

## DTI 'Strategy for Sustainable Construction'- consultation events

### SURFACE WATER MANAGEMENT

#### Flood risk management and water quality

#### 1. SUMMARY

The traditional approach to draining surface water has been through underground pipe systems that convey water from built up areas as quickly as possible.

Traditional drainage systems have not generally been designed with sustainability in mind and most have paid insufficient regard to effective catchment flood control, water quality management, water resources, amenity or biodiversity requirements.

The philosophy behind Sustainable drainage systems (SUDS) is to mimic natural drainage processes and remove pollutants from urban runoff and help manage flood risk at source. Landscaped SUDS features also have the potential to significantly contribute to biodiversity and can form part of green space and green corridors.

#### **Understanding** – moderate

Surface water management remains an issue for the construction industry. Many organisations are championing improved surface water management and many clients, contractors and consultants are aware of requirements for flood risk management through planning policy statements.

#### **Practice** – Emerging

Although guidance on surface water management has been available for some time the challenges faced in allocating long term responsibility for the maintenance of waste management has hindered implementation by the industry, particularly when considering sustainable drainage features in public space.

#### **Measurement** – some metrics set (broad assessments of flood risk and water quality undertaken)

- **Flood risk management** - The Environment Agency has produced flood maps that provide an indication of the likelihood of flood from the sea or rivers. However, flooding from surface runoff and drainage systems is not represented. Flooding associated with sewers and drainage systems is recorded by sewerage undertakers and some Local Planning Authorities. However, this information may not be publicly accessible.
- **Water quality** - The Environment Agency also monitor and manage the quality of fresh, marine, surface and underground water in England and Wales. They assess the chemical and biological water quality of water courses and monitor compliance with legislation and EC directives. They assess river quality annually using a survey called the General Quality Assessment (GQA) scheme. The river water quality indicator is one of the UK Government's sustainable development indicators. The Agency may also monitor discharge consents from construction sites to help manage risks of polluting water courses.

#### **Controls** – some regulations in place, not much enforcement

- **Flood risk management** - legislation in England and Wales is complex and largely permissive and does not provide any right to protection from flooding or coastal erosion or any particular standard of protection. However, in some instances legislation does create a requirement for protection.

With regards to development and construction PPS25 Development and flood risk utilises the spatial planning system to ensure that flood risk is considered and development is directed away from high risk areas and ensures that surface water drainage systems for new developments do not increase flood risk.

Whilst both PPS25 and the Building Regulations, Part H encourage the use of sustainable drainage. Neither of the documents introduce a statutory requirement for the implementation of SUDS.

- **Water quality** - impacts from construction and developments are heavily regulated. There are a number of statute and common laws supported by regulation. Legislation is heavily influenced by European law and directives which are enacted in the UK through a variety of acts.

## 2. VISIONS AND METRICS

### 2.1 Industry vision

#### 2.1.1 Published provisional/initial vision and metrics

##### **Flood risk management**

The targets and visions identified in the Dti Sustainable Construction Review October 2006 for flood risk management are represented in Table 1. The government target of peak run-off rates and annual volumes of runoff no worse than the existing conditions for the site is consistent with guidance from PPS 25 and the Code for Sustainable Homes Consultation Paper (ODPM, 2005). However, some organisations wish for the runoff to be reduced to green field (pre development) runoff rate or better.

The industry vision for the Dti review is consistent with the premise that SUDS should mimic the natural drainage pattern. However, it may be more appropriate to suggest that sustainable drainage rather than 'rainwater harvesting' is implemented.

With the number of stakeholders responsible for different drainage systems there are also a number of different levels of performance for the system. Table 3.1 in CIRIA publication C635 *Designing for exceedance in urban drainage –good practice* highlights a number of frequency related performance standards suggested by the various stakeholders.

The government through *Making Space for Water* is promoting integrated urban drainage pilots and a more 'joined' approach and is moving towards the development of Surface Water Management Plans for developments. In view of the interest in implementing SUDS it might be appropriate if the Dti also supported Surface Water Management Plans. It is possible that for the future new metrics and Target Levels of Service may be developed with regards to managing surface water.

At a broader national scale, Defra has a number of Service Delivery Agreements targets for flood management. The most relevant being SDA 26 and 27 that relate to the prevention of loss of life from flooding and the reduction of risk of flooding to life infrastructure, environment assets and property.

**Table 1 Proposed visions and metrics for flood risk management**

Nature of target or vision	Source of information	Associated metric
<b>Government target</b> Peak run-off rates and annual volumes of run-off no worse than the existing conditions for the site	Dti Sustainable construction review October 2006	Runoff as a percentage of pre development site runoff
<b>Industry's vision</b> Runoff reduced to green field runoff rate or better. Rainwater harvesting implemented	Dti Sustainable construction review October 2006	Runoff as a percentage of green field runoff. Number of rainwater harvesting systems implemented

##### **Water quality**

The targets and visions identified in the Dti Sustainable Construction Review October 2006 for water quality are represented in Table 1a. The government target relates to the implementation of SUDS, however this does not specify whether this is during construction or following completion.

The industry vision related to the achievement of the Water Framework Directive (WFD) quality objectives. However, the objectives will not be available in draft form until the end of December 2008.

The Environment Agency use a variety of standards and targets to manage water quality. However, it was not possible to find specific national water quality objectives. The Agency and a number of Local Planning Authorities use River Quality Objectives as reported by the Agency to monitor and manage water quality of rivers, some LPAs also use other biological indicators to assess river quality.

**Table 1a Proposed visions and metrics for water quality**

<b>Nature of target or vision</b>	<b>Source of information</b>	<b>Associated metric</b>
<b>Government target</b> Surface water is managed on sites using SUDS approach to drainage.	Dti Sustainable construction review October 2006	No adverse impacts from surface water discharge from developments
<b>Industry's vision</b> Appropriate Water Framework Directive quality objectives met.	Dti Sustainable construction review October 2006	Percentage of water quality objectives met.

**DISCUSSION POINTS**

- Are you aware of more relevant targets?
- Are these visions appropriate and will achievement lead to a significant change?
- Are the metrics appropriate and meaningful?
- Do you agree with the assessments made in Table 2?

**2.1.2. Metrics**

***Flood risk management***

The metrics associated with the targets and vision presented in the Dti review seem pragmatic and are currently used and accepted by the industry as part of the FRM process. However, these metrics are only appropriate at the individual development scale and do not consider the impacts at the wider spatial scale of communities and/or catchments.

The metrics related to runoff can be measured, however, resourcing monitoring and reporting will be an issue. The same could be said for the implementation of sustainable drainage, there is currently an under utilised national database on SUDS but this relies on self reporting.

***Water quality***

The metrics suggested for measuring improvements to water quality vary. The metric associated with the use of SUDS (no adverse impacts) is not directly a measure of SUDS implementation. However, evidence and experience suggests that SUDS will improve the water quality of discharges from developments. The Environment Agency is likely to be instrumental in measuring performance on this metric, there may be resource issues.

The industry vision of meeting the Water Framework Directive objectives will be easier to measure, this will probably have to be monitored as part of the process. However, this process can only begin once the water quality objectives have been agreed (likely to be the end of 2008).

**Table 2 – Assessment of current awareness and attainment (see appendix 1 for scoring)**

Rating 0 – 5 (see Appendix 1 for guidance)	Flood risk management		Water quality	
	Runoff ≤ existing	Runoff reduced to green field	Sites use SUDS by 2015	WFD quality objectives met by 2010
1 Established principles / sound science	4	4	3	2
2 Widely understood across industry	4	4	2	1
3 (Technically) attainable with no risk and no skills shortage	5	5	2	3
4 Cost-effective	5	3	3	3
5 Compelling business case	5	3	3	3
6 Strong Market pull	5	3	2	4
7 Established metrics and performance data	5	5	4	2
8 Degree of regulation	4	4	1	2

**DISCUSSION POINTS**

- Are you aware of the performance of your organisation / its projects in the context of these targets?
- Does your organisation have data available on its own performance – if so, over how long?
- Do you agree with the assessments made in Table 2?

**2.1.3 Current performance and interim targets**

**Flood risk management**

As a minimum all new development’s that go through a Flood Risk Assessment process should not increase the runoff compared to existing conditions for the site. In some cases the Environment Agency will request betterment where the runoff is reduced to the green field rate – however this is not standard procedure.

**Water quality**

Whilst there is guidance on the implementation of SUDS, it is predominantly the exception rather than the rule for new developments. However, during construction a number of contractors will utilise surface water management plans to manage the pollution from the construction site (there are also a number of good practice guidance documents to assist with the control of pollution from construction sites).

With regards to water quality performance, in England 71% of river length was of good biological quality in 2005 (compared with 67% in 2000) and 64% were of good chemical quality in 2005 (compared to 64% in 2000) (Defra statistics, 2006) . It is difficult to determine how this corresponds with the WFD quality objectives.

## DISCUSSION POINTS

- How attainable are the above targets?
- Given the vision and present position, what would be a reasonable achievable intermediate target?
- What regulatory or policy initiatives are likely to impact on performance?

### 2.1.4 Relative merits and limitations of proposed visions (if required)

#### **Flood risk management**

The government target is well understood and there are a number of policy and guidance documents that support its achievement.

Whilst the industry vision of reducing runoff to green field rates or better is desirable it may not be widely accepted by all of the industry and is particularly driven by the Environment Agency. There is no legal or planning requirement to support betterment in this way.

The implementation of rainwater harvesting, could be expanded to include SUDS. However, with the lack of legislation to make SUDS a statutory requirement and/or policy to assist with the allocation of long term responsibilities for maintenance this is not likely to be realised in the short term.

#### **Water quality**

Currently the implementation of SUDS is not a statutory requirement. Some LPAs have statements within Local Development Frameworks and have complementary Supplementary Planning Documents to support the implementation of SUDS. However, this may be difficult to enforce. Again, the lack of policy or legislation supporting the long term ownership and maintenance responsibility for SUDS hinders the implementation of SUDS.

Defra as part of the process to implement the WFD is currently looking at options to allocate the maintenance of SUDS and support implementation. However, it is possible that supporting legislation will be available in advance of 2015 – so the target could be made slightly more ambitious.

The target of achieving WFD water quality objectives by 2010 is slightly optimistic. The indicative WFD timetable (EA & Defra 2003) suggests that main environmental objectives will be met 2015.

## 2.2 Published Government targets

### 2.2.1. UK Targets

Targets are presented in the Dti Sustainable Construction Review

### 2.2.2 Other published government / agency targets

The Blueprint for water ([www.blueprintforwater.org.uk](http://www.blueprintforwater.org.uk)) a coalition of NGOs has developed a number of targets for the management of water.

## DISCUSSION POINTS

- How much progress in the area over the past 5 years has been driven by regulations / how much by market/voluntary measures?
- How much future change is going to be driven by regulations / enforced policy compared with market / voluntary measures?

## 3 MECHANISMS

### 3.1 Policy and regulatory responsibility

#### 3.1.1 Current regulatory & policy drivers and associated Government lead initiatives

##### ***Flood risk management***

The Environment Agency and other flood and coastal defence operating authorities, including local authorities and internal drainage boards are responsible for flood risk management planning. They prepare strategic plans for measures to reduce flood risk to existing communities and assets, in accordance with policies developed by government. These documents include Catchment Flood Management Plans (CFMPs), Shoreline Management Plans (SMPs) and Flood Risk Management Strategies (DRMS).

The management of flood risk from new developments is primarily driven through the spatial planning system. These are represented in the table below.

Scale	Assessment Techniques	Decision-making tools
Regional Spatial Strategy	Regional Flood Risk Appraisals	Sequential Approach
Local Development Framework	Strategic Flood Risk Assessment	Sequential Test and Exception Test
Individual Planning Application	Flood Risk Assessment	

##### ***Water quality***

In England and Wales, water quality for developments is primarily controlled by the Water Resources Act 1991, further amended by the Environment Act 1995. The legislation is primarily applied by the use of regulations. The most important are:

- The Anti-Pollution Works Regulations 1999
- The Groundwater Regulations 1998

Currently the key regulatory and policy drivers for the implementation of SUDS is through PPS25 *Development and flood risk* and the Building Regulations Part H. Whilst both documents recommend and encourage the implementation of SUDS they do not impose a statutory requirement.

#### 3.1.2 Planned regulatory & policy drivers and associated Government lead initiatives

The Government's *Making Space for Water* (MSfW) strategy sets out emerging government policy for flood risk management planning in England and Wales. The key MSfW project areas likely to have an impact on flood risk management and water quality from construction and development are:

- HA2 – Urban flood risk and integrated drainage
- SD8 – Land Use Planning (PPS25)
- RF3/RF4 – Resilience Standards for New Buildings

As well as these specific projects MSfW also sets out the aspiration to resolve some of the challenges that exist with regard to the implementation of SUDS, this is likely to combine synergies with the implementation of the WFD.

The Water Framework will also continue to play a key role in the management of water quality. The legal framework surrounding the water environment is evolving as a result of implementation of the Directive. Over time, much of the existing European legislation will be repealed. New and amended legislation will expand the scope of water protection.

### 3.2 Industry and market drivers

#### 3.2.1 Principal sectors and mechanisms

With regards to improved surface water management Local Planning Authorities and major clients can influence change in lieu of statutory regulations. At a strategic level the implementation of improved surface water management through sustainable drainage can contribute to the wider goals of sustainable development as outlined in PPS 1 *Delivering Sustainable Development*.

There are no formal mechanisms and initiatives to encourage the implementation of SUDS and improved surface water management. However, it is widely recognized that landscaped sustainable drainage features can improve the value of property. For the developer, this may need to be offset by additional land take of some of the features.

#### DISCUSSION POINTS

- What needs to change to accelerate progress?

### APPENDIX 1

#### Guidelines for scoring Table 1

1	2	3	4	5	6	7	8
<b>Principles</b> established and practice within reach of most companies	Widespread <b>understanding</b> of principles across most parts of the industry	Technically attainable with little or no <b>risk</b>	<b>Cost effective</b> to implement within present fiscal / regulatory regime	Compelling and well promoted <b>business case</b>	Strong <b>market pull</b> from both public sector and private sector	Published <b>metrics</b> on current performance / benchmarking	Highly regulated, clear signals of future policy / regs
SCORE 5	5						
SCORE 0	0}						
Gaps in scientific / social / economic principles	Knowledge and understanding across most parts of the industry non-existent	Technical risks / serious skills shortages	Not presently cost effective in competitive market or using conventional business case justification	Little in the form of case studies and evidence of <b>business case</b>	Little market pull beyond regulatory minima	Little in the form of any current openly available data	Largely unregulated and reliant on voluntary action