REF.	ACTIONS	PARTNERS (lead partners in bold)
5.1	**Promote awareness and acceptance of SuDS as standard for new developments amongst the construction trades.**	**ACC / AC / CNPA / SEPA / SW / Developers**
5.1.1	Host workshop to encourage SuDS implementation, explain its necessity and describe its benefits. Event to be aimed at builders, suppliers, architects, engineers etc.	**SEPA** / SW / **ACC** / **AC**
5.1.2	Promote awareness of appropriate siting of SuDS to ensure they are not exposed to floodwaters.	**AC** / **ACC** / **SEPA**
5.1.3	Promote relevant guidance e.g. SuDS Design Manual.	**AC** / **ACC** / **SEPA**
5.2	**Identify problem areas and remediate by retro-fitting SuDS.**	**ACC / AC / CNPA / SEPA / Developers / SW**
5.2.1	Identify locations where water quality is significantly affected by surface water runoff.	**SEPA** / SW
5.2.2	Carry out a cost-benefit analysis of SuDS implementation in the identified areas.	**SEPA** / SW / **ACC** / **AC**
5.2.3	Retrofit SuDS in areas where cost-benefit analysis shows it to be viable.	**Developers** / SEPA / SW / ACC / AC
5.3	**Educate home, industrial and commercial premises owners about best practice with regard to general site management and surface water drainage.**	**SEPA / ACC / AC** / SW / **Site owners / Site operators**
5.3.1	Ensure industrial sites practise good site management to prevent contamination of surface water drainage systems with oil, chemicals etc in accordance with GBRs 10 and 11 of the CAR.	**SEPA** / AC / ACC / **Site owners / Site operators**
5.3.2	Implement drainage marking scheme on several key sites (both industrial and residential) to demonstrate best practice and generate publicity (similar to the Ythan 'Yellow Fish' scheme)	SEPA / **ACC / AC** / SW / **Site owners / Site operators**
5.3.3	Conduct a mailshot of relevant guidance (e.g. SEPA-Environment Agency leaflet 'Home Pollution and How to Avoid It') to property owners in vulnerable areas identified in 4.2.1.	**SEPA**
5.3.4	Encourage implementation of water efficiency measures, particularly those which reduce surface water runoff e.g. water butts.	SEPA / **ACC** / **AC**

Acronyms are listed in the centre of this Action Card

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surface water drainage

5 WATER QUALITY

OBJECTIVE 5. Manage surface water drainage sustainably, taking account of water quality, habitat and flood risk.

BACKGROUND

In the natural world, much of the rain that falls onto land seeps into the ground. This infiltration replenishes the groundwater and helps maintain base flows in streams during dry weather. Impermeable hard surfaces (roofs, car parks, roads) typical of the built environment, prevent such replenishment from happening. The water must therefore be drained away by some other means to avoid flooding.

In conventional drainage systems, rainwater is either carried away by a system of gullies and surface water pipes and discharged directly to a watercourse (separate surface water systems), or drains into what is known as a combined sewerage system – where, in older systems, foul drainage and surface water drainage share the same pipe – and is carried to a wastewater treatment plant.

Conventional surface water drainage systems are designed to shed rainfall from built areas as quickly as possible with little consideration given to the consequences in receiving waters. The result is that during rainfall, flows in watercourses increase to a greater extent and more quickly than in undeveloped areas, increasing the risk of flooding. The resultant increase in flows can also degrade habitat due to bank scour and subsequent deposition of sediment downstream, smothering life on the bed of the watercourse. Building on the natural flood plain further exacerbates the problem by restricting the flood storage capacity downstream.

The logical improvement for separate systems are Sustainable Drainage Systems (SuDS), structures built to manage the rainwater runoff from developed areas in ways. SuDS work by slowing down the transport of rainwater, often by mimicking the natural drainage process which, in turn, will allow settlement of sediments, filtration and in some cases biodegradation. Depending on the type of SuDS facility chosen, they can include features to reduce flood risk, improve water quality and provide wildlife habitat and attractive green space in the built environment.

There are four general methods of control:

- filter strips and swales
- filter drains and permeable surfaces
- basins, ponds and wetlands
- infiltration devices.

ISSUES

- In the case of combined sewerage systems, high rainfall can place additional hydraulic pressure on the system, causing combined sewer overflows (CSOs) to spill to watercourses more frequently and impacting upon the performance of wastewater treatment plants.
- Although better than combined systems, separate surface water systems can cause problems due to both the quantity and the quality of the rainwater draining away.
  - During storms, large volumes of rainwater quickly reach the watercourse via the network of pipes and flows peak higher and sooner than in an undeveloped catchment – water can back up in pipes and in severe storms rivers get dangerously high.
  - These direct discharges of surface waters to watercourses can be a source of numerous pollutants picked up from industrial yards, residential areas and roads, such as oil, sediment, detergents, metals and road salt.
- Accidental connections to the surface water rather than the foul drainage system are also a common problem allowing detergents and dirty water to discharge to the watercourse without treatment.
- Incorrect disposal of oil and household chemicals to surface water drains is also a problem. Collectively, these inputs of contaminants can have a significant impact upon water quality in the receiving watercourse.
- Many existing built areas are serviced

WHO IS INVOLVED?

Aberdeenshire Council

Aberdeen City Council

Cairngorms National Park Authority

Developers

Scottish Environment Protection Agency

Site Owners

Site Operators

Scottish Water

Further copies can be downloaded at www.theriverdee.org. For further information contact the Dee Catchment Officer c/o The Macaulay Institute, Craigiebuckler, Aberdeen AB15 8QH Telephone: 01224 498200 email: info@theriverdee.org

deecatchment partnership

by poorly designed legacy infrastructure that was installed before surface water drainage became a matter of concern and modern drainage methods were required.

- Many industrial sites and home owners may not apply or be aware of best practice in relation to good environmental housekeeping.

EXISTING / RECENT INITIATIVES

- The inclusion of SuDS within new development plans of all sizes is an essential part of guarding against the pollution of water bodies by surface water runoff from the built environment. Many large developers are aware of the benefits, methods and requirements for using SuDS.
- Aberdeenshire and Aberdeen City Councils were the first Local Authorities in Scotland to adopt **Drainage Assessment** for all new developments. This approach, since rolled out throughout Scotland, ensures that wastewater and surface water drainage issues are properly considered at the planning stage. Requirements for provision of **SuDS** are incorporated in Local Authority plans.
- Measures to encourage **good environmental housekeeping** are ongoing. These include campaigns to promote proper storage and disposal of oils and chemicals, in both industrial and domestic contexts. The **drainage marking scheme**, using red for manholes and drains to the foul sewer and blue for those to the surface water sewer, is now widely used at industrial sites. The **Yellow Fish Project** has been trialled to raise awareness of surface water drainage issues in residential areas.
- **Retrofitting of SuDS** is encouraged as an option where watercourses are impacted by contaminated surface water discharges. This method has been used at Westhill, where a SuDS wetland has been created to help improve downgraded water quality in the Elrick Burn.

ACTIONS REQUIRED

- **Raise awareness of SuDS** amongst smaller developers and builders to help to promote their application.
- Areas served by poorly designed drainage continue to impact upon habitat and water quality and should be **retrofitted with SuDS** type drainage where appropriate.
- Regimes to **raise awareness** frequently require 'refreshing' and re-issue in order to maintain good rates of uptake. This can be targeted using knowledge of 'at risk' areas.



Water quality in the Elrick Burn has been downgraded by surface water run-off (3-Dee vision)

LEGISLATION

See Action Pack Annex for information sources

- Discharges to bodies of water are administered under the **Water Environment and Water Services (WEWS) Act**, which implements the Water Framework Directive (WFD) in Scotland and requires the incorporation of SuDS in new developments, and through the **WEWS Controlled Activities Regulations (CAR)**.
- Several other pieces of legislation, for example the **Town and Country Planning (Scotland) Act**, the **Building (Scotland) Regulations** (which defines minimum acceptable construction standards), the **Urban Wastewater Treatment (Scotland) Regulations** and the **Sewerage (Scotland) Act** (which requires the construction of separate foul and storm water drainage systems) are used to encourage best practice during development planning and construction. **Planning Advice Notes** and **National Planning Policy Guidance** are also relevant.

GUIDELINES AND INFORMATION

See Action Pack Annex for information sources

Guidance on general site management where water bodies may be at risk:

The Environment Agency (EA), Northern Ireland Environment and Heritage Service (EHS) and SEPA have produced a range of UK-wide Pollution Prevention Guidelines (PPGs). Each PPG is targeted at a particular industrial sector or activity and aims to provide advice on statutory responsibilities and good environmental practice. All are available on their website www.sepa.org but the following documents are useful:

- Getting Your Site Right (SEPA, EA, EHS)
- PPG1 General Guide to the Prevention of Water Pollution (SEPA, EA, EHS)

Guidance on effective contingency planning and storage of hazardous materials:

- Concrete Bunds for Oil Storage Tanks / Masonry Bunds for Oil Storage Tanks (SEPA)
- PPG 2 Above ground oil storage tanks (SEPA, EA, EHS)
- PPG16 Schools and Other Educational Establishments (SEPA, EA, EHS)
- PPG18 Control of spillages and fire fighting run-off (SEPA, EA, EHS)
- PPG 21 Pollution Incident Response Planning (SEPA, EA, EHS)

Guidance on design and construction of effective surface water drainage networks:

- Drainage Assessment: A Guide For Scotland (SuDSWP via. SEPA)
- C521 SuDS: Design Manual for Scotland and Northern Ireland (CIRIA)
- Domestic / Non-Domestic Handbooks (sections 3.5 to 3.9) (Scottish Building Standards Agency)
- SuDS Advice Note: Brownfield Sites (SuDSWP via. SEPA)
- Scottish Water's new Technical Manual 'Sewers for Scotland' includes a SuDS section.
- SuDS Design Manual.

A basic overview of SuDS can be found in the Sustainable Urban Drainage Scottish Working Party (SuDSWP) booklet:

- *Sustainable Urban Drainage Systems – Setting the Scene in Scotland*

Further information about the types of SuDS and the successful planning, selection and design of SuDS can be found at the following sites:

- www.sudsnet.abertay.ac.uk/
- www.ciria.org/suds/
- www.sepa.org.uk/dpi/suds/index.htm
- /www.scotland.gov.uk/Topics/Environment/Water/15561/3913.

For examples of SuDS wetlands:

- The Caw Burn Project
- Elrick SuDS wetland.

BENEFITS TO PROTECTED SPECIES

The following specially protected species will benefit from the Actions:

- Grass wrack pond weed *Potamogeton compressus*
- Pillwort *Pilularia globulifera*
- Freshwater pearl mussel *Margaritifera margaritifera*
- Common frog *Rana temporaria*
- Palmate newt *Triturus helveticus*
- Northern blue damselfly *Coenagrion hastulatum*
- Stiletto-fly *Cliorisimia rustic*
- Stone fly *Brachyptera putata*
- Atlantic salmon *Salmo salar*
- Brook lamprey *Lampetra planeri*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*
- Daubenton's bat *Myotis daubentonii*
- Otter *Lutra lutra*
- Water vole *Arvicola terrestris*
- Goldeneye *Bucephala clangula*
- Osprey *Pandion haliaetus*

RELATED ACTION CARDS

6. Public sewerage & drainage systems

16. Flood alleviation

37. Elrick burn catchment