

WATER



Clackmannanshire
Council

www.clacksweb.org.uk

Adopted August 2015

SUPPLEMENTARY GUIDANCE 4

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1. Introduction

- 1.1 Water is fundamental for our health and well being and that of the environment within which we all live. It also has the potential to be destructive through flood and drought.
- 1.2 Water is also a resource for the production of power, as well as an important element in manufacturing products and processes, providing a habitat, and comprising an important element in the landscape. It is essential that in undertaking any development that careful consideration is given to the potential impacts and consequences for the water environment.

- 1.3 The purpose of this Supplementary Guidance is to -
- ▶ ensure that, developers, public, land and property owners are aware of the relationship of water issues to the planning regime and the Council's approach to decision making on water issues;
 - ▶ raise awareness of the duties and procedures for the protection and enhancement of the water environment, including groundwater;
 - ▶ raise awareness of the risks to the water environment from development through direct and indirect pressures;
 - ▶ raise awareness of the Council's duty to support sustainable flood management;

- ▶ provide guidance on the preparation of Flood Risk Assessments by developers when considering and designing developments;
- ▶ provide guidance on the preparation of Drainage Assessments by developers when considering and designing developments;
- ▶ provide guidance on the adoption of Sustainable Drainage Systems (SUDS) for the management of on site surface water drainage, designed in accordance with the above assessments and, if appropriate, in accordance with Scottish Water's current design guidance, to protect and enhance the water environment;
- ▶ highlight the role of SUDS in contributing to good design, habitat creation, biodiversity, green networks and infrastructure; and
- ▶ provide guidance on incorporation of integrated green infrastructure to manage flood risk and drainage as a fundamental consideration in layout design to deliver sustainable development and placemaking.

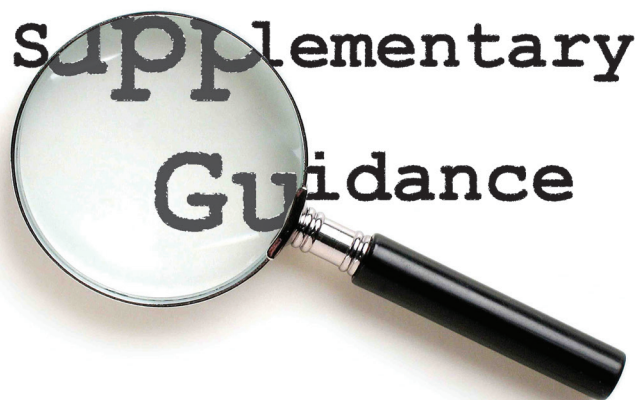
This document should be read in conjunction with the Placemaking SG.



Black Devon Wetlands

2. National Planning Policy and Guidance

- 2.1 Scottish Planning Policy (SPP) highlights the role that planning has to play in safeguarding the water environment and avoiding flood risk. SPP is supported by Planning Advice Notes (PANs), with those particularly relevant to the water environment being PAN 61 'Planning and Sustainable Urban Drainage Systems' and PAN 79 'Water and Drainage' (both being consolidated), and PAN 69 'Planning and Building Standards Advice on Flooding'.
- 2.2 The Town and Country Planning (Development Planning) (Scotland) Regulations 2008 requires the Local Development Plan (LDP) to have regard to the River Basin Management Plan (RBMP), see 4.5-4.10.
- 2.3 The Scottish Environment Protection Agency (SEPA) identifies the planning system as having a key role in protecting the water environment from deterioration and avoidance of flood risk, as well as being a facilitator for the improvement of the water environment. This can be done through influencing the location and design of development proposals. Planning also offers opportunities to redress historical physical changes such as canalised watercourses and non-native invasive bankside vegetation.



3. Council Responsibilities

- 3.1 The Water Environment and Water Services (Scotland) Act 2003 and the Flood Risk Management (Scotland) Act 2009 both designate the Council as a responsible body. This means that the Council has duties under these Acts to protect and improve the water environment and promote sustainable flood risk management. Appendix 1 outlines the relationship of the Acts. The Council discharges these duties by maintaining direct involvement in the processes to produce River Basin Management and Local Flood Risk Management Plans and Surface Water Management Plans for Potentially Vulnerable Areas. Land use planning has a significant part to play in the delivery of the statutory duties contained in the legislation and the LDP policies have been designed to support the Council's role as a responsible body (see Glossary).
- 3.2 The Climate Change (Scotland) Act 2009 places duties on public bodies relating to climate change. This requires the Council, in exercising its functions, to act in the best way calculated to assist with the delivery of emissions reduction targets, and help deliver any statutory climate change adaptation programme in a way that it considers most sustainable. Flood risk and water management are significant aspects of any adaptation strategy and the LDP policies have been developed to support these objectives. The Council is currently preparing an Adaptation Strategy to assess the vulnerability of Council services and potential impacts for the wider community due to the effects of climate change in Clackmannanshire, and to improve our resilience to the unavoidable consequences of a changing climate.
- 3.3 In undertaking any development proposals, including engineering works, in or in the vicinity of rivers, lochs, and wetlands, developers require to have regard to the above legislation as well as planning legislation. Such works should be designed to ensure that the water environment is not adversely affected and that wherever possible the proposals enhance the water environment. The Council encourages developers to have early discussions with Council and SEPA staff to ensure that they are fully aware of the requirements of the relevant environmental and planning regimes and the related consent processes.

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4. Water Quality

Water Environment

4.1 The ecological quality of the water environment is an important issue for the public in terms of water supply and as a general measure of the health of the environment, and its management is now a matter of considerable attention, especially as climate change brings the prospect of both floods and drought. Discharges into the water environment are regulated by SEPA, however the effective management of the water environment relies on a wide range of responsible authorities land managers and water users working together to ensure that Water Framework Directive (WFD) objectives are successfully delivered.

4.2 The EU WFD has the following objectives for the water environment which comprises watercourses, coastal waters, lochs, groundwater and wetlands:

- ▶ prevent deterioration;
- ▶ improve condition;
- ▶ promote sustainable water use;
- ▶ contribute to the mitigation of floods and droughts.

In Scotland it has been transposed into legislation through the Water Environment and Water Services (Scotland) Act 2003 (known as WEWSA)

4.3 The Council is a responsible authority under the WEWSA with a duty to ensure that in administering its duties it delivers the WFD objectives listed above, and it also has a duty to promote sustainable flood management. The goal is for all surface water bodies to reach good ecological status and for groundwater's to reach good status (or potential in the case of heavily modified water bodies). This involves the protection of rivers, burns, ponds, wetlands, standing, tidal or coastal waters and ground water from inappropriate development and harnessing opportunities to improve surface water bodies to good ecological status/potential through new development wherever possible.



Gartmorn Dam

4.4 To deliver these requirements a number of mechanisms have been introduced which are detailed below.

River Basin Management Planning

4.5 The development of river basin management planning represents a huge step forward in the way in which we safeguard and improve the quality of our water environment across Scotland.

4.6 These River Basin Management Plans (RBMPs) ensure that public sector bodies, businesses and individuals work together to protect the water environment and address significant impacts by co-ordinating all aspects of water management. The plans have been produced as one of the requirements of the European Union's Water Framework Directive and similar plans are being put in place across Europe. The plans will be reviewed and updated in 2015 and thereafter on a six year cycle.

4.7 The Scottish RBMP outlines the issues impacting on the water environment with the responses to them at a strategic level including legislation and funding regimes. Below this level there are a number of sub basin plans, with Clackmannanshire lying within the Forth Area. The sub basin plan focuses on local actions and partnership working to ensure that we all benefit from improvements to the water environment. Underpinning the RBMP and the Forth Area Plan are water body specific information sheets which provide an overview and details of the pressures and measures for each waterbody.

4.8 For RBMP purposes water bodies - rivers, lochs, wetlands and groundwater or sections thereof - have been classified in relation to the ecological status of the water environment. This is a measure of traditional water chemistry that also includes a measure of wider ecological parameters such as hydrology, morphology, fish and invertebrate populations and the presence of fish barriers. The status of Clackmannanshire's water bodies is detailed below.

Table 1 - Status of water bodies in Clackmannanshire

Water Body	Water Status (see glossary)
Bluther Burn (Gibsley Farm to Estuary)	Poor
Bluther Burn (Source to Gibsley Farm)	Poor
Brothie Burn (Source to Gartmorn Reservoir)	Good
Black Devon (Birkhill Plantation to Forth Estuary)	Moderate
Black Devon (Source to Birkhill Plantation)	Moderate
Foulbutts Burn	Moderate
River Devon (Gairney Burn confluence to Estuary)	Moderate
River Devon (Source to Gairney Burn confluence)	Poor
Menstrie Burn	Good
Dollar Burn (Burn of Sorrow)	Poor
Wharry Burn	High
Brothie Burn (Gartmorn Reservoir to Forth Estuary)	Poor
Gartmorn Dam	Moderate
Upper Forth Estuary	Moderate

Source: SEPA Waterbodies

Dataset extract 2015

<http://www.environment.scotland.gov.uk/get-interactive/data/water-body-classification/>

4.9 Diffuse pollution (see Glossary) is the greatest problem in terms of the water bodies not meeting good status in Clackmannanshire. This is generated from a number of sources including land management practices, effluent from urban areas, manufacturing and construction processes. Development proposals have the potential to exacerbate existing conditions which would be contrary to WEWSA. Most of the actions to address diffuse pollution will be regulated through other Agencies and legislation such as The Water Environment (Controlled Activity) (Scotland) Regulations 2011 (CAR), as well as joint working with SEPA, Scottish Water and other partners involved in the RBMP Forth Area Advisory Group. The RBMP process acknowledges the importance of the Development Plan system to support the delivery of actions to protect and improve the water environment.

4.10 Planning policy has been developed to support the delivery of the RBMP actions and to promote the enhancement of Clackmannanshire's water environment. The Council expects developers to take account of diffuse pollution when designing their proposals and incorporate elements such as buffer strips and SUDS into the development design. Wherever possible these elements should be carefully integrated with green networks on and off site.

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The Water Environment (Controlled Activity) (Scotland) Regulations 2011- (CAR)

- 4.11 CAR supports the deliver of the RBMP with a system of regulation for works which are in the vicinity of, or which affect, watercourses. The regulations are on a proportionality basis in terms of the scale of the proposed works and their potential impacts on the water environment. SEPA administers CAR and details of the regulations and their operation are available on their website.
- 4.12 Developers are encouraged to have early discussions with SEPA regarding their proposals to ensure that they are clearly aligned to, and designed to comply with, CAR requirements.

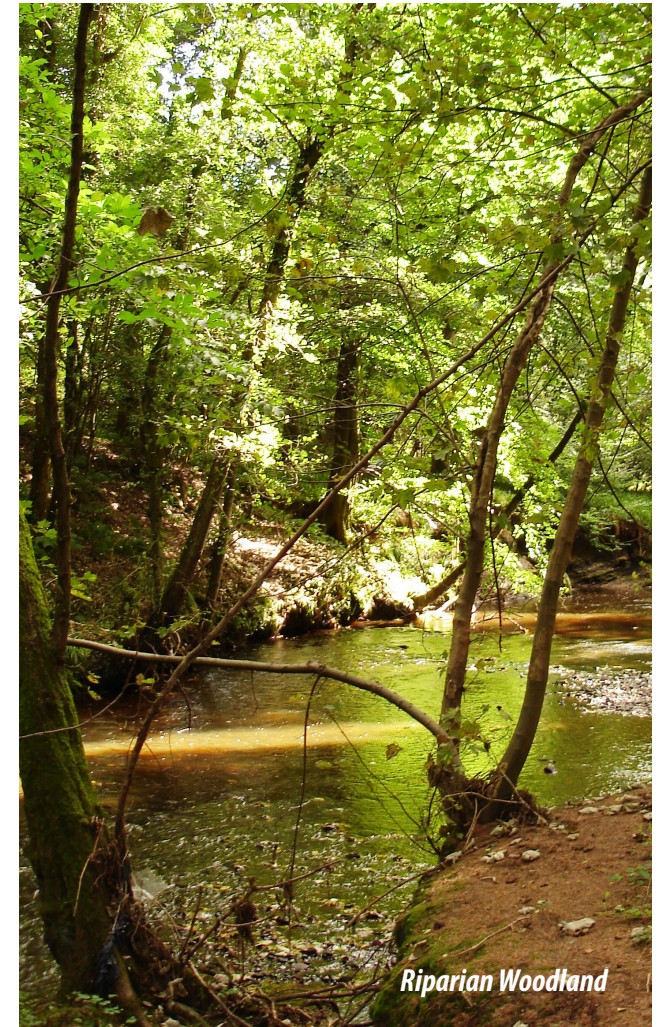
Improving the quality of the water environment through development

- 4.13 The Water Environment and Water Services (Scotland) Act 2003 requires development, other than in exceptional circumstances, to have a neutral impact as a minimum on the water environment, but that it should aim to enhance it. This can be achieved by development being designed to incorporate appropriate mitigation measures as well as appropriate drainage provision including SUDS. Development proposals will generally not be supported where they are likely to have an adverse impact on any water body. Adverse impacts include pollution, the introduction of non-native species, the reduction in river flows or flood plain capacity and also the loss of riparian habitat.

- 4.14 Development proposals, including drainage works, which are adjacent to or close by water bodies - rivers, ponds, wetland or burns - as well as proposals which could have a potential impact on groundwater, will be the subject of careful scrutiny. Developers should avoid actions which undermine the objective of improving water quality in accordance with the legislation. Designers and their clients require to give careful consideration to the ability of their proposals to enhance the local water environment by incorporating the following into their layouts and designs -

- ▶ Buffer strips between development works including civil engineering works and water bodies. The width of the buffer strips will depend on the size of the water body, but as a general rule should be between 6m and 20m wide, with larger or more sensitive watercourses having a wider buffer (refer to SEPA guidance);
- ▶ Water bodies should not be incorporated into gardens but should be a fundamental element in the landscape design for the development proposals;
- ▶ Space should be safeguarded for the re-naturalisation/ potential for de-culverting (in order that development does not have a detrimental impact on future restoration potential even if the works cannot be taken forward at the time of the development)
- ▶ Layout design should include provision for morphology alterations to deliver WFD objectives and access for watercourse maintenance. In phased developments the scheme of works shall be designed to ensure that proposed works to watercourses can be delivered in subsequent phases, and no development will be permitted which could result in these works being unable to be implemented; and

- ▶ Canalised watercourse sections should be naturalised and water courses de-culverted where ever possible (require to be designed with reference to Flood Risk Assessment for the proposed development ensuring that there is no material increase in local flood risk).



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4.15 In addition to the measures highlighted above, there are a number of other measures that should be considered for incorporation into a new development to prevent the deterioration of and/or secure improvements to the water environment, as outlined in Table 2. It should be noted that this is not a comprehensive list and there may be other site specific options available.

4.16 Many of the measures that will help to deliver river basin planning, if well designed will also contribute to other LDP policies and Council priorities such as green networks, flood risk management, climate change mitigation and adaptation and biodiversity. In designing development proposals developers should take due account of the LDP policies for the above and any related guidance.

4.17 Where water engineering works cannot be avoided, the developer shall submit a site survey of existing water features and a map of the location of all proposed engineering activities in the water environment as part of their application. A systematic table detailing the justification for the activity and how any adverse impact can be mitigated should be included. The table should be accompanied by photographs of the affected water bodies along with their dimensions. Justification for the location of any proposed water engineering works is a key issue for assessment in the application process. Where a watercourse crossing cannot be avoided bridging solutions or bottomless or arched culverts which do not affect the bed or banks of the watercourse should be used.

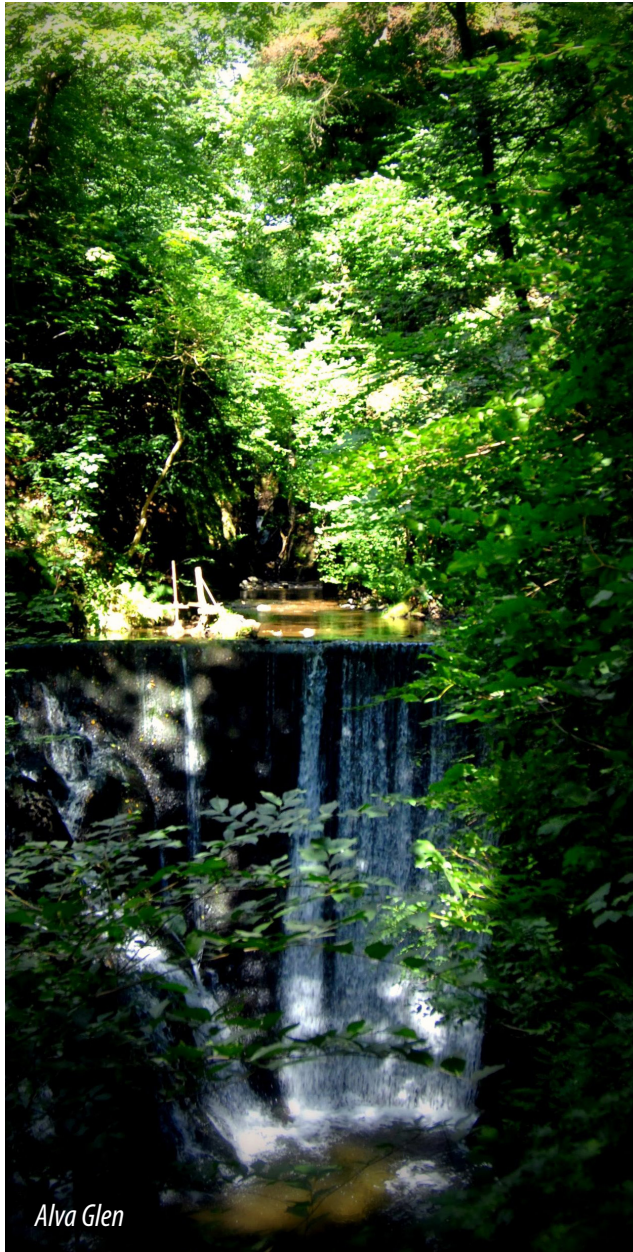
Table 2 - Water Quality Measures

Pressure	Measure
Point source pollution	<ul style="list-style-type: none"> ▶ SUDS ▶ Buffer zones along watercourses ▶ Appropriate treatment of foul effluent ▶ Regulation of discharge and appropriate aftercare of operations
Diffuse source pollution	<ul style="list-style-type: none"> ▶ SUDS ▶ Buffer zones along watercourses ▶ Appropriate restrictions of development where water bodies are nutrient enriched ▶ Appropriate siting of aquaculture operations ▶ Mitigation of impact of development proposals on wetland habitats ▶ Appropriate siting and management of forestry operations
Abstraction & flow regulation	<ul style="list-style-type: none"> ▶ Consideration of cumulative impacts associated with hydropower ▶ Locating development in areas not subject to reduced water availability ▶ Water efficiency measures in new developments
Morphological alterations (i.e. physical changes)	<ul style="list-style-type: none"> ▶ Identify opportunities to de-culvert and/or realign water courses ▶ Removal of barriers to fish passage e.g. historic dams and weirs
Invasive non-natives species	<ul style="list-style-type: none"> ▶ Measures to prevent their introduction ▶ Control and eradicate invasive non-native species as part of new development ▶ Require developers to use native species in developments



Tillicoultry Burn

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4.18 Peat has an important environmental role as it performs a role as a carbon sink, supports biodiversity and acts as a means of flood storage and improving water quality. Therefore developments affecting this soil type require particularly careful consideration. Development proposals should avoid peat areas wherever possible and if affected the works should be designed to ensure that disturbance is minimised to prevent peat oxidising and drying out, as this will result in the release of carbon, lowering of its biodiversity value and a reduction in flood storage capacity. Proposals impacting peat should include re-watering measures such as the blocking of existing drainage channels to retain its environmental significance and to act as a pollution buffer to protect water status. Landslips are a potential risk when undertaking engineering operations in peat lands due to their waterlogged nature. Therefore, planning proposals must include details clearly explaining the approach to be taken to address this risk.

5. Water Supply

5.1 Clackmannanshire has no public water supply reservoirs and the majority of Clackmannanshire's houses and businesses are served by Scottish Water's trunk mains with water from the Loch Turret supply. However some parts of Clackmannanshire, mainly the north-east, rely on private water supplies from streams, boreholes and wells. These are important private resources which require to be protected in terms of quantity and quality. Planning application proposals which are related to or likely to impact on these resources will require to include details of the following:

- ▶ Hydrology;
- ▶ Abstraction (including de-watering to enable in river works);
- ▶ Return of water to watercourse;
- ▶ Impoundment (if appropriate);
- ▶ Foul and surface water drainage details;
- ▶ Private water supply arrangements (existing and proposed); and
- ▶ Morphology

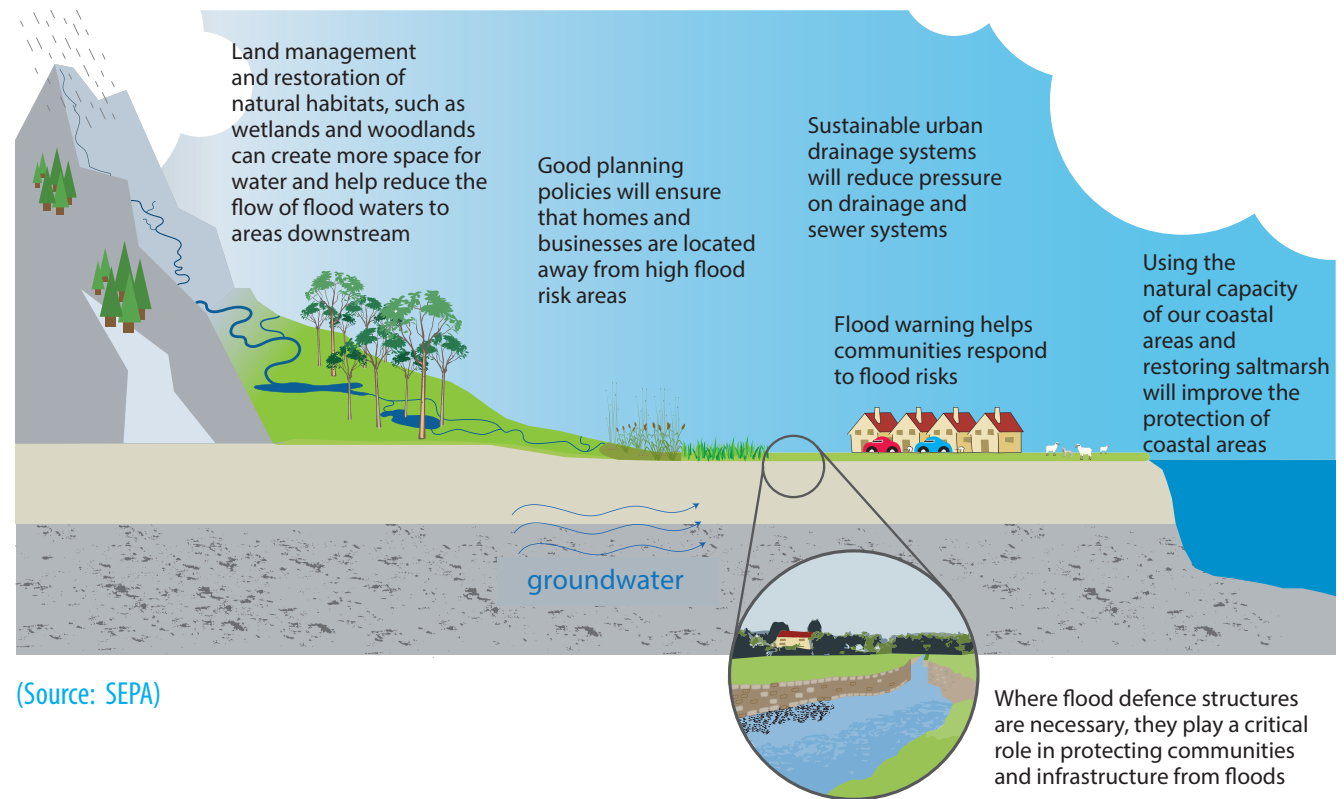
5.2 Developers should contact Clackmannanshire Council Environmental Health staff prior to submitting an application to discuss potential private water supply issues. The Council are particularly concerned that additional abstraction from wells, boreholes and watercourses has the potential to adversely affect the existing water status of water bodies, including groundwater, and the biodiversity they support. This is especially a concern with climate change predicted to cause drought conditions in the future.

6. Flood Risk Management

- 6.1 Flooding is a natural event and no matter what actions we undertake to reduce flood risk we cannot stop it completely. We can do our best to limit its potentially devastating impacts by avoiding development of land at risk of flooding, increasing awareness and preparedness and enhancing our ability to manage flood risk. As part of the preparation of the LDP all proposals have been assessed for potential flood risk and where this has been identified as an issue, constraints to development and any further actions required, e.g. the requirement for Flood Risk Assessments, have been highlighted.
- 6.2 Flooding in the context of this guidance falls into six categories as outlined below:
- ▶ **Fluvial Flooding** - from rivers, burns and streams, including that resulting from restricted capacity or the blockage of culverts on watercourses;
 - ▶ **Coastal Flooding** - from high tides and storm surges;
 - ▶ **Pluvial Flooding** - surface water which has not entered a natural drainage channel or artificial drain;
 - ▶ **Ground Water Flooding** - from rising water tables;
 - ▶ **Drainage Flooding** - flooding as a result of surcharging man made drainage systems including combined sewers; and
 - ▶ **Infrastructure Failure** - flooding due to collapse/failure of man made infrastructure including canals, flood defences and underground conduits (e.g. sewers).

- 6.3 The Flood Risk Management (Scotland) Act 2009 introduced a new approach to flood risk management planning. Land use planning has a significant part to play in the delivery of the Act's objectives. The Act and its legislative requirements also align and must integrate with key objectives of the Water Environment and Water Services (Scotland) Act 2003. The Flood Risk Management (Scotland) Act 2009 promotes sustainable flood management by adopting the following approaches:
- ▶ Avoid an increase in flood risk by appropriate land use planning
 - ▶ Protect by acting to reduce the likelihood of flooding
 - ▶ Prepare to reduce the impacts of flooding when it occurs

Figure 1 - The New Approach to Flood Risk Management



(Source: SEPA)

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6.4 SEPA has produced a National Flood Risk Assessment (NFRA) as a first step towards a new risk-based sustainable and plan-led approach to flood risk assessment and management. It improves the understanding of the causes and consequences of flooding in Scotland and helps identify areas most vulnerable to flooding. The assessment has considered the likelihood of flooding alongside the estimated impact on people, the economy, cultural heritage and the environment. This process has identified areas where the potential impact is sufficient to justify the further assessment and appraisal of flood risk management actions. These areas are referred to as Potential Vulnerable Areas (PVAs) and are defined on a catchment unit basis. Not all land within PVAs catchments will be at flood risk. However, such areas may have the potential to accommodate flood attenuation measures which could lower the risk elsewhere in their catchments. Conversely there will also be some areas at flood risk located outwith PVAs.

6.5 To deliver a plan-led approach, Scotland has been divided into 14 Local Plan Districts (LPDs) as the geographic areas for the production of Flood Risk Management Plans. The districts comprise the relevant local authorities, SEPA and Scottish Water, and will produce a Flood Risk Management Strategy and Flood Risk Management Plan which will be focused on the PVAs. The approach will seek to reduce the overall flood risk, raise awareness, provide flood warnings where appropriate, carry out maintenance and provide advice to the planning system. Clackmannanshire is in the Forth District along with Stirling and small adjoining areas in Falkirk, Fife and Perth and Kinross and contains 4 PVAs. More information on the NFRA, LPDs and PVAs can be found on SEPA's website.

Flood Risk Assessments

6.6 Some of the sites allocated in the Local Development Plan require a Flood Risk Assessment. This requirement is detailed in the development guidelines for the sites. Other development proposals will require a Flood Risk Assessment in the following circumstances:

- ▶ Site is within or in the immediate vicinity of flooding areas identified on SEPA's Indicative River and Coastal Flood Maps - N.B. these identify general areas of risk but are not site specific;
- ▶ Site is adjacent to a watercourse or wetland area; and
- ▶ Locality has been subject to past flooding events as reflected in information held by Council or SEPA.



Fields flooded between Alva and Tillicoultry

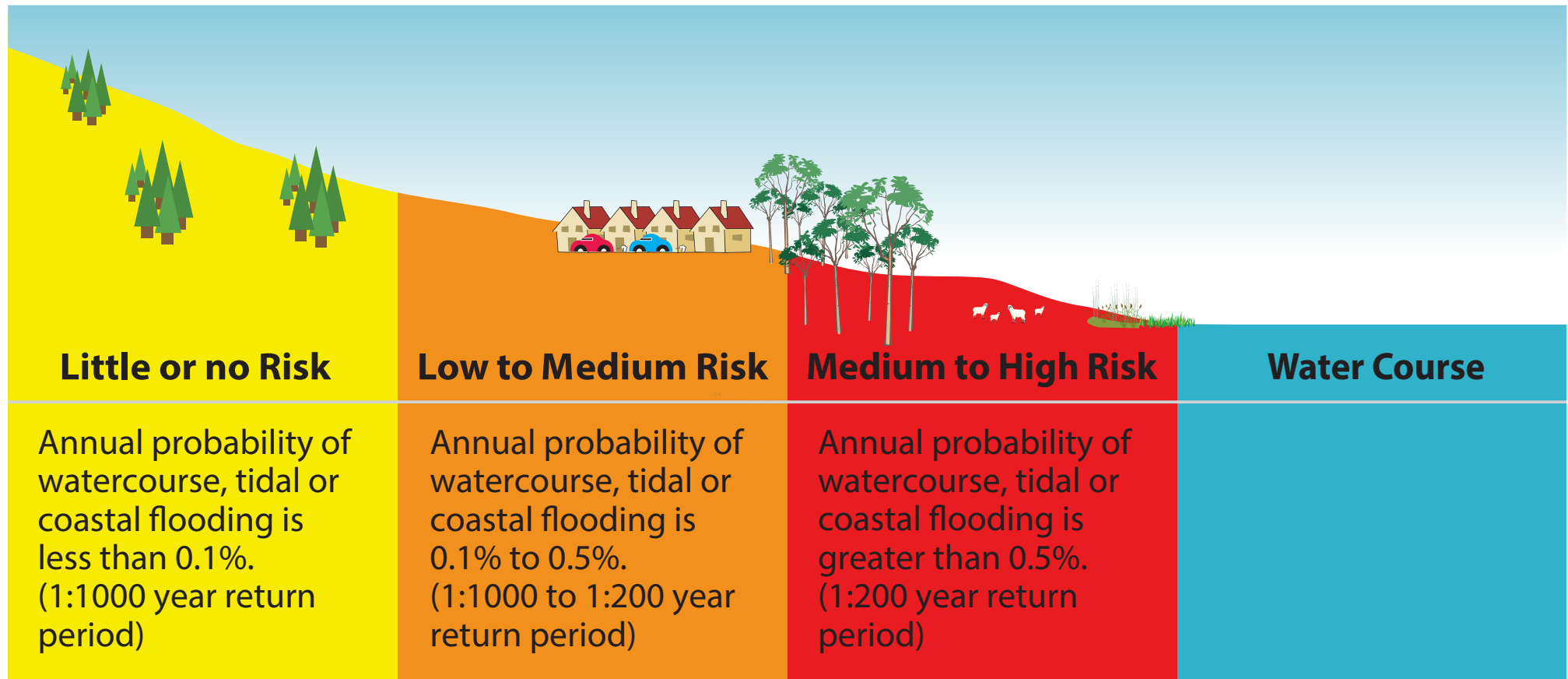
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6.7 Prior to submitting a planning application the applicant should assess the risk of flooding as it may affect the site, and consult the Council and SEPA to establish whether they hold any historic flood information and whether a flood risk assessment is required. It is the applicant's responsibility to undertake the Flood Risk Assessment (FRA) for their proposals.

6.8 Applicants undertaking a FRA should ensure that the assessment aligns to SEPA's Technical Flood Risk Guidance/Policy and their Flood Risk Guidance. Flood modelling to support a FRA requires to be prepared by a suitably qualified consultant; the scope and content of FRAs will be defined by the Council following input from SEPA. All FRAs will be subject to consultation with SEPA and the Council's Flood Management staff, as well as any other interested stakeholders.

6.9 FRAs require to establish an appropriate freeboard (see Glossary) above assessed flood levels. The Council considers that this should be a minimum of 600mm for floor level and 300mm for garden level or accessible areas of open space, as well as showing that there is no increase in flood risk.

Figure 2 - Flood Risk Framework



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6.10 Flood Risk Assessments will be assessed in relation to the risk framework detailed in the SPP (Appendix 2) . The framework divides flood risk into three categories and outlines an appropriate response in each case .The probabilities below relate to the land at the time a planning application is submitted. The Council in applying the risk framework will also take into account the following aspects in accordance with SPP:

- ▶ the characteristics of the site;
- ▶ the design and use of the proposed development;
- ▶ the size of the area likely to flood;
- ▶ depth of flood water, likely flow rate and path, and rate of rise and duration;
- ▶ the vulnerability and risk of wave action for coastal sites;
- ▶ committed and existing flood protection methods: extent, standard and maintenance regime;
- ▶ the effects of climate change, including an allowance for freeboard;
- ▶ surface water run-off from adjoining land;
- ▶ culverted watercourses, drains and field drainage;
- ▶ cumulative effects, especially the loss of storage capacity;
- ▶ cross-boundary effects and the need for consultation with adjacent authorities;
- ▶ effects of flood on access, including by emergency services;
- ▶ effects of flood on proposed open spaces including gardens; and
- ▶ The Forth and The Forth Estuary LPD Flood Risk Management Strategies and Local Flood Risk Management Plans.

6.11 The premise for all Council planning decisions will be the avoidance of new developments in medium to high-risk areas and that development sites have adequate access and egress during flood events. This is in accordance with the principles of sustainable flood risk management as set out in the Managing Flood Risk and Drainage section of the SPP and Flood Risk Management (Scotland) Act 2009. The land use planning system has a crucial role to play in ensuring that, wherever possible, unnecessary risks are avoided. The benefits of this approach include development that is -

- ▶ Free from significant flood risk to people, property, infrastructure and the environment;
- ▶ Fully insurable;
- ▶ Cost effective insofar as potentially expensive flood alleviation or protection measures can be avoided; and
- ▶ Cognisant of current predictions on the potential impacts of climate change.



6.12 In undeveloped and sparsely developed areas, medium to high risk areas are generally not suitable for additional development as stated within the SPP.

6.13 Land raising will only be considered in exceptional circumstances, where it is shown to have a neutral or better impact on flood risk outside the raised area. Compensatory storage may be required.

6.14 The redevelopment and/or change of use of a site provides an opportunity to reduce the sensitivity of that site to flooding and therefore to reduce overall flood risk. This can be achieved through changes to less sensitive land uses (see Appendix 2) and improvements to the management of flood risk on site. The Council will not allow the redevelopment of a site to a more sensitive use if it is at risk of flooding.

6.15 In exceptional circumstances where development is approved in medium to high-risk areas, for example if the location is required due to operational reasons such as water based recreation or navigation etc., the Council will expect buildings to incorporate water resistant materials and forms of construction to lower the potential for flood damage (see PAN 69) and the development should have a neutral impact on local flood risk. Dry proofing aims to prevent flood water entering a building, with the use of water barriers integral to the structure and across entrances, and non-return valves on drains. Wet proofing assumes water will enter the building and is based on the use of water resilient materials within the building and raising electrical wiring and sockets above the flood level.

7. Drainage Infrastructure

- 7.1 Water quality is a significant environmental issue and the design of surface water and foul water drainage for proposed developments has a major role in delivering and improving water quality. All development proposals should aim to enhance Clackmannanshire's water environment and, as a minimum, not have a detrimental impact on our water bodies.
- 7.2 All development proposals should be designed to have separate and distinct waste and surface water drainage systems. This will ensure that the sewer system is not overloaded and reduce the potential for pollution from waste water treatment works.

Drainage Assessment

- 7.3 Drainage matters for development works can no longer be treated as discrete matters to be dealt with in isolation. A Drainage Assessment (See Glossary) should address drainage systematically as an integral part of the sub-catchment and consider the sewer network, and surface water flow routing. The assessment requires to demonstrate that a satisfactory means of waste and surface water drainage can be provided for the proposed development incorporating the following:
- ▶ land-take required for proposed drainage facilities has been allowed for;
 - ▶ consideration has been given to the impact of the proposed development on the drainage catchment area;

- ▶ surface water run-off can be accommodated by SUDS on site;
 - ▶ existing foul drainage network, capacity and proposed connections;
 - ▶ detailed SUDS features and layout for full applications;
 - ▶ surface water drainage strategy for 'in principle' applications;
 - ▶ confirmation that extreme storm event flows will not adversely affect existing or proposed buildings;
 - ▶ agreed future management arrangements for the proposed SUDS; and
 - ▶ runoff rates from the development site agreed with the Council's Flood Management staff.
- 7.4 As the size and scope of the Drainage Assessment will vary depending on circumstances, scale and location, developers should have early contact with Scottish Water and Development Quality staff to discuss the nature of the assessment. Sensitive areas, which are likely to require an in depth study, are listed below:
- ▶ areas with no available public sewer;
 - ▶ areas affected by or affecting flood risk;
 - ▶ areas with high water tables;
 - ▶ receiving waters with no capacity for additional flow;
 - ▶ fisheries;
 - ▶ areas within or upstream of Sites of Special Scientific Interest;
 - ▶ sensitive ground water areas; and
 - ▶ contaminated land

Waste Water Drainage

- 7.5 The preferred option for waste water drainage is for it to be connected to the public waste water drainage system and in some instances this may require the developer to contribute to the upgrading of the local network. Connections to the public system should be designed to the relevant Scottish Water standards - Sewers for Scotland - on the basis that any discharge generated by the proposals should not increase the occurrence of flooding or surcharging to the existing system.
- 7.6 If a public sewer is not available in the vicinity of the proposed development site the applicant should contact Scottish Water to ascertain the possibility of extending the public sewer network to accommodate the proposals. If this is clearly demonstrated as a non-viable option and the development is of sufficient scale to warrant it, the applicant will need to consider providing a new foul sewerage system to adoptable standard and consult Scottish Water on the acceptability of the system. SEPA's preference is that sewerage systems and their associated treatment plants are publicly maintained.
- 7.7 Small scale development remote from the public sewerage system will require to be provided with a private discharge of waste water to land or controlled waters. SEPA prefers such discharges to land to be by means of a properly designed soakaway system which will require authorisation under CAR.

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Surface water management

7.8 Increased occurrences of storm events; wetter, warmer winters; and warmer, drier summers are being predicted as a consequence of climate change, meaning that the management and conservation of surface water is an increasingly important issue. Surface water runoff requires to be given careful consideration in the design and layout of developments to ensure new developments are free from flood risk and do not increase the risk of flooding locally (Placemaking SG). Sustainable Drainage Systems (SUDS) are a legislative requirement for all but single dwellinghouse developments. SUDS facilitate attenuation and treatment of surface water by replicating natural drainage systems and in doing so providing the opportunity for biological treatment before water is released back to the environment. SUDS should be located outwith the functional flood plain.

7.9 SUDS improve on traditional drainage systems as they:

- ▶ protect water quality by filtering out sediments and pollutants;
- ▶ slow runoff flows from sites; and
- ▶ provide landscape features and habitats for wildlife.

7.10 SUDS achieve this by:

- ▶ managing runoff close to where rain falls;
- ▶ managing potential pollution close to its source and prior to it reaching watercourses; and
- ▶ delaying flow to watercourses thereby reducing peak discharges entering watercourses when heavy rain occurs thus reducing flood risk.

7.11 SUDS ideally operate through a treatment train using a logical sequence of distinct SUDS facilities to manage runoff between the source and receiving watercourse or water body. This has four stages:

- ▶ **Good housekeeping** - encouraging more natural runoff paths and capturing runoff - measures include grass roofs, grey water systems, water butts, permeable surfaces;
- ▶ **Source control** - control of runoff at or near source - measures include permeable paving, swales, grasscrete;
- ▶ **Site control** - local facilities that receive runoff from upstream locations - measures include detention basins and small ponds; and
- ▶ **Regional control** - larger features which collect runoff from upstream controls - measures include large ponds and wetlands.



Green Roofs - Edinburgh (photo courtesy of SEPA)

7.12 Developers should consider the requirement for SUDS at the beginning of the design process, ensuring that the features are incorporated as an integral part of the design for the proposed development (see Placemaking SG). Integration of SUDS into the landscaping and green networks on or adjoining a development site will enhance the amenity of the proposals and be an important factor in place making and local biodiversity.

An appropriate scaled annotated plan should be included in the planning submission detailing:

- ▶ where the proposed SUDS features will be located, including a pond or basin where a second level of treatment is required;
- ▶ the land take necessary to accommodate the proposals;
- ▶ where relevant, confirmation that the proposed pond or basin has been sized to the required Treatment Volume (Vt) e.g. 1Vt for residential development; and
- ▶ confirmation that the proposals have been designed to either CIRIA or Sewers for Scotland (Second Edition) standards.

The level of surface water treatment required is dependant on the nature of the proposed development (for example residential or non residential), the size of the development, and the environmental risk posed by the development. SEPA has produced best practice advice on the levels of treatment required for various types of developments (see SEPA website). As best practice, the first level of SUDS treatment should always be provided by source control.

7.13 Small development proposals may not require the full treatment train as detailed above. However, in all cases SUDS require to be designed in accordance with CIRIA's SUDS Manual (C697). Where a scheme is to be adopted by Scottish Water the design manual Sewers for Scotland (second edition) should be used. Where the Council is to be the adopting authority reference should be made to the national technical guidance document 'SUDS for Roads'. The Council also hopes shortly to secure a Section 7 agreement with Scottish Water which will set out a framework for the fair management of surface water infrastructure serving development sites. This will enable both bodies to agree on the circumstances under which each will adopt appropriately designed surface water drainage systems, including SUDS, for the conveyance of surface water from development roads and associated premises. (See Appendix 3)



Menstrie SUDS Pond

7.14 The Council's preferred option is for SUDS facilities to be above ground, incorporated into the proposed landscaping scheme with solutions, where possible, that enable wetland habitat creation or enhancement, adding to local green networks and an important element in place making (see Placemaking SG). SEPA has produced guidance on maximising the ecological value of SUDS in its publication 'Ponds, Pools and Lochans' (Chapter 7).

Hard Standings

7.15 Hard standings have significant impact on surface water runoff. Traditional surfaces such as asphalt, block paving and concrete generate a very fast runoff during storm events which can overload the local sewers resulting in localised flooding of roads, land and sometimes property. This risk can be mitigated to a degree by reducing the runoff rate through the use of more porous materials for hard standing areas. Significant areas of hard standing such as parking areas can be designed to drain into filter strips or grass swale drainage systems. If groundwater and ground conditions are suitable, infiltration devices can help to dissipate surface water runoff into the ground. Permeable surfaces which allow rainwater to pass through the surface into an underlying storage level, where water is stored before infiltration into the ground, can also be used in certain circumstances.



Permeable Paving

Conventional Monoblock

Photo Courtesy of Neil McLean/SEPA

Householders - Hard Standings

7.16 Class 3C of the Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended) requires hard standings, new or existing, between houses and roads to be of porous construction or to have direct water run-off to a permeable surface or porous area within the garden. In all other circumstances, including any proposed hard standings in conservation areas or within the grounds of a listed building, planning permission is required.

SUPPLEMENTARY GUIDANCE 4

Useful Contacts

SEPA

Stirling Office,
Strathallan House, Castle Business Park,
Stirling. FK9 4TZ

Tel: 01786 452595

Scottish Water

Customer Connections, The Bridge, Buchanan Gate Business
Park, Cumbernauld Road, Stepps, Glasgow G33 6FB

connections@scottishwater.co.uk

Tel: 0141 414 7354 / 0744 387 6489

Development Quality

Clackmannanshire Council,
Kilncraigs, Greenside Street,
Alloa. FK10 1EB

planning@clacks.gov.uk

Tel: 01259 450000

Environmental Health

Clackmannanshire Council,
Kilncraigs, Greenside Street,
Alloa. FK10 1EB

ehealth@clacks.gov.uk

Tel: 01259 450000

Further Information Sources

Information	Source
Scottish Planning Policy Planning Advice Notes - PAN 61,69+ 79	Scottish Government
Drainage Assessment Ponds, Pools and Lochans Watercourses in the Community Land Use Vulnerability Guidance Enhancing Sustainable Urban Drainage (SUDS) for Wildlife	SEPA
Scotland River Basin Plan Forth Area Management Plan CAR Guidance Technical Flood Guidance	WWF
Slowing the Flow Flood Planner	Scottish Water
Sewers for Scotland (2nd Edition) Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland	CIRIA

Glossary

Water Environment and Water Services (Scotland) Act 2003 - Introduced a holistic approach to protecting the water environment, which comprises watercourses, coastal waters, lochs, groundwater and wetlands. Particular aims of the Act are the provision of a sufficient supply of good quality surface water and groundwater needed for a sustainable, balanced and equitable water use, significant reduction in the pollution of groundwater, protection of territorial and other marine waters and the promotion of sustainable flood management.

Point Source Pollution - single identifiable source of water pollution i.e. a pipe discharge to a water course.

Diffuse Pollution - water pollution from a variety of sources including run-off from roads, houses and commercial areas, run-off from farmland, and seepage into groundwater from developed landscapes of all kinds. Diffuse sources are often individually minor, but collectively significant.

Abstraction - the removal or diversion of water from the water environment. It can be carried out by a variety of means including a pump, pipes, an engineering structure in a watercourse, a borehole or a well.

Carbon sink - a natural or artificial reservoir that accumulates and stores some carbon containing chemical compound for an indefinite period. The process by which carbon sinks remove carbon dioxide (CO₂) from the atmosphere is known as carbon sequestration.

Potentially Vulnerable Areas - areas identified in the National Flood Assessment which are considered that a significant flood risk exists or is likely to occur. The FRM (Scotland) Act 2009 requirement for such areas are:

- ▶ SEPA to produce flood hazard and risk areas;
- ▶ SEPA in consultation, to set objectives and appraise measures to address identified risks;
- ▶ Identification of areas for the production of Local Flood Risk Management plans by lead local authorities; and
- ▶ Scottish Water to undertake an assessment of the risk of flooding from sewage systems.

Green Roof - roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproof membrane. Green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and mitigate the heat island effect. There are two types of green roofs: intensive roofs, which are thicker and can support a wider variety of plants but are heavier and require more maintenance, and extensive roofs, which are covered in a light layer of vegetation and are lighter than an intensive green roof.

Direct Impact on the Water Environment - engineering works such as canalisation, culverting and naturalisation of watercourses, septic tank outlets, pollution through leakages from site compounds, plant running through watercourses.

Indirect Impacts on the Water Environment - pollution from surface water flows, diffuse pollution from site activities, loss of bankside vegetation.

Responsible Authority (Water Environment and Water Services (Scotland) Act 2003) - The Council is designated as a responsible authority under this Act and it places a duty upon the Council to have regard to the Water Framework Directive in the course of carrying out normal duties. The key requirements that the Council must take into consideration are:

- ▶ to ensure compliance with WFD when carrying out their designated functions;
- ▶ to have regard to the social and economic impact that may result from carrying out these functions; and
- ▶ where it is consistent with the purpose of a function:
 - ▶ promote sustainable flood management;
 - ▶ act in a way best calculated to contribute to the achievement of sustainable development; and
 - ▶ adopt (if practicable) an integrated approach by co-operating with other responsible authorities with a view to co-ordinating the exercise of their respective functions.

SUPPLEMENTARY GUIDANCE 4

Responsible Authority (Flood Risk Management

(Scotland) Act 2009 - The Council is designated under the Act as a responsible authority and this places general duties upon the Council, in regard to carrying out its functions. The key requirements that the Council must take into consideration are:

- ▶ act with a view to reducing overall flood risk;
- ▶ act to ensure compliance with the EU Flood directive;
- ▶ act with a view to achieving the objectives set out in the flood risk management plans; and
- ▶ have regard to the social, environmental and economic impact of carrying out those functions.

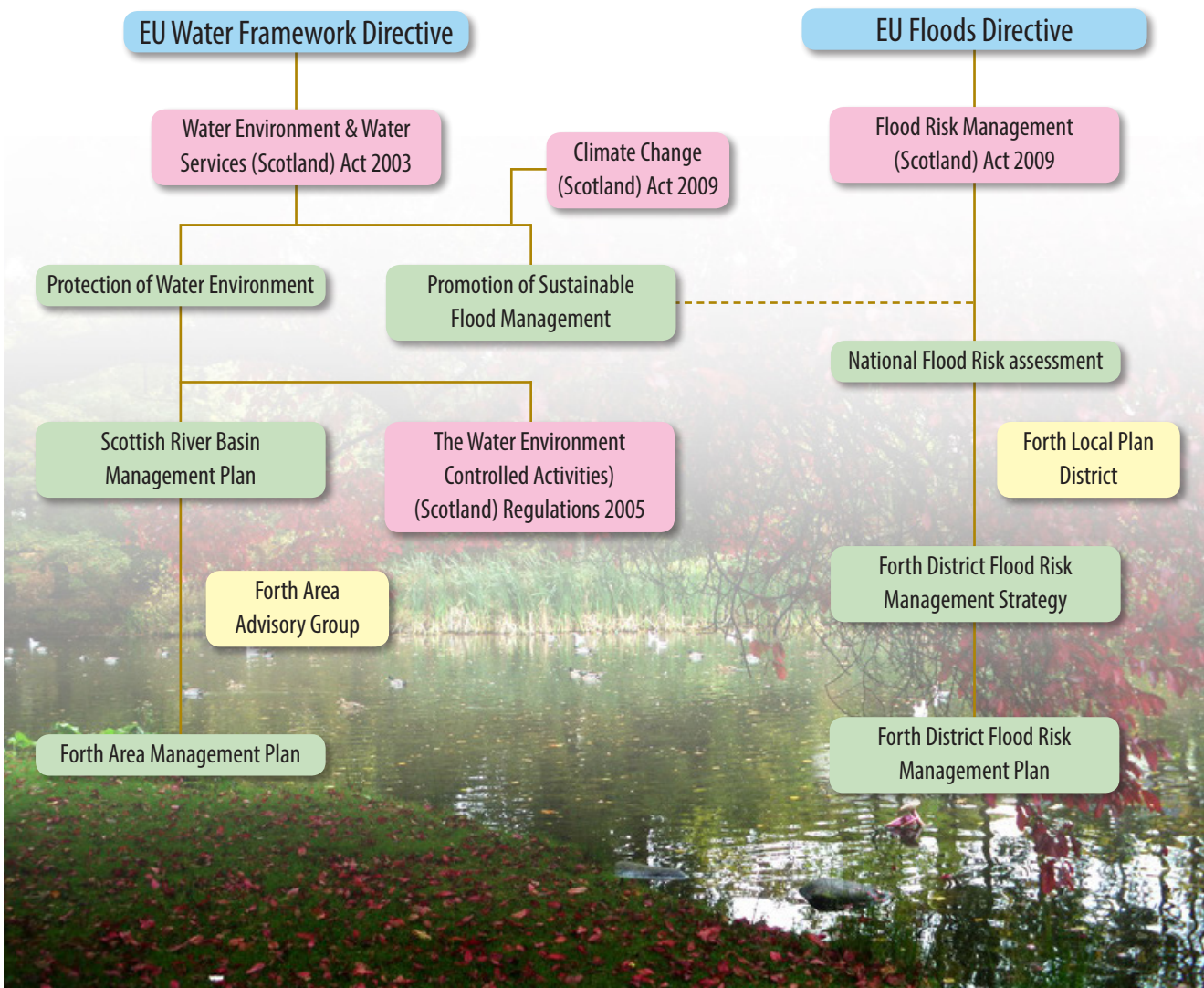
So far as is consistent with flood risk functions, the Council must also:

- ▶ act in the best way calculated to manage flood risk in a sustainable way ;
- ▶ promote sustainable flood risk management;
- ▶ act with a view to raising public awareness of flood risk; and
- ▶ act in the way best calculated to contribute to the achievement of sustainable development.

Drainage Assessment - A statement of the drainage issues relevant to a proposal and the suitable means of providing drainage. Assessments are site specific and their length and detail should be proportionate to the site issues. As appropriate they may include existing drainage systems and problems, infiltration, groundwater, surface water flow, foul and storm water disposal, SUDS and drainage related flooding issues.

Freeboard - Freeboard allowance is a height added to the predicted level of a flood to take account of account of the height of any waves or turbulence and the uncertainty in estimating the probability of flooding.

Appendix 1 Legislation Diagram



Appendix 2 SPP Flood Risk Framework

Little or No Risk - annual probability of coastal or watercourse flooding is less than 0.1% (1 :1000 years)

- ▶ No constraints due to coastal or watercourse flooding.

Low to Medium Risk Area - annual probability of coastal or watercourse flooding is between 0.1%- 0.5 % (1: 1000- 1 :200 years)

- ▶ Suitable for most development. A flood risk assessment may be required at the upper end of the probability range (i.e. close to 0.5%), and for essential infrastructure and the most vulnerable uses. Water resistant materials and construction may be required.
- ▶ Generally not suitable for civil infrastructure. Where civil infrastructure must be located in these areas or is being substantially extended, it should be designed to be capable of remaining operational and accessible during extreme flood events.

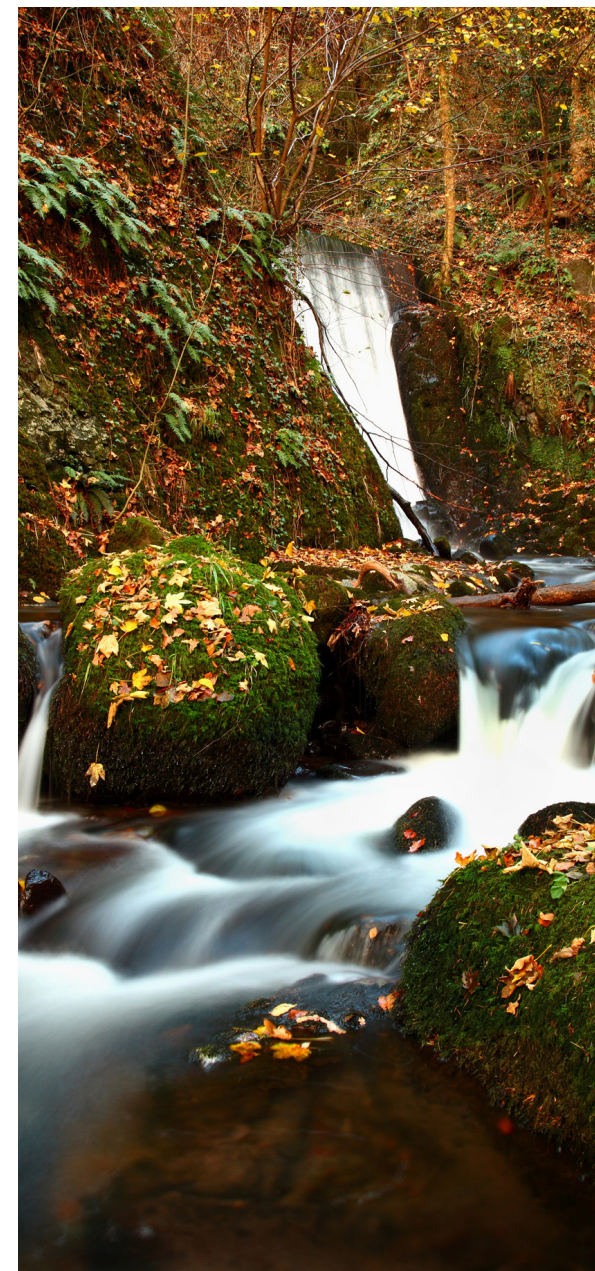
Medium to High Risk - annual probability of coastal or watercourse flooding is greater than 0.5% (1 : 200 years)

May be suitable for:

- ▶ residential, institutional, commercial and industrial development within built-up areas
- ▶ provided flood protection measures to the appropriate standard already exist and are maintained, are under construction, or are a planned measure in a current flood risk management plan;
- ▶ essential infrastructure within built-up areas, designed and constructed to remain operational during floods and not impede water flow;
- ▶ some recreational, sport, amenity and nature conservation uses, provided appropriate evacuation procedures are in place; and
- ▶ job-related accommodation, e.g. for caretakers or operational staff.

Generally not suitable for:

- ▶ civil infrastructure and the most vulnerable uses;
- ▶ additional development in undeveloped and sparsely developed areas, unless a location is essential for operational reasons, e.g. for navigation and water-based recreation, agriculture, transport or utilities infrastructure (which should be designed and constructed to be operational during floods and not impede water flow), and an alternative, lower risk location is not available;
- ▶ new caravan and camping sites;
- ▶ Where built development is permitted, measures to protect against or manage flood risk will be required and any loss of flood storage capacity mitigated to achieve a neutral or better outcome; and
- ▶ Water-resistant materials and construction should be used where appropriate. Elevated buildings on structures such as stilts are unlikely to be acceptable.



SUPPLEMENTARY GUIDANCE 4

Appendix 3 - Approach to Sustainable Urban Drainage systems(SUDS) Adoption and Maintenance

In relation to planning applications for developments that require strategic Sustainable Urban Drainage systems (SUDS) the council will advocate and, where necessary, facilitate early joint discussions to encourage collaboration between representatives of developers, Scottish Water, the Scottish Environment Protection Agency, the Council's Roads and Transportation and the Council's Planning Services. This is to promote the early agreement on the design, technical approval, ownership and subsequent maintenance of the development's SUDS. Failure to fully engage in this process to deliver this important infrastructure element

can result in a poorly performing SUDS with potential pollution and surface water issues arising. Therefore, early meaningful collaboration between representatives of the bodies, detailed above, will be encouraged with the Council endeavouring to ensure that effective engagement takes place between the bodies to reach agreement. This approach is considered to be an effective step to developing a clear approval process, from design conception through to final ownership of SUDS, ensuring that such systems are able to deliver sustainable environmental and flood risk benefits for their localities.



Menstrie Wetland



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