participating in some form of pollution prevention/recycling activities or belong to one of the two primary target audiences.
<ul style="list-style-type: none"><li>• Ethnic Events (i.e., Cinco de Mayo, Fiesta Broadway)</li></ul>	Latino events are a potential means of reaching the Neat Neighbours, Fix It Foul-Ups and particularly the Rubbish Rebels, who are an important audience due to the amount of pollution they create but need a customised message and theme.

## County Responsibilities - Activity 7

- Determine the most cost-effective countywide events to participate in
- Distribute potential event information to Co-permittees on a regular basis

- Collaborate with Co-Permittees on countywide event participation whenever possible
- Distribute Co-Permittee materials at events attended whenever possible

### **Co-permittee Responsibilities - Activity 7**

- Provide local event data to county for reporting to the Regional Board
- Participate in countywide events
- Target local events and participate on a city-level

## **CORPORATE OUTREACH**

### **Situation Analysis Overview**

For the corporate and business communities many of the salient points of the general public apply. The corporate community as a *whole* needs more information and better knowledge of good, anti-polluting business practices. Best Management Practice (BMP) materials and training materials provide basic education and specific industry-related information and “how to activities that are meaningful and motivate corporate management to implement BMPs.

### **Target Audiences**

The target audiences for this outreach are all gas stations and restaurant chain executives within the County. Additional target audiences may be added.

### **Compliance Can Be As Easy As “Good Housekeeping”**

In many instances, implementing BMPs is a simple matter of good housekeeping. However, the degree of thoroughness and completion is impacted by time, convenience and equipment. Also impacting BMP compliance is training the appropriate personnel—management as opposed to the workers who are most responsible for basic housekeeping jobs such as cleaning, disposal of waste, tidying areas and putting things in proper places. The high rate of turnover in many industries and the consequent need for ongoing training can be a burden to businesses.

### **Community Reputation**

A company’s or business’s desire to continue to enhance its good reputation within the community can provide a strong motivator in complying with BMPs -- particularly if the company can tap into a customer base that shows a preference for doing business with an environmentally friendly enterprise. In order to take advantage of this motivator, appropriate publicity for compliant businesses should be part of the plan.

## **Threats to Compliance**

While some BMPs are as easy as good housekeeping, others can be more difficult to implement. There can be increased costs of doing business with some BMP implementation, especially when a business lacks the specialised equipment or the facility set-up, and can't afford the cost of obtaining this equipment. Costs of compliance would be passed on to the customer in higher charges. These can decrease a business' competitiveness. The challenge is compounded when established businesses that have always done business a certain way are expected to implement changes that cost money.

## **Reasons for Adherence to BMPs**

According to focus group findings, individuals in the business sectors follow waste disposal rules for a variety of reasons:

- personal safety
- fear of fines and penalties
- fear of exposure to carcinogenic materials
- customer expectations

# **CORPORATE OUTREACH**

## **Communications Approach**

The corporate outreach component of the Public Education Plan is intended to be practical, efficient, and good for businesses as well as the environment in the County of Los Angeles. The activities described in this section will meet the requirements of the NPDES Permit and work within the parameters of the Model Programs.

The communications activities for corporate audiences also will take into account that many County of Los Angeles gas stations and restaurants are trying to do the right thing, but have achieved limited success because of the lack of funds and/or a misunderstanding of their own potential to pollute. Education activities implemented in the General Public/Residents Audience will have a spillover effect on the individuals working in the targeted industries.

## **Snapshot of Activities**

1. Develop collateral materials and implementation plan for corporate managers
2. Other Educational Printed Materials (Posters, Signage)
3. Advanced Technology and Telecommunications

Note: The County will continue to develop and offer to Co-permittees modular BMP “how to” materials and specific BMP fact sheets-by-industry for purchase at a nominal fee to cover printing costs.

## **Activity 1 Implementation Plan for Corporate Managers**

### **Description**

The County will develop an implementation plan for outreach to corporate managers that will include information, collateral materials and BMPs for gas stations and restaurants.

### **Distribution – Activity 1**

- Through meetings and workshops scheduled with corporate managers
- 1(888)CLEAN LA and [www.B88CleanLA.com](http://www.B88CleanLA.com)

### **County Responsibilities -- Activity 1**

- Communicate and inform corporate management of the importance of complying with storm water regulations
- Distribute and discuss educational materials regarding storm water pollution and BMPs
- Provide managers with recommendations to motivate employees to comply with storm water regulations.

## **Activity 2 Other Educational Printed Materials**

### **Description**

The purpose of posters, flyers, signage and other similar printed materials is to relay relevant information about storm water/urban runoff BMPs in a graphic format that is space-effective and can be understood at a glance. These materials are typically displayed in high-traffic areas of businesses, so information can be viewed by employees repetitively, reinforcing the messages.

Factors to consider when selecting or developing BMP posters, flyers and signage are:

- Illustrations that are striking and show BMPs so well that only a short caption or written explanation is required
- Information that is fundamental, rather than in-depth or detailed
- Information that is reflective and supportive of the BMPs developed by the Model Programs
- Size of the material should take into account the potential of limited available space



- Production of the materials should take into account interior or exterior (weather-proof) posting and should be easily movable if the job is progressive
- Languages -- the most frequently used languages are English, Spanish and Chinese

### **Distribution -- Activity 2**

- Gas Station and Restaurant Corporate Offices
- 1(888)CLEAN LA and [www.888CleanLA.com](http://www.888CleanLA.com)

### **County Responsibilities -- Activity 2**

#### **Description**

- Make existing posters (food and restaurant industry, auto repair, gas station) available to corporate managers
- Develop additional posters for the target audiences
- Provide appropriate language translation/interpretation as needed

### **Activity 3 Advanced Technology and Telecommunications**

#### **Description -- 1 (888)CLEAN LA and [www.888CleanLA.com](http://www.888CleanLA.com)**

The County of Los Angeles currently advertises and operates 1 (888)CLEAN LA and the [www.888CleanLA.com](http://www.888CleanLA.com) web site. The County's 24-hour hotline number allows callers to find out about household hazardous waste roundups and used oil recycling as well as to report clogged catch basin inlets, and dumping and illicit discharge violations. The web site offers this information online as well as additional information that cannot be accommodated by a telephone system.

The County infrastructure capability and capacity of the 1(888)CLEAN LA phone number makes it able to handle thousands of calls per day.

Co-ordination between the County and the Co-permittees with individual hotline numbers is important for dissemination of cohesive information and call handling.

### **County Responsibilities -- Activity 3**

- Include these resource web sites in the County News Bureau
- Operate effectively and continue to expand the information provided by the 1 (888)CLEAN LA hotline number and [www.888CleanLA.com](http://www.888CleanLA.com) web site
- Promote 1 (888)CLEAN LA and [www.888CleanLA.com](http://www.888CleanLA.com) through as many vehicles as possible (media relations, flyers, posters, advertising, etc.)

# School Education

## Situation Analysis Overview

While there is little existing statistical information on children and their polluting and pollution prevention behaviours, it is generally accepted that children are commonly the trend sellers or “influencers,” the people who break ground for the widespread changes of the future. For example, children have been the critical players in the education/action process for the recycling movement. Recycling activities that are conducted in the classroom and schoolwide, either curriculum projects or as fund-raisers, almost always translate into direct or indirect parental involvement. Either the parent has to collect glass, aluminium or plastic for their children to take to school, or they are reminded by their children during the course of normal family life to recycle that glass, aluminium or plastic bottle.

While children have been very successful home messengers for recycling; in reality, they don't naturally segment environmental issues into individual topics like recycling, used oil or water pollution. Teachers and other adults tend to do that and present them as specific topics —sometimes in a related context and sometimes as separate subjects presented throughout the year. Pollution prevention should be taught to children as a single overarching topic and reinforced as such throughout the year.

## Curriculum Challenges

The challenge faced by Los Angeles County and its Co-permittees -- the same challenge found with the General Public audience -- is to rise above the clutter and become known for materials that are teacher-useful and student-helpful. This means the materials must be:

- linked to State Standards for education;
- fun and enjoyable;
- flexible with supportive resources
- appropriate for specific grade levels;
- doable within potentially limited classroom budgets, resources, and time;
- expandable beyond the curriculum and the classroom; and,
- contain practical and usable information that can be interwoven into science, math, art and other curriculum subjects for greater reach and re-enforcement.

The effectiveness of the school education program will be reinforced by the materials, activities, the “messenger,” and its ability to carry beyond the classroom. This is particularly true when activities can be developed that require family involvement and that tie back into and support programs within the General Public/Residents. There is a

vast amount of high-quality curriculum existing. Every effort should be made to use what has been developed by professional educators rather than creating new amateur curriculum.

## **Youthful Motivation**

Information from teachers indicates that children in the K-3 grades have the most natural curiosity and are the most motivated and enthusiastic to carry messages home, and to share activities with their parents or guardians. As children get older --4th through 7th grades -- they more often share ideas and activities with their peers than with their parents, and curriculum activities should reflect this inclination. Activities have been designed for teams or groups of youth so they are part not only of the implementation process, but also in decision making and have some form of control over the final result. These children also can become team peer teachers, presenting their projects and accomplishments to the children in the lower grades. High school students require a different focus. While most are more concerned about themselves and their future, this self-interest can be translated into environmental "lessons" through service learning projects.

## **The Los Angeles County School System**

The 1,650 public schools, 1,320 private **schools and 2 percent home-taught student** population in Los Angeles County make the diversity of this population as daunting as the general population. Added to this challenge are the restrictive budgetary parameters that prevent schools from doing many of the basic educational activities they would like to do. This situation is complicated by the bureaucratic approval process to implement new programs even when funding is supplied.

## **SCHOOL EDUCATION -- GOALS**

- Introduce and initiate an anti-pollution ethic at an early age that will carry through to adulthood and to future generations.
- Develop (or integrate) this ethic into an umbrella pollution program that can be implemented with various grades of school children.
- Provide information to school districts about environmental/stormwater education resources.

## **Communications Approach**

Given the existence of current and successful school education programs in the

County of Los Angeles, an alliance with one or more of these programs is the most efficient and cost-effective method of communicating with school children.

More than 945,000 elementary school children are enrolled in County of Los Angeles schools. For these K-6 children, the County's school program and co-ordinating youth events will provide the vehicles to teach pollution prevention activities. For the County's more than 800,000 middle- and high school children, the Secondary Student Environmental Education Program (SSEEP) will create a higher understanding of environmental issues and motivate teenagers to take action.

Both of these programs encompass a variety of environmental subjects, including storm water pollution. The subject content is in keeping with the findings of the focus group research and segmentation study which concluded that the education emphasis should be on providing practical, "how to" information rather than an analysis of the storm drain system.

#### County Responsibilities -- School Education

- Examine all existing, comprehensive school programs and develop an alliance with the programs best suited to meet the Public Education Plan and NPDES goals and objectives:
  - integrate multiple environmental messages (e.g., recycling, water pollution, solid waste)
  - expand beyond the curriculum and classroom
  - utilise program activities/format that already has been approved by the schools and teachers
  - take into account potentially limited classroom budgets, resources and time provide schools within each School District in the County with storm water pollution prevention educational materials to educate a minimum of 50% of all school children (k-12) per Permit requirements
  - utilise Regional-Board approved methods to measure the effectiveness of in-school education programs

#### Co-permittee Responsibilities -- School Education

- Encourage local school districts/systems to take advantage of selected Countywide programs
- If jurisdictions implement their own school program, inform the County to prevent the duplication of efforts and wasted resources.
- Provide information to the County about other school programs offered for reporting to the Regional Board. Programs provided by jurisdictions should meet Permit requirements.

*Note:*

Co-permittees will not be responsible for distribution of materials to public or private schools within their respective jurisdictions unless they choose to do so.