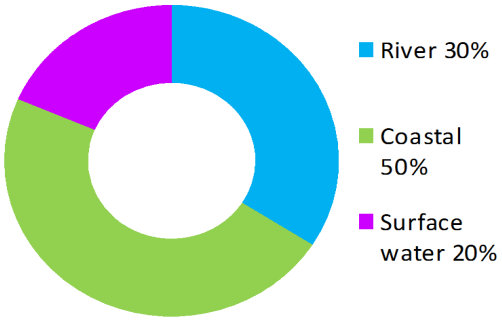
Ecclefechan - Annan (Potentially Vulnerable Area 14/08)

Local Plan District	Local authority	Main catchment
Solway	Dumfries and Galloway Council	River Annan

Summary of flooding impacts



At risk of flooding

- 240 residential properties
- 70 non-residential properties
- £590,000 Annual Average Damages

(damages by flood source shown left)

Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

Flood protection scheme/works	*Natural flood management works*	New flood warning	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

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Background

This Potentially Vulnerable Area is located in the east of the Solway Local Plan District, on the south coast of Dumfries and Galloway (shown below). It over 90km^2 and incorporates Annan in the south and Grange Fell in the north.

There are approximately 240 residential properties and 70 non-residential properties at risk of flooding. The Annual Average Damages are approximately £590,000.

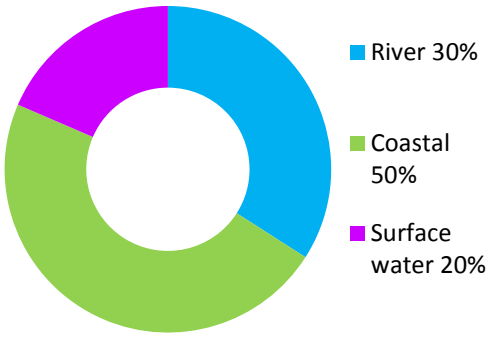


Figure 1: Annual Average Damages by flood source

Summary of flooding impacts

River flooding is mainly associated with the River Annan and its tributaries, and affects the towns of Ecclefechan, Brydekirk and Annan. In Ecclefechan, the Mein Water, a tributary of the Annan, and the Ecclefechan Burn provide the main flood risk. In Brydekirk, river flooding from the River Annan may affect a number of residential properties. Flooding has also previously occurred from the Jennymill Burn in the southern part of the village.

There is a risk of coastal flooding to the south of Annan. Within Annan town centre, problems of overflowing storm drains and culverts have been recorded. There is also a combined river and tidal risk in the lower reaches of the River Annan, which contributes to flood risk. Therefore, the combination of river, surface water and coastal flooding within this Potentially Vulnerable Area is a key issue.

There are no existing formal flood defence schemes within this area. However, there are a number of privately owned coastal defences at Battlehill and Newbie, including concrete seawalls, sleeper walls, rock armour and a dumped clay embankment. Dumfries and Galloway Council also maintain coastal erosion defences to the west of Barnkirk Point. This is by means of an old concrete wall that is fronted by a revetment of heavy rock armour. This heavyweight rock armour continues

westwards, protecting the eastern part of the Newbie. The western end of Newbie is then protected by a mixture of rock armour stone, concrete and sheet steel.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. In Ecclefechan, a number of residential properties, short sections of railway line and the B7075 and A74 roads and agricultural land is at risk. To the south of Annan, residential and non-residential properties are at risk of flooding. There are also areas of agricultural land, sections of road near Newbie and designated environmental areas at risk from elevated tidal levels in the Solway estuary.

The damages associated with floods of different likelihood are shown in Figure 2. Residential properties affected by coastal flooding experience the highest economic impact at approximately 30% of the damages. Non-residential properties also provide a notable contribution at approximately 12% of the damages.

Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 240 to 350 and the number of non-residential properties from approximately 70 to 100.

The location of the impacts of flooding is shown in Figure 3. Most of the receptors at risk of flooding lie within Annan and include people, non-residential properties, utilities, roads and railways.

History of flooding

Records show that the towns of Annan and Brydekirk have been mainly affected by river flooding. The most recent river flood took place in October 2005 and resulted in flooding to properties, gardens and roads. The most damaging river flood to properties and people in the area was recorded in October 1896, in the Lower Annandale area of Annan.

Surface water floods have been recorded in Annan and Dunbeck in 2006. Recent surface water floods have also been reported in Annan during the summer of 2013 at Standalane and Newington Park, where water flowed out of a drain and into gardens at Newington Park. The flooding was followed by mitigation works after joint investigations between Scottish Water and Dumfries and Galloway Council.

Coastal flooding has also affected the town of Annan. The coastal floods with the highest damages caused to properties and people occurred in 1896 and 1902. Less damaging coastal floods have also been recorded in 1930, 1942, 1947, 1996 and 2002. The 2002 event had high flows in the River Annan and caused joint river and coastal impacts. The most recent coastal flood event occurred on the 3 January 2014 and impacted roads, properties and agricultural land.

	1 in 10 High likelihood	1 in 200 Medium likelihood	1 in 1000 Low likelihood
Residential properties (total 5,300)	40	240	410
Non-residential properties (total 470)	30	70	100
People	90	520	900
Community facilities	0	0	0
Utilities assets	<10	10	10
Transport links – roads (km)	1.7 (of which 0.4 is motorway and 0.1 is A road)	4.1 (of which 0.5 is motorway and 0.7 is A road)	5.7 (of which 0.5 is motorway and 2.5 is A road)
Transport links – rail (km)	1.5	1.8	2.1
Environmental designated areas (km^2)	2.8	3.0	3.1
Designated cultural heritage sites	11	13	16
Agricultural land (km^2)	2.5	4.1	5.3

Table 1: Summary of flood impacts[1]

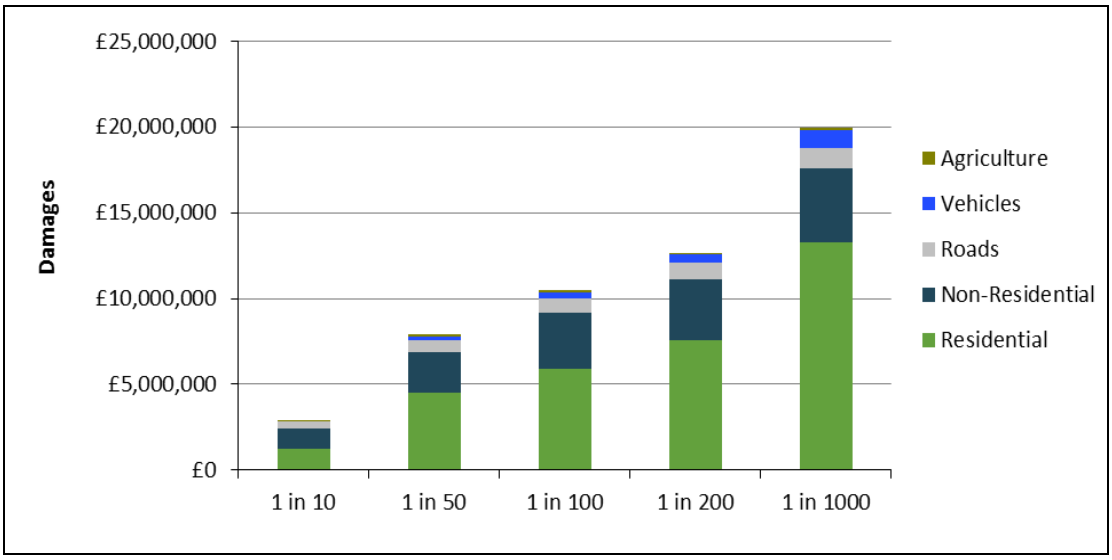


Figure 2: Damages by flood likelihood

[1] Some receptors are counted more than once if flooded from multiple sources

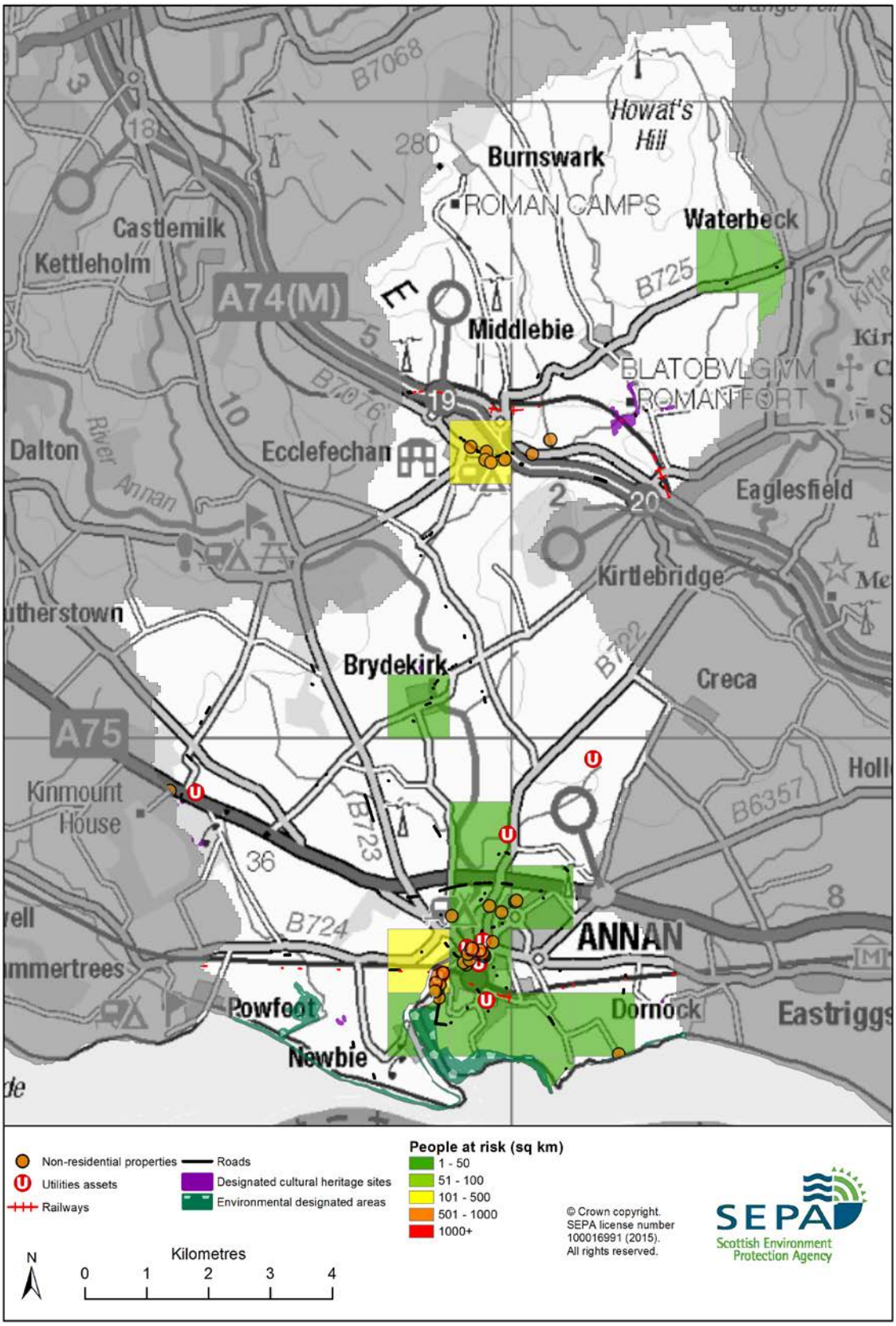
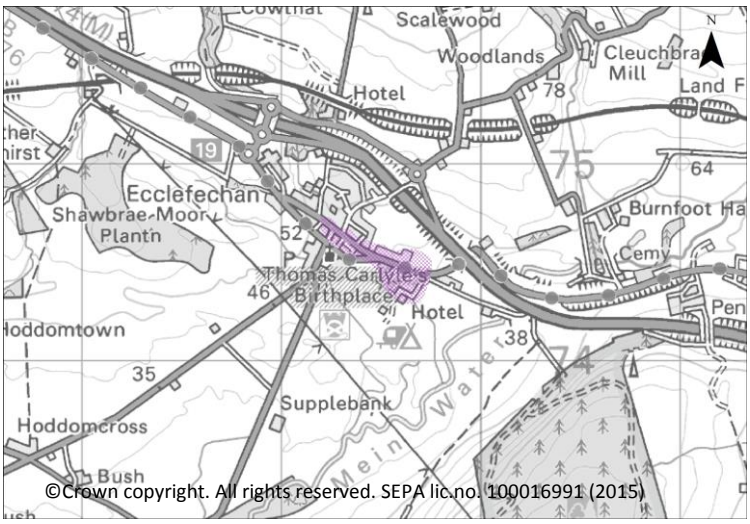


Figure 3: Impacts of flooding

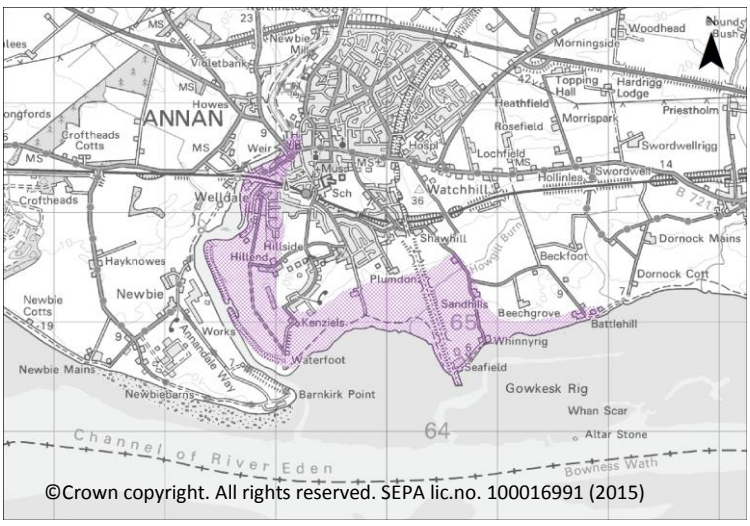
Objectives to manage flooding in Potentially Vulnerable Area 14/08

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA's flood map. The objectives below have been set for Ecclefechan - Annan Potentially Vulnerable Area.

Reduce the risk of river flooding to residential and non-residential properties in Ecclefechan

Indicators:	Target area:
• 50 residential properties • <10 non-residential properties • £74,000 Annual Average Damages	
Objective ID: 14009	

Reduce the risk of coastal flooding to residential and non residential properties in Annan

Indicators:	Target area:
• 110 residential properties • 30 non-residential properties • £270,000 Annual Average Damages	
Objective ID: 14011	

Target area	Objective	ID	Indicators within PVA
Annan	Reduce the economic damages and risk to people from surface water flooding in Annan	14034	* See note below
Applies across Solway Local Plan District	Avoid an overall increase in flood risk	14033	• 240 residential properties • £590,000 Annual Average Damages
Applies across Solway Local Plan District	Reduce overall flood risk	14040	• 240 residential properties • £590,000 Annual Average Damages
Applies across Solway Local Plan District	Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.		

* This objective will be monitored using surface water flood risk across the Potentially Vulnerable Area. For 14/08 there are 30 residential properties at risk and Annual Average Damages of £85,000.

Actions to manage flooding in Potentially Vulnerable Area 14/08

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Ecclefechan - Annan Potentially Vulnerable Area.

Selected actions					
Flood protection scheme/works	*Natural flood management works*	New flood warning	*Community flood action groups*	*Property level protection scheme*	*Site protection plans*
Flood protection study	Natural flood management study	Maintain flood warning	Awareness raising	Surface water plan/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

Action (ID):	**NEW FLOOD WARNING** (140400010)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**post 2021**
Description:	The area under consideration includes properties affected by flooding from the River Annan. Full scoping will be required before a flood warning service can be developed and implemented in this area and further assessment will help to determine appropriate timescales for delivery.		

Action (ID):	**FLOOD PROTECTION STUDY** (141220020)		
Objective (ID):	Reduce the risk of coastal flooding to residential and non residential properties in Annan (14011)		
Delivery lead:	Dumfries and Galloway Council		
Priority:	National:	Within local authority:	
	1 of 168	**1 of 10**	
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	A study is recommended to further develop the understanding of coastal flooding along the Solway coastline. This study should build on from the previous shoreline management plan to investigate flooding and coastal erosion, wave overtopping and the current coastal protection offered. The study may focus in detail on Potentially Vulnerable Areas however it could also look at the risk to		

	other areas. The study will help to develop an understanding of coastal issues and identify where further work may be required to mitigate against flooding.
Potential impacts	
Economic:	There are 259 residential properties and 64 non-residential properties at risk of flooding over the extent of this study. The potential damages avoided over this area are estimated to be up to £26.1 million.
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. To be in accord with the flood risk management strategy, the responsible authority should seek to ensure as part of the study that the Solway coastal study will not have an adverse effect on the integrity of the Loch of Inch and Torrs Warren Special Protection Area, Upper Solway Flats and Marshes Special Protection Area, Luce Bay and Sands Special Area of Conservation, and Solway Firth Special Area of Conservation. There is the potential for impacts on several coastal Sites of Special Scientific Interest.

Action (ID):	**FLOOD PROTECTION STUDY** (140110005)		
Objective (ID):	Reduce the risk of coastal flooding to residential and non residential properties in Annan (14011)		
Delivery lead:	Dumfries and Galloway Council		
Priority:	National:	Within local authority:	
	61 of 168	**5 of 10**	
Status:		Indicative delivery:	**2022-2027**
Description:	A flood protection study should be carried out to investigate further the construction of direct flood defences along the River Annan in Annan. This study may also consider property level protection actions and other complementary actions. The Solway coastal study (ID 141220020) will help to identify the requirements of this work. Therefore this study is not planned until the second cycle.		
Potential impacts			
Economic:	There are 96 residential properties and 25 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £6.1 million.		
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the flood protection study area. In addition there are two utilities which have been identified as potentially benefitting from this action.		
Environmental:	Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the		

Environmental:	environment. To be in accord with the FRM Strategy, the responsible authority should seek to ensure as part of the study that the action will not have an adverse effect on the integrity of the Solway Firth Special Area of Conservation, and Upper Solway Flats and Marshes Special Protection Area. Construction of direct defences on the River Annan has the potential for downstream impacts on the Upper Solway Flats and Marshes Site of Special Scientific Interest and Ramsar site. There is likely to be a loss of natural and semi-natural habitat in the footprint and vicinity of the defences. There is the potential for the direct defences to have negative impacts on the setting of several listed buildings on Port Street in Annan.

Action (ID):	**NATURAL FLOOD MANAGEMENT STUDY** (140090003)		
Objective (ID):	Reduce the risk of river flooding to residential and non-residential properties in Ecclefechan (14009)		
Delivery lead:	Dumfries and Galloway Council		
Status:	**Not started**	Indicative delivery:	**2022-2027**
Description:	A natural flood management study is recommended to further assess the potential to reduce runoff to Ecclefechan.		
Potential impacts			
Economic:	The economic impacts have not been defined at this stage.		
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community.		
Environmental:	Natural flood management actions can have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats. There are no international or national level environmental designations that are likely to be impacted by this action. There is the potential for the existing ecosystems in the area to be impacted through a change of land use if woodland planting is undertaken; however, this would improve biodiversity as the existing land is arable and grazing. There are likely to be improvements in water quality through reduced agricultural chemical and sediment runoff, which will have positive impacts on the terrestrial and freshwater habitats and species in the area. Implementation of this action would benefit listed buildings off Hall Road and High Street during high frequency flood floods.		

Action (ID):	**SURFACE WATER PLAN/STUDY** (140340018)
Objective (ID):	Reduce the economic damages and risk to people from surface water flooding in Annan (14034)
Delivery lead:	Dumfries and Galloway Council

Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (140400016)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,100km² of improved surface water data is currently available within this Local Plan District. The inclusion of additional surface water hazard data resulting from the completion of local authority surface water management plans and Scottish Water integrated catchment studies will be considered as these projects are completed. SEPA will seek to develop flood mapping in the Gretna to Portpatrick area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. Where this work coincides with local authority studies, SEPA will work collaboratively to ensure consistent modelling approaches are applied.		

Action (ID):	**STRATEGIC MAPPING AND MODELLING** (140400019)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	Scottish Water		
Status:	**Not started**	Indicative delivery:	**2016-2021**
Description:	Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.		

Action (ID):	**MAINTAIN FLOOD WARNING** (140400030)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Continue to maintain the Upper Solway Firth flood warning area which is part of the Solway coastal flood warning scheme.		

Action (ID):	**FLOOD FORECASTING** (140400009)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	SEPA		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.		

Action (ID):	**SELF HELP** (140400011)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	—		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. Dumfries and Galloway Council has a Pilot Flood Product Subsidy Scheme in place, it is recommended that this should be continued. Residential or business properties that are identified as being at risk of flooding are eligible for the scheme. There are various products to reduce the impact of flooding to properties which can be purchased as part of the scheme.		

Action (ID):	**AWARENESS RAISING** (140400013)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	Responsible authorities		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact. SEPA will engage with the community and promote Floodline in the Upper Solway Firth coastal flood warning area. This will be achieved through direct mailing for flood warning areas and education events. Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.		

Action (ID):	**MAINTENANCE** (140400007)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	Dumfries and Galloway Council, asset / land managers		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.		

Action (ID):	**EMERGENCY PLANS/RESPONSE** (140400014)		
Objective (ID):	Reduce overall flood risk (14040)		
Delivery lead:	Category 1 and 2 Responders		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Dumfries and Galloway Council along with the Scottish Fire and Rescue Service, SEPA and the Scottish Flood Forum have procured a Flood Pod. The Pod can be deployed to an area at risk of a flood emergency and is filled with flood protection equipment which is issued to the public.		

Action (ID):	**PLANNING POLICIES** (140330001)		
Objective (ID):	Avoid an overall increase in flood risk (14033) Reduce overall flood risk (14040)		
Delivery lead:	Planning authority		
Status:	**Existing**	Indicative delivery:	**Ongoing**
Description:	Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2.		