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# **RP664: Model agreements for sustainable water management systems**

## **Review of existing legislation**

April 2003

Version - Final

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## Abbreviations

<b>Term</b>	<b>Meaning / Definition</b>
BCDMH	Bromo-Chloro-Dimethylhydantoin
BOD <sub>5</sub>	Biochemical Oxygen Demand (5 day)
BSRIA	Building Services Research and Information Association
CDM Regulations	Construction, Design and Management Regulations
CIRIA	Construction Industry Research & Information Association
COSHH	Control of Substances Hazardous to Health
DEFRA	Department of Environment, Food and Rural Affairs
DTI	Department of Trade and Industry
DWI	Drinking Water Inspectorate
EA	Environment Agency
EAWR	Electricity At Work Regulations
NAW	National Assembly for Wales
NTU	Nephelometric Turbidity Unit
ODPM	Office of the Deputy Prime Minister
OFWAT	Office of Water Services
PPG	Planning Policy Guidance
SUDS	Sustainable Drainage Systems
UDP	Unitary Development Plan
USEPA	US Environmental Protection Agency
WRAS	Water Regulations Advisory Scheme

## **Executive Summary**

The promotion of Sustainable Drainage Systems (SUDS) and water re-use systems provides tremendous benefits in terms of water efficiency, cost savings and environmental and amenity improvements. However, the lack of provision for these technologies within existing legislation has been a barrier to their implementation. This report summarises and comments upon existing legislation with reference to SUDS and rainwater / greywater use systems and is focused on legislation that is relevant to England and Wales.

With respect to SUDS, this concentrates primarily on the provisions of the Town and Country Planning Act, the local Government Act and the Water Industry Act. This legislation sets out powers for local authorities to carry out maintenance of SUDS systems and to receive payment for these activities.

With reference to rainwater / greywater use systems, there is little legislation currently governing their implementation or the quality of the water supplied. There are a number of guidelines which provide information about the quality of water for rainwater / greywater use systems. These are mostly based on microbial standards but also in some cases provide information about esthetic parameters. Ideally this will be transferred into an acceptable standard in the future.

## Introduction

Surface water disposal has long been an often neglected material consideration to be taken into account by local planning authorities and others. It is now understood that SUDS and rainwater / greywater use systems can contribute to sustainable development through the provision of land available for amenity use, habitat creation and conservation of water resources. SUDS are designed to mimic natural drainage patterns, controlling surface water pollutants and runoff at source.

The benefits of reusing water are also only recently becoming understood on a wide basis in the UK, with potential savings in raw water and discharge requirements. The Environment Agency recently investigated the topic and found that:

- Rainwater use systems are appropriate for non potable uses such as WC flushing and garden watering. In time this could be extended to a much wider range of applications, particularly for new developments.
- Rainwater / greywater use systems can reduce demand by up to 33% of daily household water use.
- Safety of any rain, grey or black water use system is important, with potential risk coming from contact with water that has not been correctly treated and disinfected.

The primary drivers for rainwater / greywater systems in the UK are economic. The benefits to any recipient of these systems are in a reduction in metered charge, so it is clear that re-using water will only bring economic benefits where water is paid for by volume. As the proportion of properties with meters gradually increases, the benefits will over time become more widely available. Unlike SUDS, where the technology is both available and proven, the technology for re-using water is relatively new to the UK although some examples have demonstrated the economic benefits and practical nature of this technology.

There is an existing environmental and development control framework for the use of SUDS and rainwater / greywater use systems, but perceived and actual issues prevent their uptake on a wide scale. The incentives for the Local Authority and developer need to be considered. Authorities have seen schemes fail due to lack of maintenance, unclear responsibilities and a deficit of funds. Developers may not understand the overall cost benefit of SUDS and rainwater / greywater use systems and calculation of commuted sums when asked for may have not been based on clear objectives and formulae. However, investment in research and the development of demonstration projects has shown that SUDS are effective in providing a more sustainable method of surface water drainage than traditional systems. Further information about the effectiveness of rainwater / greywater use systems is available from CIRIA, the Environment Agency and others.

This report describes current legislation and government policy towards SUDS and rainwater / greywater use systems. The existing legal framework has been examined and the report suggests how local authorities can use their existing powers to achieve meaningful SUDS development and enforce their implementation.

The term 'adoption' is used in legislation such as the Water Industry Act 1991 to define the method of transferring ownership of water infrastructure to a statutory body (such as a Local Authority or Water Company). The infrastructure is constructed to a standard agreed by the statutory body. Various mechanisms may be put in place to provide future revenue for maintenance of the infrastructure, including the payment of a one-off sum when a property is connected to the public sewer and annual sewerage charges thereafter. In this document the word 'adoption' is not used in the sense of adoption under the Water Industry Act 1991 or the Highways Act 1980.

This report is not intended to be an all encompassing definitive exposition of the law but it seeks to explain how the current framework can work. In the future, better ways through legislative changes may be available to provide the required results. However, this report concentrates on the present and the provisions of current legislation rather than the future. It seeks to build on the technical design work carried out and advocated by others such as CIRIA, the Environment Agency, the Highways Agency, Water Companies and other research organisations.

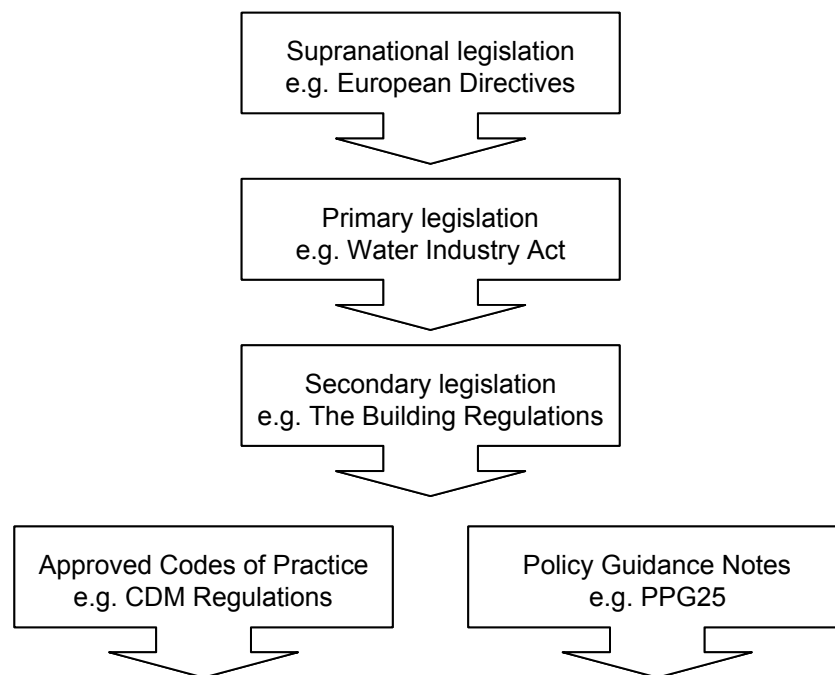
The law as stated was in force on the 1st December 2002.

## Relevant Legislation

There is a hierarchy of legislation in England and Wales which is shown schematically in Figure 1. This can be summarised as follows;

- Supranational legislation such as EU Directives (e.g. The Water Framework Directive). These do not form legislation in themselves but Member States are required to enshrine the Directives into national legislation.
- Primary legislation such as the Water Industry Act. These are Acts of Parliament, which set out the legislation relevant to a particular topic.
- Secondary legislation such as The Building Regulations.
- Approved Codes of Practice such as the CDM Regulations. Codes of Practice are an interpretation of the legislation, setting out how it should be followed. These are recognised in law and describe how the law is to be interpreted. If a Code of Practice is not followed, it is the duty of those involved to show that the procedures followed are at least equal to those set out in the Codes of Practice.
- Policy Guidance notes such as PPG25. These set out Government thinking and policies and in planning terms are the policy successors to circulars. As such the weight of these policy guidance notes is material for local authorities in preparing development plans and in the determination of individual planning applications and appeals.
- Technical Guidance notes such as CIRIA design guidance. These are not mandatory but represent best practice, often forming part of a technical specification.

Figure 1 : Hierarchy of existing legislation



The following legislation is reviewed in this report.

Primary legislation

- The Water Industry Act, 1991
- The Town & Country Planning Act, 1990
- The Highways Act, 1980
- The Health & Safety at Work Act, 1974

Secondary legislation

- The Building Regulations
- The Water Supply (Water Fittings) Regulations, 1999
- The Electricity at Work Regulations, 1989

Approved Codes of Practice

- CDM Regulations 1994

Policy Guidance Notes

- PPG3 Housing
- PPG23 Planning and Pollution Control
- PPG25 Development and Flood Risk

Technical Guidance

- Rainwater and greywater use in buildings (CIRIA C539, PR80)
- Sewers for Adoption v5
- Sustainable urban drainage systems – design manual for England and Wales, CIRIA (C522)
- WRAS (Water Regulations Advisory Scheme) Information and Guidance Notes nos;
  - 9-02-03 Conservation of Water
  - 9-02-04 Reclaimed Water Systems
  - 9-02-05 Marking and Identification of Pipework for Reclaimed (Greywater) Systems

There are several clauses from the above legislation which set out agreements which are often quoted in relation to drainage systems and adoption. These are summarised in Table 1 below.

*Table 1: Summary of common terms*

Section	Act	Description
38	Highways Act	Adoption of highway drainage
104	Water Industry Act	Adoption of works by the statutory undertaker
106	Town & Country Planning Act	Planning obligation for restricting development

## **SUDS working group**

A SUDS working group has been established to address the perceived issues impeding the widespread use of SUDS in England and Wales. It includes representatives from:

- Office of the Deputy Prime Minister (ODPM)
- Department for Environment, Food and Rural Affairs
- National Assembly for Wales
- Office of Water Services
- The Water Industry
- Local Government Association
- Planning Officers Society
- Highway Authorities
- Environment Agency
- English Nature
- CIRIA
- House Builders Federation

The group aims to formulate proposals for a core set of standards and agreements between those public organisations with statutory or regulatory responsibilities relating to the disposal of surface water. Specific matters to be covered will include design standards, legal issues, planning, regulation and consents, maintenance responsibilities and ownership. The consultation draft is expected in early 2003, when wide consultation with relevant key organisations is expected. This should lead to an agreed code of practice. A longer term aim for the group is to develop a document on the lines of Sewers for Adoption, perhaps to be called “SUDS for Adoption”.

## Regulation

Regulation of the Water Industry and the water environment in England and Wales is provided by a number of different bodies. These are summarised in Table 2, together with a brief description of their function.

Table 2 : Summary of water regulators and their function

Name	Function	Authority
Environment Agency	<p>The Agency aims to protect and enhance the environment and to make a positive contribution towards sustainable development in England and Wales.</p> <p>Water management functions of the Agency include:</p> <ul style="list-style-type: none"> <li>- Water resources regulation and planning</li> <li>- Water quality regulation and planning</li> <li>- Flood defence and drainage, maintenance and operations in statutory main rivers.</li> </ul>	<p>Powers and duties set out under the Environment Act 1995 and related legislation. Regulation and executive action on water resources, land, water and air quality, flood and coastal defence and flood warning, waste management, navigation, conservation, fisheries and recreation.</p>
Internal Drainage Boards	<p>Drainage and flood defence for low-lying land in England and Wales.</p> <p>Regulation of watercourses apart from designated main river.</p>	<p>Set out in the Land Drainage Acts 1991 &amp; 1994 covering: maintenance, improvement and operation of drainage systems, conservation and revenue raising.</p>
Local Authority Drainage Departments	<p>Drainage, flood alleviation and regulation of watercourses apart from designated main river.</p>	<p>Particular responsibilities in Drainage Districts. Set out in the Land Drainage Act 1991.</p>
Highways Agency	<p>Maintenance and improvement of trunk road and motorway network in England, minimising its impact on the natural environment.</p>	<p>Executive Agency of the Department for Transport for England only. The National Assembly of Wales is responsible for the highway network in Wales.</p>
OFWAT	<p>Economic regulation of the water supply and sewerage companies in England and Wales. Ensuring that customers interests are protected.</p>	<p>Established under the Water Act (1989).</p>
DWI	<p>DWI assesses and regulates drinking water quality in England and Wales. DWI checks that the water supply companies supply water that is safe to drink and meets the standards set in the Water Quality Regulations.</p> <p>Technical audits of each water company include:</p> <ul style="list-style-type: none"> <li>- annual assessments of drinking water quality</li> <li>- inspection of individual water companies.</li> </ul>	<p>The Secretary of State for Environment, Food and Rural Affairs, and the NAW have powers and duties in the Water Industry Act (1991) to regulate the quality of public drinking water supplies.</p> <p>DEFRA and the NAW have delegated drinking water quality enforcement and prosecution powers to the Chief Inspector to act on their behalf. DWI has a duty to require water companies to take action to address failures to meet standards.</p>
ODPM	<p>Oversee the Planning System in England; responsible for Policy, research, approval of plans and major planning decisions.</p> <p>ODPM issues:</p> <ul style="list-style-type: none"> <li>- Planning Policy Guidance,</li> <li>- Minerals Planning Guidance</li> <li>- Regional Planning Guidance.</li> </ul>	<p>Deputy Prime Minister responsible to Cabinet and Parliament.</p> <p>Junior Ministers with responsibilities for Transport, Housing, Local Government etc.</p> <p>Must be notified of Plans before adoption and certain planning applications.</p>

## Sustainable Water Management Systems

Sustainable water management systems can take many forms. For the purposes of this legislative review these are separated between;

- Sustainable Drainage Systems (SUDS)
- Rainwater / greywater use systems

### SUDS

Examples of SUDS are;

- Filter strips and swales. These are vegetated landscape features with smooth surfaces and gentle downhill gradient to drain water evenly off impermeable surfaces, mimicking natural drainage patterns.
- Filter drains and permeable and porous pavements to allow water to be stored underground prior to discharge.
- Infiltration devices - below ground or surface structures to drain water directly into the ground.
- Basins and ponds - e.g. balancing ponds, lagoons and wetland/reed beds.

Descriptions of SUDS techniques, design and the issues around them are clearly set out on the CIRIA website ([www.ciria.org.uk/suds](http://www.ciria.org.uk/suds)), together with design guidance and a best practice manual.

Special precautions should be taken in areas which are particularly sensitive, either for their groundwater, surface water or ecological resource. There may be particular requirements with regard to drainage and the control of pollution which should be discussed and agreed with the Environment Agency and English Nature. The inclusion of these special requirements should protect the resources that are either present on site at the time of development or where valuable habitat is created as a consequence of the environmental enhancements.

Careful design and planning should be applied to SUDS and other sustainable water management systems and should take into account site specific factors. For example the EA's Policy and Practice for the protection of Groundwater<sup>1</sup> would prohibit certain systems in groundwater protection zones<sup>2</sup>. More information about Groundwater Protection Zones is available on the Environment Agency website ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)) under Water Resources, groundwater.

Section 104 of the Water Industry Act<sup>3</sup> allows for a statutory undertaker to adopt the works and vest them in the undertaker. In this case the undertaker needs to determine if the design meets operational and maintenance requirements, a standard set by Sewers for Adoption. Current legislation therefore allows SUDS to be adopted only if they are legally sewers. SUDS combine amenity and environmental benefits with their drainage function, so often will not fully meet these requirements.

This legislative review examines options for Model Agreements within existing legislation to allow promotion of their wider uptake. This is primarily through the provisions of the Town and Country Planning Act 1990<sup>4</sup>. In such cases the consenting authority would be part of the relevant agreement.

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<sup>1</sup> Policy and Practice for the Protection of Groundwater, Environment Agency 1998

<sup>2</sup> Groundwater Regulations SI 2746/1998

<sup>3</sup> Water Industry Act 1991 (1991 c56)

<sup>4</sup> Town and Country Planning Act 1990

## Rainwater / greywater use systems

Examples of rainwater / greywater use schemes are;

- Rainwater use for irrigation or non-potable internal domestic use
- Greywater (and potentially black water) use for irrigation or non-potable internal domestic use

Rainwater systems usually employ a collection tank to store untreated water from roofs and paved areas prior to distribution via a separate supply system to the point of use. In its most basic form, a rainwater butt is an example of rainwater use, although it is possible to use rainwater for a range of other activities such as to flush toilets. Rainwater collection and use is not technically ‘re-use’ as the raw product has not been used before, although it is often referred to in this way.

Greywater systems use a dedicated collection network to draw water from sinks, showers, baths and washing machines (though not usually kitchen sinks or dish washers). Water is then treated and returned for uses such as toilet flushing. Rainwater and greywater systems may be combined, however in these cases any overflow from the collection point should direct greywater to the foul sewer and rainwater to the surface water sewer. More information about this is provided by the Environment Agency leaflet ‘ Making the right connection’<sup>5</sup>.

Black water systems collect all waste water from houses or offices and employ a more complex treatment process to ‘polish’ the water before returning it via a dedicated network. Because supply always exceeds demand in black water systems it is possible to extend the applications of the reused water to irrigation and communal water features. Some discussions have centred around the use of black water for washing machine supply although this is not currently recommended practice for reasons of possible bodily contact.

There is in theory nothing to stop rain, grey or black water use systems from being used in any application, subject to the appropriate treatment. Much work has been carried out on the relative merits of each system. In general each type of system has a particular niche where it is most effective and where examples actually exist. Table 3 below shows common domestic applications and ownership routes, which are not necessarily those recommended as most effective. Larger industrial scale water re-use projects have been implemented successfully in the UK, for example the Wessex Water headquarters at Claverton Down (see [www.wessexwater.co.uk](http://www.wessexwater.co.uk) for more information).

Table 3 : Common domestic applications of rainwater / greywater use systems<sup>6</sup>

System	Population served	Ownership	Maintenance
Rainwater	2 – 5	Domestic ownership	Usually as part of general building maintenance
Greywater	2 – 25	Domestic ownership, or direct by hotel/office owner	Usually as part of general building maintenance
Blackwater	250 – 2500	Joint venture company or water undertaker (as inset)	Through contract with skilled maintenance contractor

There are examples throughout the UK where rainwater is stored in lagoons and used for irrigation, but for the purposes of this report rainwater use shall be considered as applying to domestic or hotel / office applications only.

<sup>5</sup> Making the right connection, Environment Agency leaflet

<sup>6</sup> Ward M; M.Phil thesis, 2001Cranfield University

## Government Policy

### SUDS

Government Policy on SUDS is clear in PPG25, Development and Flood Risk<sup>7</sup>.

*"...early consideration at all levels of the planning and development process can lead to opportunities for more imaginative and attractive developments."*<sup>8</sup>

Promotion of SUDS is advocated through the planning process by;

- *"incorporating favourable strategic policies within regional planning guidance and structure plans*
- *adopting detailed policies for promoting sustainable drainage systems in local plans*
- *persuading developers to adopt sustainable drainage systems wherever practicable, as part of all future development, if necessary through the use of appropriate planning conditions or by planning agreements; and*
- *developing joint strategies with the sewerage undertaker and the Environment Agency to further encourage the use of sustainable drainage systems."*<sup>9</sup>

SUDS are viewed as a material consideration within the planning process.<sup>10</sup>

*"Developers should be encouraged to incorporate into their proposals sustainable drainage systems (SUDS) to treat at source the runoff from various types of development including car parks, buildings, paved area and roads. It should be established that ground conditions are suitable for SUDS and at the same time it is strongly advisable that a permanent arrangement is put in place to determine their responsibility and safeguard their management. The Environment Agency and sewerage undertakers should also be consulted to ensure that the pollution aspects are fully considered."*<sup>11</sup>

A re-affirmation of the applicability of Section 106 Agreements is in paragraph 47 of PPG25.

*"Measures which it might be possible to consider for section 106 agreements include:-*

- *the funding for provisions of SUDS for a development"*

PPG25 goes on to state that;

*"consideration of the following issues early in the planning and design stages is essential:*

- *integration of sustainable drainage systems into the overall site concept and layout*
- *the need for investigation and subsequent remediation of contaminated land*
- *agreements and adoption maintenance and operation of the systems; and*
- *the need for monitoring long term performance."*<sup>12</sup>

PPG's 23 and 25 relate only to England Planning Policy. A sustainability appraisal in the preparation of Unitary Development Plans is required for Wales<sup>13</sup> and

*"surface water drainage schemes, included in development applications should be the subject of an assessment of their effects on the environment amenity and public health in the locality...."*<sup>14</sup>

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<sup>7</sup> Planning Policy Guidance Note 25 Development and Flood Risk 2002

<sup>8</sup> para E8 Appendix E PPG25

<sup>9</sup> para E15

<sup>10</sup> Planning Policy Guidance Note 23 - Pollution Control Consultation Paper Oct 2002

<sup>11</sup> Planning Policy Guidance Note 23 - para 35

<sup>12</sup> PPG25 para E14

<sup>13</sup> Welsh Assembly May 2002

<sup>14</sup> para 3.3.1 Planning Policy Wales

Planning Policy Wales goes on to add:

*"A catchment wide perspective should be adopted including the use of Sustainable Urban Drainage Systems where appropriate"*<sup>15</sup>

It is envisaged that a revised Technical Advice Note (Wales) no 15, 1998 'Development and Flood Risk' will provide further advice on the use of SUDS where appropriate.

### **Rainwater / Greywater use systems**

There is no formal government policy for the use of rain, grey or black water as an alternative source of water either in the home or as part of an industrial development. However, through the promotion of sustainable development and other initiatives, the government encourages a reduction in the use of resources. Uptake on a wide scale of rainwater / greywater use systems would go a long way towards this goal.

In terms of water quality the Water Regulations Advisory Scheme (WRAS) has produced a series of guidance notes for installing or modifying water reclamation schemes and has defined two classes of water, A and B. Class A water is that which is suitable for drinking and meets all relevant quality legislation as set out by the Water Supply regulations, while class B water is that which is intended for other uses, and is not potable. There are no clear quality parameters defined for class B water.

The technical guidance is more generally related to the safety and risk to public health than with the adoption of a single definitive standard for any particular area of water recycling technology. The detail and advice given within WRAS is sufficient to allow for the safe construction and use of rain and grey water systems as long as clear separation between the potable and non potable networks are clearly defined. WRAS technical guidance can be found on their website ([www.wras.co.uk](http://www.wras.co.uk))

The WRAS guidance also describes the use of greywater to irrigate soil and gardens in addition to using it to provide an alternative supply for toilet flushing. This also is not an officially endorsed policy as the health risks of using potentially faecally contaminated water for irrigating crops which could become part of the food chain again have been investigated and are verified. The advice given is therefore to use greywater as irrigation for lawns and non edible plants only and not for ponds or food crops. This position is also stated by the United States Environmental Protection Agency (USEPA) who refer to water for irrigation and toilet flushing within the same set of quality guidelines.

Other more general guidance is also available about rainwater and greywater use schemes. This includes the document "Conserving Water in Buildings"<sup>16</sup> produced by the Environment Agency and "Rainwater and greywater use in buildings, best practice guidance"<sup>17</sup> and "Decision making for water conservation"<sup>18</sup>, both published by CIRIA.

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<sup>15</sup> para 12.4.3 Planning Policy Wales

<sup>16</sup> Conserving water in buildings, EA 2001

<sup>17</sup> Rainwater and greywater use in buildings, CIRIA C539

<sup>18</sup> Rainwater and greywater use in buildings, decision making for water conservation, CIRIA PR80

## Legislation – SUDS

The legislation relevant to SUDS is described below. More information about legislation may be obtained from Her Majesty's Stationery Office ([www.hmso.gov.uk](http://www.hmso.gov.uk)).

### Water Industry Act, 1991

The Water Industry Act sets out the duties and powers of water companies with respect to water supply and drainage. Parts of a SUDS scheme could be defined as a 'surface water sewer' under the terms of the Water Industry Act. Section 104 of the Water Industry Act sets out the method of adoption, being;

*“(1) Subject to subsection (7) and section 146(3) below, a sewerage undertaker may agree with any person constructing, or proposing to construct —*

- (a) any sewer; or*
- (b) any sewage disposal works,*

*that, if the sewer or works is or are constructed in accordance with the terms of the agreement, the undertaker will, upon the completion of the work, at some specified date or on the happening of some future event, declare the sewer or works to be vested in that undertaker.*

*A person constructing or proposing to construct a sewer may make an application to a sewerage undertaker requesting the undertaker to make an agreement under this section.*

*An application under subsection (2) above shall be accompanied and supplemented by all such information as the undertaker may reasonably require; but, subject to subsection (4) below and without prejudice to the effect (if any) of any other contravention of the requirements of this section in relation to such an application, a failure to provide information in pursuance of the obligation to supplement such an application shall not invalidate the application.”*

Further the possible use of Section 115 of the Water Industry Act 1991 may allow the adoption of various SUDS techniques where there is a piped outlet.

Thus the Water Industry Act sets out a mechanism for the adoption of sewers. Sewerage systems are usually constructed in accordance with Sewers for Adoption (v5) together with any amendments made by individual Water Companies. Revenue for water companies who adopt the sewer is through payments by those who connect to the sewer and through sewerage charges.

However, many parts of a SUDS scheme could not be defined as a sewer under the Act although the use of Section 115 may be a way around part of this problem. Further, the costs of maintaining systems such as permeable paving have been difficult to define. Hence water companies have shown caution when faced with adopting SUDS, as the cost of maintaining them in the future is unknown and a mechanism for funding has not been put in place.

However, a possible separate funding mechanism via Section 106 of the Town and Country Planning Act 1990 is discussed below. In this case, if the water company is the operating authority for the adoption of part of the SUDS, the mechanism for funding will be via the model agreement. Hence, within the Section 106 Agreement the maintenance cost can be included in the calculation of the payment to be made to the Local Authority. This payment can then be passed on to the water company in order to cover the cost of the operation of the scheme. Hence funding via the Water Industry Act would not be required.

### The Town and Country Planning Act 1990 (as amended) – Section 106

*(1) Any person interested in land in the area of a local planning authority may, by agreement or otherwise enter into an obligation (referred to in this section and sections 106A and 106B as a 'planning obligation') enforceable to the extent mentioned in subsection (3) –*

- (a) restricting the development or use of the land in any specified way*

- (b) *requiring specified operations or activities to be carried out in, on, under or over the land*
- (c) *requiring the land to be used in any specified way*
- (d) *requiring a sum or sums to be paid to the authority and specified date or dates or periodically.*

These criteria would allow the local planning authority, which has the sole power of enforcement under the Town and Country Planning Act, to specify within the obligation (or to accept if the obligation is unilateral) works to be carried out above and below ground in connection with SUDS and require restrictions as to use. Thus for example the obligation could require no building over any underground pipes in order for regular maintenance of the scheme - the local planning authority could agree to do this maintenance.

Local authorities have a general power Section 111 of the Local Government Act 1972 states:-

*"111(1) without prejudice to any powers exercisable apart from this section but subject to the provisions of this Act, and any other enactment passed before or after this Act, a local authority shall have the power to do anything (whether or not involving the expenditure borrowing or lending or the acquisition or disposal of any property or rights) which is calculated to facilitate or is conducive or incidental to the discharge of any of their functions."*

Additionally the Local Government Act 2000 section 2 provides

- "2 (1) every local authority are to have power to do anything which they consider is likely to achieve one of the following objects:-
- (c) *the promotion or improvement of the environmental well being of their area."*

This latter power is constrained by the need to have implemented community strategies under section 4 of the Act however as local authorities adopt such strategies they will be guided by Government to

*"ensure they can promote and improve the well being of their areas and contribute to sustainable development".<sup>19</sup>*

The power under section 2 (1) includes powers for authorities to (*inter alia*)

- "(a) incur expenditure*
- (b) give financial assistance to any person*
- (c) enter into arrangements or agreements with any person*
- (d) co-operate with or facilitate or co-ordinate the activities of any person*
- (e) exercise on behalf of any person any functions of that person, and*
- (f) provide staff goods services or accommodation to any person"*

The ability to an authority to undertake a function on behalf of another body does not transfer any statutory responsibility or accountability for the carrying out of that function. It does however give greater scope for authorities and their partners to determine how best to discharge their functions.

Subsection 1(d) also provides for a sum or sums to be paid on a specified date or dates or "periodically". This would seem not to rule out financial payment to the local planning authority for a commuted sum if it is taking on maintenance of the SUDS, provision of a bond or no fault insurance cover in the event that a third party maintenance body either has insufficient liquid funds to carry out works or goes into liquidation nor prohibit the payment to the authority of an annual charge (in effect a service charge) where the authority carries out maintenance. Alternatives or mixture of all three could be adopted.

These periodic payments [subsection 106 (2) (c)] can be for a definite or indefinite period although guidance in circular 1/97 Planning Obligations advises that they should not be in perpetuity. PPG25

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<sup>19</sup> Power to Promote or Improve Economic Social or Environmental Well Being - Guidance to Local Authorities - DETR March 2001

addresses the issues of sums for flood defences, advocating 'for the lifetime of the development' and sets a timeframe of 30 years.

- (2) *A planning obligation may -*
  - (a) *be unconditional or subject to conditions*
  - (b) *impose any restriction or requirement mentioned in subsection (1) (a) to (c) either indefinitely or for such period or periods as may be specified and*
  - (c) *if it requires a sum or sums to be paid require the payment of a specified amount or an amount determined in accordance with the instrument by which the obligation is entered into and, if it requires the payment of periodical sums require them to be paid indefinitely or for a specified period.*
- (3) *Subject to subsection (4) a planning obligation is enforceable by the authority identified in accordance with subsection (9) (d)*
  - (a) *against the person entering into the obligation and*
  - (b) *against any person deriving title from that person*
- (4) *The instrument by which a planning obligation is entered into may provide that a person shall not be bound by the obligation in respect of any period during which he no longer has an interest in the land.*
- (5) *A restriction or requirement imposed under a planning obligation is enforceable by an injunction*
- (6) *Without prejudice to subsection (5) if there is a breach of a requirement of a planning obligation to carry out any operations in, on, under or over the land to which the obligation relates the authority by whom the obligation is enforceable may*
  - (a) *enter the land and carry out the operations: and*
  - (b) *recover from the person or persons against whom the obligation is enforceable any expenses reasonably incurred by them in doing so.*

If the maintenance agreement is breached, the Authority can enter and do the work themselves. Also, if any periodic charges are not met these could be reclaimed as a civil debt. The problem arises where the authority itself fails to maintain who would have the necessary locus (legal standing) to force the authority to honour its responsibilities. If the maintenance, or lack of, was causing or likely to cause pollution this could be the Environment Agency under the Water Resources Act 1991<sup>20</sup>. Equally it could be an action group, environmental organisation or statutory undertaker<sup>21</sup>.

Government thinking clearly steers the implementation of SUDS through the planning process and advocates the grant of planning permission with or without a Section 106 Agreement as the vehicle for ensuring future maintenance and funding. The legislation equally provides the mechanism for this.

The 'operating authority' is envisaged as having the benefit of either specific conditions' or obligations entered into via a Section 106 Agreement to ensure that the SUDS work. The 'operating authority' could for example be the local authority, the Environment Agency where SUDS are incorporated into a flood defence scheme or a Water Company in cases where the SUDS are adopted.

### **The Town and Country Planning Act, 1990 (as amended) – Section 70**

- "(1) Where an application is made to a local planning authority for planning permission -*
- (a) *subject to sections 91 and 92 [duration and outline planning permissions] they may grant planning permission either unconditionally or subject to such conditions as they think fit, or*

<sup>20</sup> Section 165A Water Resources Act 1991

<sup>21</sup> See R-v-Inspectorate of Pollution and an other ex parte Greenpeace Ltd (1994) CA

(b) *they may refuse planning permission."*

Circular 11/95<sup>22</sup> covers the use of planning conditions in planning permissions and sets down a number of criteria which a condition must achieve if it is to be valid and enforceable.

A condition must be relevant to planning, it must also be relevant to the development to be permitted and it must be capable of enforcement. The framing of the condition requires care. To ensure enforcement of the obligation it should be precise, clear and reasonable. Particular caution is needed when conditions require works to be carried out on land in which the applicant has no interest when permission is granted.

It should also be remembered that it is easier to appeal conditions than planning obligations. Authorities may therefore find more comfort from the use of a planning obligation.

### **The Highways Act, 1980**

The Highways Act sets out legislation with respect to Highways. With respect to drainage, the incorporation of SUDS which involve road drainage usually requires the developer either to enter into an agreement under Section 38 of the Highways Act if involving new development or an agreement under Section 278 of the Act if existing arrangements are to be modified.

Highway Authorities have the power to construct, adopt and maintain highway drainage infrastructure. For consistency each Highway Authority sets down standards which developers must follow to ensure that highways and drainage systems are satisfactorily constructed, safe and easily maintainable.

Highway Authorities are not required to obtain discharge consents for highways runoff either to surface waters or to ground. Given that a large number of local authorities are now both the planning and highway authority there is therefore great potential to promote SUDS.

### **The Health and Safety at Work Act, 1974**

The Health and Safety at Work Act 1974<sup>23</sup> and regulations under it also apply to SUDS. Of more significance is the general duty in regard to the safety of employees and others, which includes the minimisation of exposure to biological risks (Control of Substances Hazardous to Health (Amendment) Regulations (COSHH, 1992).<sup>24</sup> This means that the management, maintenance and use of SUDS in a work place should be subject to a risk assessment.

### **The Building Regulations, 2000 & 2002**

The most recent edition of the Building Regulations<sup>25</sup> came into effect on 1<sup>st</sup> April 2002. Section H3 addresses issues of surface water drainage. Of particular concern to SUDS is the section which addresses soakaways and other infiltration drainage systems. More information about the latest edition of the Building Regulations can be found at the following website –

[www.safety.odpm.gov.uk/bregs/building.htm](http://www.safety.odpm.gov.uk/bregs/building.htm)

This edition of the Building Regulations requires that surface water drainage is in preference by infiltration via a soakaway, secondly by discharge to a watercourse and lastly by discharge to a surface water sewer. This clearly emphasises the requirement to use infiltration, or other SUDS methods for the removal of surface water. The guidance also states that soakaways should not be constructed within 5m of a road or a building, as this may damage foundations or underground structures. The type of soil and foundation depth are other relevant factors which should be considered.

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<sup>22</sup> The use of conditions in Planning Permissions DOE July 1995 WO Circular 35/95 July 1995

<sup>23</sup> Health & Safety at Work Act 1974

<sup>24</sup> Control of Substances Hazardous to Health (Amendment) Regulations SI 2383/1992

<sup>25</sup> The Building Regulations, 2002

Paragraphs 3.31 to 3.35 examine different types of infiltration system, including swales, infiltration basins, filter drains and detention ponds. Reference is made to design in other documents, including “*Sustainable Urban Drainage Systems – A Design Manual for England and Wales*” published by CIRIA.

The advice provided in Section 3.25 (a) of The Building Regulations conflicts slightly with the practical design of SUDS schemes. The Building Regulations are intended to protect existing or proposed structures and a common sense approach should be applied when considering the applicability of SUDS in any one instance.

## **PPG25**

PPG25 sets out Government Policy on the role of land-use planning to reduce the risks from flooding. A brief introduction to PPG25 was included in Section 4 above. The overall aim is to avoid development in areas at risk from flooding or manage the risks in an acceptable way. The Environment Agency has taken a lead role in providing advice on flooding issues, although ultimately the local planning authority will decide if a particular development can go ahead. The local planning authorities are required to apply a risk based sequential test when prioritising potential development sites.

If an application is submitted for an area at risk from flooding it must be supported with a full Flood Risk Assessment, as detailed in Appendix F of PPG25. Failure to do so could result in the planning application being delayed or refused. The assessment should consider the increase of flood risk caused by increasing the area of impermeable ground. The guidance requires that SUDS are considered for all developments to reduce the surface water run-off and impact to neighbouring sites. Paragraph 41 lists the following options,

*“surface water storage areas, flow limiting devices in conjunction with surface or sub-surface storage or where ground conditions permit the use of ‘soft’ sustainable drainage systems to mimic natural drainage”<sup>26</sup>*

PPG25 is highly relevant to SUDS as it sets out government policy with relation to flooding and development. More information about PPG25 can be obtained from the Office of the Deputy Prime Minister ([www.planning.odpm.gov.uk/ppg25](http://www.planning.odpm.gov.uk/ppg25)).

## **PPG3**

PPG3 sets out planning guidance with reference to housing densities for new developments. The demand for housing is growing, particularly within the suburbs. It is clear that in order to protect greenfield sites the density of new developments should be increased. PPG3 recommends that densities of 30 - 50 dwellings per hectare should be achieved. Traditionally, suburban estates are constructed at a density of approximately 23 dwellings per hectare.

This increased density leads to a greater pressure on land within developments, leading to reduced space for SUDS. SUDS require more land than traditional piped drainage systems because of components such as swales. Thus, the requirement for increased densities in PPG3, although necessary, opposes the aim of the promotion of SUDS in PPG25.

HR Wallingford has been commissioned by DTI to report on this problem. For more information about this topic, the report should be consulted when it has been issued.

It should be noted that paragraph 36 of PPG25 reinforces the advice provided in PPG3 about taking into account the environmental constraints on the development of land for housing, including flood risk. More information about PPG3 can be obtained from the Office of the Deputy Prime Minister ([www.planning.odpm.gov.uk/ppg3/](http://www.planning.odpm.gov.uk/ppg3/)).

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<sup>26</sup> Planning Policy Guidance Note 25 – para 41

## **Sewers for adoption**

The fifth edition of Sewers for Adoption was issued in October 2001. It is a guide to assist in the submission to a Sewerage Undertaker prior to entering an Adoption Agreement under Section 104 of the Water Industry Act 1991. The philosophy is such that a developer, for example, should be expected to work to the same standards as those used by the Sewerage Undertaker.

The document is well recognised within the industry and works well, as it sets common and clear standards for constructing drainage infrastructure. More information about Sewers for Adoption can be found on the WRC website ([www.wrcplc.co.uk](http://www.wrcplc.co.uk)).

## Legislation – rainwater / greywater use systems

### The Health and Safety at Work Act 1974

The Health and Safety at Work Act applies to rainwater / greywater use systems where electrical equipment or potentially hazardous chemicals are used. In those installations which are not domestic in nature, chemicals used for disinfection would be subject to COSHH regulations, and would be required to be handled and stored safely. In addition, all staff operating the equipment would need to receive training and any specialist safety clothing as needed.

There is also an obligation under this Act to minimise the risk of exposure to biological hazards. It has been established that in a typical toilet bowl there may be *Legionella*, miscellaneous coliform and *E.Coli* counts which would constitute a serious health risk were the water to be sprayed in an ingestible form. Flushing the toilet would provide such an aerosol and could potentially provide a vector for disease, particularly in the case of *Legionella* which has been the subject of much research.<sup>27</sup> It is possible that the use of rainwater or greywater for toilet flushing without disinfection would increase this risk above the normal background level of risk.

However, this is unlikely to be a problem at the domestic level where there is no common source of infectious agent, particularly for the use of rainwater systems. For larger scale systems, such as office or domestic applications where there is a more readily available source of pathogens, some disinfection should be considered for both rainwater or greywater, to minimise the risk of the transmission of disease.

A similar problem exists when considering irrigation as a use for reused water, although the risk from coliform transmittal via non edible garden plants is very low indeed. A similar approach should be taken as above and the correct disinfection procedures followed for irrigation in public open spaces.

### The Water Industry Act 1999

There is provision within the Water Industry Act<sup>28</sup> for water companies to levy additional charges to any customer who knowingly discharges water from a source other than the potable network into a foul sewer. This has particular relevance to rainwater use systems where the discharge of water via toilets into foul sewer will increase the proportion of foul to potable flows within a property, and could be considered as infiltration. This is an issue where payment for sewerage charges is based on the potable water supply. This does not apply to greywater or blackwater systems because the water is originally supplied as potable water so cannot be considered as infiltration.

In practice, the issue of discharge of rainwater from roofs to sewer is often ignored by water companies as the volumes involved are relatively small when compared to the volumes of unintentional infiltration from other sources. There will inevitably be a natural tendency for installers to also ignore this, as to inform the receiving water company would invite the possibly of additional charge. A general dispensation from the receiving water company to discharge such water up to an agreed volume has been suggested as a way to overcome this.

There is a potential conflict within the Water Industry Act when statutory water companies install any system which provides a centralised supply of non-potable water to domestic customers via an asset owned by itself. The only way currently identified for a water company to provide a supply of anything other than potable quality water is for it to use a subsidiary company as asset owner, which is not obliged to comply with this particular requirement.

### Water Supply (Water Fittings) Regulations 1999

The main consideration regarding the installation and operation of rainwater / greywater use systems is to ensure that no possibility of contamination exists by cross connection of pipes carrying reused water and potable water. The commonest point of potential cross connection is where the potable water

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<sup>27</sup> CIRIA C539

<sup>28</sup> Water Industry Act 1999

backup system meets the non-potable water storage tank, and where the various potable and non-potable water pipes are routed within the structure of a building and could therefore be confused during work carried out at a later date.

It is therefore necessary to ensure that current codes of practice are enforced where applicable, and where pipes are to carry reused water, they should be labelled in accordance with the guidelines described by WRAS<sup>29</sup>. This document recommends a green and black striped colour scheme to mark pipes that are unique to reclaimed water, hence it is highly unlikely that accidental cross connections would be made. This approach has been trialled at a number of experimental water recovery sites in the UK.

The WRAS guidance states that *'The marking can be achieved by either marking the pipe during manufacture or by adding labels or wraps to the pipe during installation. Until there is sufficient commercial incentive it is likely that internal pipework will be identified by installation labelling. Pipes that are insulated should carry pipe labels irrespective of whether they are surface marked or identified during manufacture. Labels should be either self-adhesive, wrap around or mechanically secured to the pipe. They should be green and carry the marking 'RECLAIMED WATER' in black lettering. Labels should not be less than 100mm long with lettering 5mm in height. Larger labels and larger size of lettering is appropriate for larger diameter pipes'*.

This pipe specification is not yet widely available in the UK, so it is not always possible for installations to comply with this guidance. As a minimum, pipes should be clearly labelled to identify the nature of the water being transported. Reliance upon existing practice and existing pipe materials is not considered adequate protection against cross contamination.

### **The Electricity at Work Regulations 1989**

All electrical equipment should be installed in accordance with EAWR regulations where installed in a non-domestic application. The principal concern regarding the control systems is to ensure that there is no danger from the power systems or the feed supplies to them. There is also an obligation under EAWR to ensure that any previous electrical installations which may be affected by the installation of a rainwater / greywater use system are made safe.

In practice, there is little difference between a greywater use system and any other commonly available appliance such as a washing machine or dishwasher. The natural tendency of bespoke manufacturers of rainwater or greywater use systems is however to copy industrial practice and construct equipment on large skids with open sides, and this tends to result in increased potential exposure to electrical equipment so necessitates the kind of protection encountered on larger systems.

Were manufacturers to adopt the kind of mass production used in kitchen appliances for example, it is probable that the risk of electrical hazard would be reduced to as near to zero as possible. Type approval could then be granted to a device which consists of a proprietary unit with feed and waste pipes and power supply, with all necessary protection being incorporated within the unit.

In this case there is a difference between rainwater use and greywater systems, where rainwater use systems are more commonly available and more affordable than greywater systems due to their simplicity. In order to produce a greywater treatment device which would be granted type approval for domestic use the manufacturer would need to be assured of high volume sales in order to make the system affordable to home owners.<sup>30</sup>

### **Water Quality Technical Guidance**

In addition to the above legally enforceable requirements, there are a number of technical guidance documents which relate to the quality of rainwater / greywater for cases other than irrigation. Guidelines have been produced by the following bodies;

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<sup>29</sup> Marking and identification of pipework for reclaimed water systems, WRAS 9-02-05 1999

<sup>30</sup> Ward M; M.Phil thesis, 2001 Cranfield University

- Buildings that save water, CIRIA<sup>31</sup>
- BSRIA Water Reclamation Standard<sup>32</sup>
- USEPA Guidelines for water reuse<sup>33</sup>
- WRAS Reclaimed Water Systems<sup>34</sup>

If these guidelines are followed, this will ensure that minimal risk of disease transfer exists from the use of rainwater or greywater. Different requirements are employed in different countries and there is no universal agreement on the parameters to be measured, although the commonest concerns are microbial activity and residual nutrient in the form of soluble BOD<sub>5</sub>. A summary of these standards is shown in Table 4 below. Note that the CIRIA guidance (C539) does not itself recommend standards, but suggests that the BSRIA, WRAS and Bathing Water Directive<sup>35</sup> guidelines are followed.

Table 4 : Summary of water quality technical guidance for the non-potable use of rainwater and greywater

Parameter	BSRIA	USEPA	WRAS	BATHING WATER DIRECTIVE
BOD <sub>5</sub>	Dissolved oxygen > 1mg/l	< 10 mg/l BOD <sub>5</sub>	No parameters provided	No parameters provided
Turbidity	Opacity < 60% at 254nm	< 2 NTU	No parameters provided	No parameters provided
Microbiological quality	<1000/100 ml total coliforms	( <i>E. Coli</i> ) < 1 / 100ml	<10,000/100ml faecal coliforms <100/100ml fecal enterococci	<10,000/100ml total coliforms <2000/100ml faecal coliforms
pH (measure of acidity or alkalinity)	No parameter provided	6 – 9	No parameters provided	No parameters provided
Chlorine (Cl <sub>2</sub> ) residual disinfectant	0.5 – 2 mg/l	< 1 mg/l	No parameters provided	No parameters provided

Thus there are a number of different standards which could be applied when rainwater and greywater use is considered. The two most wide ranging tests are those devised by BSRIA and the USEPA. Comparing the different parameters, we make the following observations;

- BOD<sub>5</sub> – this is a laboratory test and so may be seen as complex for the testing of rainwater or greywater. The BSRIA guidance recommends testing for dissolved oxygen which can be carried out using hand held equipment, therefore obtaining results more simply.
- Turbidity – measuring either opacity or turbidity is a measure of the clarity of the water. The BSRIA test for opacity is simpler than the turbidity test recommended by the USEPA.
- Microbiological quality – various different standards are recommended. The test for total coliforms is simplest, but still would be required to be undertaken by a laboratory.
- pH – only the USEPA guidelines provide a recommended level of pH.
- Disinfectant – both BSRIA and the USEPA guidelines recommend similar values of Cl<sub>2</sub> residual (although other disinfectants such as bromine may be acceptable).

<sup>31</sup> Rainwater and greywater use in buildings, CIRIA C539 (Buildings that save water)

<sup>32</sup> Water reclamation standard, BSRIA TN7/2002

<sup>33</sup> Guidelines for water reuse EPA/625/R-92/004 United States Environmental Protection Agency, Ohio 1992

<sup>34</sup> WRAS, Reclaimed Water Systems no 9-02-04, August 1999

<sup>35</sup> Bathing Water Directive, Directive 76/160/EEC, 1975

Given the recommendations set out above, we would recommend that the BSRIA guidance is followed for rainwater and greywater use systems. This is also consistent with other technical literature on the subject.

Although often considered together as sources of non potable water, the treatment requirements for rainwater or greywater are different. For small scale rainwater use applications treatment would not be expected. However, care should be taken where the roof type (such as asbestos and metal roofs) may adversely affect water quality. Treatment would be prudent for large scale rainwater systems together with all greywater systems. The parameters within the proposed BSRIA non potable water quality standards are discussed below.

If there is disinfectant within the greywater, no coliforms should be present. If undertaking tests against the BSRIA standard, particularly at a domestic level, it would be prudent to test for residual chlorine (where this is used) rather than undertaking expensive laboratory tests to determine the total coliforms present. Other commonly available disinfectants such as bromine or bromine based compounds are not prescribed in the standards, although one study has shown that BCDMH is a suitable material for disinfection in long networks.<sup>36</sup> This chemical works by releasing bromine as the active ingredient, and by constantly regenerating the bromine it allows a residual to be maintained throughout a long distribution network. For this reason it is commonly used in swimming pools as a replacement for chlorine and may be suitable for certain greywater systems.

CIRIA also recommend a minimum dissolved oxygen level of 50% saturation under minimum flow; which is in line with the German requirements for similar levels and the majority of data from various research into the behaviour of reused water after treatment. The BSRIA standard does not specify pH levels as some countries' requirements do (US, Japan and Germany) although in practice it is highly unlikely that the pH of any greywater will vary beyond 6.9 to 7.4 without the addition of acids or alkalis, and there is no particular reason why this should ever happen in a domestic situation.

It would not be practical for a typical household system to be subject to the above tests in service, as discussed certain of the tests are expensive to carry out and are only possible at laboratories equipped with the relevant materials. It is therefore recommended that a type approval approach be sought, whereby a new design or process is subject to the relevant tests before being marketed and is considered to meet all relevant standards if operated within the prescribed methods. This is particularly relevant to the BSRIA standard, which sets out a mechanism for the laboratory testing of systems using greywater.

It would be possible to use the above series of water quality guidelines for larger installations where more resources are available for regular sampling. The BSRIA guidance does not recommend a sampling procedure, but any large scale recycling plant should be sampled a minimum of once a year in the same manner as a Legionella survey. The exact number of samples would be defined as part of the maintenance contract. In the case of larger installations only, some form of in line monitoring could be employed to provide a continuous record of water quality and provide an early warning of any problems with the site or hardware.

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<sup>36</sup> Ward M; M.Phil thesis, 2001 Cranfield University

## Conclusions

This report sets out a review of the existing legislation with reference to SUDS and rainwater / greywater use systems. A summary of the significant points are set out below which should be reviewed with reference to the development of model agreements.

1. Government policy promotes the use of SUDS, for example through PPG25 and the Building Regulations.
2. Government thinking steers the implementation of SUDS through the planning process and advocates the grant of planning permission with or without a Section 106 Agreement as the vehicle for ensuring future maintenance and funding. The legislation equally provides the mechanism for this.
3. The Town and Country Planning Act 1990 sets out powers for a local authority to require restrictions as to use. This Act also provides for financial payment to local authorities for carrying out maintenance of SUDS systems.
4. There is also provision for a local authority to carry out maintenance work themselves if there is a breach of the maintenance agreement.
5. There is little current legislation which governs the implementation of rainwater / greywater use systems. It is recommended that the WRAS guidelines are followed to avoid cross contamination and the USEPA guidelines followed as a definition of the water quality.
6. It is recommended that no testing of domestic scale rainwater or greywater systems is required as this would be a barrier to uptake. Rather, type approval should be sought by manufacturers. Testing of the water quality provided by larger industrial scale systems may be included within the maintenance requirements of the Model Agreement.
7. The inclusion of rainwater / greywater use technology in Planning Policy Guidance Notes should be considered.
8. It will be important for all stakeholders to support the proposed approach for the implementation of the Model Agreements. This is particularly important with respect to Local Authorities using the Section 106 process as the vehicle for the SUDS Model Agreement.

## Appendix A

### References

#### Legislation & guidance

- Bathing Water Directive 76/160/EEC, 1975
- BSRIA no. 14415/1 July 1999
- BSRIA TN7/2002, Water reclamation standard
- DWI no. 43/2/82 June 2000
- Conserving water in Buildings, Environment Agency 2001
- Construction, Design and Management Regulations 1994
- Control of Substances Hazardous to Health (Amendment) Regulations SI 2383/1992
- Groundwater Regulations SI 2746 / 1998
- Making the right connection, Environment Agency leaflet
- Planning Policy Wales
- Policy and Practice for the protection of groundwater, Environment Agency 1998
- Power to Promote or Improve Social or Environmental Well Being – guidance to Local Authorities – DETR March 2001
- PPG3, Housing
- PPG23, Planning and Pollution Control
- PPG25, Development and Flood Risk
- Rainwater and greywater use in buildings, CIRIA C539
- Rainwater and greywater use in buildings, decision making for water conservation, CIRIA PR80
- Rainwater & greywater in buildings, BSRIA TN 7/2001
- Sewers for Adoption (v5)
- Sustainable Urban Drainage Systems – A Design Manual for England and Wales, CIRIA C522
- Technical Advice Note (Wales) no 15, 1998 ‘Development and Flood Risk’
- The Building Regulations
- The Electricity at Work Regulations, 1989
- The Health & Safety at Work Act, 1974
- The Highways Act, 1980
- The Land Drainage Act, 1991
- The Local Government Act, 1972 & 2000
- The Town & Country Planning Act, 1990
- The use of conditions in Planning Permissions DOE July 1995 WO Circular 35/95 July 1995
- The Water Industry Act, 1991 & 1999
- The Water Resources Act, 1991
- The Water Supply (Water Fittings) Regulations, 1999
- Water Regulations Advisory Scheme Information Guidance Notes
  - 9-02-03 Conservation of Water
  - 9-02-04 Reclaimed Water Systems
  - 9-02-05 Marking and Identification of Pipework for Reclaimed (Greywater) Systems

## Websites

Resource	Website address
CIRIA website - technical information about SUDS design.	<a href="http://www.ciria.org.uk/suds">www.ciria.org.uk/suds</a>
Environment Agency	<a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a>
Her Majesty's Stationery Office – electronic copies of legislation	<a href="http://www.hmsso.gov.uk">www.hmsso.gov.uk</a>
Office of the Deputy Prime Minister – electronic copies of the Building Regulations	<a href="http://www.safety.odpm.gov.uk/bregs/building.htm">www.safety.odpm.gov.uk/bregs/building.htm</a>
WRC – sale of Sewers for Adoption	<a href="http://www.wrcplc.co.uk">www.wrcplc.co.uk</a>
Office of the Deputy Prime Minister – electronic copies of PPG25	<a href="http://www.planning.odpm.gov.uk/ppg25">www.planning.odpm.gov.uk/ppg25</a>
Office of the Deputy Prime Minister – electronic copies of PPG3	<a href="http://www.planning.odpm.gov.uk/ppg3">www.planning.odpm.gov.uk/ppg3</a>
Water Regulations Advisory Scheme	<a href="http://www.wras.co.uk">www.wras.co.uk</a>
Wessex Water	<a href="http://www.wessexwater.co.uk">www.wessexwater.co.uk</a>