

Flood Risk Management
(Scotland) Act 2009:

Local Flood Risk Management Plan

Tay Estuary and Montrose Basin

Local Plan District



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Delivering sustainable flood risk management is important for Scotland's continued economic success and well-being. It is essential that we avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities.

This is first Local Flood Risk Management Plan for the Tay Estuary and Montrose Basin Local Plan District, describing the actions which will make a real difference to managing the risk of flooding and recovering from any future flood events.

The task now for us – Local authorities, Scottish Water, SEPA, the Scottish Government and all other responsible authorities and public bodies – is to turn our plan into action.

Contributors



Scottish Water
Trusted to serve Scotland



Foreword by Cllr Jeanette Gaul, Angus Council



The impacts of flooding experienced by individuals, communities and businesses can be devastating and long lasting. It is vital that we continue to reduce the risk of any such future events and improve Scotland's ability to manage and recover from any events which do occur.

The publication of this Plan is an important milestone in implementing the Flood Risk Management (Scotland) Act 2009 and improving how we cope with and manage floods in the Tay Estuary and Montrose Basin local plan district. The Plan translates this legislation into actions to reduce the damage and distress caused by flooding over the first implementation cycle from 2016 to 2022.

The Tay Estuary and Montrose Basin local plan district is led and is published by Angus Council on behalf of a partnership comprising five local authorities: Angus Council; Perth and Kinross Council, Fife Council; Aberdeenshire Council; Dundee City Council; as well as Scottish Water; SEPA; Cairngorms National Park Authority and Forestry Commission Scotland.

In summary, there are 19 areas that have been identified as being potentially vulnerable to flood risk across the Tay Estuary and Montrose Basin local plan district. Within these areas, there are approximately 3,490 residential and 1,210 non-residential properties at risk from flooding. The estimated annual average damage of these flood risks is approximately £13.6million.

This Plan presents actions to avoid and reduce the risk of flooding, and prepare and protect ourselves and our communities within these potentially vulnerable areas and across the local plan district. These actions include 5 flood protection schemes or works; 11 flood protection studies; 3 natural flood management studies; 1 natural flood management works; as well as flood warning schemes, surface water management plans, and emergency plans and response. The delivery of many of these actions may be dependent on the availability of funding; however, we can all play our part in managing flood risk as we are able.

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from flooding. The publication of this Plan shows that the coordinated and collaborative efforts of public bodies can be brought together to deliver sustainable outcomes. However, the actions in this Plan can only be delivered with the support of all the public bodies, The Scottish Government, and most importantly you and your communities.

This Plan therefore provides the blueprint upon which SEPA, local authorities and Scottish Water and any other responsible authorities will deliver their flood risk management responsibilities and, in particular, that all steps should be taken to manage flooding in a sustainable manner.

I would like to thank all those who contributed to the development of this Plan which will help shape the way in which floods and their impacts are managed across the Tay Estuary and Montrose Basin local plan district.

A handwritten signature in black ink, appearing to read 'Jeanette Gaul'. The signature is written in a cursive style with a large initial 'J'.

Councillor Jeanette Gaul
Vice Convener Communities, Angus Council
15 June 2016

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List of Acronyms and Abbreviations

CoSLA	Convention of Scottish Local Authorities
FRM	Flood Risk Management
FRMS	Flood Risk Management Strategies (prepared by SEPA)
ICS	Integrated Catchment Study
LA	Local Authority
LFRMP	Local Flood Risk Management Plan
LLA	Lead Local Authority
LPD	Local Plan District
NFM	Natural Flood Management
PFI	Public Finance Initiative
PVA	Potentially Vulnerable Area
Q&S	Quality & Standards (Scottish Water)
SEPA	Scottish Environment Protection Agency
SR10/15	Spending Review periods for 2010-2015 and 2016-2021 for Scottish Water capital maintenance expenditure
SWMP	Surface Water Management Planning
TEAMB	Tay Estuary and Montrose Basin

Chapter 1: Flood Risk Management in the Tay Estuary and Montrose Basin Local Plan District

1.0 What is a Local Flood Risk Management Plan?

The Local Flood Risk Management Plan (the 'Plan') has been developed to detail the actions adopted to reduce the devastating and costly impact of flooding in the Tay Estuary and Montrose Basin (TEAMB) local plan district (LPD). The Plan supplements the [Flood Risk Management Strategy](#) (the 'Strategy') for the Tay Estuary and Montrose Basin LPD developed by SEPA in consultation with local authorities, Scottish Water, and transport and utility companies. The Strategy was developed to coordinate the efforts of all organisations that tackle flooding from all sources and in both urban and rural areas. The Strategy sets the objectives to tackle flooding and identify actions to deliver these objectives. Objectives and actions have been set and agreed by all responsible authorities and prioritised over six-year planning cycles. The Strategy sets out the short term to long term ambition for flood risk management in Scotland, identifying where the risk of flooding and benefits of investment are greatest. Supporting information extracted from the Tay Estuary and Montrose Basin Flood Risk Management Strategy is included in [Annex 2](#).

The Plan takes the actions contained in the Strategy and adds details as to who will be responsible for implementing actions, a timetable of when actions will be delivered, a description of the co-ordination requirements and funding arrangements (for detail [see Chapter 3](#)). The plan covers the first six-year implementation cycle from 2016 to 2022.

By publishing the Plan, individuals and local communities are provided with information that allows them to better manage their own responsibilities. Everyone can take action with the confidence of what others are doing and with the clear knowledge of when they are undertaking these actions. It is through this risk-based and plan-led approach that flood management will improve for the individuals, communities and businesses at risk in the TEAMB LPD.

The content of the Plan has been agreed by the lead authority, all responsible authorities and SEPA.

The Plan is published by Angus Council, lead authority for the TEAMB LPD. It has been prepared in collaboration with Aberdeenshire Council, Dundee City Council, Fife Council, Perth & Kinross Council, SEPA, Scottish Water, Cairngorms National Park Authority and other organisations with an existing and ongoing responsibility or interest in managing flooding. The Plan is a requirement under the Flood Risk Management (Scotland) Act 2009.

1.1 How to read this plan

The Local Flood Risk Management Plan has been developed in three sections:

- **Chapter 1** explains what the flood risk management plan is, how it has been developed and the obligations different partners have to fulfil duties under the Flood Risk Management (2009) Scotland Act,
- **Chapter 2** provides a summary of flood risk in the TEAMB LPD and an overview of objectives and actions that apply across the LPD;
- **Chapter 3** looks at the detail of the objectives and actions set within each Potentially Vulnerable Area for the first implementation cycle 2016 - 2022 along with historical information.

Annexes to the Plan provide supporting documents and references, and present more detailed information in various formats. A **glossary of terms** is also available.

The Plan should be read alongside the Strategy for the TEAMB LPD. The Strategy for the TEAMB LPD has been developed in parallel and provides additional background information and national context. The Strategy was published in December 2015. Both the Plan and the Strategy will be updated every six years – see Chapter 1.4 of the Plan.

In developing the maps, SEPA worked in partnership with local authorities. They also worked with the industry to define the overall approach to flood hazard mapping and undertook a series of internal checks and local authority reviews of outputs. Further information on Flood Hazard and Risk including mapping can be found at:

<http://www.sepa.org.uk/environment/water/flooding/flood-maps/>

Flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website here:

<http://map.sepa.org.uk/floodmap/map.htm>

Further details of flood risk from distinct sources can be found in the river, coastal and surface water chapters in Section 3 of the **Flood Risk Management Strategy for TEAMB LPD**.

1.2 How we have developed the Plan?

1.2.1 Coordination, collaboration and partnership working

Many organisations and individuals have been involved in helping to improve flood risk management in Scotland and provide a more holistic approach than was previously undertaken. It is recognised that a piecemeal or reactive approach to tackling flooding does not work. Working jointly to overcome political differences and geographical boundaries is essential to deliver effective flood risk management options.

The Plan has been developed in close partnership between all responsible authorities, SEPA and Scottish Water. In local partnerships, here and throughout Scotland, SEPA has provided the technical analysis and the evidence to ensure that a nationally consistent approach is taken. Local authorities, Scottish Water and the Cairngorms National Park Authority have made sure that local knowledge and expertise has informed the decision-making. The TEAMB Plan has been developed in partnership by:

Angus Council (lead authority);
Aberdeenshire Council;
Dundee City Council;
Fife Council;
Perth and Kinross Council;
Scottish Water;
SEPA;
Cairngorms National Park Authority; and
Forestry Commission Scotland.

1.2.2 Roles and responsibilities for flood risk management planning

Individuals are the first line of defence against flooding and have responsibilities to protect themselves from inundation. Being prepared by knowing what to do and who to contact if flooding happens can help you reduce the damage and disruption flooding can have on your life. However, the responsibility for planning flood risk management falls in the main to SEPA, local authorities and Scottish Water.

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. SEPA has a statutory duty to produce Scotland's Flood Risk Management Strategies. They work closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted. SEPA also has an existing and ongoing responsibility to identify where in Scotland there is the potential for natural flood management techniques to be introduced.

In running Floodline, SEPA provides direct warnings, live flooding information and advice on how to prepare for or cope with the impacts of flooding 24 hours a day, seven days a week. To help forecast for flooding SEPA works in partnership with the **Met Office** through the Scottish Flood Forecasting Service. SEPA has piloted surface water flood forecasting to help urban areas improve their resilience to and preparedness for flooding. The development and wider roll-out of this service is being considered alongside the technical, resource and communication challenges associated with providing surface water flooding guidance.

To raise awareness of flooding at a national level SEPA runs education initiatives, community engagement programmes and an annual campaign to promote the useful advice and information available through Floodline. SEPA works in partnership with local authorities, Neighbourhood Watch Scotland, Ready Scotland and others to share resources and help to promote preparedness and understanding of how flood risk is managed.

Local authorities work together for flood risk management planning purposes through a single lead authority which has the responsibility to produce a Local Flood Risk Management Plan. Local authorities have been working collaboratively to develop these. It is the responsibility of your local authority to implement its flood protection actions agreed within the Plan from new engineering projects to clearance and repair of watercourses. During severe flooding, local authorities will work with the emergency services and coordinate shelter for people evacuated from their homes.

Scottish Water is a responsible authority for flood risk management and is working closely with SEPA, local authorities and others to coordinate plans to manage flood risk. Scottish Water has the public drainage duty and is responsible for foul drainage and the drainage of rainwater run-off from roofs and any paved ground surface from the boundary of properties. Additionally, Scottish Water helps to protect homes from flooding caused by sewers either overflowing or becoming blocked. Scottish Water is not responsible for private pipework or guttering within the property boundary

Cairngorms National Park Authority is a responsible authority for flood risk management and as a major landowner and land manager has potential to contribute to flood risk reduction. Cairngorms National Park Authority play an important role in land use planning, carrying out activities and granting permission for activities that play a key role in managing and reducing flood risk.

Forestry Commission Scotland is a responsible authority for flood risk management and as a major landowner and land manager had potential to contribute to flood risk reduction

Further details on some of the key roles are outlined in [Annex 3](#).

1.2.3 Consultation, engagement and advice

Local authorities and SEPA were keen to hear from the people and communities that live under the threat of flooding, to ensure that our technical analysis of the risks is accurate and that efforts to manage flooding are targeted to where most can be achieved. Two statutory public consultations were held during the development of the Flood Risk Management Strategies and Plans. The first consultation, held in 2011 and led by SEPA, was on the general approach to flood risk management planning and the identification of PVA. The second, held in 2015 was a joint SEPA and lead authority consultation on the draft Flood Risk Management Strategies and the implementation plans. The views and representations of the respondents to this second consultation were taken account of in developing and finalising the Local Flood Risk Management Plan.

In addition to input from the public consultations, advice has been sought from relevant organisations at key stages. The Flood Risk Management Strategies and Local Flood Risk Management Plans have benefitted from input from Local Advisory Groups throughout the process, providing important area-based knowledge. Advice was also taken from a National Flood Management Advisory Group consisting of over 50 member organisations, reflecting the national importance and impact of flooding on our communities, economy, environment and cultural heritage.

Some of the work carried out has been complex and technical in nature for which professional advice was sought. Working together, SEPA, The Scottish Government, local authorities, Scottish Water, Forestry Commission Scotland, the National Park Authorities and other key interested organisations have assisted each other and developed industry best practice guidance for flood risk management planning.

Further detail on consultation and engagement can be found within [Annex 4](#).

1.2.4 Identification of objectives, appraisal and prioritisation of actions

The identification of objectives and selection of actions was led by SEPA as part of Flood Risk Management Strategy with significant input from local authorities and Scottish Water.

Working collaboratively with local partnerships, SEPA has agreed the objectives for addressing the main flooding impacts. Actions that could deliver these agreed objectives have been appraised for their costs and benefits to ensure the right combinations are identified and prioritised. The actions considered in the development of the strategy include structural actions (such as building floodwalls, restoring flood plains, or clearance and repair works to rivers) and non-structural actions (such as flood warning, land use planning or improving our emergency response). Structural and non-structural actions are used together to manage flood risk effectively.

An assessment of the potential for natural flood management was used to help identify opportunities for using the land and coast to slow down and store water. Natural flood management actions have been recommended in areas where they could contribute to the management of flood risk. In such instances these actions are described as part of flood protection or natural flood management studies.

To prioritise actions across Scotland, SEPA made a technical, risk-based assessment of the costs and impacts of actions. This independent assessment was used alongside information from partner organisations jointly agree priorities and identify indicative delivery dates for actions. A National Prioritisation Advisory Group was established to provide guidance to SEPA on the priority of flood risk management actions, having considered both the technical ranking prepared by SEPA and issues of local priority. This group was made up of representatives from SEPA, local authorities, CoSLA and Scottish Water.

The lists of prioritised actions to meet agreed goals and objectives in the first six-year cycle considered what would be achievable assuming a similar level of funding for flood risk management activities from The Scottish Government. However, given the timing of spending reviews and annualised financial settlements for local government, the actual ability to deliver all the actions set in the Strategies in December 2015 and detailed in this Plan will be dependent on the availability of the necessary funding in each year of the six year Plan.

1.2.5 Post-consultation communication and engagement

Progress in the development of the Plan since consultation has been reported through governance arrangements of responsible authorities. In the case of local authorities, where committee reporting is the norm for such updates and approval, reports and minutes of meetings are publicised openly. Through the local democratic process, such reports have served as communication with the wider public.

Communication more generally varies across the partnership dependent on the target audience and the likely impact of the Plan in specific areas. The publication of the Plan and the content of the actions to manage flood risk across the LPD from 2016-2022 has been communicated where appropriate to resilience and flood action groups and meetings, as well as correspondence with the public and organisations in dealing with day to day flood risk management activities. Responsible authorities also continue to raise public awareness through the use of websites and social media applications. In particular, storm events and flooding in the period between the publication of the Strategy and the Plan have provided such an opportunity to communicate and engage on flood risk management, and inform people of the publication of the Plan.

Further detail on consultation and engagement can be found within [Annex 4](#)

1.2.6 Links with other plans, policies, strategies and legislative requirements

The Plan does not stand in isolation. As far as is practicable, an integrated approach to land and water management has been pursued. When developing Flood Risk Management Strategy and the Local Flood Risk Management Plan, early links were made with other relevant aspects of water and land management including local development plans, river basin management plans and emergency plans – see [Annex 5](#). In turn, the responsible authorities will work proactively to ensure the findings from these flood risk management plans and strategies will influence other planning initiatives in an interactive and iterative cycle. Making these links has helped identify opportunities to deliver multiple benefits from flood risk management goals, objectives and actions.

1.2.6.1 Strategic Environmental Assessment

Angus Council undertook a Strategic Environmental Assessment (SEA) screening exercise to assess the significant environmental effects of the Plan. A screening decision was sought from SEA Gateway who consulted with the statutory bodies SEPA, SNH and Historic Environment Scotland in 2014. At that time, given the stage of development of the Plan it was considered that the Plan may contain activities that may have significant environmental effects, which may not been fully addressed within the SEA process applied by SEPA for the Strategy. A Scoping Report was therefore recommended to be produced for the TEAMB LPD Plan.

Following development of the Strategy, and the application of SEA by SEPA, the extent of significant environmental effects included in the Plan that have not already been addressed in SEPA's post-adoption statement for the Strategy have been reviewed. On the basis that this review and discussions with SEA Gateway, it is no longer considered that a Scoping Report is necessary for the Plan. A new screening decision request has therefore been submitted to SEA Gateway. A decision was awaited at the time of publication of the Plan. In any event, any significant environmental effects of the Strategy and Plan will be monitored by SEPA and Angus Council through the LPD partnership.

1.2.6.2 Habitats Regulations Appraisal

Angus Council also undertook a Habitats Regulations Appraisal to ensure that the Plan will not adversely affect the integrity of Special Areas of Conservation and Special Protection Areas. Mitigation has been applied where required to ensure that the Plan will not adversely affect the integrity of Special Areas of Conservation and Special Protection Areas. Scottish Natural Heritage have been consulted on our appraisal and their views, which were awaited at the time of publication of the Plan, will be taken into account in the delivery of the actions in the Plan.

1.2.6.3 River Basin Management Plans

Reducing flood risk in Scotland through the development of Flood Risk Management Strategies has provided an opportunity to connect with plans to improve the quality of Scotland's water environment. For example, coordination between river basin management and flood risk management can reduce flood risk, whilst improving water quality and biodiversity.

SEPA is co-ordinating the delivery of River Basin Management Plans and Flood Risk Management Strategies, and local authorities for Local Flood Risk Management Plans, and they have worked to ensure that there is integration and coordination between them. This coordination, particularly in regard to consultation and engagement but also in delivering environmental improvements, will be important for stakeholders many of whom have an interest in both the plans and strategies. Where relevant, the co-ordination requirements have been described as part of flood protection and natural flood management studies and scheme.

Water body Identification numbers used for the classification of waterbodies [under RBMP](#) are referenced in the Plan as appropriate.

Further detail on River Basin Management Planning for the Scotland river basin district can be found within [Annex 5](#).

1.2.6.4 Scottish Water Business Plan 2015-2021

Scottish Water's investment programme is set out in their business plan 2015-2021, which can be found in their website:

<https://www.scottishwater.co.uk/about-us/publications/strategic-projections>

Scottish Water's customers have told them that reducing internal property flooding from sewers is a high priority and this is reflected in Scottish Waters Business Plan commitments for the period 2015-21. Addressing sewer flooding is of the highest importance to Scottish Water, as highlighted by their customers who have helped shape the investment plans for 2015-21.

In recognition of this high priority, within the period 2015-2021, Scottish Water will invest c. £115 m to improve the hydraulic capability of the sewer network so that they can remove all customers from the high risk internal sewer flooding register (greater than 10% chance per annum) as quickly as possible, typically within four years of

their problem being confirmed. However Scottish Water has made a commitment to those customers on the register on 31 March 2015 that they will no longer be on the register by 31 March 2021.

Scottish Water Customers have also highlighted external flooding is an important issue. As a result, within the period 2015-2021, they are investing c. £40 m to develop and to begin to implement solutions to reduce the flood risk for 400 high priority external sewer flooding areas suffering from frequent repeat flooding events.

As a responsible authority under the Flood Risk Management (Scotland) Act 2009, Scottish Water is also working collaboratively with third parties such as SEPA and Local Authorities through the Flood Risk Management Planning process which will assess the risk of flooding into the future.

As part of that work, Scottish Water has allocated investment to undertake further modelling and assessment in sewer catchments within PVA's to improve knowledge and understanding of flood risk from the sewers in these areas, as required under Section 16 of the Flood Risk Management (Scotland) Act 2009. Scottish Water is also working in partnership with SEPA and Local Authorities, to lead on the production of Integrated Catchment Studies across key catchments. Work carried out under these Flood Risk Management (Scotland) Act 2009 duties will continue to inform future investment requirements for Scottish Water.

1.2.6.5 Surface Water Management Planning

Surface water flooding is experienced in almost all Plan areas and therefore there is a need for Surface Water Management Planning. Surface water flooding is a key component of the flood risk assessment that has led to the development of this Plan. This Plan identifies a number of areas where a surface water plan/study is to be carried out as a planned action.

In addition Integrated Catchment Studies (ICS) are being led by Scottish Water in partnership with local authorities and SEPA. These studies will improve knowledge and understanding of the interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and (where appropriate) the sea. This will improve the understanding of contributions these drainage networks play in local surface water flood risk.

Five ICS's were undertaken in Scotland during SR10 (2010-2015), to Modelling and Flood Risk assessment stage, which have provided a fuller understanding of the sources and mechanisms of flooding across these catchments. These studies are expected to undertake an Optioneering phase between 2015-2021. This will identify the actions to reduce flood risk across the catchments, with the outputs feeding into the local authority led Surface Water Management Planning process.

Fifteen ICS's will begin in Scotland during SR15 (2015-2021). These studies will go through the Scoping and Modelling phases, which culminate in defining the sources and mechanisms of flooding in the catchment, and an understanding of the impacts of that flooding. It is expected that the ICS partnerships will remain and it is

anticipated that the Optioneering phase for these studies will be initiated directly after the preceding phases.

1.2.6.6 Tayside Integrated Catchment Study

The Tayside Integrated Catchment Study is being undertaken within the LPD. Scottish Water, Dundee City Council, Angus Council and Perth & Kinross Council have entered into a partnership to prepare an integrated catchment study of the Hatton PFI treatment works drainage catchment. This stretches from Invergowrie in the West to Arbroath in the East including the entirety of Dundee, Broughty Ferry, Monifeith and Carnoustie. This study has involved extensive surveys and monitoring of the existing surface water, foul and combined sewer system, modelling and verification. Optioneering to identify measures to reduce the risk of flooding will be undertaken between 2016 and 2019.

The outputs of this process will go through a similar prioritisation process as was undertaken for the plan with the identified actions fed into the identified Surface Water Management Plans, future cycles of the Flood Risk Management Plan or Scottish Water's investment programme.

A Catchment map for the Tayside ICS work can be found in [Annex 5](#).

1.3 Next steps and monitoring progress

The Plan runs for six years from June 2016 to 2022. Over this period the Tay Estuary and Montrose Basin LPD partnership will continue to meet periodically to monitor progress towards implementing the actions detailed in [Chapter 3](#)

Between years 2 and 3 of the FRM cycle (i.e. before June 2019), Angus Council, as lead authority will publish a report on the conclusions of a review of the Plan, including information on the progress that has been made towards implementing the measures identified in the implementation part of the Plan.

Between years 5 and 6 of the FRM cycle (i.e. before June 2022), Angus Council, as lead authority will publish a report on the Plan containing an assessment of the progress made towards implementing the current measures, a summary of the current measures which were not implemented, with reasons for their non-implementation, and a description of any other measures implemented since the plan was finalised which the lead authority considers have contributed to the achievement of the objectives summarised in the Plan.

The lead authority will make these reports available for public inspection. A second set of Flood Risk Management Strategies and Local Flood Risk Management Plans will be published in December 2021 and June 2022 respectively.

1.4 Licensing acknowledgements

Full licensing acknowledgements can be found in [Annex 1](#) of this Plan.

Chapter 2: Managing Flood Risk in the Tay Estuary and Montrose Basin Local Plan District

2.0 Understanding of flooding within the Tay Estuary and Montrose Basin Local Plan District

This chapter presents the summaries of objectives and actions for the Tay Estuary and Montrose Basin Local Plan District for delivery between 2016 and 2022. It identifies who will be responsible for the delivery and implementation of the actions, along with a timetable of when the actions will be undertaken and the funding arrangements.

This chapter also summarises the characteristics and impacts of flooding from river, coastal and surface water sources on the Tay Estuary and Montrose Basin Local Plan District and how flooding from these mechanisms are to be managed.

This chapter is divided into the following main sections:

- Section 2.1 presents a summary of flood risk in the TEAMB LPD;
- Section 2.2 present a summary of objectives and actions; and
- Section 2.3 presents a summary of other flood risk activities by local authorities in the Tay Estuary and Montrose Basin Local Plan District.

Chapter 3 presents planned actions to manage flooding that have been prioritised for delivery between 2016 and 2022 for the 17 Potentially Vulnerable Areas (PVAs) in the Tay Estuary and Montrose Basin Local Plan District.

2.1 Background information on the Tay Estuary and Montrose Basin Local Plan District

The Tay Estuary and Montrose Basin Local Plan District covers an area of 2,712km² with a population of approximately 340,000. The area contains five local authorities and 19 Potentially Vulnerable Areas.

There are approximately 3,800 residential and 1,400 non-residential properties at risk of flooding within the Local Plan District. This is approximately 2.5% of all residential and 9% of all non-residential properties. It is estimated that 89% of these properties are located within Potentially Vulnerable Areas. The Annual Average Damages from flooding are approximately £16 million.

River flooding is the main source of flood risk, followed by surface water flooding. The Annual Average Damages caused by river flooding are £6.5 million, those caused by coastal flooding are £5.3 million and those caused by surface water flooding are £4.3 million (Figure 1).

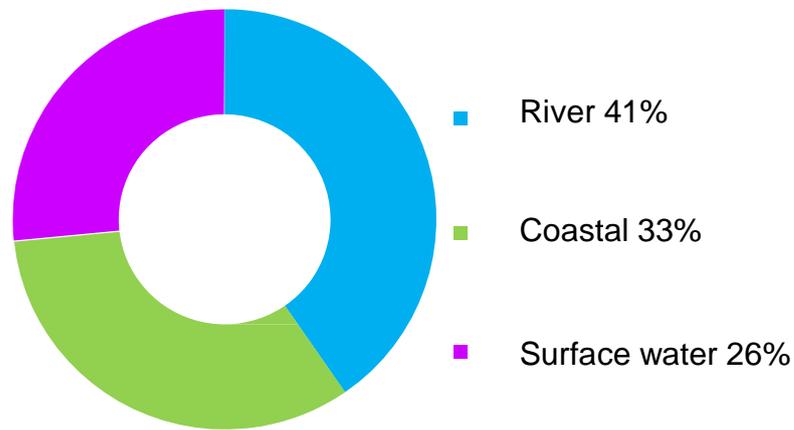


Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

The Local Plan District also has 233km of coastline stretching from Inverbervie in the north to Fife Ness in the south. The coastline includes the Montrose Basin, the Firth of Tay, and the Angus and Fife coastlines that are exposed to the North Sea. The main river catchments: North Esk and South Esk, Lunan Water, Dighty Water and the River Eden are shown in Figure 2.

As detailed in [Section 1.1](#) of the Plan, flood hazard and risk maps are referred to collectively as flood maps and are available on the SEPA website here:

<http://map.sepa.org.uk/floodmap/map.htm>

Further details of flood risk from distinct sources can be found in the river, coastal and surface water chapters in Section 3 of the [SEPA Strategy](#) for the TEAMB LPD.

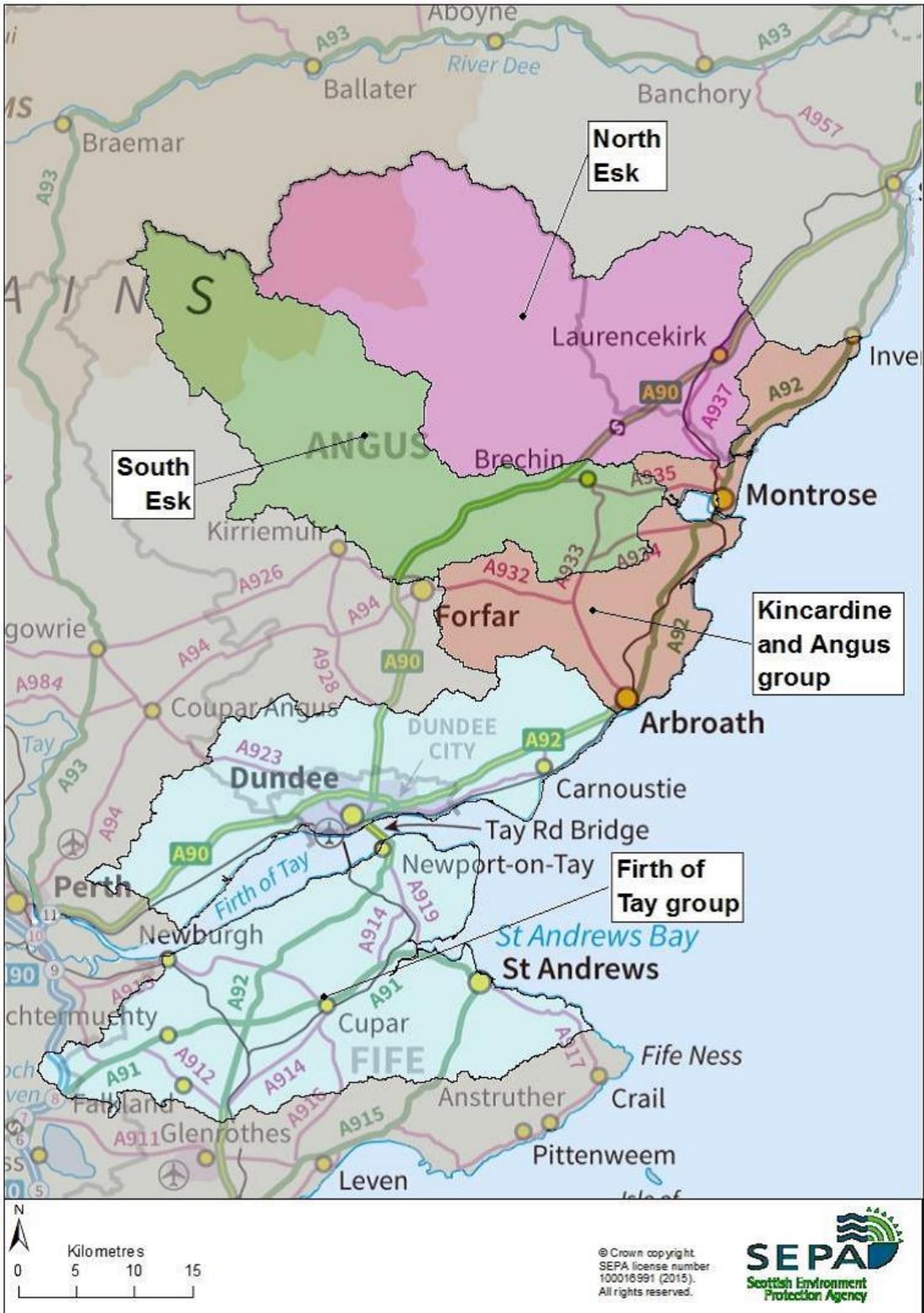


Figure 2: River Catchments within the Tay Estuary and Montrose Basin Local Plan District¹

¹ Reproduced from *Tay Estuary and Montrose Basin Local Plan District Flood Risk Management Strategy*, SEPA (December 2015)

The extent of the Tay Estuary and Montrose Basin Local Plan District and the location of the Potentially Vulnerable Areas are shown in Figure 3.

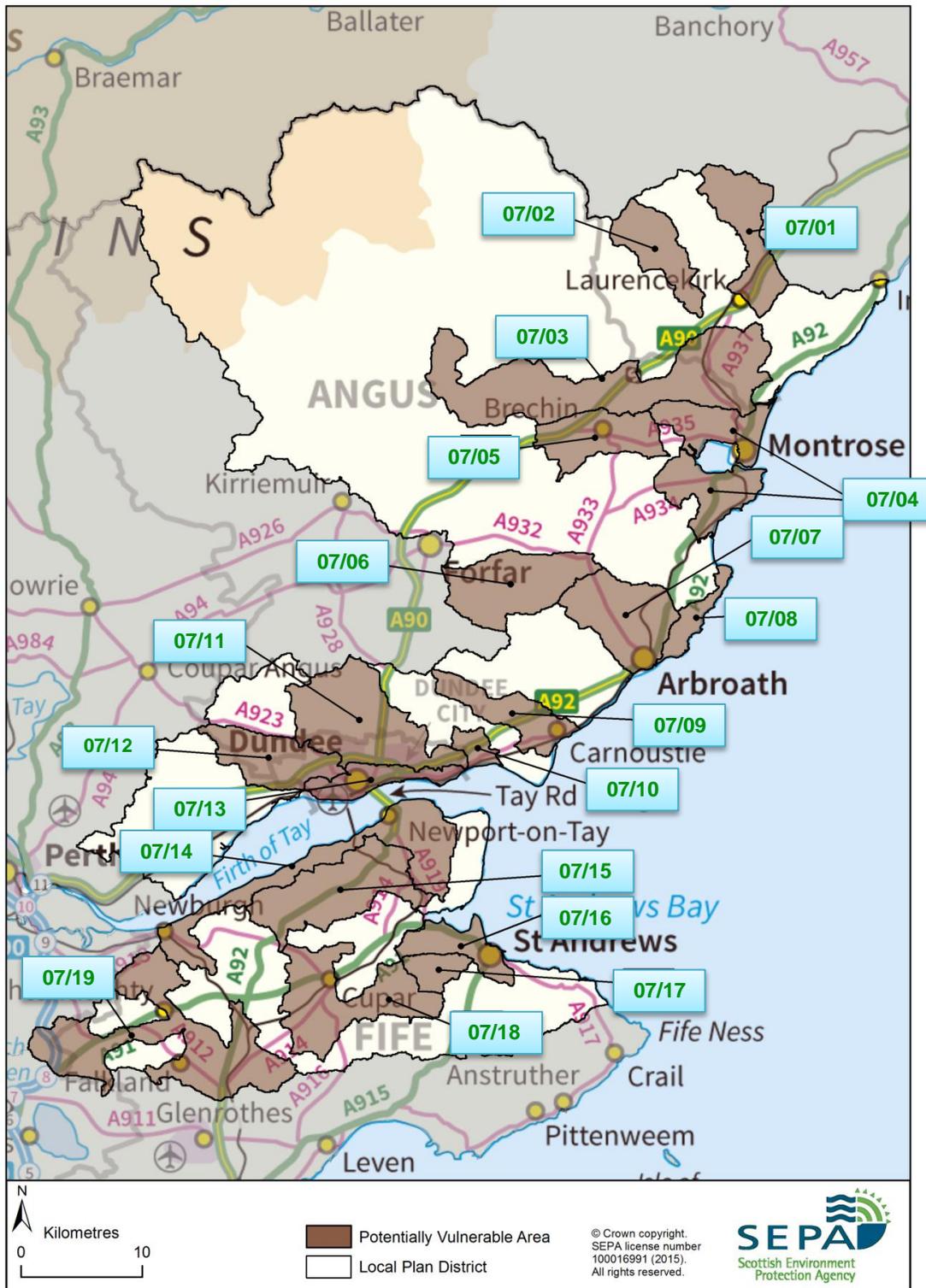


Figure 3: The Tay Estuary and Montrose Basin Local Plan District with Potentially Vulnerable Areas identified² (click tabs to move to specific areas)

² Reproduced from *Tay Estuary and Montrose Basin Local Plan District Flood Risk Management Strategy*, SEPA (December 2015)

The areas with the most properties at flood risk and associated damages in the Tay Estuary and Montrose Basin Local Plan District are shown in Figure 4.

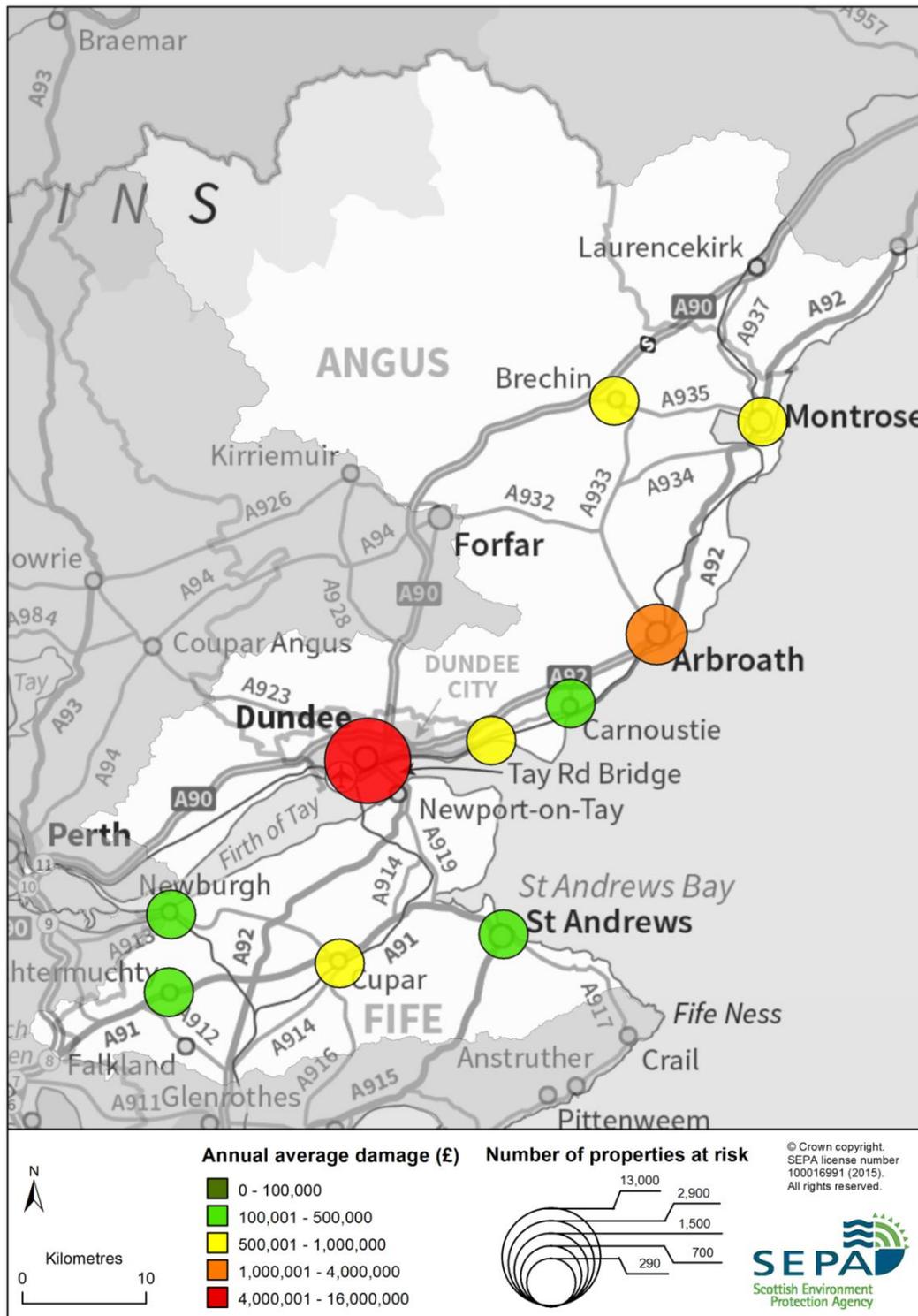


Figure 4: The Tay Estuary and Montrose Basin Local Plan District showing areas with most properties at risk of flooding and associated damages³

³ Reproduced from *Tay Estuary and Montrose Basin Local Plan District Flood Risk Management Strategy*, SEPA (December 2015)

2.2 Summary of Objectives and Actions across LPD

The following section takes the information detailed in the Strategy and summarises the flood risk, objectives, actions and prioritisation for the whole of TEAMB LPD only. In addition, as required by the Plan, it identifies who will be responsible for the delivery and implementation of these LPD-wide actions, along with a timetable of when the actions will be undertaken and the funding arrangements for financing those actions.

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 this Plan.

The identified objectives and associated actions are shared aims that have been developed by SEPA in consultation with responsible authorities to manage flooding within the TEAMB LPD.

2.2.1 Objectives

The objectives identified in the Strategy that apply across the TEAMB LPD are:

- Avoid an overall increase in flood risk (ID reference 7001) and
- Reduce overall flood risk (ID reference 7054).

The indicators on which there the objectives will be assessed for the TEAMB LPD are:

- 3,800 residential properties;
- 1,400 non-residential properties; and
- 8,400 people

2.2.2 Actions

The actions identified in the Strategy that apply across the TEAMB LPD are:

- Flood forecasting;
- Self help;
- Awareness raising;
- Maintenance;
- Emergency plans/response; and
- Planning Policy.

Details of these LPD-wide actions including who will be responsible for the completion of actions currently being implemented, and the implementation of actions yet to be commenced, along with a timetable of when the actions will be undertaken, co-ordination requirements and the funding arrangements are as follows

Flood forecasting – TEAMB LPD (Action ID 70540009)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding. 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.

Related Actions (as shaded above):

Awareness raising; self help; maintenance; emergency plans/response.

Objective (ID):

Reduce overall flood risk (7054)

Coordination:

This is a joint initiative between SEPA and the Met Office. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – TEAMB LPD (Action ID 70540013)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

Public awareness, participation and community support are essential components of sustainable flood risk management. SEPA and the responsible authorities have an existing and ongoing duty to raise public awareness of flood risk. This is undertaken both individually and collaboratively by a range of organisations. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.

From 2016 SEPA will undertake flood risk education and awareness raising activities.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with

community resilience groups and community safety partnerships. Local authorities will be undertaking additional awareness raising activities when developing any specific project proposals and will engage with community resilience groups and local communities.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnership.

Related Actions (as shaded above):

Flood forecasting; self help; maintenance; emergency plans/response.

Objective (ID):

Reduce overall flood risk (7054)

Coordination:

Awareness raising will be coordinated through the Local Plan District partnership between SEPA and the responsible authorities. SEPA and the responsible authorities will use any studies, projects and flood schemes to engage with communities and raise awareness of flood risk. Communications activity will be coordinated through existing arrangements within Local Plan District

Partnerships. Information will be disseminated through website, social media and other community engagement activity. SEPA and responsible authorities will coordinate awareness raising activities with related actions.

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement.

Awareness raising activities will be funded from the Council's revenue budget. Scottish Water is funded by customer charges as set by their economic regulator, all business activities required under this action by Scottish Water are accounted for in its capital or operational expenditure.

Self help – TEAMB LPD (Action ID 70540011)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Self-help actions can be undertaken by any individuals, businesses, organisations or communities at risk of flooding. They are applicable to all sources, frequency and scales of flooding. They focus on awareness raising and understanding of flood risk.

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 the Resilient Communities Initiative, and ensuring that properties and

businesses are insured against flood damage.

Related Actions (as shaded above):

Flood forecasting; awareness raising; maintenance; emergency plans/response.

Objective (ID):

Reduce overall flood risk (7054).

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Councils can provide advice on flood protection products for properties in flood risk areas.

Responsible Authorities will also actively promote Floodline

Funding:

Individuals have prime responsibility to protect themselves and their property from flooding and are therefore are expected to meet the costs of protecting themselves.

Maintenance – TEAMB LPD (Action ID 7054007)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Local authorities have an existing and ongoing 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 will undertake risk based inspection, maintenance 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.

Sections 18 and 59 of the Flood Risk Management (Scotland) Act 2009 place duties of watercourse assessment, clearance and repair on local authorities. In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or defences.

Related Actions (as shaded above):

Awareness raising; self help.

Objective (ID):

Reduce overall flood risk (7054)

Coordination:

Sections 17 and 18 of the Flood Risk Management (Scotland) Act 2009 require local authorities to prepare maps of relevant bodies of water and sustainable urban drainage systems (SUDS), assess flood risk on those bodies of water from time to time and to prepare a schedule of clearance and repair works where such works would substantially reduce flood risk. Under Section 59 of the same Act, Local authorities also have a duty to carry out clearance and repair works described on the schedule. The Council's schedule of clearance and repair works is made available for public inspection on its website.

The Council carries out routine, scheduled inspections of watercourses on its list at a frequency which depends on flood risk. Further reactive inspections are carried out when issues are highlighted or during times of flooding.

Further bodies of water will be included where it has been identified that they may give rise to a risk of flooding.

Any identified clearance and repair works from these inspections are logged in a database/spreadsheet and are undertaken in order of priority, subject to available funding.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk. In the first instance, clearance and repair works are therefore referred to the landowner, where they can be identified. The Council usually only carries out works where there has been a failure of the landowner to act, where landownership is not clear, or where urgent intervention is required.

In addition, local authorities may also be responsible for maintenance of existing flood protection schemes or works.

Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital

maintenance work to identify opportunities for co-ordination.

If any removal of trees is proposed, this may require permission from Forestry Commission Scotland. Removal without permission could be a breach of the Forestry Act and also Cross Compliance.

Local Authorities will liaise with SEPA where controlled activities may be required and with private landowners where they may require to take access on private land or to notify landowners that they require to undertake maintenance.

The Council will coordinate maintenance activities with related actions.

Funding:

Maintenance activities are subject to funding from the relevant Council revenue budgets. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure

Emergency plans/response – TEAMB LPD (Action ID 70540014)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Emergency response plans are applicable for all types of flooding. They set out the steps to be taken during flooding in order to maximise safety and minimise impacts where possible. Under the Civil Contingencies Act, Category 1 Responders have a duty to maintain emergency plans. Emergency plans may also be prepared by individuals, businesses, organisations or communities.

Scottish Water is a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help.

Objective (ID):

Reduce overall flood risk (7054)

Coordination:

Councils have developed a Generic Emergency Plan and a Flooding Emergency Response Plans. These Plans are designed to ensure that contingency measures are in place for the co-ordinated and flexible response to flooding incidents to mitigate the effects of flooding emergencies.

SEPA flood alerts and warnings will be monitored and resources made ready as required. A co-ordinated response will follow any reports of flooding.

Emergency response is coordinated with regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. A debrief and plan review will be carried out following any flood events.

Protecting property from flooding is the responsibility of the owner of the property. Councils can sometimes provide sandbags to properties. Unfortunately the Council only has the resources to supply sandbags to residents where there is an imminent risk of flooding.

Emergency plans/response activities will be coordinated with related actions.

Funding:

Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event. Scottish Water is funded by customer charges as set by their economic regulator, all business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.

Planning policies – TEAMB LPD (Action ID 70010001)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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 5](#).

Current national planning policies, the Scottish Planning Policy and accompanying Planning Advice notes restrict development within the floodplain and limit exposure of new receptors to flood risk. In addition to national policies, local planning policies may place further requirements within their area of

operation to restrict inappropriate development and prevent unacceptable risk.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood

risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Related Actions (as shaded above):

Awareness raising; self help; maintenance.

Objective (ID):

Avoid an overall increase in flood risk (7001); Reduce overall flood risk (7054)

Coordination:

Councils and the National Parks Authorities, as local planning authorities, will coordinate its work with the strategic development planning authorities as appropriate.

The Councils will work with regional planning authorities to incorporate national policy on flood risk management, e.g. TayPlan Strategic Development Planning Authority (SDPA). Furthermore Councils will work directly with their planners to

ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans.

Councils will adopt proactive strategies to mitigate and adapt to climate change, taking full account of flood risk. Councils will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Funding:

SEPA's land use planning activities will be funded by the Scottish Government through SEPA's grant in aid settlement. Council planning activities will be funded from the Council revenue budgets. Scottish Water is funded by customer charges as set by their economic regulator, all business activities required under this action by Scottish Water are accounted for in its capital or operational expenditure.

2.3 Other flood risk activities by local authorities in the Tay Estuary and Montrose Basin Local Plan District

The Plan presents the actions to manage flood risk in The Tay Estuary and Montrose Basin Local Plan District. These actions are at a LPD-wide scale or are targeted at specific PVA. In addition to the actions in this Plan, responsible authorities are undertaking other activities to manage flood risk. There are activities included in the Flood Risk Management (Scotland) Act 2009 that are undertaken by each local authority in the LPD. The main activities that have a significant effect and should be considered in conjunction with the Plan are summarised as follows:

Section 18 & 59: Works of Clearance and Repair

Based on an assessment of the condition of a body of water, local authorities must prepare a schedule of clearance and repair works that would substantially reduce the risk of flooding of land. This is commonly referred to as a Section 18 Schedule, which is made available by each local authority within the LPD for public inspection. Under s.59 of the Act, the local authority must carry out the works in the Section 18 Schedule if it considers that this will contribute to the implementation of actions in the Plan, but that these works will not affect the implementation of actions in this Plan. Details of how to access Section 18 Schedules for each local authority in the LPD are included in [Annex 5](#) of the Plan.

Section 56: General Power to manage flood risk

Without affecting the implementation of actions in this Plan, a local authority may do anything which it considers will contribute to the implementation of actions in the Plan or is necessary to reduce the risk of a flood which is likely to occur imminently and have serious adverse consequences for human health, the environment, cultural heritage or economic activity in its area. This may include carrying out flood protection works, which may not be identified as actions in the Plan.

Related Statutory Duties

Local authorities have duties under other legislation and regulation which may affect directly or indirectly the actions described in this Plan. An example of this is the Roads (Scotland) Act 1984 which includes responsibilities for road drainage and water on roads. Local authorities should therefore seek to coordinate their flood risk management actions with any associated responsibilities.

Chapter 3: Objectives and Actions within PVAs

3.1 Summary of Objectives and Actions for each PVA

The following Chapter takes the information detailed in the Tay Estuary and Montrose Basin Flood Risk Management Strategy and summarises the flood risk, objectives, actions and prioritisation for individual PVAs, which are shown on Figure 5 and listed below. In addition, as required by the Plan, it details PVA-specific actions including who will be responsible for the completion of actions currently being implemented, and the implementation of actions yet to be commenced, along with a timetable of when the actions will be undertaken and the funding arrangements for financing those actions.

Along with a timetable of when the actions will be undertaken, co-ordination requirements and the funding arrangements are as follows.

The identified objectives and associated actions are shared aims that have been developed by SEPA in consultation with responsible authorities to manage flooding within the TEAMB LPD.

3.1.1 PVA

The 19 PVA in TEAMB LPD are:

- PVA 07/01 Laurencekirk
- PVA 07/02 Fettercairn
- PVA 07/03 North of Brechin
- PVA 07/04 Montrose Basin
- PVA 07/05 Brechin
- PVA 07/06 Lunan Water
- PVA 07/07 Arbroath
- PVA 07/08 Coast North of Arbroath
- PVA 07/09 Carnoustie and Barry
- PVA 07/10 Monifieth
- PVA 07/11 Downfield and Dundee/Monifieth & Sidlaws
- PVA 07/12 Invergowrie
- PVA 07/13 Dundee and Broughty Ferry
- PVA 07/14 Tayport and Newburgh
- PVA 07/15 Lucklawhill
- PVA 07/16 St Andrews to Guardbridge
- PVA 07/17 St Andrews (Denhead and Strathkinness)
- PVA 07/18 Cupar
- PVA 07/19 Auchtermuchty and Pleasance

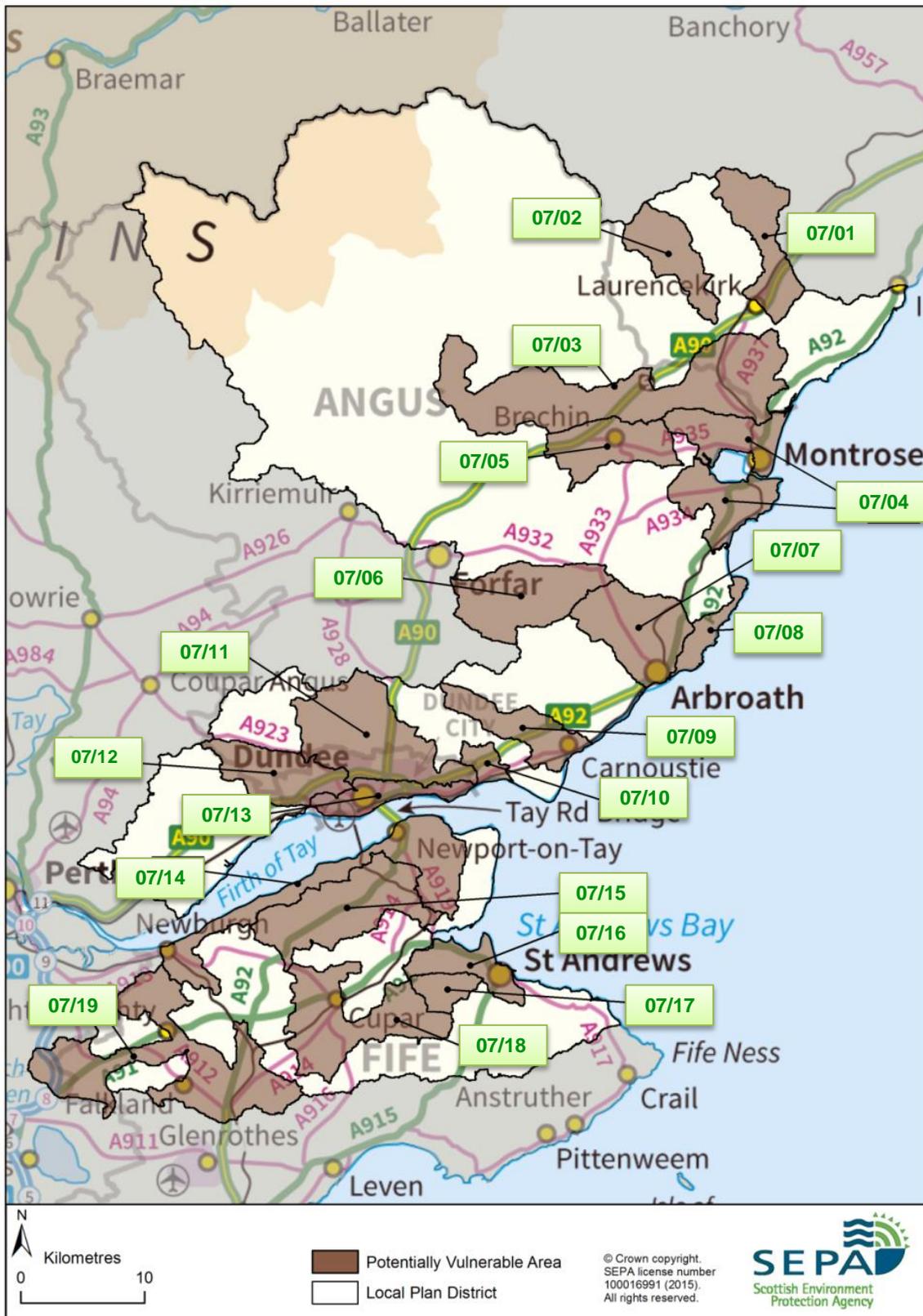


Figure 5: The Tay Estuary and Montrose Basin Local Plan District with Potentially Vulnerable Areas identified⁴ (click tabs to move to specific areas)

⁴ Reproduced from *Tay Estuary and Montrose Basin Local Plan District Flood Risk Management Strategy*, SEPA (December 2015)

3.1.2 Objectives

The objectives identified in the Strategy that apply to individual PVA across the TEAMB LPD are:

- Avoid an overall increase in flood risk;
- Reduce overall flood risk;
- Reduce economic damages to residential and non-residential properties and risk to people of river flooding;
- Reduce economic damages to residential and non-residential properties caused by coastal flooding; and
- Reduce economic damages and number of residential properties at risk of surface water flooding.

3.1.3 Actions

The actions identified in the Strategy that apply in each PVA in the TEAMB LPD range from structural to non-structural and in scale and frequency of intervention. The complete range of actions available is as listed below:

- 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; and
- Planning Policy.

In this Plan, there are no specific actions identified for 'property level protection scheme' and 'site protection plans' actions. Consideration of property level protection schemes will be included in the 'flood protection study', 'surface water plan/study' and/or 'emergency plans/response' actions. Site protection plans will be identified through these same 'study' actions and also 'planning policies' action.

A summary of the actions to be applied specific to individual PVA are shown in Figure 6. Full details of the objectives and actions by individual PVA are then presented in the remainder of Chapter 3.

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
07/01							✓	N/A	N/A	✓			✓	✓	✓		✓	✓
07/02				✓			✓	✓	N/A	✓		✓	✓	✓	✓		✓	✓
07/03							✓	N/A	✓	✓			✓	✓	✓		✓	✓
07/04			✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓
07/05		✓			✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
07/06							✓	N/A	N/A	✓			✓	✓	✓		✓	✓
07/07	✓					✓	✓	✓	✓	✓			✓	✓	✓		✓	✓
07/08						✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
07/09				✓		✓	✓	✓	N/A	✓			✓	✓	✓		✓	✓
07/10			✓	✓		✓	✓	✓	N/A	✓			✓	✓	✓		✓	✓
07/11			✓	✓		✓	✓	N/A	N/A	✓		✓	✓	✓	✓		✓	✓
07/12					✓	✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
07/13	✓					✓	✓	✓	✓	✓			✓	✓	✓		✓	✓

Figure 6 - Summary of actions to manage flood risk in the Potentially Vulnerable Areas of the Tay Estuary and Montrose Basin

*Note: N/A is used where there is no formal Flood Protection Scheme or flood warning scheme present

PVA	Flood protections scheme/works	Natural flood management works	New flood warning	Flood protection study	Natural flood management study	Surface water plan/study	Strategic mapping and modelling	Maintain flood protection scheme*	Maintain flood warning	Flood forecasting	Property level protection scheme	Community flood action groups	Self help	Awareness raising	Maintenance	Site protection plans	Emergency plans/response	Planning policies
07/14				✓			✓	N/A	✓	✓			✓	✓	✓		✓	✓
07/15							✓	N/A	N/A	✓			✓	✓	✓		✓	✓
07/16	✓		✓	✓		✓	✓	N/A	✓	✓			✓	✓	✓		✓	✓
07/17	✓		✓	✓		✓	✓	N/A	N/A	✓			✓	✓	✓		✓	✓
07/18			✓	✓		✓	✓	✓	N/A	✓			✓	✓	✓		✓	✓
07/19			✓	✓	✓		✓	✓	N/A	✓		✓	✓	✓	✓		✓	✓

Figure 6 - Summary of actions to manage flood risk in the Potentially Vulnerable Areas of the Tay Estuary and Montrose Basin

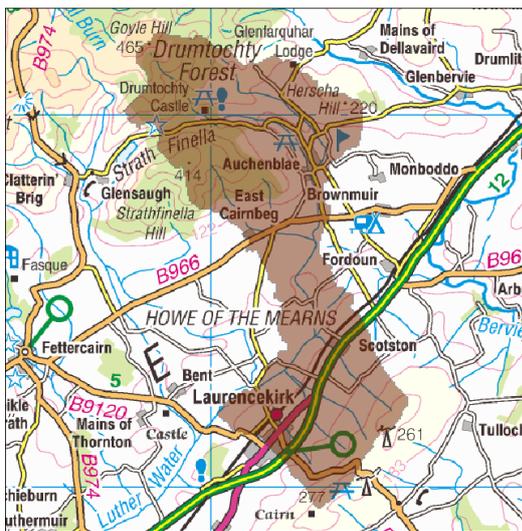
*Note: N/A is used where there is no formal Flood Protection Scheme or flood warning scheme present

Laurencekirk (Potentially Vulnerable Area 07/01)

Local Plan District	Local Authority	Main Catchment
Tay Estuary and Montrose Basin	Aberdeenshire Council	River North Esk (Tayside)

Background

This Potentially Vulnerable Area is 40km² (shown below). It is situated in the northeast of the River North Esk catchment and includes Laurencekirk and Auchenblae. The main source of flooding is the Luther Water.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

There are approximately 20 residential properties at risk of flooding. The Annual Average Damages are approximately £110,000.

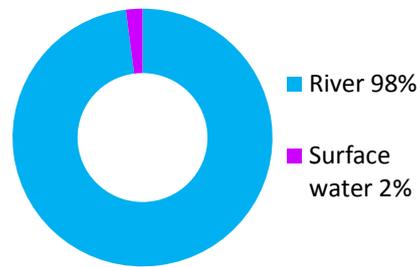


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The main risk of flooding in this area is to Auchenblae from the Luther Water.

For this Potentially Vulnerable Area, the highest damages are to residential properties, followed by damages to agricultural land. A small number of non-residential properties identified as being at flood risk in this area are no

longer functioning as commercial properties. The Dundee to Aberdeen railway line is also notably impacted.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Laurencekirk (Potentially Vulnerable Area 07/03)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_01_Full.pdf

Objectives to manage flooding in Laurencekirk

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. The following objectives have been set for Laurencekirk Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Laurencekirk

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. The actions shaded have been selected as the most appropriate for Laurencekirk Basin 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Flood forecasting					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning policies					

Details of actions to manage flooding in Laurencekirk

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Laurencekirk PVA are shown overleaf. Actions related to (shaded only) the selected action are also shown to

demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

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Strategic mapping and modelling – Laurencekirk (Potentially Vulnerable Area 07/01)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					

Description:

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

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.

Scottish Water will undertake further investigation and modelling in the

Laurencekirk DOA (2016-2019) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Related Actions (as shaded above):

Flood forecasting; emergency plans/response; planning policies.

Coordination:

Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

Flood forecasting – Laurencekirk (Potentially Vulnerable Area 07/01)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Strategic mapping & modelling;
awareness raising; self help;
emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Laurencekirk (Potentially Vulnerable Area 07/01)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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. This will be achieved through property level protection events delivered by the Scottish Flood Forum and SEPA-led education events.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Aberdeenshire Council have an existing and ongoing duty to raise

public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Aberdeenshire Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding. Aberdeenshire Council will also develop emergency plans/response and work with any community flood action groups.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

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Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Self help; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA, Aberdeenshire Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Aberdeenshire Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

PA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as

required. Aberdeenshire Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Aberdeenshire Council funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Laurencekirk (Potentially Vulnerable Area 07/01)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Aberdeenshire Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Aberdeenshire Council provides a range of flood protection products at

cost price with free delivery across Aberdeenshire. The products are available for all types of flooding.

Related Actions (as shaded above):

Awareness raising; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Aberdeenshire Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintenance – Laurencekirk (Potentially Vulnerable Area 07/01)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Aberdeenshire Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Aberdeenshire Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Aberdeenshire Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Awareness raising; self help; emergency plans/response; planning policies.

Coordination:

Aberdeenshire Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Aberdeenshire Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business

activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Laurencekirk (Potentially Vulnerable Area (07/01))

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Aberdeenshire Council has developed an Operational Flood Response Plan, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Aberdeenshire Council will conduct assessments at known hotspots and prepare resources as required. Aberdeenshire Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The Operational Flood Response Plan will undergo review on an annual basis to reflect operational or responsibility changes. A debrief and plan review will also be carried out after the Plan is activated.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; maintenance; planning policies.

Coordination:

Aberdeenshire Council will coordinate emergency plans/response with related actions (shaded only in table above).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.

Funding:

Aberdeenshire Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency

plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Laurencekirk (Potentially Vulnerable Area 07/01)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in

development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Aberdeenshire Council is a local planning authority and will work with the regional planning authority, the Aberdeen City and Shire Strategic Development Planning Authority.

As a consultee on planning applications, Aberdeenshire Council's Flood & Coast Protection team will work directly with colleagues in the Planning Service to ensure that appropriate policies and measures are put in place to reduce flood risk.

Planning applications are assessed against the flooding standards set out in the current Aberdeenshire Local Development Plan, and in future those in the proposed Aberdeenshire Local Development Plan 2016.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; emergency plans/response.

Coordination:

SEPA and Aberdeenshire Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required.

Funding:

SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Aberdeenshire Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

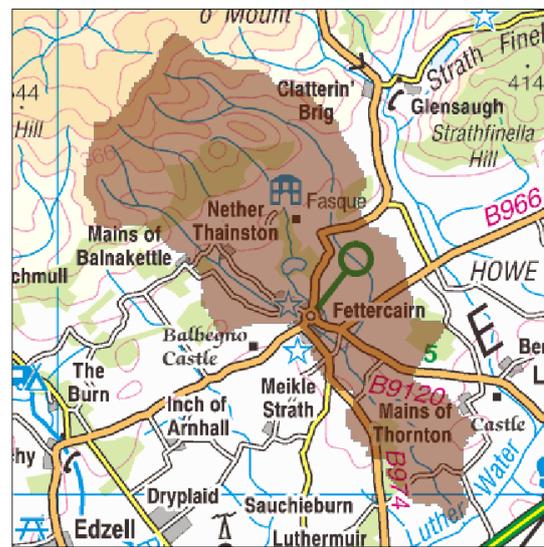
Fettercairn (Potentially Vulnerable Area 07/02)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Aberdeenshire Council	River North Esk (Tayside)

Background

This Potentially Vulnerable Area is 32km² and is situated in the River North Esk catchment (shown to the right). It includes Fettercairn and the main watercourses are the Dowrie Burn and its tributaries, the Burn of Cauldcotts, the Crichtie Burn and the Craigmoston Burn.

There are approximately 50 residential properties and 10 non-residential properties at risk of flooding. The Annual Average Damages are approximately £140,000. All damages are derived from river flooding.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Fettercairn and Craigmoston from the Burn of Cauldcotts and Craigmoston Burn.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties.

Further details of the risk of flooding to people and property, as well as to

community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Fettercairn (Potentially Vulnerable Area 07/02)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_02_Full.pdf

Objectives to manage flooding in Fettercairn

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.

The following objectives have been set for Fettercairn Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in Fettercairn caused by river flooding (objective ID 7003)

- Avoid an overall increase in flood risk (Objective ID 7001) and reduce overall flood risk (Objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Fettercairn

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. The actions shaded have been selected as the most appropriate for Fettercairn 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme (existing)					
Flood forecasting					
Community flood action groups					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning policies					

Details of actions to manage flooding in Fettercairn

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Fettercairn PVA are shown overleaf. Actions related to (shaded only) the

selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

Maintain flood protection scheme – Fettercairn (Potentially Vulnerable Area 07/02)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					

Description:

The existing Fettercairn Flood Protection scheme provides relief from watercourse flooding. This includes an informal flood storage area on the Burn of Cauldcotts constructed in 2011. Aberdeenshire Council will maintain the existing Flood Protection Scheme ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out Aberdeenshire Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct watercourse inspections annually and structural inspections biennially.

Related Actions (as shaded above):

Flood forecasting; awareness raising; maintenance; emergency plans/response.

Coordination:

Aberdeenshire Council will coordinate maintaining flood protection scheme with related actions (shaded only in table above).

Funding:

Aberdeenshire Council funding for maintain flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Flood forecasting – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Awareness raising; self help; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Community flood action groups – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Community flood action groups					

Description:

Aberdeenshire Council will work with the Fettercairn Flood Resilience Group to reduce flood risk, improve preparedness and increase resilience against flooding. Aberdeenshire Council will provide regular updates

Aberdeenshire Council will ensure stocks of sandbags are delivered to the Distillery for distribution by the community. A water level indicator board has been erected on the Cauldcots Burn near the Royal Arch as an aid to residents in deciding when sandbags should be deployed.

Aberdeenshire Council will also maintain the existing watercourse gauges at the Distillery and Town Centre which provide the Fettercairn Flood Resilience Group with early warning.

Related Actions (as shaded above):

Awareness raising; self help; maintenance; emergency plans/response; planning policies.

Coordination:

Aberdeenshire Council will coordinate community flood action groups with related actions (shaded only in table above).

Aberdeenshire Council will continue to co-ordinate with existing community flood action groups throughout the next 6 years on a priority needs basis where resources allow.

Funding:

Aberdeenshire Council funding for its own activities to support the Fettercairn Flood Resilience Group will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Awareness raising – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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. This will be achieved through property level protection events delivered by the Scottish Flood Forum and SEPA-led education events.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Aberdeenshire Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland)

Act 2009. Over the six-year planning cycle, Aberdeenshire Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Aberdeenshire Council will also develop emergency plans/response and work with any community flood action groups.

Related Actions (as shaded above):

Community flood action groups; self help; maintenance; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA, Aberdeenshire Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements. SEPA, Aberdeenshire Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above). SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as

required. Aberdeenshire Council will also disseminate more general information to raise awareness via social media streams relating to flooding, i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Aberdeenshire Council funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Aberdeenshire Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Aberdeenshire Council provides a range of flood protection products at cost price with free delivery across

Aberdeenshire. The products are available for all types of flooding.

Related Actions (as shaded above):

Community flood action groups; awareness raising; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Aberdeenshire Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintenance – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Aberdeenshire Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Aberdeenshire Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Aberdeenshire Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Maintain flood protection scheme; community flood action groups; awareness raising; self help; emergency plans/response; planning policies.

Coordination:

Aberdeenshire Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Aberdeenshire Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Aberdeenshire Council has developed an Operational Flood Response Plan, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Aberdeenshire Council will conduct assessments at known hotspots and prepare resources as required. Aberdeenshire Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Maintain flood protection scheme; flood forecasting; community flood action groups; awareness raising; self help; maintenance; planning policies.

Coordination:

Aberdeenshire Council will coordinate emergency plans/response with related actions (shaded only in table above).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.

The Operational Flood Response Plan will undergo review on an annual basis to reflect operational or responsibility changes. A debrief and plan review will also be carried out after the Plan is activated.

Funding:

Aberdeenshire Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Fettercairn (Potentially Vulnerable Area 07/02)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Aberdeenshire Council is a local planning authority and will work with the regional planning authority, the Aberdeen City and Shire Strategic Development Planning Authority.

As a consultee on planning applications, Aberdeenshire Council's Flood & Coast Protection team will work directly with colleagues in the Planning Service to ensure that appropriate policies and measures are put in place to reduce flood risk. Planning applications are assessed against the flooding standards set out

in the current Aberdeenshire Local Development Plan, and in future those in the proposed Aberdeenshire Local Development Plan 2016.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; emergency plans/response.

Coordination:

SEPA and Aberdeenshire Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required.

Funding:

SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Aberdeenshire Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

North of Brechin (Potentially Vulnerable Area 07/03)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Aberdeenshire Council, Angus Council	River North Esk (Tayside)

Background

This Potentially Vulnerable Area is 124km². It is situated at the mouth of the River North Esk catchment where it meets the North Sea (shown below). It includes Marykirk and the main watercourses are the River North Esk and its tributaries the Cruick Water and Keithock Burn.

majority of damages caused by river flooding.

There are approximately 20 residential properties and 20 non-residential properties at risk of flooding. The Annual Average Damages are approximately £110,000.

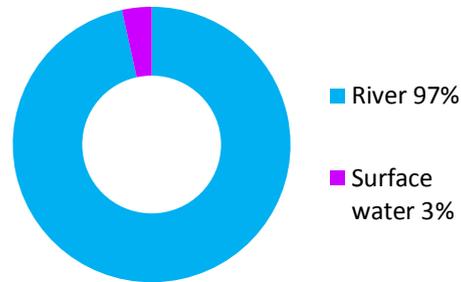
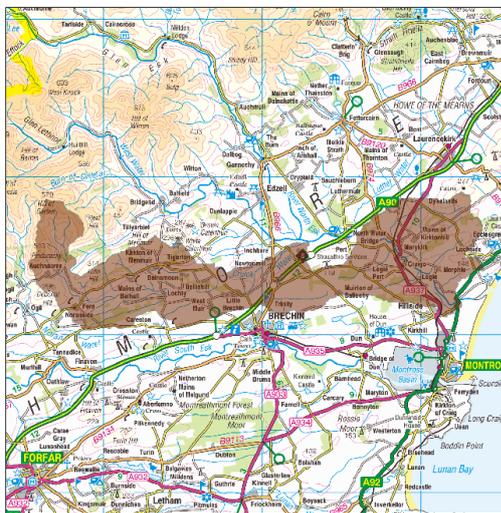


Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

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Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

There is a risk of river flooding and surface water flooding, with the

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

Flood risk is spread out across the Potentially Vulnerable Area and flooding occurs to small pockets of land adjacent to the River North Esk and its tributaries. The Dundee to Aberdeen railway line is also notably impacted.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the

Flood Risk Management Strategy for Tay Estuary and Montrose Basin,

North of Brechin (Potentially Vulnerable Area 07/03)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_03_Full.pdf

Objectives to manage flooding in North of Brechin

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. The following objectives have been set for North of Brechin

Actions to manage flood risk and deliver the objectives are shown overleaf.

Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

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of Brechin

Actions to manage flooding in North of Brechin

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. The actions shaded have been selected as the most appropriate for North of Brechin 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Maintain flood warning					
Flood forecasting					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning policies					

Details of actions to manage flooding in North of Brechin

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the North of Brechin PVA are shown overleaf. Actions related to (shaded only) the

selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

Strategic mapping and modelling – North of Brechin (Potentially Vulnerable Area 07/03)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Cruick Water and Lower North Esk areas to improve understanding of flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.

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.

River mapping improvements and surface water mapping improvements are SEPA-led. Mapping improvements on the Cruick Water are expected to be carried out in 2017 to 2018. Surface water mapping improvements are expected to be carried out in 2016 to 2017.

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.

Scottish Water will undertake further investigation and modelling in the Brechin (2018-2020), Laurencekirk (2016-2019) and Montrose (2016-2019) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Maintain flood warning; flood forecasting; emergency plans/response; planning policies.

Coordination:

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD)

partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Maintain flood warning – North of Brechin (Potentially Vulnerable Area 07/03)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Inchbare, Marykirk and the Logie Mill and Craigo flood warning areas which are part of the North Esk river flood warning scheme.

When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; emergency plans/response.

Coordination:

SEPA will work with the local authority to ensure that any new information about flood risk is considered in the existing flood warning system.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.

Flood forecasting – North of Brechin (Potentially Vulnerable Area 07/03)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Strategic mapping & modelling; maintain flood warning; awareness raising; self help; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – North of Brechin (Potentially Vulnerable Area 07/03)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Aberdeenshire Council and Angus Council have an existing and ongoing

duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, which will be shared across to North of Brechin PVA, Aberdeenshire Council and Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding. Aberdeenshire Council and Angus Council will also develop emergency plans/response and work with any community flood action groups.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Maintain flood warning; self help; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA, Aberdeenshire Council, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Aberdeenshire Council, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

SEPA's awareness raising activities will be co-ordinated with the activities

of other responsible authorities as required. Aberdeenshire Council and Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding, i.e. road closures, transport disruptions and weather forecasts.

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Aberdeenshire Council and Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – North of Brechin (Potentially Vulnerable Area 07/03)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Aberdeenshire Council and Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Aberdeenshire Council provides a range of flood protection products at cost price with free delivery across Aberdeenshire. The products are available for all types of flooding.

Related Actions (as shaded above):

Maintain flood warning; awareness raising; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Aberdeenshire Council and Angus Council activities to

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assist, support and educate those to self help will be subject to Scottish Government's block grant and capital

support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – North of Brechin (Potentially Vulnerable Area 07/03)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Aberdeenshire Council and Angus Council each have an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Aberdeenshire Council and Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Aberdeenshire Council and Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible

authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Awareness raising; self help; emergency plans/response; planning policies.

Coordination:

Aberdeenshire Council, Angus Council and Scottish water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Aberdeenshire Council and Angus Council funding for maintenance will be shared with others as appropriate

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and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic

regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – North of Brechin (Potentially Vulnerable Area 07/03)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

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Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plans for North of Brechin, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk in Logie Mill, Edzell and Inchbare. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Aberdeenshire Council has developed an Operational Flood Response Plan, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk at Marykirk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Aberdeenshire Council will conduct assessments at known hotspots and prepare resources as required. Aberdeenshire Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

Aberdeenshire Council’s Operational Flood Response Plan will undergo review on an annual basis to reflect operational or responsibility changes.

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A debrief and plan review will also be carried out after the Plan is activated.

Formed in 2012, the Edzell Flood Group and Angus Council have prepared an Emergency Flood Plan for Edzell, which details roles and responsibilities and co-ordination arrangements for flood events. Angus Council will continue to work with the Edzell community flood action groups to set out arrangements to reduce flood risk, improve preparedness and increase resilience against flooding.

Angus Council has provided officer support and a suite of information highlighting sources of flooding, emergency kit advice, flood response advice and contact information for partner agencies such as SEPA, Scottish Water, Scottish Flood Forum etc. Angus Council will continue to co-ordinate with the Edzell Flood Group throughout the next 6 years on a priority needs basis where resources allow.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Maintain flood warning; flood forecasting; awareness raising; self help; maintenance; planning policies.

Coordination:

Angus Council and Aberdeenshire Council will coordinate emergency plans/response with related actions (shaded only in table above).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.

Funding:

Aberdeenshire Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Planning policies – North of Brechin (Potentially Vulnerable Area 07/03)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Aberdeenshire Council is a local planning authority and will work with the regional planning authority, the Aberdeen City and Shire Strategic Development Planning Authority.

As a consultee on planning applications, Aberdeenshire Council's Flood & Coast Protection team will work directly with colleagues in the Planning Service to ensure that appropriate policies and measures are put in place to reduce flood risk. Planning applications are assessed against the flooding standards set out

in the current Aberdeenshire Local Development Plan, and in future those in the proposed Aberdeenshire Local Development Plan 2016.

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk i.e. Local Development Plans.

Angus Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; self help; emergency plans/response; planning policies.

Coordination:

SEPA, Aberdeenshire Council and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required.

Funding:

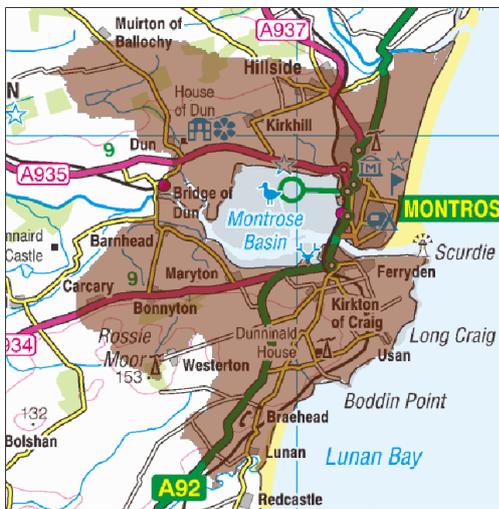
SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Aberdeenshire Council and Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Montrose Basin (Potentially Vulnerable Area 07/04)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	Kincardine and Angus Coastal

Background

This Potentially Vulnerable Area is 63km² and is made up of small coastal watercourses that flow into the Montrose Basin and Montrose Bay (shown below). It includes the towns of Montrose and Ferryden.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

The area has a risk of river, coastal and surface water flooding with the majority of damages caused by coastal and surface water flooding.

There are approximately 130 residential properties and 90 non-residential properties at risk of flooding. The Annual Average Damages are approximately £700,000.

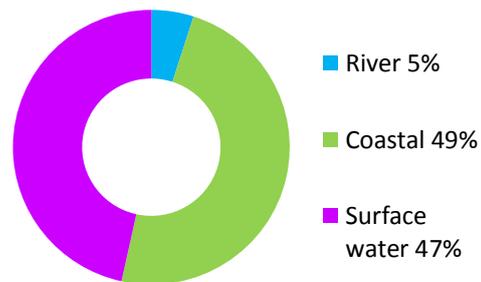


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of coastal flooding is from the North Sea and Montrose Basin to Montrose, Ferryden and Bridge of Dun. The highest risk of surface water flooding is in Montrose and Ferryden.

For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties and roads. The Dundee to Aberdeen railway line is also notably impacted.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Montrose Basin (Potentially Vulnerable Area 07/04)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_04_Full.pdf

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Objectives to manage flooding in Montrose Basin

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. The following objectives have been set for Montrose Basin Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties and risk to people in Montrose caused by coastal flooding (objective ID 7007, 7008)

- Reduce economic damages and number of residential properties at risk of surface water flooding in Montrose and Ferryden where practical (objective ID 7005)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Montrose Basin

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. The actions shaded have been selected as the most appropriate for Montrose Basin 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Maintain flood protection scheme (existing)					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
New flood warning					
Maintain flood warning					
Flood forecasting					
Community flood action groups					
Awareness raising					
Self help					
Surface water plan/study					
Maintenance					
Emergency plans/response					
Planning policies					

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Details of actions to manage flooding in Montrose Basin

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Montrose Basin PVA are shown overleaf. Actions related to (shaded

only) the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

Flood protection study – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Angus Council will undertake a flood protection study for Montrose to be delivered by financial year 2018/19. This will assess whether flood defences and natural flood management can be used to reduce flood risk. Natural flood management options will consider wave and surge attenuation. The study will also consider the viability of property level protection. The study will take a sustainable approach and consider the interactions between actions and effects on coastal processes along the shoreline, This will be in line with Angus Shoreline Management Plan.

The study has the potential to benefit 104 residential properties and 43 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £5.2 million. The

study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. 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 study area. The study could also benefit three utilities and three roads located within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to enhance and restore the environment will be considered by

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coordinating with river basin management planning. The proposed actions will not have an adverse effect on the integrity of the nationally and locally designated sites in the study area (Montrose Basin Special Protection Area, Montrose Basin SAC or SSSI), which could be positively or negatively impacted. These include conservation areas, listed buildings, Sites of Special Scientific Interest and Ramsar sites.

Related Actions (as shaded above):

Strategic mapping & modelling; new flood warning; community flood action groups; awareness raising; self help; surface water plan/study; emergency plans/response.

Coordination:

Angus Council will coordinate the study with Scottish Water, Marine Scotland, The Crown Estate, SEPA, SNH and landowners, Montrose Port Authority, Montrose Golf Links Community, etc.

Angus Council will coordinate the flood protection study through the Local Planning District (LPD) partnership and or separate agreements.

Angus Council will coordinate the flood protection study with related actions (shaded only in table above).

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintain flood protection scheme – Montrose Basin (Potentially Vulnerable Area 07/04)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
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Maintain flood protection scheme

Description:

The existing Montrose Flood Protection scheme provides protection from coastal processes. This extends from the northern end of the splash seawall frontage to the eastern boundary of Montrose Port. These measures include a piled sea wall with a rock armour toe, rock flank protection, rock armour revetment with two strong points and a small dune system and gabion mattress.

Angus Council will maintain the existing Flood Protection Scheme ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Angus Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct watercourse inspections annually and structural inspections biennially.

Where required Angus Council will co-ordinate required maintenance works with the Scottish Environment

Protection Agency (SEPA); Scottish Natural Heritage (SNH); Marine Scotland; The Crown Estate, Network Rail, landowners etc. Maintenance of the Flood Protection Schemes will also be in line with Angus Shoreline Management Plan.

Related Actions (as shaded above):

Flood protection study; maintain flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate maintaining flood protection scheme with related actions (shaded only in table above).

Funding:

Angus Council funding for maintain flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Strategic mapping and modelling – Montrose Basin (Potentially Vulnerable Area 07/04)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Montrose area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. As a local authority study is proposed in this area, SEPA will work collaboratively to ensure consistent modelling approaches are applied.

Mapping improvements in this area are dependent on a local authority study. However, wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019.

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 by 2019/20.

Scottish Water will undertake further investigation and modelling in the Montrose sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection study; new flood warning; maintain flood warning; flood forecasting; surface water plan/study; emergency plans/response; planning policies.

Coordination:

A coastal flood protection study is proposed for Montrose and a new coastal flood warning scheme is under consideration for the Aberdeenshire coast from Peterhead to Montrose. SEPA will ensure that any new information about flood risk resulting from the proposed study and flood warning developments is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.

SEPA and Scottish Water will coordinate their strategic mapping and

modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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New flood warning – Montrose Basin (Potentially Vulnerable Area 07/04)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
New flood warning					

Description:

Flood warning is required for communities at risk of coastal flooding along the Aberdeenshire coast from Peterhead to Montrose. A flood forecasting system will be required before the flood warning scheme can be developed.

The flood forecasting system is to be updated and the new flood warning service is to be launched in December 2017.

Related Actions (as shaded above):

Flood protection study; strategic mapping & modelling; new flood warning; maintain flood warning; flood forecasting; community flood action groups; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A coastal flood protection study is proposed for Montrose. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in developing the new flood warning system.

SEPA will coordinate new flood warning with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, Scottish Government provides grant funding to enable SEPA to implement new flood warning schemes.

Maintain flood warning – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Kinnaird/Bridge of Dun flood warning area which is part of the South Esk river flood warning scheme.

When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Flood forecasting; community flood action groups; awareness raising; self help; emergency plans/response.

Coordination:

SEPA will work with the local authority to ensure that any new information about flood risk is considered in the existing flood warning system.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.

Flood forecasting – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Strategic mapping & modelling; new flood warning; maintain flood warning; awareness raising; self help; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Community flood action groups – Montrose Basin (Potentially Vulnerable Area 07/04)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Community flood action groups					

Description:

to reduce flood risk, improve preparedness and increase resilience against flooding. Angus Council is engaging with Ferryden and Craig Community Council (formed in 2014) and Aulton Way Community Flood Group (formed in 2015) who are currently developing the scope of the group. Angus Council will co-ordinate these works with Scottish Water and emergency services when required.

Angus Council has provided each community group with a suite of information highlighting sources of flooding, emergency kit advice, flood response advice and contact information for partner agencies such as SEPA, Scottish Water, Scottish Flood Forum, etc.

Related Actions (as shaded above):

Flood protection study; new flood warning; awareness raising; self help; surface water plan/study;

maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate community flood action groups with related actions (shaded only in table above).

Angus Council will work with existing community flood action groups to set out arrangements
Angus Council will continue to co-ordinate with existing community flood action groups throughout the next 6 years on a priority needs basis where resources allow.

Funding:

Angus Council funding for community flood action groups will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Awareness raising – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.

Angus Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council will use the delivery of a flood

protection study to address flood risk and undertake surface water management plan/study by 2019/20 as opportunities to raise awareness. Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; maintain flood warning; community flood action groups; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A new flood warning scheme is proposed for the Aberdeenshire coast from Peterhead to Montrose. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.

SEPA, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; maintain flood warning; community flood action groups; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Montrose Basin (Potentially Vulnerable Area 07/04)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study					

Description:

Angus Council will prepare Surface Water Management Plans (SWMPs) to cover Montrose and Ferryden. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Angus Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best available knowledge and data is used

to input into the surface water management plans.

Related Actions (as shaded above):

Flood protection study; strategic mapping & modelling; maintain flood warning; flood forecasting; awareness raising; self help; maintenance; emergency plans/response; planning policies.

Coordination:

Angus Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Angus Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council funding for surface water management will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Angus Council will continue to maintain the existing sea walls, gabions, embankments and revetments around Montrose Basin in line with the Angus Shoreline Management Plan.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale

capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection study; maintain flood protection scheme; community flood action groups; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Angus Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations

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over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by

Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

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Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plan for Montrose, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection study; maintain flood protection scheme; new flood warning; maintain flood warning; flood forecasting; community flood action groups; awareness raising; self help; surface water plan/study; maintenance; planning policies.

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Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Providing an emergency response to flooding is the responsibility of many organisations, Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as

appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA’s grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Montrose Basin (Potentially Vulnerable Area 07/04)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with

planning authorities in the preparation of development plans. When consulted in relation to planning applications for

development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA).

Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans.

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Angus Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Brechin (Potentially Vulnerable Area 07/05)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	River South Esk (Tayside)

Background

This Potentially Vulnerable Area is 36km² and includes Brechin (shown below). It is situated near the mouth of the River South Esk where it flows into the Montrose Basin. The main sources of flooding are river and surface water.

There are approximately 100 residential properties and 70 non-residential properties at risk of flooding. The Annual Average Damages are approximately £670,000.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

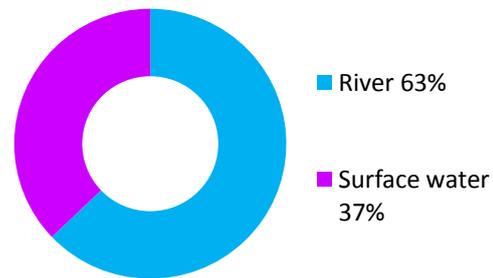


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Brechin from the River South Esk. Brechin is also notably impacted by surface water flooding. In Brechin, Angus Council has undertaken detailed studies for the design and build of the Brechin Flood Protection Scheme. The information in this report uses SEPA data which may be different from the flooding information from the Scheme.

For this Potentially Vulnerable Area the highest damages are to non-residential

properties followed by damages to residential properties.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Brechin (Potentially Vulnerable Area 07/05)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_05_Full.pdf

Objectives to manage flooding in Brechin

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. The following objectives have been set for Brechin Basin Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties and risk to people in Brechin caused by flooding from the River South Esk (objective ID 7011, 7012)

- Reduce economic damages and number of residential properties at risk of surface water flooding in Brechin where practical (objective ID 7009)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf

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Actions to manage flooding in Brechin

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities Brechin Potentially Vulnerable Area.

following consultation. The actions shaded have been selected as the most appropriate for

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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

Delivery of selected actions

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					
Natural flood management works					
Natural flood management study					
		Strategic mapping and modelling (Scottish Water)			
Maintain flood warning					
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study					
Maintenance					
Emergency plans/response					
Planning Policies					

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Details of actions to manage flooding in Brechin

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Brechin PVA are shown overleaf. Actions related to (shaded only) the

selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

Maintain flood protection scheme – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					

Description:

The existing Brechin Flood Prevention Scheme 2015/16 provides protection from river flooding. The existing scheme is located along River Street, Brechin. The scheme comprises a number of features to reduce flood risk in Brechin. This included the construction of a 1.5km flood defence wall, 1.8m high embankment, and installation of 3 submerged pumping stations, improving the Denburn culvert, upgrading existing surface water drainage, numerous headwall outfall structures and raising 300m of the footway in River Street.

Angus Council will maintain the existing Flood Protection Schemes ensuring works are co-ordinated and infrastructure is fully assessed. This

will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Angus Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct watercourse inspections

annually and structural inspections biennially.

Related Actions (as shaded above):

Maintain flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Where required Angus Council will co-ordinate required maintenance works with the Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH); Marine Scotland; The Crown Estate, Network Rail, landowners, etc.

Angus Council will coordinate maintaining flood protection scheme

with related actions (shaded only in table above).

Funding:

Angus Council funding for maintain flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Natural flood management works – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural flood management works					

Description:

Natural flood management works are continuing following completion of the Brechin Flood Protection Scheme. The works, which include upland reforestation, will be informed by Natural flood management study (described below) and the River South Esk Catchment Management Plan produced by the River South Esk catchment Partnership. Angus Council will work with other partners and stakeholders to help co-ordinate the proposed work. Partners and stakeholders include but are not limited to SEPA, SNH, RSPB, Forestry Commission and Cairngorms National Park Authority. A number of projects

have been proposed including the River South Esk restoration pilot projects led by SEPA and the Esk River and Fisheries Trust and contour planting project led by the Forestry commission Scotland. It is expected that the projects will be delivered by 2019/20 and funded by SEPA and Scottish Government.

The economic, social and environmental impacts of the natural flood management actions will be considered. The economic impact of natural flood management actions is difficult to define. However, such actions can reduce flood risk for high likelihood events to 84 residential and non-residential properties in this

location. Natural flood management actions can also have a positive impact on the ecological quality of the environment by restoring and enhancing natural habitats.

Related Actions (as shaded above):

Natural flood management study; strategic mapping & modelling; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Angus Council will coordinate these works through the Local Planning District (LPD) partnership and/or separate agreements.

Angus Council will coordinate natural flood management works with related actions (shaded only in table above).

Funding:

The NFM works are funded through the Water Environment Fund. The fund is managed by SEPA and is supported by the Scottish Government, Scottish Natural Heritage and the Forestry Commission. The fund aims to restore rivers, lochs and their catchments which have been damaged by historical activities.

Angus Council funding for natural flood management works will be shared with others as appropriate, and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Natural flood management study – Brechin (Potentially Vulnerable Area 07/05)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural flood management study					

Description:

Angus Council is working with the River South Esk Catchment Partnership on a trial Natural Flood Management (NFM) project, comprising of contour and riparian tree planting in Glen Clova, within the Brechin catchment. The economic, social and environmental impacts of the natural flood management actions will be considered in the study.

The economic impact of natural flood management actions is difficult to define. However, such actions can reduce flood risk for high likelihood events. Opportunities to improve the condition of the Melgund Burn and Lemno Burn (Water body IDs 5804 and 5806), which are located within the study area and the physical condition of these rivers is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. Natural flood management actions can also have a positive impact on the ecological quality of the environment

by restoring and enhancing natural habitats.

The South Esk pilot catchment project aims to identify and prioritise opportunities for delivering improvements to river habitats whilst helping to reduce flood risk. Phase 1 of the study has been completed and SEPA is currently in discussion with landowners with regard to taking forward some sites to options appraisal and outline design.

Scoping identified a number of reaches in the lower catchment of the River South Esk as priorities for restoration and natural flood management. Proposals for the Melgund Burn and Lemno Burn are now at outline design stage.

Phase 2 outline design is to be completed in February 2016. Phase 3 implementation is scheduled for June 2016 to September 2016.

Related Actions (as shaded above):

Natural flood management works; strategic mapping & modelling; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

The Melgund Burn component is managed by the Esk Rivers Fisheries Trust and the Lemno Burn component by SEPA.

This pilot catchment project aims to work with local landowners and land managers on a voluntary basis to demonstrate how we could combine improvements to river habitats, with measures that will help to reduce flood risk, whilst ensuring proper consideration of existing land use.

Angus Council will coordinate the natural flood management study through the Local Planning District (LPD) partnership and or separate agreements.

Angus Council will coordinate the natural flood management study with related actions (shaded only in table above).

Funding:

This River South Esk Catchment Partnership on NFM project is funded through the Water Environment Fund. The fund is managed by SEPA and is supported by the Scottish Government, Scottish Natural Heritage and the Forestry Commission. The fund aims to restore rivers, lochs and their catchments which have been damaged by historical activities.

Angus Council funding for natural flood management studies will be shared with others as appropriate, and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – Brechin (Potentially Vulnerable Area 07/05)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
		Strategic mapping and modelling (Scottish Water)			

Description:

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk from 2018-2021.

Scottish Water will undertake further investigation and modelling in the Brechin sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management

plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Natural flood management works maintain flood warning; flood forecasting; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

Maintain flood warning – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Brechin, Kinnaird/Bridge of Dun and the Finavon and Tannadice flood warning areas which are part of the South Esk river flood warning scheme. When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Maintain flood protection scheme; flood forecasting; awareness raising; self help; emergency plans/response.

Coordination:

There are ongoing natural flood management works and a natural flood management study in this PVA. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the ongoing works and any new information about flood risk resulting from the study are fully considered in the existing flood warning system.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.

Flood forecasting – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Maintain flood protection scheme; natural flood management works; strategic mapping & modelling; maintain flood warning; awareness

raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements

Funding:

SEPA’s flood forecasting service is funded through Scottish Government’s grant in aid allocation. The Met Office receives funding from the UK Government.

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Awareness raising – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Angus Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council will use the delivery of a flood protection study to address flood risk and undertake surface water management plan/study by 2019/20 as opportunities to raise awareness.

Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding, i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Maintain flood protection scheme; natural flood management works; natural flood management study; maintain flood warning; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure

Self help – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Natural flood management works; maintain flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with 'awareness raising', 'community flood action groups' and 'emergency plans/response' actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study					

Description:

Angus Council will prepare Surface Water Management Plans (SWMPs) to cover Brechin. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Angus Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best

available knowledge and data is used to input into the surface water management plans.

Related Actions (as shaded above):

Maintain flood protection scheme; strategic mapping and modelling; maintain flood warning; flood forecasting; awareness raising; self help; maintenance; emergency plans/response; planning policies.

Coordination:

Angus Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships.

Angus Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Maintain flood protection scheme; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our

economic regulator, all business activities required under this action by

Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plan for Brechin, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk in Brechin. At predetermined trigger levels for the River South Esk flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with

partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Maintain flood protection scheme; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; planning policies.

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Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as

appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA’s grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Brechin (Potentially Vulnerable Area 07/05)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk i.e. Local Development Plans.

Angus Council adopts proactive strategies to mitigate and adapt to

climate change, taking full account of flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

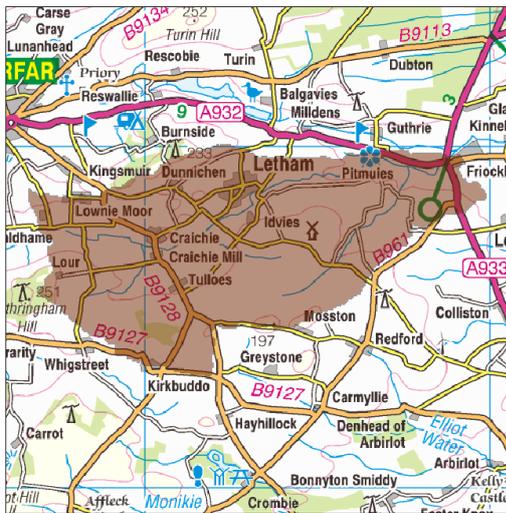
SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Lunan Water (Potentially Vulnerable Area 07/06)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	Lunan Water

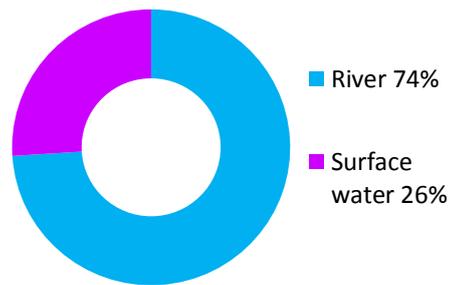
Background

This Potentially Vulnerable Area is 53km² and situated in the upper reaches of the Lunan Water catchment (shown below).



This area includes Letham and the main watercourse is the Vinny Water, a tributary of the Lunan Water. The majority of damages in this area are caused by river flooding with a lower risk of surface water flooding.

There are approximately 20 residential properties at risk of flooding. The Annual Average Damages are approximately £60,000.



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Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

The main risk of flooding in this area is to Letham from the Vinny Water.

For this Potentially Vulnerable Area, the highest damages are to residential properties followed by damages to

agricultural land. Within this Potentially Vulnerable Area there is one asset identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Lunan Water (Potentially Vulnerable Area 07/06)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_06_Full.pdf

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Objectives to manage flooding in Lunan Water

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. The following objectives have been set for Lunan Water Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown below.

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Actions to manage flooding in Lunan Water

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. The actions shaded have been selected as the most appropriate for Lunan Water 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Flood forecasting					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Lunan Water

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Lunan Water PVA are shown overleaf. Actions related to (shaded only) the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

Strategic mapping and modelling – Lunan Water (Potentially Vulnerable Area 07/06)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

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 led surface water mapping improvements are expected to be carried out in 2016 to 2017.

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 by 2019/20.

Scottish Water will undertake further investigation and modelling in the Letham sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood forecasting; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's strategic mapping activities will be coordinated with the activities of other responsible authorities as required.

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Flood forecasting – Lunan Water (Potentially Vulnerable Area 07/06)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Strategic mapping & modelling; awareness raising; self help; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Lunan Water (Potentially Vulnerable Area 07/06)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Angus Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council will use the delivery of a flood protection study to address flood risk and undertake surface water management plan/study by 2019/20 as opportunities to raise awareness.

Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding, i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Self help; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Lunan Water (Potentially Vulnerable Area 07/06)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; maintain flood warning; community flood action groups; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintenance – Lunan Water (Potentially Vulnerable Area 07/06)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, , target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Maintain flood protection scheme; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Lunan Water (Potentially Vulnerable Area 07/06)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plan for Brechin, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk in Brechin. At predetermined trigger levels for the River South Esk flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; maintenance; planning policies.

Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Lunan Water (Potentially Vulnerable Area 07/06)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans.

Angus Council adopts proactive strategies to mitigate and adapt to

climate change, taking full account of flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

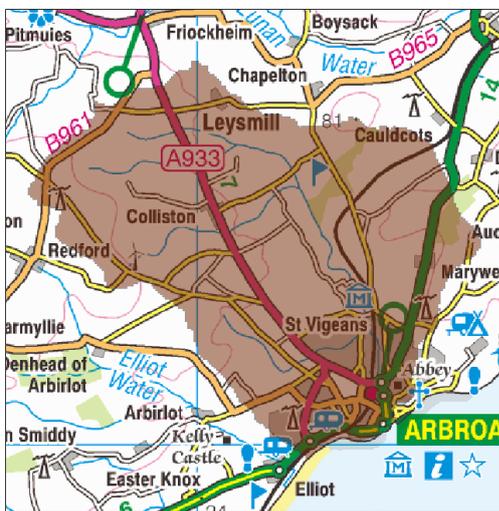
SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Arbroath (Potentially Vulnerable Area 07/07)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	Brothock Water

Background

This Potentially Vulnerable Area is 50km² and includes the whole Brothock Water catchment. It contains Arbroath and the main watercourses are the Brothock Water and its tributaries including the Magungie Burn, Denside Burn, Coliston Burn and Hercules Den Burn.



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Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

There are approximately 250 residential properties and 140 non-residential properties at risk of flooding. The Annual Average Damages from flooding are approximately £1.6 million.

The main sources of flood damages are river and surface water flooding.

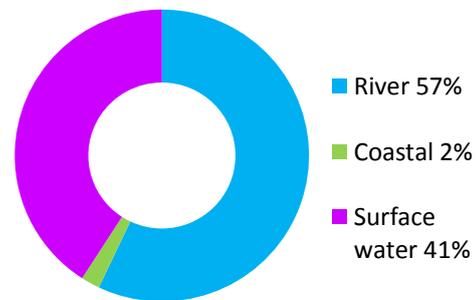


Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Arbroath from the Brothock Water. Arbroath is also notably impacted by surface water flooding.

For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties. The Dundee to Aberdeen railway line is also notably impacted.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Arbroath (Potentially Vulnerable Area 07/07)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_07_Full.pdf

Objectives to manage flooding in Arbroath

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. The following objectives have been set for Arbroath Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties and risk to people in Arbroath caused by flooding from the Brothock Water (objective ID 7016, 7017);

- Reduce economic damages and number of residential properties at risk of surface water flooding in Arbroath, Arbirlot, Auchmithie and Colliston where practical (objective ID 7014); and
- Avoid an overall increase in flood risk (7001) and reduce overall flood risk (objective ID 7054).

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Arbroath

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. The actions shaded have been selected as the most appropriate for Arbroath 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

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Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection scheme/works					
Maintain flood protection scheme (existing)			Maintain flood protection scheme (existing and new)		
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS – Scottish Water)					
Awareness raising					
Flood forecasting					
Maintain flood warning					
Self help					
Emergency plans/response					
Maintenance					
Planning Policies					

Details of actions to manage flooding in Arbroath

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Arbroath PVA are shown below. Actions related to (shaded only) the

selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

Flood protection scheme/works – Arbroath (Potentially Vulnerable Area 07/07)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection scheme/works					

Description:

The Arbroath Flood Protection Scheme will reduce river flood risk. The scheme is being advanced as a formal flood protection scheme under the Flood Risk Management (Scotland) Act 2009. The proposed scheme will provide a 1 in 200 year standard of protection and is to be delivered by 2018/19 addressing fluvial flood risk from the Brothock Water. It is anticipated that the scheme will be at a cost of £11.4m. The proposed scheme has estimated damages avoided of £16 million and an estimated benefit cost ratio of 1.40.

The scheme includes improvements to existing flood defences and the construction of two upstream flood storage areas; this will attenuate flood waters in areas to the north and north-west of Arbroath reducing peak flows downstream. It is expected that the scheme will remove 530 people at risk of flooding saving an estimated £840,000 in annual average damages.

A reduction in flood risk will have a positive benefit to the health and wellbeing of the community and socially vulnerable people located

within the flood protection scheme area. In addition there are two utilities, three roads and one railway line which have been identified as potentially benefitting from this action. There may be negative impacts through disturbance to the local community during the construction phase.

The flood protection scheme may have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Opportunities to improve the condition of the Brothock Water (water body ID 5603), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management. A number of nationally and locally designated sites are present in the study area and could be positively or negatively impacted. These include conservation areas, scheduled monuments, listed buildings and ancient woodlands.

The Strategic Environmental Assessment screening decision for the Arbroath Flood Strategy, which included the flood protection scheme as well as coastal protection works,

was that there were no significant environmental impacts. However, local environmental impacts of the construction works will be assessed and managed as the scheme is developed and delivered.

Related Actions (as shaded above):

Maintain flood protection scheme; strategic mapping and modelling; maintain flood warning; flood forecasting; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate the flood protection scheme through the Local Planning District (LPD) partnership and or separate agreements.

Angus Council will coordinate the flood protection scheme with related actions (shaded only in table above).

Funding:

Funding for the Arbroath Flood Protection Scheme will be subject to 80% grant funding by Scottish Government with the remainder from Angus Council capital budgets.

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Maintain flood protection scheme – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme (existing)			Maintain flood protection scheme (existing and new)		

Description:

The existing Brothock Water Flood Prevention Scheme 1987 provides protection from river flooding. The existing scheme is situated between Arbroath Harbour and St.Vigeans. The scheme comprises a number of features to reduce flood risk in Arbroath. This included the construction of floodwalls, heightening of existing walls, altering the soffit level of two bridges, re-grading and realignment of existing embankments, removing various buildings and structures that span the Brothock Water, installation of concrete screens and waterproofing buildings that span the Brothock Water.

The new Arbroath Flood Protection Scheme, due for completion in 2018/19 will provide a higher level of protection from river flooding. Details of the scheme are shown above in section 'Flood Protection Scheme/Works'.

Angus Council will maintain the existing Flood Protection Schemes ensuring works are co-ordinated and infrastructure is fully assessed. This

will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Angus Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct watercourse inspections annually and structural inspections biennially.

The existing Brothock Water Flood Prevention Scheme 1987 provides protection from river Where required Angus Council will co-ordinate required maintenance works with the Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH); Marine Scotland; The Crown Estate, Network Rail, landowners etc. Maintenance of the Flood Protection Schemes will also be in line with Angus Shoreline Management Plan.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

A flood protection scheme is proposed for Arbroath. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme are fully considered in the existing flood warning system.

Funding:

Angus Council funding for maintain flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Arbroath to Dundee area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. A detailed local authority led study has already been undertaken in this area and SEPA will work collaboratively to ensure consistent modelling approaches are applied.

Strategic coastal mapping improvements in this area are dependent on the implementation of local authority led flood protection scheme. Timescales are therefore indicative only and it is estimated that these improvements will be carried out in 2018 to 2019 subject to positive assessment.

However, wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the

intention of updating the strategic coastal maps in 2016 to 2019.

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk by 2019/20.

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood warning; flood forecasting; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A flood protection scheme is planned for Arbroath. SEPA will work with the local authority to ensure that strategic mapping and modelling developments reflect the changes in flood risk resulting from the new flood protection scheme where appropriate and relevant.

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Maintain flood warning – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Arbroath flood warning area which is part of the Brothock river flood warning scheme.

SEPA will continue to maintain the Arbroath Coastal flood warning area which is part of the Firth of Forth and Tay coastal flood warning scheme.

When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme; flood forecasting; awareness raising; self help; emergency plans/response.

Coordination:

A flood protection scheme is proposed for Arbroath. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme are fully considered in the existing flood warning system.

Funding:

The maintenance of SEPA’s flood warning service is funded by Scottish Government through SEPA’s grant in aid settlement.

Flood forecasting – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme strategic mapping & modelling; maintain flood warning; awareness

raising; self help; Surface water plan/study; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through SEPA led education events.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

For the new flood protection scheme, SEPA will support the local authority's communications and engagement activities with media activity, local

public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.

Angus Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council will use the delivery of a flood protection study to address flood risk and undertake surface water management plan/study by 2019/20 as opportunities to raise awareness.

Angus Council will also disseminate more general information to raise

awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection scheme/works;
maintain flood protection scheme;
maintain flood warning; self help;
Surface water plan/study;
maintenance; emergency plans/response; planning policies.

Coordination:

A flood protection scheme is proposed for Arbroath. SEPA will support the local authority's communications and engagement activities.

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Maintain flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS - Scottish Water)					

Description:

Angus Council will prepare Surface Water Management Plans (SWMPs) to cover Arbroath, Arbirlot, Auchmithie and Colliston. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Angus Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process.

Scottish Water will work with and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Arbroath, Arbirlot, Auchmithie and Colliston. The study has improved knowledge and understanding of surface water flood risk and The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network, e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

The study will support the surface water management plan process and

improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding, e.g. with the sewer network, watercourses and the sea.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme; strategic mapping and modelling maintain flood warning; flood forecasting awareness raising self help; maintenance; emergency plans/response; planning policies.

Coordination:

Angus Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Angus Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

Maintenance – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plan for Brechin, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk in Brechin. At predetermined trigger levels for the River South Esk flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study maintenance; planning policies.

Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies - Arbroath (Potentially Vulnerable Area 07/07)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans.

Angus Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of

flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Coast North of Arbroath (Potentially Vulnerable Area 07/08)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	Kincardine and Angus Coastal

Background

This Potentially Vulnerable Area is 13km² and part of the Kincardine and Angus catchment (shown below). It contains small coastal watercourses that flow into the North Sea and includes the town of Arbroath.



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Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

The area has a risk of river and surface water flooding with the majority of flood impacts caused by surface water.

Approximately 30 residential properties and 10 non-residential properties have a risk of flooding. The Annual Average Damages are approximately £56,000.

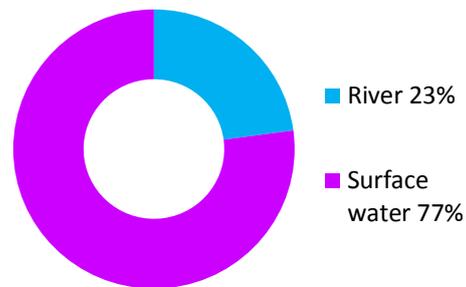


Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle. The highest risk of flooding is from surface water to Arbroath.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. Within this

Potentially Vulnerable Area there is one asset identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Coast North of Arbroath (Potentially Vulnerable Area 07/08)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_08_Full.pdf

Objectives to manage flooding in Coast North of Arbroath

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. The following objectives have been set for coast north of Arbroath Potentially Vulnerable Area:

- Reduce economic damages and number of residential properties at risk of surface water flooding in

Arbroath, Arbirlot, Auchmithie and Colliston where practical (objective ID 7014)

- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Coast North of Arbroath

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. The actions shaded have been selected as the most appropriate for Coast north of Arbroath 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Flood forecasting					
Awareness raising					
Self help					
Surface water/plan study					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Arbroath

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Coast north of Arbroath PVA are shown below. Actions related to (shaded only)

the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

Strategic mapping and modelling – Coast North of Arbroath (Potentially Vulnerable Area 07/08)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Arbroath to Dundee area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.

Wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019.

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk by 2019/20.

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under

Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress.

Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood forecasting; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through

the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water

funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Flood forecasting – Coast North of Arbroath (Potentially Vulnerable Area 07/08)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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

Related Actions (as shaded above):

Strategic mapping & modelling; maintain flood warning; awareness raising; self help; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Coast North of Arbroath (Potentially Vulnerable Area 07/08)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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. This will be achieved through SEPA led education events.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Angus Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council will seek opportunities

to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council will use the delivery of a flood protection study to address flood risk and undertake surface water management plan/study by 2019/20 as opportunities to raise awareness.

Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and

detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood forecasting; self help; Surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Coast North of Arbroath (Potentially Vulnerable Area 07/08)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Surface water plans/study – Coast North of Arbroath (Potentially Vulnerable Area 07/08)

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 plans/study	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning Policies
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plans/study					

Description:

Angus Council will prepare Surface Water Management Plans (SWMPs) to cover Arbroath, Arbirlot, Auchmithie and Colliston. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Angus Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management

planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in Arbroath, Arbirlot, Auchmithie and Colliston. The study will support the surface water management plan process and improve has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Angus Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council funding for surface water management will be subject to

Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

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Maintenance – Coast North of Arbroath (Potentially Vulnerable Area 07/08)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Coast North of Arbroath (Potentially Vulnerable Area 07/08)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plan for Brechin, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk in Brechin. At predetermined trigger levels for the River South Esk flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; surface water plan/study; maintenance; planning policies.

Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Coast North of Arbroath (Potentially Vulnerable Area 07/08)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk i.e. Local Development Plans.

Angus Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of

flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Angus Council will coordinate land use planning policies

with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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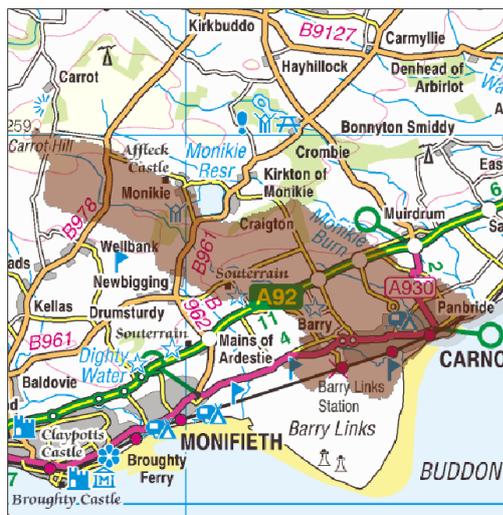
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Carnoustie and Barry (Potentially Vulnerable Area 07/09)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council	Dundee coastal

Background

This Potentially Vulnerable Area is 31km² and part of the Firth of Tay catchment. It contains the Lochty Burn and Barry Burn and includes the town of Carnoustie.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

The area has a risk of river, coastal and surface water flooding with the majority of damages caused by river flooding.

There are approximately 180 residential properties and 30 non-residential properties at risk of flooding. The Annual Average Damages are approximately £470,000.

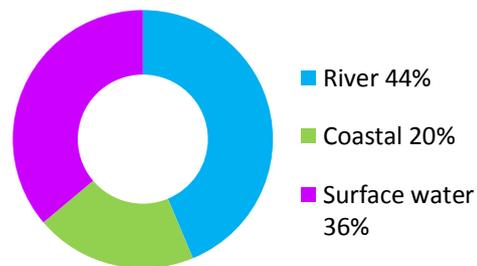


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Carnoustie from the Barry Burn and Lochty Burn. Carnoustie also has a risk of surface water flooding. The Dundee to Aberdeen railway line is also notably impacted.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. Within this Potentially Vulnerable Area there are five assets identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Carnoustie and Barry (Potentially Vulnerable Area 07/09)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_09_Full.pdf

Objectives to manage flooding in Carnoustie and Barry

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. The following objectives have been set for Carnoustie and Barry Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in Carnoustie caused by flooding from the Barry Burn and coastal flooding (objective ID 7022)

- Reduce economic damages and number of residential properties at risk of surface water flooding in Carnoustie, Barry, Panbride and Westhaven where practical (objective ID 7020)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Carnoustie and Barry

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. The actions shaded have been selected as the most appropriate for Carnoustie and Barry 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

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Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Maintain flood protection scheme					
Strategic mapping and modelling (Scottish Water)					
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS – Scottish Water)					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Carnoustie and Barry

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Carnoustie and Barry PVA are shown below. Actions related to (shaded only)

the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

Flood Protection Study – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood Protection Study					

Description:

Angus Council will undertake a flood protection study for Carnoustie and Barry to be delivered by financial year 2019/20. This will assess a number of options to manage flood risk including flood storage, modification of conveyance, installation/ modification of fluvial control structures, flood defences, sediment management and the viability of property level protection. The potential for natural flood management is also being assessed, including river/ floodplain restoration, sediment management and wave attenuation. The study is recognising that existing flood defences may not operate to the design standard. The study will take a sustainable approach and consider the interaction between actions upstream and downstream and potential effects on coastal processes along the shoreline. This will be in line with Angus Shoreline Management Plan.

The study has the potential to benefit 37 residential properties and 8 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £5.0 million. The

study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. 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.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the Barry Burn (water body ID 5953), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. The proposed actions will not have an adverse effect on the integrity of the nationally and locally designated sites in the study area (Barry Links Special Area of Conservation, and Firth of Tay and Eden Estuary Special Area of

Conservation and Special Protection Area), which could be positively or negatively impacted. These include conservation areas and listed buildings.

Related Actions (as shaded above):

Strategic mapping and modelling; awareness raising self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate the study with Scottish Water, Marine Scotland, The Crown Estate, SEPA

and Landowners, Carnoustie Golf Links, etc.

Angus Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Angus Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintain flood protection scheme – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					

Description:

The existing Carnoustie (Barry Burn) Flood Prevention Scheme 1979 provides protection from river flooding. The existing scheme is situated between the Railway Bridge and A930 Road Bridge over a 1.4km length. The scheme comprises a number of features to reduce flood risk in Carnoustie. This included the widening and regarding of the Barry Burn over a 1.4km distance, the construction of floodbanks, and the raising of existing banks on both riverbanks, infilling of the existing Waterybutts Ditch and provision of an outfall culvert fitted with flap valve, making watertight the deck of the railway bridge over the Barry Burn and removing existing footbridge and replacing with a new, higher footbridge at the same location.

Angus Council will maintain the existing Flood Protection Schemes ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Angus Council engineers on a priority needs

basis as resource allows. The general maintenance standard target is to conduct watercourse inspections annually and structural inspections biennially.

Where required Angus Council will co-ordinate required maintenance works with the Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH); Marine Scotland; The Crown Estate, Network Rail, landowners etc. Maintenance of the Flood Protection Schemes will also be in line with Angus Shoreline Management Plan.

Related Actions (as shaded above):

Flood protection study; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate the maintaining of the flood protection scheme with related actions (shaded only in table above).

Funding:

Angus Council funding for maintaining flood protection schemes will be shared with others as appropriate and will be subject to Scottish

Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					

Description:

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk by 2019/20.

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress.

Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where

relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection study; flood forecasting; awareness raising; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Flood forecasting – Carnoustie and Barry (Potentially Vulnerable Area 07/09)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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

Related Actions (as shaded above):

Strategic mapping & modelling; awareness raising; self help; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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. This will be achieved through SEPA led education events.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Angus Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009.

Over the six-year planning cycle, Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council will use the delivery of a flood protection study to address flood risk and undertake surface water management plan/study by 2019/20 as opportunities to raise awareness.

Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water

specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; maintain flood protection scheme; flood forecasting; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Surface water plan/study – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS - Scottish Water)					

Description:

Angus Council will prepare Surface Water Management Plans (SWMPs) to cover Carnoustie, Barry, Panbride and Westhaven. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Angus Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process.

Scottish Water will work with and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in (SWMP Priority Areas The study has improved knowledge and understanding of surface water flood risk and The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

The study will support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding, e.g. with the sewer network, watercourses and the sea.

Related Actions (as shaded above):

Flood protection study; maintain flood protection scheme; Strategic mapping and modelling; awareness raising; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Angus Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

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Maintenance – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Maintain flood protection scheme; flood forecasting; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Carnoustie and Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Angus Council has developed and operate an emergency flood plan for Brechin, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk in Brechin. At predetermined trigger levels for the River South Esk flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection study; maintain flood protection scheme; flood forecasting; awareness raising; self help; surface water plan/study maintenance; planning policies.

Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

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Funding:

Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Carnoustie & Barry (Potentially Vulnerable Area 07/09)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore, Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk i.e. Local Development Plans.

Angus Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of

flood risk. Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of

other responsible authorities as required.

Funding:

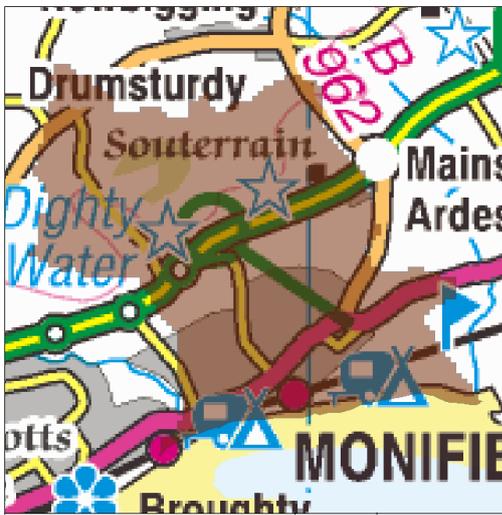
SEPA's planning activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Monifieth (Potentially Vulnerable Area 07/10)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council, Dundee City Council	Dundee coastal

Background

This Potentially Vulnerable Area is 8km² and part of the Firth of Tay catchment (shown below). It contains the Monifieth Burn and includes the town of Monifieth.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

The area is at risk from river and surface water flooding with the majority of damages caused by river flooding.

There are approximately 250 residential properties and 20 non-residential properties at risk of flooding. The Annual Average Damages are approximately £670,000.

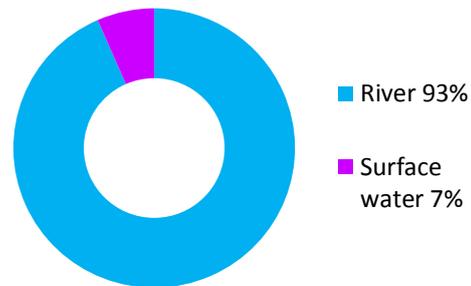


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Monifieth from the Monifieth Burn. Monifieth is also notably impacted from surface water flooding.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites

and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Monifieth (Potentially Vulnerable Area 07/10)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_10_Full.pdf

Objectives to manage flooding in Monifieth

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. The following objectives have been set for Monifieth Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties and risk to people in Monifieth caused by flooding from the Monifieth Burn (objective ID 7023, 7024)

- Reduce economic damages and number of residential properties at risk of surface water flooding in Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth where practical (objective ID 7021)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Monifieth

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. The actions shaded have been selected as the most appropriate for Monifieth 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Maintain flood protection scheme					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
New flood warning					
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS – Scottish Water)					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Monifieth

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Monifieth PVA are shown below. Actions related to (shaded only) the

selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

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Flood protection study – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Angus Council will undertake a flood protection study for Monifieth to be delivered by financial year 2019/20. This will assess whether flood storage, flood defences and sediment management could reduce flood risk. The study will take a sustainable approach and consider the interaction between actions upstream and downstream and potential effects on coastal processes along the shoreline. This will be in line with Angus Shoreline Management Plan.

The study has the potential to benefit 243 residential properties and 15 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £17 million. The study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. 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 study area. The study could also benefit two

utilities and one railway line located within the study area.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the Buddon Burn (water body ID 5954), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. The proposed actions will not have an adverse effect on the integrity of the nationally and locally designated sites in the study area (Firth of Tay and Eden Estuary Special Area of Conservation and Special Protection Area), which could be positively or negatively impacted. These include listed buildings, Sites of Special Scientific Interest and Ramsar sites.

Related Actions (as shaded above):

Strategic mapping and modelling; new flood warning; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate the study with Scottish Water, Marine Scotland, The Crown Estate, SEPA and Landowners, etc.

Angus Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Angus Council will coordinate the flood protection study with related actions (shaded only in table above).

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintain flood protection scheme – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					

Description:

The existing Monifieth Flood Protection scheme provides protection from coastal processes. This extends from the mouth of the Dighty Water to Tayview Caravan Park. These measures include targeted sections of rock armour and the construction and replacement of coastal groynes.

Angus Council will maintain the existing Flood Protection Scheme ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Angus Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct watercourse inspections annually and structural inspections biennially.

Where required Angus Council will co-ordinate required maintenance works with the Scottish Environment Protection Agency (SEPA); Scottish

Natural Heritage (SNH); Marine Scotland; The Crown Estate, Network Rail, landowners, etc. Maintenance of the Flood Protection Schemes will also be in line with Angus Shoreline Management Plan.

Related Actions (as shaded above):

Flood protection study; new flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council will coordinate maintaining the flood protection scheme with related actions (shaded only in table above).

Funding:

Angus Council funding for maintain flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – Monifieth (Potentially Vulnerable Area 07/10)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Arbroath to Dundee area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.

Wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019. Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009 by 2019/20.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress.

Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection study; new flood warning; flood forecasting; surface water plan/study; emergency plans/response; planning policies.

Coordination:

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD)

partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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New flood warning – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
New flood warning					

Description:

The area under consideration includes properties in Monifieth affected by flooding from the Monifieth Burn.

Further feasibility assessment is required to assess the delivery potential of a new flood warning scheme in this location. Status and timing will be confirmed once the feasibility assessment has been completed. A local authority flood protection study has been proposed for this area which can inform the scoping exercise once the study has been completed.

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; flood forecasting; awareness raising; self help; emergency plans/response.

Coordination:

A fluvial flood protection study is proposed for Monifieth. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in developing the new flood warning system.

SEPA will coordinate new flood warning with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, Scottish Government provides grant funding to enable SEPA to implement new flood warning schemes.

Flood forecasting – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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

Related Actions (as shaded above):

Maintain flood protection scheme; strategic mapping & modelling; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA’s flood forecasting service is funded through Scottish Government’s grant in aid allocation. The Met Office receives funding from the UK Government

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Awareness raising – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

To support the delivery of the new SEPA flood warning scheme, SEPA

will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.

Angus Council and Dundee City Council each have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council and Dundee City Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Dundee City Council will work with communities through LCCP's to raise awareness and promote self help (i.e. flood warning and property level protection). Dundee City Council will also review

the Flood Emergency Plan annually and work with any community flood action groups. Angus Council will also develop emergency plans/response and work with any community flood action groups.

Angus Council and Dundee City Council will use the delivery of the flood protection study for the Dighty Water to address flood risk and undertake surface water management plan/study by 2019/20 working with SEPA and Scottish Water as opportunities to raise awareness.

Angus Council and Dundee City Council will also disseminate more general information to raise awareness via social media streams relating to flooding, i.e. road closures, transport disruptions and weather forecasts. Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; new flood warning; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A new flood warning scheme is under consideration for properties in Monifieth. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities. SEPA's awareness raising activities will be coordinated with the activities of other responsible authorities as required.

SEPA, Angus Council, Dundee City Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council, Dundee City Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council and Dundee City Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council and Dundee City Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; new flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with 'awareness raising', 'community flood action groups' and 'emergency plans/response' actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council and Dundee City Council activities to assist, support and educate those to self help will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS - Scottish Water)					

Description:

A surface water management plan or plans to cover Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth, which set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives will be prepared. Dundee City Council will co-ordinate the preparation of a surface water management plan in partnership with Angus Council, Scottish Water and SEPA. This will include agreeing the most sustainable actions to manage surface water determined from the Integrated Catchment Study and co-ordinating the implementation of the actions. The Surface Water Management Plan will be developed in 2017 and the actions identified considered for implementation following this as part of the flood risk management planning process.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of

Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in (SWMP Priority Areas). The study has improved knowledge and understanding of surface water flood risk and The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network, e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

The study will support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding, e.g. with the sewer network, watercourses and the sea.

Related Actions (as shaded above):

Flood protection study; Maintain flood protection scheme; strategic mapping and modelling; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Angus Council and Dundee City Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships.

Angus Council and Dundee City Council will coordinate surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council and Dundee City Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

Maintenance – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council and Dundee City Council have an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Maintain flood protection scheme; flood forecasting; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Dundee City Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council and Dundee City Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish

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Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Dundee City Council and Angus Council have each developed and operate emergency flood plans, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the emergency plan is to set out arrangements to deal effectively with flood risk.

In response to weather warnings received from SEPA, Dundee City Council and Angus Council will conduct assessments at known flooding hotspots and prepare resources as required. Dundee City Council and Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

Angus Council has developed and operate an emergency flood plan for Monifieth, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Angus Council will conduct assessments at known hotspots and prepare resources as required. Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection study; maintain flood protection scheme; new flood warning; flood forecasting; awareness raising; self help; surface water plan/study maintenance; planning policies.

Coordination:

Angus Council and Dundee City Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Dundee City Council and Angus Council funding for emergency plans/response will be shared with

other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Monifieth (Potentially Vulnerable Area 07/10)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council and Dundee City Council are each local planning authorities and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore Angus Council and Dundee City Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk i.e. Local Development Plans.

Angus Council and Dundee City Council adopt proactive strategies to mitigate and adapt to climate change,

taking full account of flood risk. Angus Council and Dundee City Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study maintenance; emergency plans/response.

Coordination:

SEPA, Angus Council and Dundee City Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of

other responsible authorities as required

Funding:

SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council and Dundee City Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

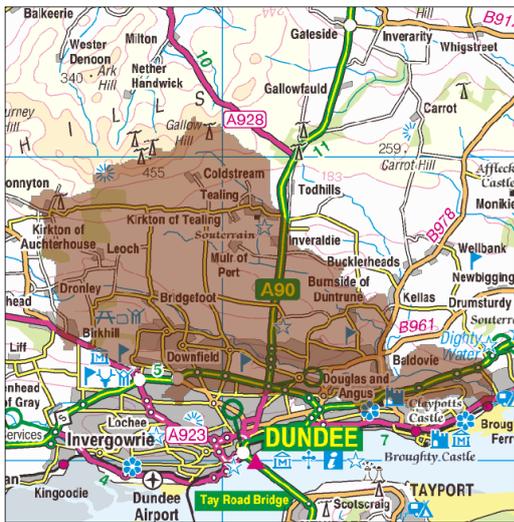
Downfield and Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council, Dundee City Council	Dighty Water

Background

This Potentially Vulnerable Area is 73km² and part of the Firth of Tay catchment (shown below). It is situated in the lower reaches of the Dighty Water and includes the city of Dundee.

There are approximately 190 residential properties and 80 non-residential properties at risk of flooding. The Annual Average Damages are approximately £580,000.



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Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

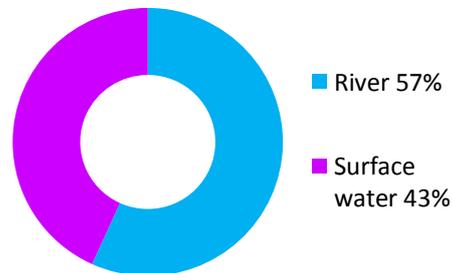


Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Dundee from the Dighty Water. Dundee is also notably impacted by surface water flooding.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. Within this Potentially Vulnerable Area there are two assets identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Dundee and Downfield (Potentially Vulnerable Area 07/11)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_11_Full.pdf

Objectives to manage flooding in Downfield & Dundee/Monifieth & Sidlaws

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. The following objectives have been set for Downfield and Dundee Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties and risk to people in Dundee caused by flooding from the Dighty Water and Fithie Burn (objective ID 7027, 7028)
- Reduce economic damages and number of residential properties at risk of surface water flooding in Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth where practical (objective ID 7021)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Downfield & Dundee/Monifieth & Sidlaws

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. The actions shaded have been selected as the most appropriate for Downfield and Dundee 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

The delivery of selected actions by year over the six-year plan cycle is summarised below

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Flood forecasting					
Community flood action groups					
Awareness raising					
Self help					
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS - Scottish Water)					
Maintenance					
Emergency plans/response					
Planning Policies					

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Details of actions to manage flooding in Downfield & Dundee/Monifieth & Sidlaws

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Downfield & Dundee PVA are shown below. Actions related to (shaded only) the selected action are also shown to demonstrate the requirements for coordination. The timetable for the

delivery of the selected action is also shown overleaf.

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Flood protection study – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Angus Council and Dundee City Council will undertake a flood protection study of the Downfield and Dundee to be delivered by financial year 2019/20. This will assess whether flood defences, sediment management and natural flood management could reduce flood risk. Natural flood management options that will be considered include river / floodplain restoration and sediment management. The study will also investigate the viability of property level protection. The study will take a sustainable approach and consider the interaction between actions upstream and downstream and potential effects on coastal processes along the shoreline. The study requirements will be coordinated with the surface water management plan/study and integrated catchment study for this area.

The study has the potential to benefit 534 residential properties and 138 non-residential properties at risk of

flooding in this location, with potential damages avoided of up to £5.8 million. The study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. The study could also benefit three utilities and two roads located within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the Dighty Water, Fithie Burn and Dronley Burn (water body IDs 6001, 6004 and 6007), which are located within the study area and the physical condition of these rivers are identified

by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. The study will consider conservation areas, listed buildings and local nature reserves present in the area, which could be positively or negatively impacted.

Related Actions (as shaded above):

Strategic mapping and modelling; community flood action groups; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Angus Council and Dundee City Council, coordinate the study with Scottish Water, Marine Scotland, The Crown Estate, SEPA and Landowners, etc.

Angus Council and Dundee City Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Arbroath to Dundee area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability.

Wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019. Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk.

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009 by 2019/20.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress.

Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection study; flood forecasting; community flood action groups; surface water plan/study; emergency plans/response; planning policies.

Coordination:

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD)

partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's

grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers

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Flood forecasting – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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 business. For more information please visit SEPA's website.

Related Actions (as shaded above):

Strategic mapping & modelling; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Community flood action groups – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Community flood action groups					

Description:

Dundee City Council and Angus Council will work with existing flood action groups to set out arrangements to reduce flood risk, improve preparedness and increase resilience against flooding. Dundee City Council and Angus Council are engaging with Dighty Flood Action Group and Strathmartine Community Council Flood Group respectively. Angus Council and Dundee City Council will co-ordinate these works with each other, Scottish Water and emergency services when required. Completion of the Integrated Catchment Study may identify further collaboration opportunities

Related Actions (as shaded above):

Flood protection study; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Dundee City Council and Angus Council will coordinate community flood action groups with related actions (shaded only in table above).

Dundee City Council and Angus Council will continue to co-ordinate with existing community flood action groups throughout the next 6 years on a priority needs basis where resources allow.

Funding:

Dundee City Council and Angus Council funding for community flood action groups will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Awareness raising – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Angus Council and Dundee City Council each have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Angus Council and Dundee City Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Dundee City Council will work with communities through LCCP's to raise awareness and promote self help (i.e. flood warning and property level protection). Dundee City Council will also review the Flood Emergency Plan annually and work with any community flood action groups. Angus Council will also develop emergency plans/response and work with any community flood action groups. Angus Council and Dundee City Council will use the delivery of the flood protection study for the Dighty Water to address flood risk and undertake surface water management plan/study by 2019/20

working with SEPA and Scottish Water as opportunities to raise awareness.

Angus Council and Dundee City Council will also disseminate more general information to raise awareness via social media streams relating to flooding, i.e. road closures, transport disruptions and weather forecasts. Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; new flood warning; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council, Dundee City Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council, Dundee City Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council and Dundee City Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Angus Council and Dundee City Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; community flood action groups; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Angus Council and Dundee City Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS - Scottish Water)					

Description:

A surface water management plan or plans to cover Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth, which set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives will be prepared. Dundee City Council will co-ordinate the preparation of a surface water management plan in partnership with Angus Council, Scottish Water and SEPA. This will include agreeing the most sustainable actions to manage surface water determined from the Integrated Catchment Study and co-ordinating the implementation of the actions. The Surface Water Management Plan will be developed in 2017 and the actions identified considered for implementation following this as part of the flood risk management planning process.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of

Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in (SWMP Priority Areas). The study has improved knowledge and understanding of surface water flood risk and The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network, e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

The study will support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding, e.g. with the sewer network, watercourses and the sea.

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; community flood action groups; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Angus Council and Dundee City Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Angus Council and Dundee City Council will coordinate surface water plan/study with related actions (shaded only in table above).

Funding:

Angus Council and Dundee City Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

Maintenance – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Angus Council and Dundee City Council have an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council and Dundee City Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Angus Council and Dundee City Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Dundee City Council and Angus Council have each developed and operate emergency flood plans, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the emergency plan is to set out arrangements to deal effectively with flood risk.

In response to weather warnings received from SEPA, Dundee City Council and Angus Council will conduct assessments at known flooding hotspots and prepare resources as required. Dundee City Council and Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.)

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Dundee City Council’s emergency plan is reviewed and updated annually. Angus Council Resilience Team review and update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection study; flood forecasting; community flood action groups; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Angus Council will coordinate emergency plans/response with related actions (shaded only in table above).

Dundee City Council and Angus Council will coordinate emergency plan/response with related actions (shaded only in table above).

Funding:

Dundee City Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to

Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Downfield & Dundee/Monifieth & Sidlaws (Potentially Vulnerable Area 07/11)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Angus Council and Dundee City Council are each local planning authorities and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore Angus Council and Dundee City Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans. Angus Council and Dundee City Council adopt proactive strategies to

mitigate and adapt to climate change, taking full account of flood risk. Angus Council and Dundee City Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study maintenance; emergency plans/response.

Coordination:

SEPA, Angus Council and Dundee City Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required.

Funding:

SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Angus Council and Dundee City Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Invergowrie (Potentially Vulnerable Area 07/12)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Angus Council, Dundee City Council, Perth and Kinross Council	Invergowrie Burn

Background

This Potentially Vulnerable Area is 37km² and part of the Firth of Tay catchment (shown below). It contains the Invergowrie Burn and includes the town of Invergowrie as well as the west of Dundee City.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

The area has a risk of river and surface water flooding with the majority of damages caused by surface water flooding.

There are approximately 240 residential properties and 60 non-residential properties at risk of flooding. The Annual Average Damages are approximately £740,000.

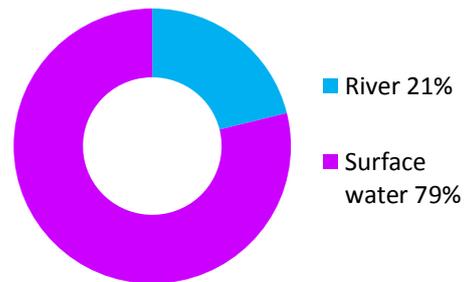


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The greatest risk of flooding in this area is from surface water to Invergowrie. There is also notable risk of river flooding in Invergowrie and Dundee from the Invergowrie Burn.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads, notably the A90.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Invergowrie (Potentially Vulnerable Area 07/12)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_12_Full.pdf

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Objectives to manage flooding in Invergowrie

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. The following objectives have been set for Invergowrie Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in Invergowrie and Dundee caused by flooding from the Invergowrie Burn (objective ID 7031)

- Reduce economic damages and number of residential properties at risk of surface water flooding in Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth where practical (objective ID 7021)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Invergowrie

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. The actions shaded have been selected as the most appropriate for Invergowrie 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

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Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural flood management study					
Strategic mapping and modelling (Scottish Water)					
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Invergowrie

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Invergowrie PVA are shown below. Actions related to (shaded only) the

selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

Natural flood management study – Invergowrie (Potentially Vulnerable Area 07/12)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural flood management study					

Description:

Dundee City Council, Perth & Kinross Council and Angus Council will undertake a natural flood management study to assess whether river / floodplain restoration and sediment management could help reduce flood risk. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream economically, socially and environmentally.

Opportunities to improve the condition of the Invergowrie Burn (water body ID 6405), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. Listed buildings are also present in the study area, which could be positively or negatively impacted, will also be considered.

Natural flood management actions can reduce flood risk for high likelihood events to fifty-two residential and non-residential properties. These actions can restore and enhance natural

environments and create opportunities for recreation and tourism. A reduction in flood risk would also have a positive benefit to the health and wellbeing of the community.

Related Actions (as shaded above):

Strategic mapping and modelling; flood forecasting; awareness raising; self help; surface water plan/study maintenance; emergency plans/response; planning policies.

Coordination:

Dundee City Council, Perth & Kinross Council and Angus Council will coordinate the natural flood management study through the Local Planning District (LPD) partnership and or separate agreements.

Dundee City Council, Perth & Kinross Council and Angus Council will coordinate the natural flood management study with related actions (shaded only in table above).

Funding:

Dundee City Council, Perth & Kinross Council and Angus Council funding for natural flood management studies will be shared with other organisations as

appropriate, and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – Invergowrie (Potentially Vulnerable Area 07/12)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					

Description:

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009 by 2019/20.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress.

Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform

surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood forecasting; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

Flood forecasting – Invergowrie (Potentially Vulnerable Area 07/12)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Natural flood management study; strategic mapping & modelling; awareness raising; self help; Surface water plan/study; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA’s flood forecasting service is funded through Scottish Government’s grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Invergowrie (Potentially Vulnerable Area 07/12)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community through local participation in national initiatives, including partnership working with Neighbourhood Watch Scotland. In addition, SEPA will engage with local authorities and community resilience groups where possible. Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Dundee City Council, Perth & Kinross and Angus Council each have an existing and ongoing duty to raise

public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Dundee City Council, Perth & Kinross and Angus Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Angus Council will work with local communities to raise awareness. Dundee City Council will work with communities through LCCP's to raise awareness and promote self help (i.e. flood warning and property level protection). Dundee City Council will also review the Flood Emergency Plan annually and work with any community flood action groups. Angus Council will also develop emergency plans/response and work with any community flood action groups. Dundee City Council, Perth & Kinross and Angus Council will use the delivery of the natural flood management study for Invergowrie to address flood risk and undertake surface water management plan/study by 2019/20 working with SEPA and Scottish Water as opportunities to raise awareness.

Dundee City Council, Perth & Kinross and Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Natural flood management study; self help; Surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Angus Council, Dundee City Council, Perth & Kinross Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Angus Council, Dundee City Council, Perth & Kinross Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Dundee City Council, Perth & Kinross and Angus Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Invergowrie (Potentially Vulnerable Area 07/12)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Dundee City Council, Perth & Kinross Council and Angus Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Dundee City Council, Perth & Kinross Council and Angus Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Surface water plan/study – Invergowrie (Potentially Vulnerable Area 07/12)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study (Angus Council)					
Surface water plan/study (ICS - Scottish Water)					

Description:

A surface water management plan or plans to cover Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth, which set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives will be prepared. Dundee City Council will co-ordinate the preparation of a surface water management plan in partnership with Perth & Kinross Council, Angus Council, Scottish Water and SEPA. This will include agreeing the most sustainable actions to manage surface water determined from the Integrated Catchment Study and co-ordinating the implementation of the actions. The Surface Water Management Plan will be developed in 2017 and the actions identified considered for implementation following this as part of the flood risk management planning process.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in

Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth. The study has improved knowledge and understanding of surface water flood risk and The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

The study will support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding, e.g. with the sewer network, watercourses and the sea.

Related Actions (as shaded above):

Natural flood management study; Strategic mapping and modelling; awareness raising; self help; surface

water plan/study; maintenance;
emergency plans/response.

Coordination:

Dundee City Council, Perth & Kinross Council and Angus Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Dundee City Council, Perth & Kinross Council and Angus Council will coordinate surface water plan/study with related actions (shaded only in table above).

Funding:

Dundee City Council, Perth & Kinross Council and Angus Council funding for surface water management will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

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Maintenance – Invergowrie (Potentially Vulnerable Area 07/12)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Dundee City Council, Perth & Kinross Council and Angus Council have an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Dundee City Council, Perth & Kinross Council and Angus Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Dundee City Council, Perth & Kinross Council and Angus Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Natural flood management study; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Dundee City Council, Perth & Kinross and Angus Council, and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Dundee City Council, Perth & Kinross Council and Angus Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our

economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Invergowrie (Potentially Vulnerable Area 07/12)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Dundee City Council, Perth & Kinross Council and Angus Council have each developed and operate emergency flood plans, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the emergency plan is to set out arrangements to deal effectively with flood risk.

In response to weather warnings received from SEPA, Dundee City Council, Perth & Kinross Council and Angus Council will conduct assessments at known flooding hotspots and prepare resources as required. Dundee City Council, Perth & Kinross Council and Angus Council will also co-ordinate measures in conjunction with partner agencies

(emergency services, SEPA, Scottish Water, etc.).

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; surface water plan/study; maintenance; planning policies.

Coordination:

Dundee City Council, Perth & Kinross Council and Angus Council will coordinate emergency plan/response with related actions (shaded only in table above).

Funding:

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Dundee City Council’s emergency plan is reviewed and updated annually. Perth & Kinross Council’s review and update their emergency plan biennially. Angus Council Resilience Team review and

update the Emergency Plan biennially and can be found via the Angus Council website, search “emergency plan”.

Dundee City Council, Perth & Kinross Council and Angus Council I will coordinate emergency plan/response with related actions (shaded only in table above).

Dundee City Council, Perth & Kinross Council and Angus Council funding for emergency plans/response will be shared with other organisations,

emergency services and responders, as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA’s grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Invergowrie (Potentially Vulnerable Area 07/12)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Dundee City Council, Perth & Kinross Council and Angus Council are local planning authorities and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore Dundee City Council, Perth & Kinross Council and Angus Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans.

Dundee City Council, Perth & Kinross Council and Angus Council adopt proactive strategies to mitigate and adapt to climate change, taking full account of flood risk. Dundee City Council, Perth & Kinross Council and Angus Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; Emergency plans/response.

Coordination:

SEPA, Dundee City Council, Perth & Kinross Council and Angus Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of

other responsible authorities as required

Funding:

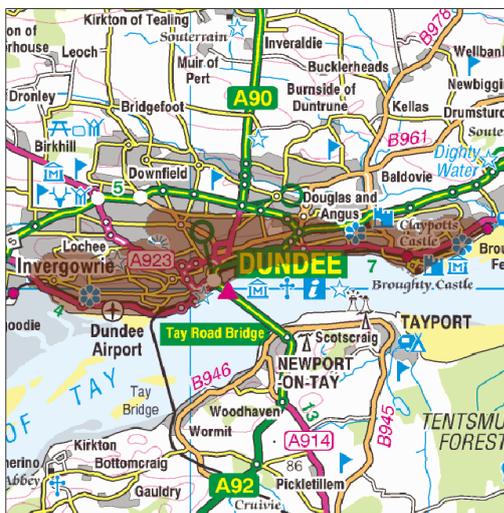
SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Dundee City Council, Perth & Kinross Council and Angus Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Dundee City Council	Dundee coastal

Background

This Potentially Vulnerable Area is 21km² (shown below). It contains small coastal watercourses that flow into the Firth of Tay and includes Dundee and Broughty Ferry.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

The area has a risk of coastal and surface water flooding with the majority of damages caused by coastal flooding.

There are approximately 1,300 residential properties and 460 non-residential properties at risk of flooding. The Annual Average Damages are approximately £4.3 million.

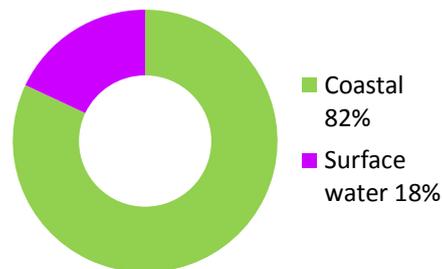


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Dundee and Broughty Ferry from coastal and surface water flooding.

For this Potentially Vulnerable Area the highest damages are to roads and non-residential properties followed by damages to residential properties. Other parts of the transport network (Dundee airport and railway routes) are also notably impacted. Within this Potentially Vulnerable Area there are 12 assets identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_13_Full.pdf

Objectives to manage flooding in Dundee and Broughty Ferry

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. The following objectives have been set for Dundee and Broughty Ferry Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in Dundee caused by coastal flooding (objective ID 7034)
- Reduce economic damages to residential and non-residential properties and risk to people in

Broughty Ferry caused by coastal flooding (objective ID 7035, 7036)

- Reduce economic damages and number of residential properties at risk of surface water flooding in Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth where practical (objective ID 7021)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Dundee and Broughty Ferry

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. The actions

shaded have been selected as the most appropriate for Dundee and Broughty Ferry 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

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Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
	Flood protection scheme (Broughty Ferry)				
Flood protection scheme (Dundee)					
	Maintain flood protection scheme (Dundee)		Maintain flood protection scheme (Dundee & Broughty Ferry)		
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Maintain flood warning					
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study (Dundee City and Angus Council)					
Surface water plan/study (ICS – Scottish water)					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Dundee and Broughty Ferry

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Dundee and Broughty Ferry PVA are shown below. Actions related to (shaded only) the selected action are

also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

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Flood protection scheme/works – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
	Flood protection scheme (Broughty Ferry)				
Flood protection scheme (Dundee)					

Description:

Dundee City Council will prepare a flood protection scheme for Broughty Ferry to protect properties at risk of coastal flooding from a 1 in 200 year event. The scheme is due to be delivered by 2018/19 at an estimated cost of £10million. The scheme includes improvement of the existing coastal defences from Grassy Beach to the Esplanade and is estimated to remove the risk of coastal flooding for 450 properties.

A reduction in flood risk will have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the flood protection scheme area. There may be negative impacts through disturbance to the local community during the construction phase.

The flood protection scheme may have both positive and negative impacts on the ecological quality of the

environment depending on how they are designed. Dundee City Council will seek to ensure that the works will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Area of Conservation and Special Protection Area. In addition, a number of nationally and locally designated sites are also present in the study area and could be positively or negatively impacted. These include conservation areas, scheduled monuments, listed buildings and designated bathing waters.

Dundee City Council will address the environmental implications of the Broughty Ferry scheme and any measures which may be required to address these. Dundee City Council will co-ordinate the implementation of this scheme with the relevant statutory bodies.

Dundee City Council will prepare a flood protection scheme for Dundee City to protect properties at risk of

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coastal flooding from a 1 in 200 year event. The scheme is due to be delivered in 2016/17 at an estimated cost of £6million. The scheme includes improvement of the existing coastal defences from City Quay to Riverside Airport and is estimated to remove the risk of coastal flooding for 200 properties and also the Waterfront Development currently under construction.

A reduction in flood risk will have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the flood protection scheme area. In addition there are two emergency services and one railway station which have been identified as potentially benefitting from this action. There may be negative impacts through disturbance to the local community during the construction phase.

The flood protection scheme may have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Dundee City Council will seek to ensure that the works will not have an adverse effect on the integrity of the Firth of Tay and Eden Estuary Special Area of Conservation and Special Protection Area. In addition, a number of nationally and locally designated sites are also present in the study area and could be positively or negatively impacted. These include

listed buildings, local nature reserves and Sites of Special Scientific Interest.

Related Actions (as shaded above):

Maintain flood protection scheme; strategic mapping and modelling; maintain flood warning; flood forecasting; awareness raising; surface water plan/study; emergency plans/response.

Coordination:

Dundee City Council will co-ordinate the implementation of the Dundee scheme with the relevant statutory bodies.

Dundee City Council will coordinate both flood protection schemes with Scottish Water due to Hatton Rising Main and other assets.

Dundee City Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Dundee City Council will coordinate these works with related actions (shaded only in table above).

Funding:

Funding for the Flood Protection Schemes will be subject to 80% grant funding by Scottish Government with the remainder from Dundee City Council capital budgets.

Maintain flood protection scheme – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
	Maintain flood protection scheme (Dundee)	Maintain flood protection scheme (Dundee & Broughty Ferry)			

Description:

The new Flood Protection Schemes for Dundee and Broughty Ferry, due for completion in 2016/17 and 2018/19 respectively will provide a higher level of protection from coastal flooding. Details of the scheme are shown above in section 'Flood Protection Scheme/Works'.

Dundee City Council will maintain the existing Flood Protection Schemes ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Dundee City Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct coastal inspections annually.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood warning; flood forecasting; awareness raising; surface water plan/study; emergency plans/response.

Coordination:

Flood protection schemes are proposed for Dundee and Broughty Ferry. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection schemes are fully considered in the existing flood warning system

Funding:

Dundee City Council funding for maintain flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Strategic mapping and modelling – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the Arbroath to Dundee area to improve understanding of coastal flood risk. The extent and timing of improvements will depend on detailed scoping and data availability. A detailed local authority led study has already been undertaken in this area and SEPA will work collaboratively to ensure consistent modelling approaches are applied.

Strategic mapping improvements in this area are dependent on the implementation of local authority led flood protection schemes (Dundee and Broughty Ferry). Timescales are therefore indicative only and it is estimated that these improvements will be carried out in 2018 to 2019 subject to positive assessment.

However, wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the

intention of updating the strategic coastal maps in 2016 to 2019.

Scottish Water will review the assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk by 2019/20.

Scottish Water will undertake further investigation and modelling in the Hatton sewer catchment to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress.

Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform

surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood warning; flood forecasting; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Coastal flood protection schemes are planned for the Dundee and Broughty Ferry coastline. SEPA will work with the local authority to ensure that strategic mapping and modelling developments reflect the changes in flood risk resulting from the new flood

protection schemes where appropriate and relevant.

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Maintain flood warning – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Broughty Ferry, Dundee Central and Riverside West flood warning areas which are part of the Firth of Forth and Tay coastal flood warning scheme.

When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme flood

forecasting; awareness raising; self help; emergency plans/response.

Coordination:

Flood protection schemes are proposed for Dundee and Broughty Ferry. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection schemes are fully considered in the existing flood warning system.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.

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Flood forecasting – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Flood protection scheme/works; strategic mapping & modelling; maintain flood warning; awareness raising; self help; surface water

plan/study; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through community safety partnership events.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

For the new flood protection scheme, SEPA will support the local authority's communications and engagement activities with media activity, local public awareness events and

education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.

Dundee City Council has an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Dundee City Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Dundee City Council will work with communities through LCCP's to raise awareness and promote self help (i.e. flood warning and property level protection). Dundee City Council will also review the Flood Emergency Plan annually and work with any community flood action groups. Dundee City Council will use the delivery of the flood protection schemes for Dundee and Broughty Ferry to address flood risk. Dundee City Council will undertake surface water management plan/study by 2019/20 working with

SEPA and Scottish Water as opportunities to raise awareness.

Dundee City Council and Angus Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts. Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection scheme/works; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Flood protection schemes are proposed for Dundee and Broughty Ferry. SEPA will support the local

authority's communications and engagement activities.

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Dundee City Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Dundee City Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Dundee City Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure

Self help – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Dundee City Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Maintain flood warning; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Dundee City Council’s activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study (Dundee City and Angus Council)					
Surface water plan/study (ICS - Scottish Water)					

Description:

A surface water management plan or plans to cover Dundee, Broughty Ferry, Invergowrie, Lochee and Monifieth, which set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives will be prepared. Dundee City Council will co-ordinate the preparation of a surface water management plan in partnership with Angus Council, Scottish Water and SEPA. This will include agreeing the most sustainable actions to manage surface water determined from the Integrated Catchment Study and co-ordinating the implementation of the actions. The Surface Water Management Plan will be developed in 2017 and the actions identified considered for implementation following this as part of the flood risk management planning process.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of

Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best available knowledge and data is used to input into the surface water management plans.

An integrated catchment study covering the Hatton DOA catchment was carried out in SR10 (2010-2015) to support the surface water management planning process in (SWMP Priority Areas). The study has improved knowledge and understanding of surface water flood risk and The study has improved knowledge and understanding of surface water flood risk and interactions between the above ground and below ground drainage network, e.g. with the sewer network, watercourses and (where applicable) the sea. The Optioneering phase of this study, to establish the preferred solution(s) to the significant flooding issues, will be carried out in SR15 (2015-2021).

The study will support the surface water management plan process and improve knowledge and understanding of surface water flood risk and interactions with other sources of flooding, e.g. with the sewer network, watercourses and the sea.

Related Actions (as shaded above):

Strategic mapping and modelling; maintain flood warning; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Dundee City Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Dundee City Council will coordinate surface water plan/study with related actions (shaded only in table above).

Funding:

Dundee City Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

The integrated catchment study covering the Hatton DOA catchment is being funded by Scottish Water in partnership with Angus Council, Dundee City Council and Perth & Kinross Council.

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Maintenance – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Dundee City Council have an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Dundee City Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Dundee City Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. The schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Dundee City Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Dundee City Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Dundee City Council has developed and operates an emergency flood plan, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the emergency plan is to set out arrangements to deal effectively with flood risk.

In response to weather warnings received from SEPA, Dundee City Council and Angus Council will conduct assessments at known flooding hotspots and prepare resources as required. Dundee City Council and Angus Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Dundee City Council’s emergency plan is reviewed and updated annually.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection scheme/works; maintain flood protection scheme; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Dundee City Council will coordinate emergency plan/response with related actions (shaded only in table above).

Funding:

Dundee City Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Dundee and Broughty Ferry (Potentially Vulnerable Area 07/13)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
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Planning policies

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Dundee City Council is local planning authorities and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TayPlan Strategic Development Planning Authority (SDPA). Furthermore Dundee City Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. Local Development Plans.

Dundee City Council adopt proactive strategies to mitigate and adapt to

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climate change, taking full account of flood risk. Dundee City Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Dundee City Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Dundee City Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Tayport and Newburgh (Potentially Vulnerable Area 07/14)

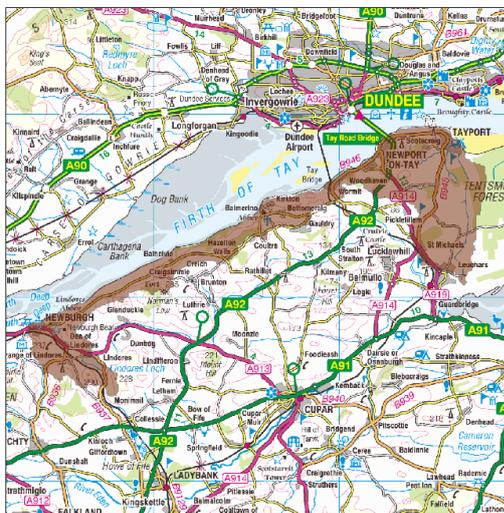
Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Fife Council	North Fife coastal

Background

This Potentially Vulnerable Area is 65km². It contains small coastal watercourses that flow into the Firth of Tay and includes the towns of Newburgh, Leuchars, Newport-on-Tay and Tayport.

The area has a risk of river, coastal and surface water flooding with the majority of damages caused by coastal flooding.

There are approximately 140 residential properties and 30 non-residential properties at risk of flooding. The Annual Average Damages from flooding are approximately £540,000.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

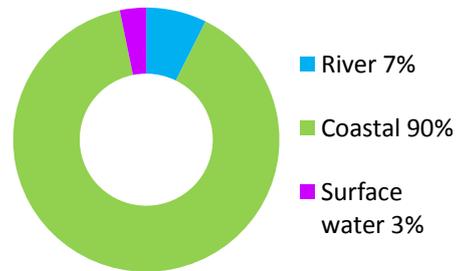


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015)

Summary of flooding impacts

The highest risk of flooding is in Newburgh from river and coastal flooding and in Tayport from coastal flooding.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. Two railway routes are also notably impacted. Within this Potentially Vulnerable Area there are six assets identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Tayport and Newburgh (Potentially Vulnerable Area 07/14)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_14_Full.pdf

Objectives to manage flooding in Tayport and Newburgh

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. The following objectives have been set for Tayport and Newburgh Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in Newburgh caused by coastal flooding (objective ID 7037)

- Reduce economic damages to residential and non-residential properties in Tayport caused by coastal flooding (objective ID 7038)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf

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Actions to manage flooding in Tayport and Newburgh

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. The actions shaded have been selected as the most appropriate for Tayport and Newburgh 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

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Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Maintain flood warning					
Flood forecasting					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Tayport and Newburgh

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Tayport and Newburgh PVA are shown below. Actions related to (shaded only)

the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

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Flood protection study – Tayport and Newburgh (Potentially Vulnerable Area 07/14)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

A flood protection study has been progressed for Tayport to assess whether flood defences and natural flood management could reduce flood risk. The Tayport Coastal Study was completed in December 2015. Fife Council will assess the outcomes and a further study will be completed from 2016-2018. This will be in line with Fife Shoreline Management Plan.

Further consultation with Planning service on progression of outcomes highlighted within the Study completed in Dec 2015.

A further flood protection study recommended for Newburgh will assess whether flood defences and natural flood management could reduce flood risk. Natural flood management options will be considered, including wave attenuation. The study will also investigate the viability of property level protection. The study will take a sustainable approach and consider the interaction between actions and potential effects on coastal processes along the shoreline. This will be in line with Fife Shoreline Management Plan.

The study has the potential to benefit 117 residential properties and 12 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £12 million. The study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. The study could also benefit three utilities within the study area.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to enhance and restore the environment will be considered by coordinating with river basin management planning. The proposed actions will not have an adverse effect on the integrity of the nationally and locally designated sites in the study area (Firth of Tay and Eden Estuary Special Area of Conservation and Special Protection Area), which could be positively or negatively impacted.

These include conservation areas, Sites of Special Scientific Interest and Ramsar sites.

Related Actions (as shaded above):

Strategic mapping and modelling; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the study with Scottish Water, Marine Scotland,

The Crown Estate, SEPA and Landowners, etc.

Fife Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – Tayport and Newburgh (Potentially Vulnerable Area 07/14)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

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 St Andrews 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.

Strategic mapping improvements in this area are dependent on the implementation of local authority led flood protection study (Tayport). Timescales are therefore indicative only and it is estimated that these improvements will be carried out in 2018 to 2019 subject to positive assessment.

However, wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019. Surface water mapping improvements expected to be undertaken 2016-2017.

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.

Scottish Water will undertake further investigation and modelling in the Guardbridge (2016-2020), Newport

Wormit (2016-2019) and Newburgh (2016-2019) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009. Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection study; maintain flood warning; flood forecasting; emergency plans/response; planning policies.

Coordination:

A flood protection study is proposed for Tayport. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in SEPA's strategic mapping and modelling developments where appropriate and relevant.

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

Maintain flood warning – Tayport and Newburgh (Potentially Vulnerable Area 07/14)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Newburgh, Newport on Tay and Tayport flood warning areas which are part of the Firth of Forth and Tay coastal flood warning scheme.

When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Flood protection scheme/works; flood forecasting; awareness raising; self help emergency plans/response.

Coordination:

Flood protection studies are proposed for Newburgh and Tayport. SEPA will work with the local authority to ensure that any new information about flood risk resulting from the proposed flood protection studies is considered in the existing flood warning system.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.

Flood forecasting – Tayport and Newburgh (Potentially Vulnerable Area 07/14)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

Dundee City Council and Angus Council will work with existing flood action groups to set out arrangements to reduce flood risk, improve preparedness and increase resilience against flooding. Dundee City Council and Angus Council are engaging with Dighty Flood Action Group and Strathmartine Community Council Flood Group respectively. Angus Council and Dundee City Council will co-ordinate these works with each other, Scottish Water and emergency services when required. Completion of the Integrated Catchment Study may identify further collaboration opportunities

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; maintain flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Tayport and Newburgh (Potentially Vulnerable Area 07/14)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will engage with the community and promote Floodline. This will be achieved through property level protection events delivered by the Scottish Flood Forum, SEPA led education events and promoting community resilience groups where possible with Fife Council.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Fife Council have an existing and ongoing duty to raise public awareness

of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Fife Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the flood warning system. We will work with community flood action groups to develop emergency plans/response. We will build and develop the outcomes detailed in the Shoreline Management Plan (2011). We will maintain bodies of water as required within the council's schedule of clearance and repair. Sharing good practice, providing information on property level protection and developing and reviewing emergency plans.

Fife Council will work with local communities to raise awareness. Fife Council will also develop emergency plans/response and work with any community flood action groups. Fife Council will use the delivery of a flood protection study to address flood risk

by 2019/20 as an opportunity to raise awareness.

Fife Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; maintain flood warning; flood forecasting; self help; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Fife Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Fife Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Tayport and Newburgh (Potentially Vulnerable Area 07/14)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Fife Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; awareness raising; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Fife Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintenance – Tayport and Newburgh (Potentially Vulnerable Area 07/14)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Fife Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Fife Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Fife Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection study; awareness raising; self help; emergency plans/response; planning policies.

Coordination:

Fife Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022 Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Emergency plans/response – Tayport and Newburgh (Potentially Vulnerable Area 07/14)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Fife Council has developed and operates an emergency flood plan for Tayport and Newburgh, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Fife Council will conduct assessments at known hotspots and prepare resources as required. Fife Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Fife Council Resilience Team review and update the Emergency Plan biennially and can be found via the Fife Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection study; flood forecasting; awareness raising; self help; maintenance; planning policies.

Coordination:

Fife Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Fife Council and Angus Council funding for emergency plans/response

will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. SEPA's emergency plans/response are funded by Scottish

Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Tayport and Newburgh (Potentially Vulnerable Area 07/14)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Fife Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TAYplan and SESplan strategic development plans. Furthermore, Fife Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. FIFEplan, Fife Local Development Plan.

Fife Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of

flood risk. Fife Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Flood protection study; flood forecasting; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA and Fife Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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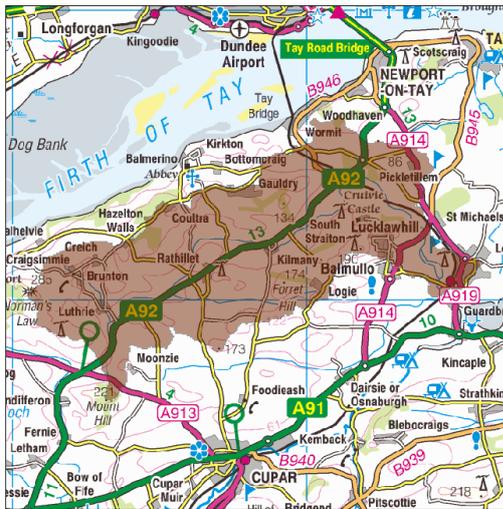
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Lucklawhill (Potentially Vulnerable Area 07/15)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Fife Council	North Fife coastal

Background

This Potentially Vulnerable Area is 63km² and part of the Firth of Tay catchment group. It contains the Motray Water and includes the towns of Leuchars and Lucklawhill.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

The main sources of flooding are from river and surface water, with the majority of damages caused by river flooding.

There are approximately 20 residential properties and 10 non-residential properties at risk of flooding. The Annual Average Damages from flooding are approximately £130,000.

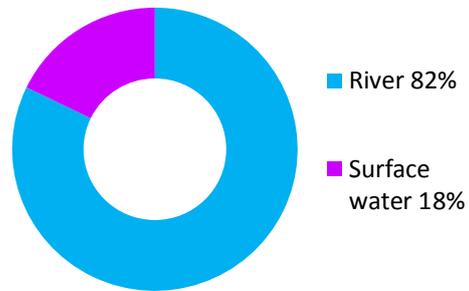


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

Work carried out since the National Flood Risk Assessment in 2011 has concluded that the risk of flooding in this Potentially Vulnerable Area is now relatively low. The designation of this Potentially Vulnerable Area will be reviewed in the next flood risk management planning cycle.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties. Within this Potentially Vulnerable Area there is

one asset identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Lucklawhill (Potentially Vulnerable Area 07/15)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_15_Full.pdf

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Objectives to manage flooding in Lucklawhill

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. The following objectives have been set for Lucklawhill Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Lucklawhill

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. The actions shaded have been selected as the most appropriate for Lucklawhill 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
Flood forecasting					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Lucklawhill

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Lucklawhill PVA are shown overleaf. Actions related to (shaded only) the selected action are also shown to

demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown.

Strategic mapping and modelling – Lucklawhill (Potentially Vulnerable Area 07/15)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the St Andrews 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.

Wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019.

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.

Scottish Water will undertake further investigation and modelling in the Guardbridge (2016-2020), Newport Wormit (2016-2019) and Newburgh

(2016-2019) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood forecasting; emergency plans/response; planning policies.

Coordination:

SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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Flood forecasting – Lucklawhill (Potentially Vulnerable Area 07/15)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Strategic mapping & modelling; awareness raising; self help;

maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements

Funding:

SEPA’s flood forecasting service is funded through Scottish Government’s grant in aid allocation. The Met Office receives funding from the UK Government.

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Awareness raising – Lucklawhill (Potentially Vulnerable Area 07/15)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with Fife Council and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

Fife Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009.

Over the six-year planning cycle, Fife Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Fife Council will work with local communities to raise awareness. We will work with community flood action groups to develop emergency plans/response. We will build and develop the outcomes detailed in the Shoreline Management Plan (2011). We will maintain bodies of water as required within the council's schedule of clearance and repair. Sharing good practice, providing information on property level protection and developing and reviewing emergency plans.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Fife Council will also develop emergency plans/response and work with any community flood action groups. Fife Council will use the delivery of a flood protection study to address flood risk by 2019/20 as an opportunity to raise awareness.

Fife Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Self help; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Fife Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Fife Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Lucklawhill (Potentially Vulnerable Area 07/15)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Fife Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Awareness raising; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with 'awareness raising', 'community flood action groups' and 'emergency plans/response' actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Fife Council activities to assist, support and educate those to self help will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – Lucklawhill (Potentially Vulnerable Area 07/15)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Fife Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Fife Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Fife Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Awareness raising; self help; emergency plans/response; planning policies.

Coordination:

Fife Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022 Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Lucklawhill (Potentially Vulnerable Area 07/15)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Fife Council has developed and operates an emergency flood plan for Tayport and Newburgh, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Fife Council will conduct assessments at known hotspots and prepare resources as required. Fife Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Fife Council Resilience Team review and update the Emergency Plan biennially and can be found via the Fife Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; maintenance; planning policies.

Coordination:

Fife Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Fife Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Lucklawhill (Potentially Vulnerable Area 07/15)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Fife Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TAYplan and SESplan strategic development plans. Furthermore, Fife Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. FIFEplan, Fife Local Development Plan.

Fife Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of

flood risk. Fife Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Flood forecasting; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA and Fife Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

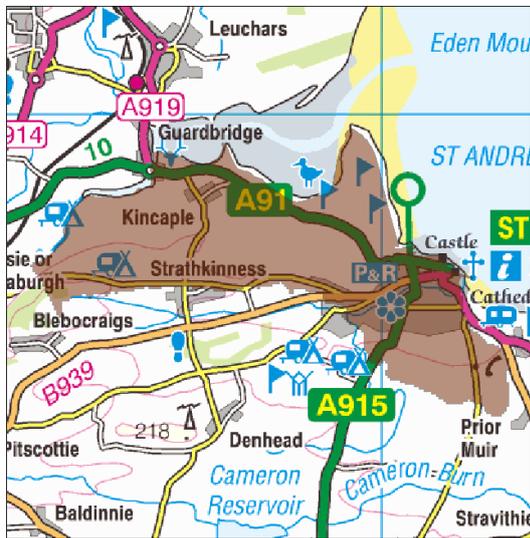
Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Fife Council	North Fife coastal

Background

This Potentially Vulnerable Area is 23km² (shown below). It is situated on the south side of the River Eden and the Eden Estuary and also contains the lower reaches of the Kinness Burn. It includes the urban areas of Guardbridge and St Andrews.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

This Potentially Vulnerable Area has a risk of river, coastal and surface water flooding with the majority of damages caused by coastal flooding.

There are approximately 80 residential properties and 40 non-residential properties at risk of flooding. The Annual Average Damages are approximately £670,000.

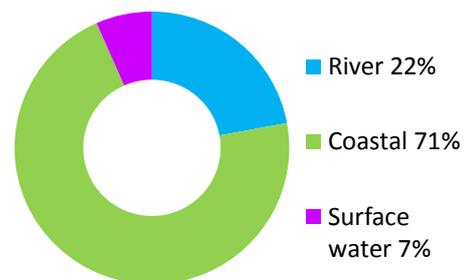


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in St Andrews from the Kinness Burn and surface water flooding. Roads are notably impacted with A91 road showing the highest damages.

For this Potentially Vulnerable Area the highest damages are to roads, residential properties and non-residential properties. Within this Potentially Vulnerable Area there are two assets identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_16_Full.pdf

Objectives to manage flooding in St Andrews to Guardbridge

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. The following objectives have been set for St Andrews to Guardbridge Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in St Andrews caused by flooding from the Kinness Burn (objective ID 7046)

- Reduce economic damages and number of residential properties at risk from surface water flooding in St Andrews where practical (objective ID 7040)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf

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Actions to manage flooding in St Andrews to Guardbridge

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. The actions

shaded have been selected as the most appropriate for St Andrews to Guardbridge 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection scheme/works					
Flood protection study					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
			New flood warning		
Maintain flood warning					
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study					
Maintenance					
Emergency plans/response					
Planning Policies					

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Andrews to Guardbridge

Details of actions to manage flooding in St Andrews to Guardbridge

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the St Andrews to Guardbridge PVA are shown below. Actions related to

(shaded only) the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

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Flood protection scheme/works – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
		Flood protection scheme/works			

Description:

Fife Council will deliver a flood protection scheme for the Kinness Burn in St Andrews. The scheme requires detailed study and design. Part of this proposed flood protection scheme is located in Potentially Vulnerable Area 07/17. The benefits and impacts have been assessed for the whole scheme. Fife Council will prepare a further study, which is required to be completed to update the original. Once completed, this will inform the final scheme.

Scheme design will be prepared 2018-2020 (following a study and option appraisal from 2016-2018). The scheme will be constructed in 2021-2022.

A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. There may be negative impacts through disturbance to the local community during the construction phase.

The flood protection scheme may have both positive and negative impacts on

the ecological quality of the environment depending on how they are designed. Opportunities to improve the condition of the Kinness Burn (water body ID 6107), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management. A number of nationally and locally designated sites are present in the study area and could be positively or negatively impacted, which will be assessed and managed as the scheme is developed and delivered.

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; new flood warning; maintain flood warning; flood forecasting; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate these works through the Local Planning

District (LPD) partnership and or separate agreements.

Fife Council will coordinate these works with related actions (shaded only in table above).

Funding:

Funding for the Flood Protection Schemes will be subject to 80% grant funding by Scottish Government with the remainder from Fife Council capital budgets.

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Flood protection study – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Fife Council will prepare a flood protection study for St Andrews to assess whether a combination of structural actions could reduce flood risk from the Kinness Burn from 2016-2018. The study will look at installation / modification of fluvial control structures, flood defences and natural flood management. Natural flood management options will be considered include runoff control, river / floodplain restoration and sediment management. The study will also investigate the viability of property level protection. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream. It will build on previous studies carried out in 2007 and 2011. Part of this proposed flood protection study is located in Potentially Vulnerable Area 07/17. The benefits and impacts have been assessed for the whole study. The study has the potential to benefit 127 residential properties and 6 non-residential properties at risk of flooding

in this location, with potential damages avoided of up to £6.1 million. The study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. 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 study area. The study could also benefit two utilities within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the Kinness Burn (water body ID 6107), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin

management planning. The study will consider conservation areas, designated bathing waters and listed buildings, which could be positively or negatively impacted.

Related Actions (as shaded above):

Flood protection scheme/works; strategic mapping and modelling; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the study with Scottish Water, Marine Scotland, The Crown Estate, SEPA and Landowners, etc.

Fife Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

Description:

SEPA will seek to develop flood mapping in the St Andrews 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.

Wider coastal mapping and modelling improvements may take place in this area and these will be further refined in 2016 with the intention of updating the strategic coastal maps in 2016 to 2019.

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.

Scottish Water will undertake further investigation and modelling in the Guardbridge (2016-2020) and St

Andrews (2017-2020) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; new flood warning; maintain flood warning; flood forecasting; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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New flood warning – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
			New flood warning		

Description:

The area under consideration includes properties affected by flooding in Fife and Perth and Kinross and is likely to include St Andrews which is affected by flooding from the Kinness Burn. Further feasibility assessment will be required to assess delivery potential and the final detail of communities for which warnings can be provided will be determined during the scoping process.

Hydrometry developments are to begin in spring 2019. The new flood warning service is to be launched in May 2021.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; strategic mapping and modelling; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A flood protection study and scheme are both proposed for the Kinness Burn in St Andrews. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme and new information about flood risk resulting from the proposed flood protection study are fully considered in the new flood warning system.

SEPA will coordinate new flood warning with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, Scottish Government provides grant funding to enable SEPA to implement new flood warning schemes.

Maintain flood warning – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood warning					

Description:

SEPA will continue to maintain the Guardbridge and St Andrews flood warning areas which are part of the Firth of Forth and Tay coastal flood warning scheme.

When flood events occur in an area with an existing flood warning service, SEPA will seek to verify the flood forecasts and warnings. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; strategic mapping and modelling; maintain flood warning; flood forecasting; awareness raising; self help; emergency plans/response.

Coordination:

SEPA will work with the local authority to ensure that any new information about flood risk is considered in the existing flood warning system.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.

Flood forecasting – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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.

Related Actions (as shaded above):

Strategic mapping & modelling; new flood warning; maintain flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with Fife Council and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

For the new flood protection scheme, SEPA will support the local authority's communications and engagement

activities with media activity, local public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.

To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.

Fife Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Fife Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the flood warning system. We will work with community flood action groups to develop emergency plans/response. We will build and develop the outcomes detailed in the Shoreline Management Plan (2011). We will maintain bodies of water as required within the council's schedule of clearance and repair. Sharing good practice, providing information on property level protection and developing and reviewing emergency plans.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Fife Council will also develop emergency plans/response and work with any community flood action groups. Fife Council will use the delivery of a flood protection study to address flood risk by 2018/19 as an opportunity to raise awareness.

Fife Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection scheme/works; flood protections study; new flood warning; maintain flood warning; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A flood protection scheme is proposed for St Andrews. SEPA will support the local authority's communications and engagement activities.

A new flood warning scheme is under consideration for properties affected by flooding in Fife and Perth and Kinross and is likely to include St Andrews. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Fife Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Fife Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of

the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Self help – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Fife Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; awareness raising; maintenance; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Fife Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study					

Description:

Fife Council will prepare Surface Water Management Plans (SWMPs) to cover St Andrews and Guardbridge. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Fife Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best

available knowledge and data is used to input into the surface water management plans.

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; new flood warning; awareness raising; self help; maintenance; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Fife Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Fife Council funding for surface water management will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Fife Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Fife Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Fife Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection study; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Fife Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022 Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Fife Council has developed and operates an emergency flood plan for Tayport and Newburgh, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Fife Council will conduct assessments at known hotspots and prepare resources as required. Fife Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Fife Council Resilience Team review and update the Emergency Plan biennially and can be found via the Fife Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protections scheme/works; flood protection study; new flood warning; maintain flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; planning policies.

Coordination:

Fife Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Fife Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – St Andrews to Guardbridge (Potentially Vulnerable Area 07/16)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Fife Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TAYplan and SESplan strategic development plans. Furthermore, Fife Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. FIFEplan, Fife Local Development Plan.

Fife Council adopts proactive strategies to mitigate and adapt to

climate change, taking full account of flood risk. Fife Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Flood protections scheme/works; flood protection study; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

SEPA and Fife Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Fife Council	North Fife coastal

Background

This Potentially Vulnerable Area is 13km². It is situated in the upper reaches of the Kinness Burn and includes St Andrews and Strathkinness.

The area has a risk of river and surface water flooding. The majority of damages are caused by river flooding.

There are approximately 40 residential properties at risk of flooding. The Annual Average Damages from flooding are approximately £94,000.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

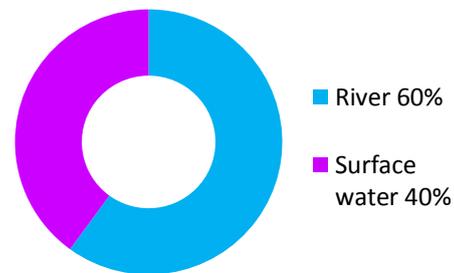


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy*, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in St Andrews from the Kinness Burn. St Andrews is also notably impacted by surface water flooding.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to roads. Within this Potentially Vulnerable Area there are three assets identified as being at risk of flooding.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_17_Full.pdf

Objectives to manage flooding in St Andrews (Denhead and Strathkinness)

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. The following objectives have been set for St Andrews (Denhead and Strathkinness) Potentially Vulnerable Area:

- Reduce economic damages to residential and non-residential properties in St Andrews caused by flooding from the Kinness Burn (objective ID 7046)

- Reduce economic damages and number of residential properties at risk from surface water flooding in St Andrews where practical (objective ID 7040)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in St Andrews (Denhead and Strathkinness)

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. The actions

shaded have been selected as the most appropriate for St Andrews (Denhead and Strathkinness) 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

The delivery of selected actions by year over the six-year plan cycle is summarised below.

Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection scheme/works					
Flood protection study					
Strategic mapping and modelling (Scottish Water)					
			New flood warning		
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study					
Maintenance					
Emergency plans/response					
Planning Policies					

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Details of actions to manage flooding in St Andrews (Denhead and Strathkinness)

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the St Andrews (Denhead and Strathkinness) PVA are shown below. Actions related

to (shaded only) the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

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Flood protection scheme/works – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
		Flood protection scheme/works			

Description:

Fife Council will deliver a flood protection scheme for the Kinness Burn in St Andrews. The scheme requires detailed study and design. Part of this proposed flood protection scheme is located in Potentially Vulnerable Area 07/16. The benefits and impacts have been assessed for the whole scheme. Fife Council will prepare a further study, which is required to be completed to update the original. Once completed, this will inform the final scheme.

Scheme design will be prepared 2018-2020 (following a study and option appraisal from 2016-2018). The scheme will be constructed in 2021-2022.

A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. There may be negative impacts through disturbance to the local community during the construction phase.

The flood protection scheme may have both positive and negative impacts on the ecological quality of the

environment depending on how they are designed. Opportunities to improve the condition of the Kinness Burn (water body ID 6107), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management. A number of nationally and locally designated sites are present in the study area and could be positively or negatively impacted, which will be assessed and managed as the scheme is developed and delivered.

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; new flood warning; flood forecasting; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Fife Council will coordinate these works with related actions (shaded only in table above).

funding by Scottish Government with the remainder from Fife Council capital budgets.

Funding:

Funding for the Flood Protection Schemes will be subject to 80% grant

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Flood protection study – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Fife Council will prepare a flood protection study for St Andrews to assess whether a combination of structural actions could reduce flood risk from the Kinness Burn from 2016-2018. The study will look at installation / modification of fluvial control structures, flood defences and natural flood management. Natural flood management options will be considered include runoff control, river / floodplain restoration and sediment management. The study will also investigate the viability of property level protection. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream. It will build on previous studies carried out in 2007 and 2011. Part of this proposed flood protection study is located in Potentially Vulnerable Area 07/16. The benefits and impacts have been assessed for the whole study. The study has the potential to benefit 144 residential properties and 18 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £19 million. The study

will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. 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 study area. The study could also benefit two utilities and two roads within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the Kinness Burn (water body ID 6107), which is located within the study area and the physical condition of these rivers is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. The study will consider conservation areas

and listed buildings, which could be positively or negatively impacted.

Related Actions (as shaded above):

Strategic mapping and modelling; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the study with Scottish Water, Marine Scotland,

The Crown Estate, SEPA and Landowners etc.

Fife Council will coordinate these works through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
	Strategic mapping and modelling (Scottish Water)				

Description:

Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

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.

Scottish Water will undertake further investigation and modelling in the St Andrews (2017-2020) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; new flood warning; flood forecasting; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Funding:

Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

New flood warning – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
			New flood warning		

Description:

The area under consideration includes properties affected by flooding in Fife and Perth and Kinross and is likely to include St Andrews which is affected by flooding from the Kinness Burn. Further feasibility assessment will be required to assess delivery potential and the final detail of communities for which warnings can be provided will be determined during the scoping process.

Hydrometry developments are to begin in spring 2019. The new flood warning service is to be launched in May 2021.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; strategic mapping and modelling; new flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A flood protection study and scheme are both proposed for the Kinness Burn in St Andrews. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme and new information about flood risk resulting from the proposed flood protection study are fully considered in the new flood warning system.

SEPA will coordinate new flood warning with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, Scottish Government provides grant funding to enable SEPA to implement new flood warning schemes.

Flood forecasting – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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..

Related Actions (as shaded above):

Strategic mapping & modelling; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with Fife Council and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

For the new flood protection scheme, SEPA will support the local authority's communications and engagement

activities with media activity, local public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.

To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.

Fife Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Fife Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the flood warning system. We will work with community flood action groups to develop emergency plans/response. We will build and develop the outcomes detailed in the Shoreline Management Plan (2011). We will maintain bodies of water as required within the council's schedule of clearance and repair. Sharing good practice, providing information on property level protection and developing and reviewing emergency plans.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Fife Council will also develop emergency plans/response and work with any community flood action groups. Fife Council will use the delivery of a flood protection study to address flood risk by 2018/19 as an opportunity to raise awareness.

Fife Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; new flood warning; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A flood protection scheme is proposed for St Andrews. SEPA will support the local authority's communications and engagement activities.

A new flood warning scheme is under consideration for properties affected by flooding in Fife and Perth and Kinross and is likely to include St Andrews. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Fife Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Fife Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council's funding will be subject to Scottish Government's block grant and capital support, and

budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Self help – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Fife Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with 'awareness raising', 'community flood action groups' and 'emergency plans/response' actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Fife Council activities to assist, support and educate those to self help will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study					

Description:

Fife Council will prepare Surface Water Management Plans (SWMPs) to cover St Andrews. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Fife Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best

available knowledge and data is used to input into the surface water management plans.

Related Actions (as shaded above):

Flood protection study; strategic mapping & modelling; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Fife Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Fife Council funding for surface water management will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Fife Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Fife Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Fife Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection study; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Fife Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022 Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital Maintenance expenditure.

Emergency plans/response – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Fife Council has developed and operates an emergency flood plan for St Andrews, Denhead and Strathkinness, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Fife Council will conduct assessments at known hotspots and prepare resources as required. Fife Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Fife Council Resilience Team review and update the Emergency Plan biennially and can be found via the Fife Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection scheme/works; flood protection study; new flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Fife Council will coordinate emergency plans/response with related actions (shaded only in table above).

Funding:

Fife Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – St Andrews (Denhead and Strathkinness) (Potentially Vulnerable Area 07/17)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Fife Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TAYplan and SESplan strategic development plans. Furthermore, Fife Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. FIFEplan, Fife Local Development Plan.

Fife Council adopts proactive strategies to mitigate and adapt to

climate change, taking full account of flood risk. Fife Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Flood protections scheme/works; flood protection study; awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Fife Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

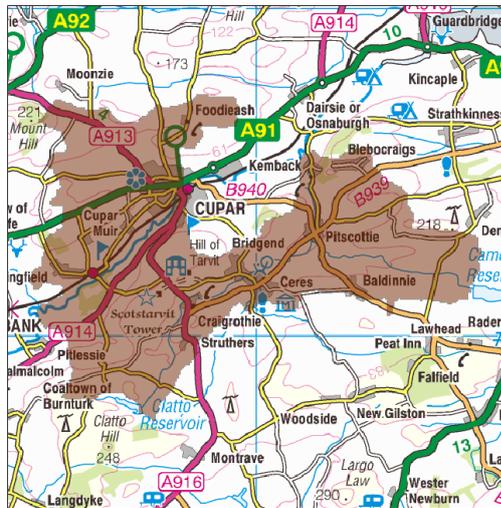
Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Cupar (Potentially Vulnerable Area 07/18)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Fife Council	River Eden

Background

This Potentially Vulnerable Area is 63km² (shown below). It is situated in the lower reaches of the River Eden catchment and includes the town of Cupar.



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Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015)*.

The area has a risk of river and surface water flooding with the majority of damages caused by river flooding.

There are approximately 260 residential properties and 80 non-residential properties at risk of flooding. The Annual Average Damages are approximately £1.3 million.

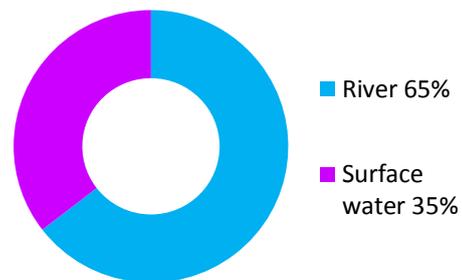


Figure 1: Annual Average Damages by flood source

Reproduced from *Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015)*.

Summary of flooding impacts

The highest risk of flooding is in Cupar from the River Eden and Lady Burn. Cupar is also notably impacted by surface water flooding.

For this Potentially Vulnerable Area the highest damages are to non-residential properties followed by damages to residential properties.

Further details of the risk of flooding to people and property, as well as to

community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Cupar (Potentially Vulnerable Area 07/18)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_18_Full.pdf

Objectives to manage flooding in Cupar

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. The following objectives have been set for Cupar Potentially Vulnerable Area:

- Reduce economic damages to residential and number of residential properties at risk of surface water flooding in Cupar caused by flooding from the River Eden and Lady Burn. Reduce risk to people from river flooding in Cults ad Cupar (objective ID 7049, 7051)

- Reduce economic damages to residential and non-residential properties in the Cupar Potentially Vulnerable Area caused by river flooding (objective ID 7050)
- Reduce economic damages and number of residential properties at risk of surface water flooding in Cupar and Springfield where practical (objective ID 7047)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Cupar

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. The actions

shaded have been selected as the most appropriate for Cupar 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

Delivery of selected actions

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
		New flood warning			
Flood forecasting					
Awareness raising					
Self help					
Surface water plan/study					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Cupar

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Cupar PVA are shown below. Actions related to (shaded only) the selected action

are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

Flood protection study – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Fife Council will prepare a flood protection study for Kemback and Pitscottie from 2016-2018 to assess whether flood defences and sediment management could reduce river flood risk. The study will also investigate the viability of property level protection and property relocation. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream.

The study has the potential to benefit 45 residential properties and 18 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £5 million. The study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. A reduction in flood risk would have a positive benefit to the health and wellbeing of the community.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the

environment and on designated sites. Opportunities to enhance and restore the environment will be considered by coordinating with river basin management planning.

Fife Council will prepare a flood protection study for Cupar and Cults Mill from 2016-2018 to assess whether flood storage, flood defences and natural flood management could reduce flood risk from the River Eden and Lady Burn from. Natural flood management options will be considered include river / floodplain restoration and sediment management. The study will also investigate the viability of property level protection and property relocation. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream.

The study has the potential to benefit 144 residential properties and 18 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £19 million. The study will consider economic, social and environmental impacts.

Social impacts will depend on the outcome of the study and recommended actions. 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 study area. The study could also benefit two utilities and two roads within the study area. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the River Eden, Foodieash Burn, Fernie Burn, Kettle Burn, Laprig Burn, Glassart Burn and Ballingall Burn (water body IDs 6200, 6205, 6206, 6209, 6211, 6212 and 6213), which are located within the study area and the physical condition of these rivers is identified by SEPA to be at less than good status, will be considered by coordinating with river basin

management planning. The study will consider conservation areas and listed buildings, which could be positively or negatively impacted.

Related Actions (as shaded above):

Strategic mapping and modelling; new flood warning; awareness raising; self help; maintenance; surface water plan/study; emergency plans/response.

Coordination:

Fife Council will coordinate the studies with Scottish Water, SEPA and Landowners, etc.

Fife Council will coordinate these studies through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintain flood protection scheme – Cupar (Potentially Vulnerable Area 07/18)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					

Description:

Fife Council will continue to maintain the existing flood defences along the Blebo Burn, Ceres Burn, Craigrothie Burn, Latch Burn and an unnamed watercourse (old lade). These defences provide protection against flooding in Pitscottie and Ceres.

Fife Council will continue to maintain the Millfield of Cupar Flood Protection Scheme. The scheme aims to manage surface water runoff and has a design standard of protection of 1 in 100 years.

Fife Council will maintain the existing Flood Protection Scheme ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Fife Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to

conduct watercourse inspections annually and structural inspections biennially.

Related Actions (as shaded above):

Flood protection study; awareness raising; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate maintaining flood protection scheme with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance of flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Strategic mapping and modelling– Cupar (Potentially Vulnerable Area 07/18)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

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 led surface water mapping improvements are expected to be undertaken in 2016 to 2017.

Further improvements may be made as a result of a surface water management study and the timings of these improvements are dependent on the local authority study.

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.

Scottish Water will undertake further investigation and modelling in the Ceres (2018-2020), Cupar (2016-2018), Springfield (2018-2020) and St Andrews (2017-2020) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Related Actions (as shaded above):

Flood protection study; new flood warning; flood forecasting; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

A surface water management plan is proposed for the Cupar and Springfield area. SEPA will work with the responsible authorities to ensure that new information about flood risk resulting from the proposed surface water management plan is considered

in SEPA's strategic mapping and modelling developments where appropriate and relevant.

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

New flood warning – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
			New flood warning		

Description:

The area under consideration includes properties affected by flooding in Fife and Perth and Kinross and is likely to include Cupar. Further feasibility assessment will be required to assess delivery potential and the final detail of communities for which warnings can be provided will be determined during the scoping process.

Hydrometry developments are to begin in spring 2018. The new flood warning service is to be launched in May 2021.

Related Actions (as shaded above):

Flood protection study; strategic mapping & modelling; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A fluvial flood protection study is proposed for Cupar/ Cults Mill. SEPA will work with the local authority to ensure that new information about

flood risk resulting from the proposed flood protection study is considered in developing the new flood warning system.

SEPA will coordinate new flood warning with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement. In addition, Scottish Government provides grant funding to enable SEPA to implement new flood warning schemes

Flood forecasting – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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..

Related Actions (as shaded above):

Flood protection study; strategic mapping & modelling; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Awareness raising – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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. From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with Fife Council and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the area. This will be supported by local

and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.

Fife Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Fife Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the flood warning system. We will work with community flood action groups to develop emergency plans/response. We will maintain bodies of water as required within the council's schedule of clearance and repair. Sharing good practice, providing information on property level protection and developing and reviewing emergency plans.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Fife Council will also develop emergency plans/response and work with any community flood action groups. Fife Council will use the delivery of a flood protection study to address flood risk by 2018/19 as an opportunity to raise awareness.

Fife Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; new flood warning; self help; surface water plan/study; maintenance; emergency plans/response; planning policies.

Coordination:

A new flood warning scheme is under consideration for properties affected by flooding in Fife and Perth and Kinross and is likely to include Cupar. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Fife Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Fife Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA and the responsible authorities have an existing and ongoing duty to raise public awareness of flood risk. SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Fife Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; awareness raising; surface water plan/study; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with ‘awareness raising’, ‘community flood action groups’ and ‘emergency plans/response’ actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Fife Council activities to assist, support and educate those to self help will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Surface water plan/study – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Surface water plan/study					

Description:

Fife Council will prepare Surface Water Management Plans (SWMPs) to cover Ceres, Cupar, Springfield and Strathmiglo. This will identify the most sustainable measures to manage urban drainage and the risk of surface water flooding, as well as sources of flooding such as the sewer network, watercourses and sea. This will establish a long-term action plan for each area to manage surface water and influence future capital investment, drainage maintenance, land-use planning, emergency planning etc. Fife Council will co-ordinate this work with Scottish Water and SEPA through the local plan district (LPD) partnership with delivery of the SWMP by 2019/2020.

Scottish Water will provide local knowledge and understanding of the sewer network. This includes Scottish Water corporate data (as applicable) and, where available, outputs of Section 16 or integrated catchment studies, to assist with the surface water management planning process. Scottish Water will work with and support surface water management planning through ensuring that best

available knowledge and data is used to input into the surface water management plans.

Related Actions (as shaded above):

Flood protection study; maintain flood protections scheme; strategic mapping and modelling; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the surface water plan/study through the Local Planning District (LPD) partnership and or separate agreements, for example SWMP partnerships..

Fife Council will coordinate the surface water plan/study with related actions (shaded only in table above).

Funding:

Fife Council funding for surface water management will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintenance – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Fife Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Fife Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Fife Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance and management of their own assets

including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection study; awareness raising; self help; surface water plan/study; emergency plans/response; planning policies.

Coordination:

Fife Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022 Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Emergency plans/response – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Fife Council has developed and operates an emergency flood plan for Cupar, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Fife Council will conduct assessments at known hotspots and prepare resources as required. Fife Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Fife Council Resilience Team review and update the Emergency Plan biennially and can be found via the Fife Council website, search “emergency plan”.

Related Actions (as shaded above):

Flood protection study; new flood warning; flood forecasting; awareness raising; self help; surface water plan/study; maintenance; planning policies.

Coordination:

Fife Council will coordinate emergency plans/response with related actions (shaded only in table above).

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Funding:

Fife Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Cupar (Potentially Vulnerable Area 07/18)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may

be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Fife Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TAYplan and SESplan strategic development plans. Furthermore, Fife Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. FIFEplan, Fife Local Development Plan.

Fife Council adopts proactive strategies to mitigate and adapt to climate change, taking full account of

flood risk. Fife Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Flood protection study; awareness raising; surface water plan/study; emergency plans/response.

Coordination:

SEPA and Fife Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish

SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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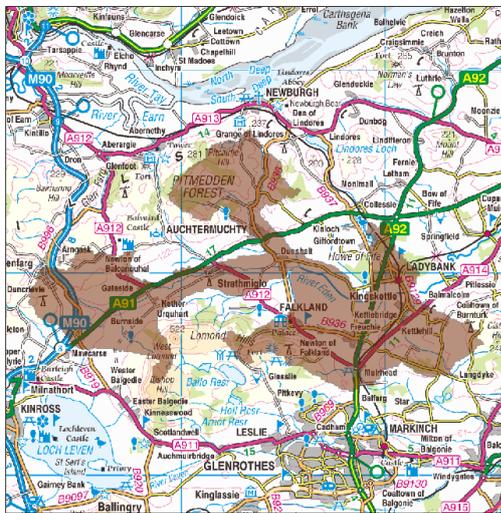
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Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

Local Plan District	Local authority	Main catchment
Tay Estuary and Montrose Basin	Fife Council, Perth and Kinross Council	River Eden

Background

This Potentially Vulnerable Area is 101km² (shown below). It is situated in the upper reaches of the River Eden catchment and includes Auchtermuchty.



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Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

This Potentially Vulnerable Area has a risk of river and surface water flooding with the majority of damages caused by river flooding.

There are approximately 170 residential properties and 30 non-residential properties at risk of flooding. The Annual Average Damages are approximately £610,000.

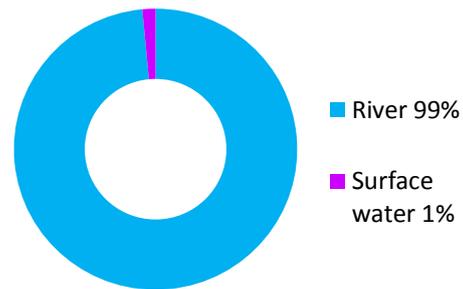


Figure 1: Annual Average Damages by flood source

Reproduced from Tay Estuary and Montrose Basin Flood Risk Management Strategy, SEPA (December 2015).

Summary of flooding impacts

The highest risk of flooding is in Auchtermuchty from the Auchtermuchty Burn. The risk of flooding is dispersed across this area and may also impact Strathmiglo, Kettlebridge and Falkland.

For this Potentially Vulnerable Area the highest damages are to residential properties followed by damages to non-residential properties.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Tay Estuary and Montrose Basin, 'Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)':

http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_07_19_Full.pdf

Objectives to manage flooding in Auchtermuchty and Pleasance

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. The following objectives have been set for Auchtermuchty and Pleasance Potentially Vulnerable Area:

- Reduce economic damages to residential and number of residential properties in Auchtermuchty caused by flooding from the Auchtermuchty Burn (objective ID 7052)

- Reduce economic damages to residential and non-residential properties in the Auchtermuchty and Pleasance Potentially Vulnerable Area caused by river flooding (objective ID 7053)
- Avoid an overall increase in flood risk (objective ID 7001) and reduce overall flood risk (objective ID 7054)

Actions to manage flood risk and deliver the objectives are shown overleaf.

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Actions to manage flooding in Auchtermuchty and Pleasance

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. The actions

shaded have been selected as the most appropriate for Auchtermuchty and Pleasance 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

The delivery of selected actions by year over the six-year plan cycle is summarised overleaf.

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Delivery of selected actions					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					
Maintain flood protection scheme					
Natural flood management study					
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					
			New flood warning		
Flood forecasting					
Community flood action groups					
Awareness raising					
Self help					
Maintenance					
Emergency plans/response					
Planning Policies					

Details of actions to manage flooding in Auchtermuchty and Pleasance

Detailed descriptions of the delivery arrangements for each selected action (shaded/bold in the table) in the Auchtermuchty and Pleasance PVA are shown below. Actions related to

(shaded only) the selected action are also shown to demonstrate the requirements for coordination. The timetable for the delivery of the selected action is also shown overleaf.

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Flood protection study – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood protection study					

Description:

Fife Council will prepare the study a flood protection study for Auchtermuchty from 2017-2019 to assess whether flood storage and natural flood management could further reduce flood risk from the Auchtermuchty Burn. The study will supplement previous studies carried out by Fife Council and consider the existing flood protection works. Natural flood management options that will be considered include river / floodplain restoration and sediment management. The study will also investigate property relocation and the viability of property level protection. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream.

The study has the potential to benefit 44 residential properties and 13 non-residential properties at risk of flooding in this location, with potential damages avoided of up to £4.7 million. The study will consider economic, social and environmental impacts. Social impacts will depend on the outcome of the study and

recommended actions. 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.

The study will consider the positive and negative impacts of proposed actions on the ecological quality of the environment and on designated sites. Opportunities to improve the condition of the Glassart Burn (water body ID 6212), which is located within the study area and the physical condition of this river is identified by SEPA to be at less than good status, will be considered by coordinating with river basin management planning. The study will consider conservation areas and listed buildings, which could be positively or negatively impacted.

Related Actions (as shaded above):

Strategic mapping and modelling; new flood warning; community flood action groups; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate the study with Scottish Water, SEPA and Landowners etc.
Fife Council will coordinate this study through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

Funding for flood protection study will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Maintain flood protection scheme – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintain flood protection scheme					

Description:

Fife Council will continue to maintain the existing Auchtermuchty Flood Protection Scheme. The scheme consists mainly of flood walls and a low earth embankment. The scheme has a design standard of protection of 1 in 50 years.

Fife Council will continue to maintain the existing Dunshalt Village Flood Protection Scheme. Fife Council will maintain the existing Flood Protection Schemes ensuring works are co-ordinated and infrastructure is fully assessed. This will be done by undertaking routine, reactive, programmed, regulatory and emergency response inspections. This work will be carried out by Fife Council engineers on a priority needs basis as resource allows. The general maintenance standard target is to conduct watercourse inspections

annually and structural inspections biennially.

Related Actions (as shaded above):

Flood protection study; awareness raising; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate maintaining flood protection scheme with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance flood protection schemes will be shared with others as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Natural flood management study – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Natural flood management study					

Description:

A natural flood management study has been recommended for Dunshalt, Freuchie Mill and Kingskettle to assess whether river / floodplain restoration and sediment management could help reduce flood risk. Fife Council will prepare the study from 2017-2019. The study will take a catchment approach and consider the potential benefits and disbenefits and interaction between actions upstream and downstream. Fife Council will coordinate the natural flood management study through the Local Planning District (LPD) partnership and or separate agreements. The economic, social and environmental impacts of the natural flood management actions will be considered in the study.

Opportunities to improve the condition of the River Eden, Fernie Burn, Kettle Burn, Laprig Burn, Glassart Burn and Ballingall Burn (water body IDs 6200, 6206, 6209, 6211, 6212 and 6213), which are located within the study area and the physical condition of these rivers is identified by SEPA to be at less than good status, will be considered by coordinating with river

basin management planning. Listed buildings are also present in the study area, which could be positively or negatively impacted, will also be considered.

Natural flood management actions can reduce flood risk for high likelihood events to 60 residential and non-residential properties. These actions can restore and enhance natural environments and create opportunities for recreation and tourism. A reduction in flood risk would also have a positive benefit to the health and wellbeing of the community.

Related Actions (as shaded above):

Flood protection study; strategic mapping and modelling; new flood warning; flood forecasting; community flood action groups; awareness raising; self help; maintenance; emergency plans/response; planning policies.

Coordination:

Fife Council will coordinate the study with SEPA landowners and Flood Action Groups as well as general public and interested parties

Fife Council will coordinate the natural flood management study with related actions (shaded only in table above).

Funding:

Fife Council funding for natural flood management studies will be shared with others as appropriate, and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

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Strategic mapping and modelling– Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Strategic mapping and modelling (Scottish Water)					
Strategic mapping and modelling (SEPA)					

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 led surface water mapping improvements are expected to be undertaken in 2016 to 2017.

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.

Scottish Water will undertake further investigation and modelling in the Bowhouse (2016-2019), Springfield (2018-2020) and Strathmiglo (2018-

2020) sewer catchments to improve knowledge and understanding of flood risk in this area as required under Section 16 of the Flood Risk Management (Scotland) Act 2009.

Scottish Water will work with responsible authorities to incorporate relevant information into these studies and by regularly keeping the responsible authorities informed of their progress. Scottish Water will provide responsible authorities with the outputs of the Section 16 assessment which, where relevant, may be used to inform surface water management plans and SEPA flood hazard and risk maps.

Related Actions (as shaded above):

Flood protection study; natural flood management study; new flood warning; flood forecasting; maintenance; emergency plans/response; planning policies.

Coordination:

SEPA and Scottish Water will coordinate their strategic mapping and modelling activities with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

Funding:

SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water funding is committed in its capital programme through Q&S 4a (2015-2021) which is approved by its regulators and customers.

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New flood warning– Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
			New flood warning		

Description:

The area under consideration includes properties affected by flooding in Fife and Perth and Kinross and is likely to include Auchtermuchty. Further feasibility assessment will be required to assess delivery potential and the final detail of communities for which warnings can be provided will be determined during the scoping process.

Hydrometry developments are to begin in spring 2019. The new flood warning service is to be launched in May 2021.

Related Actions (as shaded above):

Flood protection study; natural flood management study; strategic mapping and modelling; flood forecasting; community flood action groups; awareness raising; self help; maintenance; emergency plans/response; planning policies.

Coordination:

A fluvial flood protection study is proposed for Auchtermuchty. SEPA will work with the local authority to ensure that new information about flood risk resulting from the proposed flood protection study is considered in developing the new flood warning system.

SEPA will coordinate new flood warning with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and or separate agreements.

Funding:

The maintenance of SEPA’s flood warning service is funded by Scottish Government through SEPA’s grant in aid settlement. In addition, Scottish Government provides grant funding to enable SEPA to implement new flood warning schemes.

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Flood forecasting – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Flood forecasting					

Description:

The Scottish Flood Forecasting Service is an existing and ongoing 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 flood guidance statements provide an assessment of the risk of flooding for a five day period allowing responders time to put preparations in place to reduce the impact of flooding. 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..

Related Actions (as shaded above):

Flood protection study; natural flood management study; strategic mapping and modelling; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

SEPA/Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

SEPA will coordinate flood forecasting with related actions (shaded only in table above) through the Local Planning District (LPD) partnership and/or separate agreements.

Funding:

SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.

Community flood action groups – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Community flood action groups					

Description:

Reduce flood risk, improve preparedness and increase resilience against flooding. Fife Council is engaging with Falkland Flood Action Group, Freuchie Flood Action Group and the Kettle and District Flood Resilience Group operate in this area and aim to increase community resilience to flooding. Glenfarg Community Council also operates in this area and have prepared a community resilience plan to help prepare for and respond to emergencies.

Related Actions (as shaded above):

Flood protection study; natural flood management study; new flood warning; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Fife Council will coordinate community flood action groups with related actions (shaded only in table above).

Fife Council will continue to co-ordinate with existing community flood action groups throughout the next 6 years on a priority needs basis where resources allow.

Funding:

Fife Council will work with existing community flood action groups to set out arrangements to Fife Council funding for community flood action groups will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Awareness raising – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Awareness raising					

Description:

SEPA and the responsible authorities have an existing and ongoing 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.

From 2016 SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with Fife Council and community resilience groups where possible.

Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). Where they exist, SEPA will engage with community resilience groups and community safety partnerships.

To support the delivery of the new SEPA flood warning scheme, SEPA will carry out a local launch event and engage directly with residents in the

area. This will be supported by local and national media communications. SEPA will also support and participate in local public awareness events, in partnership with the local authority, community council or other local representative organisations, including schools.

Fife Council have an existing and ongoing duty to raise public awareness of flood risk under the Flood Risk Management (Scotland) Act 2009. Over the six-year planning cycle, Fife Council will seek opportunities to raise awareness of flood risk and actions that prepare individuals, homes and businesses to reduce the overall impact of flooding.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the flood warning system. We will work with community flood action groups to develop emergency plans/response. We will maintain bodies of water as required within the council's schedule of clearance and repair. Sharing good practice, providing information on property level protection and developing and reviewing emergency plans.

Fife Council will work with local communities to raise awareness and assist SEPA in relation to the new flood warning system. Fife Council will also develop emergency plans/response and work with any community flood action groups. Fife Council will use the delivery of a flood protection study to address flood risk by 2019/20 as an opportunity to raise awareness.

Fife Council will also disseminate more general information to raise awareness via social media streams relating to flooding i.e. road closures, transport disruptions and weather forecasts.

Scottish Water will support SEPA and responsible authorities with their awareness raising activities as required and provide targeted flooding communications for Scottish Water specific activities. Scottish Water will raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies. More general information and flooding guidance will be available on the website at:

<https://www.scottishwater.co.uk/you-and-your-home/your-home/flooding-information>.

Scottish Water will keep responsible authorities informed of its awareness raising activities through the Local Plan District partnerships.

Related Actions (as shaded above):

Flood protection study; natural flood management study; new flood warning; community flood action groups; self help; maintenance; emergency plans/response; planning policies.

Coordination:

A new flood warning scheme is under consideration for properties affected by flooding in Fife and Perth and Kinross and is likely to include Auchtermuchty. To support the delivery of the new SEPA flood warning scheme, SEPA will carry out communications and engagement activities.

SEPA's awareness raising activities will be co-ordinated with the activities of other responsible authorities as required.

SEPA, Fife Council and Scottish Water will coordinate awareness raising through the Local Planning District (LPD) partnership and or separate agreements.

SEPA, Fife Council and Scottish Water will coordinate awareness raising with related actions (shaded only in table above).

Funding:

SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council's funding will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

Self help – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Self help					

Description:

Everyone is responsible for protecting themselves and their property from flooding.

Responsible Authorities have an existing and ongoing duty to raise public awareness of flood risk. Helping individuals understand the risks from which they are most vulnerable is the first step in the process.

Fife Council will assist, support and educate, as appropriate, property and business owners to protect themselves and their property from flooding, which is their responsibility. 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.

Related Actions (as shaded above):

Flood protection study; natural flood management study; community flood action groups; awareness raising; self help; maintenance; emergency plans/response.

Coordination:

Self help actions will be co-ordinated with SEPA and other responsible authorities and other actions, as shaded above, and in particular with 'awareness raising', 'community flood action groups' and 'emergency plans/response' actions. This is to be through the Local Planning District (LPD) Partnership.

Funding:

Funding for self help will largely be by the individual property and business owner, although Fife Council activities to assist, support and educate those to self help will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022.

Maintenance – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Maintenance					

Description:

Fife Council has an existing and ongoing duty to assess bodies of water and conduct clearance and repair works which would substantially reduce flood risk. Fife Council will coordinate with landowners and other responsible authorities where a risk has been identified and carry out works necessary. Fife Council will prepare a schedule of clearance and repair as required by the Flood Risk Management (Scotland) Act 2009 and make this available for public inspection. Each schedule will include the name of water body, location, description of works, target for completion and the date of the next assessment.

Scottish Water will undertake risk based inspection, maintenance and repair on the public sewer network. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

Asset owners and riparian landowners are responsible for the maintenance

and management of their own assets including those which help to reduce flood risk.

Related Actions (as shaded above):

Flood protection study; natural flood management study; awareness raising; self help; emergency plans/response; planning policies.

Coordination:

Fife Council and Scottish Water will coordinate their maintenance activities with related actions (shaded only in table above).

Funding:

Fife Council funding for maintenance will be shared with others as appropriate and will be subject to Scottish Government’s block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022 Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure

Emergency plans/response – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)					
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
Delivery of selected action					
Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Emergency plans/response					

Description:

Providing an emergency response to flooding is an existing and ongoing 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.

Fife Council has developed and operates an emergency flood plan for Auchtermuchty and Pleasance, which is coordinated through the responders identified under the Civil Contingencies Act 2004. The aim of the plan is to set out arrangements to deal effectively with flood risk. At predetermined trigger levels flood alerts and warnings will be issued through Floodline and Fife Council will conduct assessments at known hotspots and prepare resources as required. Fife Council will also co-ordinate measures in conjunction with partner agencies (emergency services, SEPA, Scottish Water, etc.).

The emergency response process is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. Fife Council Resilience Team review and update the Emergency Plan biennially and can be found via the Fife Council website, search “emergency plan”.

Scottish Water are a Category 2 responder under the Civil Contingencies Act 2004 and will support regional and local resilience partnerships as required.

Related Actions (as shaded above):

Flood protection study; natural flood management study new flood warning; flood forecasting; community flood action groups; awareness raising; self help; maintenance; planning policies.

Coordination:

Fife Council will coordinate emergency plans/response with related actions (shaded only in table above).

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Funding:

Fife Council and Angus Council funding for emergency plans/response will be shared with other organisations, emergency services and responders, as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-

2022. SEPA's emergency plans/response are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by Scottish Water are accounted for in our Capital or operational expenditure.

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Planning policies – Auchtermuchty and Pleasance (Potentially Vulnerable Area 07/19)

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

Delivery of selected action

Year 1 (2016/17)	Year 2 (2017/18)	Year 3 (2018/19)	Year 4 (2019/20)	Year 5 (2020/21)	Year 6 (2021/22)
Planning Policies					

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.

SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has an existing and ongoing duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the

planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA website:

<http://www.sepa.org.uk/environment/land/planning/>

Fife Council is a local planning authority and will work with regional planning authorities to incorporate national policy on flood risk management, i.e. TAYplan and SESplan strategic development plans. Furthermore, Fife Council will work directly with their planners to ensure that appropriate policies and measures are put in place to reduce flood risk, i.e. FIFEplan, Fife Local Development Plan.

Fife Council adopts proactive strategies to mitigate and adapt to

climate change, taking full account of flood risk. Fife Council will develop appropriate planning policies and measures to reduce flood risk through the Local Development Plan, masterplans, site planning briefs and other appropriate measures as required.

Scottish Water are accounted for in our Capital or operational expenditure

Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.

Related Actions (as shaded above):

Flood protection study; natural flood management study; awareness raising emergency plans/response.

Coordination:

SEPA and Fife Council will coordinate land use planning policies with related actions (shaded only in table above).

SEPA's land use planning activities will be coordinated with the activities of other responsible authorities as required

Funding:

Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish SEPA's land use planning policy activities are funded by Scottish Government through SEPA's grant in aid settlement. Fife Council funding for land use planning policies will be shared as appropriate and will be subject to Scottish Government's block grant and capital support, and budget allocations over the six years of the Plan, 2016-2022. Scottish Water is funded by customer charges as set by our economic regulator, all business activities required under this action by

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The information described in this Annex relates to the Figures and Maps that have been generated by SEPA and have been reproduced in this Local Flood Risk Management Plan from the Tay Estuary and Montrose Basin Flood Risk Management Strategy. The Tay Estuary and Montrose Basin Local Plan District Partners gratefully acknowledge the cooperation and input that various parties have provided, including inter alia, the following organisations:

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Local authorities

Lead Authorities acknowledge the provision of flood models and other supporting data and information from local authorities in Scotland and their collaboration in the production of flood risk management information.

Scottish Water

Local Authorities acknowledge the inclusion of surface water flooding data generated by Scottish Water in preparation of flood risk information.

Annex 2: Supporting information

The following information has been extracted from the Tay Estuary and Montrose Basin Flood Risk Management Strategy⁵.

Sources of flooding described in the strategy

The Flood Risk Management Strategy addresses the risk of flooding from rivers, the coast and surface water. The risk of flooding from rivers is usually due to rainfall causing a river to rise above bank level spreading out and inundating adjacent areas. Coastal flooding is where the risk is from the sea. Sea levels can change in response to tidal cycles or atmospheric conditions. Over the longer term sea levels and coastal flood risk may change due to climate change. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead. There can be interactions between these sources of flooding, but for the purposes of this strategy they are dealt with independently.

The following aspects of flooding have not been incorporated into the strategy:

- Groundwater is generally a contributing factor to flooding rather than the primary source. It is caused by water rising up from underlying rocks or flowing from springs.
- Reservoir breaches have been assessed under separate legislation (Reservoirs (Scotland) Act 2011). Further information and maps can be found on SEPA's website.
- The Flood Risk Management (Scotland) Act 2009 does not require SEPA or responsible authorities to assess or manage coastal erosion. However, SEPA has included consideration of erosion in the Flood Risk Management Strategies by identifying areas that are likely to be susceptible to erosion and where erosion can exacerbate flood risk. As part of considering where actions might deliver multiple benefits, we have looked to see where the focus of coastal flood risk management studies coincides with areas of high susceptibility to coastal erosion. Subsequent detailed studies and scheme design will need to consider coastal erosion in these areas.
- Coastal flood modelling. The information on coastal flooding used to set objectives and identify actions is based on SEPA modelling using simplified coastal processes and flooding mechanisms at work during a storm. Wave overtopping cannot be accurately modelled at a national scale due to the importance of local factors such as prevailing wind conditions, the depth and profile of the near-shore sea bed or the influence of any existing defences or management structures. As a result, coastal flood risk may be underestimated in some areas. Conversely, in locations with wide and flat floodplains, the modelling may overestimate flood risk. To address this, in a number of locations

⁵ Forth Estuary Flood Risk Management Strategy, SEPA (December 2015). Found at

(<http://apps.sepa.org.uk/FRMStrategies/forth-estuary.html>)

where more detailed local models were available they have been incorporated into the development of the Flood Risk Management Strategies. Where wave overtopping has been specifically identified as a concern – but where no further detailed modelling is available – particular compensation has been made in the selecting actions to address coastal flood risk.

Commonly used terms

Below are explanatory notes for commonly used terms in the strategy. A glossary of terms is also available.

- Reference to flood risk. During the development of the strategy flood risk has been assessed over a range of likelihoods. For consistency in reporting information within the strategies, unless otherwise stated, all references to properties or other receptors being ‘at risk of flooding’ refer to a medium likelihood flood (up to a 1 in 200 chance of flooding in any given year). By exception, references will be made to high or low risk flooding, which should be taken to mean a 1 in 10 chance/likelihood or 1 in 1000 chance/likelihood of flooding in any given year respectively.

Chance / likelihood of flooding	
High	1 in 10 year
Medium	1 in 200 year
Low	1 in 1000 year

- Annual Average Damages have been used to assess the potential economic impact of flooding within an area. Depending on its size or severity each flood will cause a different amount of damage to a given area. Annual Average Damages are the theoretical average economic damages caused by flooding when considered over a very long period of time. It does not mean that damage will occur every year: in many years there will be no damages, in some years minor damages and in a few years major damages may occur.
- High likelihood events, which occur more regularly, contribute proportionally more to Annual Average Damages than rarer events. Within the Flood Risk Management Strategies Annual Average Damages incorporate economic damages to the following receptors: residential properties, non-residential properties, vehicles, emergency services, agriculture and roads. They have been calculated based on the principles set out in the Flood Hazard Research Centre Multi-Coloured Handbook (2010).
- History of flooding. The history of flooding sections of this document report floods that have occurred up to July 2015.

Flood risk management planning process

Flood risk management in Scotland aims to manage flooding in a sustainable way. Sustainable flood risk management considers where floods are likely to occur in the future and takes action to reduce their impact without moving the problem elsewhere. It considers all sources of flooding, whether from rivers, the sea or from

surface water. It delivers actions that will meet the needs of present and future generations whilst also protecting and enhancing the environment.

The sustainable approach to managing flood risk works on a six year planning cycle, progressing through the key stages outlined below.

Identifying priority areas at significant flood risk

The first step to delivering a risk-based, sustainable and plan-led approach to flood risk management was SEPA's National Flood Risk Assessment, which was published in 2011. The assessment considered the likelihood of flooding from rivers, groundwater and the sea, as well as flooding caused when heavy rainfall is unable to enter drainage systems or the river network. The likelihood of flooding was examined alongside the estimated impact on people, the economy, cultural heritage and the environment. It significantly improved our understanding of the causes and consequences of flooding, and identified areas most vulnerable to floods.

Based on the National Flood Risk Assessment, SEPA identified areas where flooding was considered to be nationally significant. These areas are based on catchment units as it is within the context of the wider catchment that flooding can be best understood and managed. These nationally significant catchments are referred to as Potentially Vulnerable Areas. In Scotland, 243 Potentially Vulnerable Areas were identified. They are estimated to contain 92% of the total number of properties at risk.

A small number of Candidate Potentially Vulnerable Areas were identified after the National Flood Risk Assessment in light of new information that warranted further assessment and appraisal. They are included in the flood risk management planning process. The National Flood Risk Assessment will be updated to inform each subsequent planning cycle.

Improving the understanding of flooding

SEPA developed flood hazard and flood risk maps between 2012 and 2014. These maps improved our understanding of flooding and helped inform the subsequent selection of actions to manage flood risk in Potentially Vulnerable Areas. The flood hazard maps show information such as the extent of flooding, water level, as well as depth and velocity where appropriate. The flood risk maps provide detail on the impacts on people, the economy, cultural heritage and the environment.

In 2012 SEPA also developed an assessment of the potential for natural flood management. The assessment produced the first national source of information on where natural flood management actions would be most effective within Scotland. Flood hazard and flood risk maps and the assessment of the potential for natural flood management can be viewed on the SEPA website www.sepa.org.uk.

Identifying objectives and selecting actions

The objectives and actions to manage flooding will provide the long-term vision and practical steps for delivering flood risk management in Scotland.

Working collaboratively with local partnerships, SEPA has agreed the objectives for addressing the main flooding impacts. Actions that could deliver these agreed objectives have been appraised for their costs and benefits to ensure the right combinations are identified and prioritised. The actions considered in the development of this strategy include structural actions (such as building floodwalls, restoring flood plains, or clearance and repair works to rivers) and non-structural actions (such as flood warning, land use planning or improving our emergency response). Structural and non-structural actions should be used together to manage flood risk effectively.

An assessment of the potential for natural flood management was used to help identify opportunities for using the land and coast to slow down and store water. Natural flood management actions were recommended in areas where they could contribute to the management of flood risk. In such instances these actions were put forward as part of flood protection or natural flood management studies.

Annex 3: LPD roles & responsibilities

Roles and responsibilities for flood risk management planning

Individuals are the first line of defence against flooding. However, public bodies have responsibilities too and are working together to reduce the impacts of flooding in Scotland. Responsibility for flood risk management planning falls in the main to SEPA, local authorities and Scottish Water. However, individuals have a personal responsibility to protect themselves and their property.

Some of the key roles are outlined below and more information is available from the SEPA website.

Your responsibilities:

Organisations and individuals have responsibilities to protect themselves from flooding. Being prepared by knowing what to do and who to contact if flooding happens can help you reduce the damage and disruption flooding can have on your life.

The first step to being prepared is signing up to Floodline so you can receive messages to let you know where and when flooding is likely to happen. Other useful tools and advice on how to be prepared are available on the Floodline website including a quick guide to who to contact in the event of a flood. You can also check how your area could be affected by flooding by looking at SEPA's flood maps.

SEPA

SEPA is Scotland's national flood forecasting, flood warning and strategic flood risk management authority. We have a statutory duty to produce Scotland's Flood Risk Management Strategies. As described above, we work closely with other organisations responsible for managing flood risk through a network of partnerships and stakeholder groups to ensure that a nationally consistent approach to flood risk management is adopted.

SEPA also has a responsibility to identify where in Scotland there is the potential for natural flood management techniques to be introduced. Natural flood management is the use of the natural features of the land to store and slow down the flow of water.

In running Floodline, we provide live flooding information and advice on how to prepare for or cope with the impacts of flooding 24 hours a day, seven days a week. To help us forecast for flooding we work closely with the Met Office.

To raise awareness of flooding at a national level SEPA runs education initiatives, community engagement programmes and an annual campaign to promote the useful advice and information available through Floodline. We work in partnership with local authorities, Neighbourhood Watch Scotland, Ready Scotland and others to share our resources and help to promote preparedness and understanding of how flood risk is managed.

Local authorities

Local authorities work together for flood risk management planning purposes through a single lead authority which has the responsibility to produce a Local Flood Risk Management Plan. Local authorities have been working collaboratively in the manner described above to develop these.

It is the responsibility of your local authority to implement its flood protection actions agreed within the Flood Risk Management Strategy, including to new schemes or works and the requirement to clearance and repair of watercourses. You can help your local authority to manage flooding by letting them know if debris is blocking watercourses or if flood defences are tampered with.

During severe flooding, local authorities will work with the emergency services and coordinate shelter for people evacuated from their homes.

The lead authority for the Tay Estuary and Montrose Basin Local Plan District is:

- Angus Council

Other local authorities who are responsible authorities for the Tay Estuary and Montrose Basin Local Plan District are:

- Perth and Kinross Council;
- Aberdeenshire Council;
- Fife Council and
- Dundee City Council

Scottish Water

Scottish Water is a responsible authority for flood risk management and is working closely with SEPA, local authorities and other responsible authorities to coordinate plans to manage flood risk.

Scottish Water is responsible for the drainage of surface water from roofs and paved ground surfaces within a property boundary. Scottish Water can help to protect properties from flooding caused by overflowing or blocked sewers. To find out more about waste water flooding visit the Scottish Water website.

National Parks

The two National Park Authorities, Loch Lomond and Trossachs National Park and Cairngorms National Park, were designated as responsible authorities for flood risk management purposes in 2012. Both have worked with SEPA, local authorities and Scottish Water to help develop Flood Risk Management Strategies and Local Flood Risk Management Plans. They also fulfil an important role in land use planning, carrying out or granting permission for activities that can play a key role in managing and reducing flood risk.

Cairngorms National Park is a responsible authority for the Tay Estuary and Montrose Basin Local Plan District.

Other organisations

- The Scottish Government oversees the implementation of the Flood Risk Management (Scotland) Act 2009 which requires the production of Flood Risk Management Strategies and Local Flood Risk Management Plans. Scottish Ministers are responsible for setting the policy framework for how organisations collectively manage flooding in Scotland. Scottish Government has also approved this Flood Risk Management Strategy.
- Scottish Natural Heritage has provided general and local advice in the development of this Flood Risk Management Strategies. Flooding is seen as natural process that can maintain the features of interest at many designated sites, so Scottish Natural Heritage helps to ensure that any changes to patterns of flooding do not adversely affect the environment. Scottish Natural Heritage also provides advice on the impact of Flood Protection Schemes and other land use development on designated sites and species.
- Forestry Commission Scotland was designated in 2012 as a responsible authority for flood risk management planning purposes and has engaged in the development of the Flood Risk Management Strategies through national and local advisory groups. This reflects the widely held view that forestry can play a significant role in managing flooding.
- During the preparation of the first flood risk management plans Network Rail and Transport Scotland have undertaken works to address flooding at a number of frequently flooded sites. Further engagement is planned with SEPA and local authorities to identify areas of future work. There is the opportunity for further works to be undertaken during the first flood risk management planning cycle although locations for these works are yet to be confirmed.
- Utility companies have undertaken site specific flood risk studies for their primary assets and have management plans in place to mitigate the effects of flooding to their assets and also minimise the impacts on customers.
- The Met Office provides a wide range of forecasts and weather warnings. SEPA and the Met Office work together through the Scottish Flood Forecasting Service.
- The emergency services provide emergency relief when flooding occurs and can coordinate evacuations. You should call the emergency services on 999 if you are concerned about your safety or the safety of others and act immediately on any advice provided.
- Historic Environment Scotland considers flooding as part of their regular site assessments. As such, flooding is considered as one of the many factors which inform the development and delivery of its management and maintenance programmes.

Annex 4: Consultation and Engagement

It is essential that any action taken on flooding is informed by the best available data. The 2009 Act therefore required that the draft Flood Risk Management Strategies and corresponding supplementary parts of Local Flood Risk Management Plans be put to public consultation. SEPA and the lead local authorities were required to coordinate their consultation arrangements during the production of these documents.

The purpose of the consultation was to seek views from everyone including individuals, businesses and interested community groups at risk of flooding as well as organisations with an interest in how flood risk is managed and delivered.

The public consultation was delivered through a phased approach which was approved by the Scottish Ministers. The first phase commenced on 22 December 2014 and the second on 2 March 2015. The consultation closed on 2 June 2015.

The consultation was a web based exercise carried out jointly with SEPA and the other responsible authorities. The Citizen Space platform was used to host the consultation. Hard copies of the consultation documents were also placed in the Council's Perth and Area offices. Consultation questions were developed to stimulate a response and respondents were also given the opportunity to make comment.

In order to encourage appropriate participation in the public consultation the Angus Council placed public notices in newspapers circulating in the TEAMB LPD and the Council wrote to other responsible authorities, Category 1 Responders, SEPA, SNH and the national park authorities.

The Council also wrote to community councils and advertised the consultation online, in newspapers and through social media. Hard copies of the consultation documents were made available in the Council's headquarters in Forfar. The other responsible authorities in the TEAMB LPD also followed out similar arrangements.

The TEAMB LPD received a total of eight responses; two of which were from local flood groups and one of which was from a public body. One of the respondents did not answer any of the questions. The summary of the responses are as follows:

Individual (07/02):

Happy with characterisation
Mostly happy with objectives

The respondent feels that dredging should be carried out on the watercourse through Fettercairn and feels that the actions should be carried out in a shorter timeframe.

Falkland Flood Action Group (07/19):

Mostly happy with characterisation however has concerns regarding timescales and is unhappy that Falkland has no specific objectives. The respondent feels that SEPA and local authorities are not being ambitious enough and refers to the Dutch example where "no property should flood". They feel that Falkland should have a specific plan and flood warning system.

Aberdeenshire Council:

The respondent was strongly supportive of all aspects of the proposals.

Individual (07/18):

The flooding on the 12 October 2012 in Pitscottie and Dura Den resulting in the C54 being washed away has not been recorded.

The respondent raises issues with flooding in Pitscottie and the Council's reluctance to adopt and maintain their garden wall as part of the flood protection scheme protecting the village. They feel that the entire length of the wall should be taken under council control to ensure that there are no gaps in the protection of the village.

They also raised concerns regarding the ownership of the weir at Dura Den and attributed the 2012 flooding to its blockage.

Individual (07/18):

The respondent highlighted three issues that they felt were key.

All walls and embankments bordering the Pitscottie Burn should be upgraded to flood defences and taken under the responsibility of Fife Council.
The burn must be regularly cleared.

All ditches and offlets should be kept clear.

Individual (07/02):

The respondent requests that clearance and repair should be a statutory duty and feels that the 50 properties threshold is too high. Flood warning should be given to 10 properties or less and a 2 hour warning should be given.

They feel that the calculated damages for the area are not high enough.

They feel that the Fettercairn sewage works is at risk and has not been noted in the characterisation

They feel that the historical flooding in Fettercairn has not been noted.

Fettercairn Flood Group (07/02):

The respondent requests that clearance and repair should be a statutory duty and feels that the 50 properties threshold is too high. Flood warning should be given to 10 properties or less and a 2 hour warning should be given.

They feel that the calculated damages for the area are not high enough.

They feel that the Fettercairn sewage works is at risk and has not been noted in the characterisation.

They feel that the historical flooding in Fettercairn has not been noted.

Overview

The responses were generally in agreement with the characterisation but felt that actions were too vague and timescales were ill defined. This issue should be resolved with the preparation of the flood risk management plans.

The issue of clearance and repair was highlighted emphasising how important it is to ensure a regime is in place and schedule is available.

The responses were generally very detail oriented and highlighted issues that were personally important to the respondents rather than critical of the wider process.

There was a consensus that the 50 property thresholds were set too high.

Several historic flood events were highlighted, it is not clear if these were reported but filtered out by SEPA or the Local Authorities as their magnitude was deemed to be too low.

Issues were raised regarding the accuracy of some of the cost estimates relating to damages. This may be related to the use of Annual Average Damages (AAD) within the characterisation rather than damages from a specific event experienced by the community. AAD are a statistical measure of likely damages in any given year and are not meant to represent the impact of an individual flood event. It is a metric that is used to allow comparison of damages between different areas.

Issues were raised with the apparent ambiguity and contradictions between identified actions for an area. Respondents were also concerned that the proposed timescales for implementing the measures were too long. Some of these concerns will be addressed with the publication of the Local Flood Risk Management Plan (the consultation was on the Local Flood Risk Management Strategy). The plan will outline the chosen actions and the timescales in which they should be implemented. The contradictions in the strategy were due to SEPA and the Local Authorities wanting to put all viable options on the table for people's input. As this is a long term plan for dealing with flood risk nationally; it may not be possible to accelerate the timescales enough to meet people's expectations.

A common theme was that the Local Authority should take greater responsibility for flood risk and adopt structures that reduce flood risk. It should be highlighted that the primary responsibility for protection from flood risk lies with the individual. Local Authorities have a general duty to manage flood risk however these powers are permissive.

Several of the issues raised will be addressed through later stages of the plan or have been addressed already. The respondents were correct to highlight concerns but these should be allayed once the plans and strategies have been published.

However, as reported to Angus Council Communities Committee of 18 August 2015 (reference Report No 297/15), the responses received were not considered significant and therefore no allowance needs to be made in the development of the Local Flood Risk Management Plans.

The following councils presented the findings of their consultation to elected members as follows:

Angus Council

Angus Council presented the findings of the consultation to their elected members on 18 August 2015 (reference Report No 297/15):

http://www.angus.gov.uk/download/meetings/id/1337/agenda_item_no_12_-_report_no_29715_-_flood_risk_management_scotland_act_2009_arbroath_flood_strategy_and_arbroath_brothock_water_flood_prevention_scheme_updates

Aberdeenshire Council

Aberdeenshire Council presented a bulletin report to their elected members on 20 August 2015:

<http://committees.aberdeenshire.gov.uk/committees.aspx?commid=7&meetid=18157>

Dundee City Council

Dundee City Council did not report to Committee on Consultations

Fife Council

Fife Council presented the findings of the consultation to their elected members on 23 June 2015 as detailed here:

<http://www.fifedirect.org.uk/publications/index.cfm?fuseaction=publication.pop&pubid=00D35649-0D6A-6C03-88A22B9F288F29A8> under item No. 17

Perth & Kinross Council

Perth and Kinross Council presented the findings of the consultation in a report to their Environment Committee on 9 September 2015. The committee report can be viewed here:

<http://www.pkc.gov.uk/CHttpHandler.ashx?id=32972&p=0>

Annex 5: Links to other plans, policies, strategies and legislative requirements

S18 Schedule of Clearance and Repair

The following are links for each local authority to access schedules of clearance and repair under Section 18 of the Flood Risk Management (Scotland) Act 2009:

Local Authority	Method of public access to the S18 Schedule
Angus Council	Angus Council Schedule of Clearance and Repair is available at: - County Buildings, Market Street, Forfar, Angus, DD8 3WE
Aberdeenshire Council	Aberdeenshire Council Schedule of Clearance and Repair can be made available for public inspection at: - Woodhill House, Westburn Rod, Aberdeen, AB16 5GB
Perth & Kinross Council	1.0 The Perth & Kinross Council Schedule of Clearance & Repair is available at the following web address: http://www.pkc.gov.uk/CHttpHandler.ashx?id=22028&p=0
Dundee City Council	Dundee City Council Schedule of Clearance and Repair is available at: -50 North Lindsay Street, Dundee, DD1 1QE
Fife Council	Fife Council's Schedule of Clearance & Repair is available at the following web address: http://www.fifedirect.org.uk/topics/index.cfm?fuseaction=page.display&p2sid=618DD563-ABBC-ECA5-1675450324EED528&themeid=81E299FB-1BCF-4994-8C8A-233463B738F6

Strategic Environmental Assessment (SEA) and Habitats Regulations Appraisal (HRA)

Information on the SEA and HRA for the TEAMB LPD Plan will be provided as an addendum to this annex.

River Basin Management Plans

SEPA is co-ordinating the delivery of River Basin Management Plans and Flood Risk Management Strategies, and local authorities for Local Flood Risk Management Plans, and they have worked to ensure that there is integration and coordination between them.

Detail on River Basin Management Planning for the Scotland river basin district can be found at:

<http://www.sepa.org.uk/media/163445/the-river-basin-management-plan-for-the-scotland-river-basin-district-2015-2027.pdf>

Local Development Plan

Angus Council	Local Development Plan	http://www.angus.gov.uk/info/20307/local_development_plan
Angus Council	Shoreline Management Plan	http://www.angus.gov.uk/directory_record/11370/angus_council_shoreline_management_plan_ii_smp2/category/204/current_consultations
Angus Council	Strategic Development Plan (TAYplan website)	http://www.tayplan-sdpa.gov.uk/
Perth & Kinross	Local Development Plan	http://www.pkc.gov.uk/CHttpHandler.ashx?id=23633&p=0
Perth & Kinross	Local Development Plan	http://www.pkc.gov.uk/developmentplan
Perth & Kinross	Strategic Development Plan	http://www.tayplansdpa.gov.uk/system/files_force/publications/Approved_TAYplanSDP_June2012_0.pdf?download=1
Perth & Kinross	Strategic Development Plan (TAYPlan Website)	http://www.tayplansdpa.gov.uk/strategic_development_plan
Fife Council	TAYPlan and SESPlan are the soon to be adopted Strategic Development Plans	http://www.fifedirect.org.uk/topics/index.cfm?fuseaction=service.display&p2sid=BA85256B-C559-16FB-C2D8A09D3FEB7E83&themeid=2B482E89-1CC4-E06A-52FBA69F838F4D24
Fife Council	Local Development Plan due to be adopted in 2016	http://www.fifedirect.org.uk/topics/index.cfm?fuseaction=page.display&p2sid=D61AC1F5-DD4B-CE6A-51E3BDDDED79D5ABC&themeid=2B482E89-1CC4-E06A-52FBA69F838F4D24
Fife Council	Adopted St Andrews & East Fife Local Plan	http://fife-consult.objective.co.uk/portal/local_view_fusion/eflp/eflp

Fife Council	Adopted Mid Fife Local Plan	http://fifeconsult.objective.co.uk/portal/local_view_fusion/mid_fife_local_plan/mflp
Fife Council	Adopted Dunfermline & West Fife Local Plan	http://fifeconsult.objective.co.uk/portal/local_view_fusion/dunfermlinewest_fife_local_plan/wflp
Fife Council	South East Scotland and Tay Strategic Transport Plans	http://www.sestran.gov.uk/ http://www.tactran.gov.uk/
Fife Council	Shoreline Management Plan	http://www.fifedirect.org.uk/minisites/index.cfm?fuseaction=page.display&pageid=C040877C-B767-3F71-8454BE5167C5BC58&siteID=C03E446A-0241-A6A5-
Dundee City Council	Local Development Plan & Tayplan Strategic Development Plan	http://www.dundee.gov.uk/localdevplan
Aberdeenshire Council	Local Development Plan	https://www.aberdeenshire.gov.uk/planning/plans-and-policies/the-proposed-aberdeenshire-local-development-plan-2016-shaping-aberdeenshire/

Emergency Plans

Councils have developed a Generic Emergency Plan and a Flooding Emergency Response Plans. These Plans are designed to ensure that contingency measures are in place for the co-ordinated and flexible response to flooding incidents to mitigate the effects of flooding emergencies.

SEPA flood alerts and warnings will be monitored and resources made ready as required. A co-ordinated response will follow any reports of flooding. Emergency response is coordinated with regional and local resilience partnerships. This response may be supported by the work of voluntary organisations. A debrief and plan review will be carried out following any flood events.

Protecting property from flooding is the responsibility of the owner of the property. Councils can sometimes provide sandbags to properties. Unfortunately the Council only has the resources to supply sandbags to residents where there is an imminent risk of flooding.

Details of the Emergency Plans/Responses from each local authority in TEAMB LPD can be found as follows:

Angus Council:

- http://www.angus.gov.uk/info/20269/emergency_planning_and_information
- http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjc4PjnwwXMAhWpBcAKHRZLD7UQFggcMAA&url=http%3A%2F%2Fwww.angus.gov.uk%2Fdownload%2Fdownloads%2Fid%2F970%2Fangus_council_emergency_plan.pdf&usg=AFQjCNG4fet6PZdBnkGKpFn0vWp3N9axLq
- <http://www.angus.gov.uk/info/20397/flooding>

Aberdeenshire Council:

- <https://www.aberdeenshire.gov.uk/communities-and-events/planning-for-emergencies/>
- <https://www.aberdeenshire.gov.uk/environment/flooding/flooding>

Dundee City Council:

- <https://www.dundee.gov.uk/emergencyplanning>
- <https://civilcontingencies.dundee.gov.uk/dcc-plans/Flood%20Plan%20Rev%2005%20March%2009.pdf>

Fife Council:

- <http://www.fifedirect.org.uk/topics/index.cfm?fuseaction=subject.display&subjectid=496DB758-E065-457E-93FB-C7C340E0CA1A&themeid=2B892409-722D-4F61-B1CC-7DE81CC06A90>
- <http://www.fifedirect.org.uk/topics/index.cfm?fuseaction=page.display&p2sid=A641DE1D-AE9F-BC4D-1CEB8DE7C190273C&themeid=2B892409-722D-4F61-B1CC-7DE81CC06A90>

Perth & Kinross Council:

- <http://www.pkc.gov.uk/emergencies>
- <http://www.pkc.gov.uk/flooding>

Integrated Catchment Management Studies

A catchment map for the Tayside Integrated Catchment Study, which is being undertaken within the LPD by a partnership led by Scottish Water with Dundee City Council, Angus Council and Perth & Kinross Council, is shown below.



Appendix A

- Foul Sewer
- Surface Water
- Combined Sewer
- - - - - Rising Main
- Watercourses



**STW001805 - Tay Hatton
Integrated Model Scoping
Catchment Plan**

CLEAR ENVIRONMENTAL LIMITED



DRAWN BY RN	SCALE NTS	DATE OCT 2011	REVISION A
CHECKED BY IMcL	DRG. NO. Appendix A		

Based upon the Ordnance Survey's 1:25,000 scale vector maps with the permission of the Controller of Her Majesty's Stationery Office (© Crown Copyright)

Annex 6: Glossary

TERMINOLOGY	DEFINITION
Accretion	Accumulation of sediment.
Annual Average Damages (AAD)	Depending on its size or severity, each flood will cause a different amount of damage to a flood prone area and we can calculate the cost of this damage. Annual Average Damages for an area are the average costs per year that would occur from flooding over a very long period of time. Scottish figures have been calculated based on the method set out in the Flood Hazard Research Centre's Multi-Coloured Handbook (2010).
Appraisal	A method designed to set objectives and identify the most sustainable combination of actions to tackle flooding from rivers, the coast and urban surface water.
Appraisal baseline	Defines the existing level of flood risk under the current flood risk management regime.
Area of benefit (AOB)	An area which has benefited from a flood defence or flood protection scheme and is now at a reduced risk of flooding relative to the scheme's standard of protection.
Assets	Flood risk assets are structures and features which are likely to have a significant effect on flood risk. These can include pumping stations, culverts, walls and river banks.
Bathing waters	Bathing waters are classed as protected areas under Annex IV of the Water Framework Directive (WFD). There are 84 designated bathing waters in Scotland ⁱ
Benefit cost ratio	Benefit cost ratio is a way of expressing benefits from a project as a ratio of project costs. If the ratio is greater than 1:1 then the project is deemed to represent value for money and should be taken forward.
Blue infrastructure	Blue infrastructure is often complementary to 'green infrastructure' and includes sustainable drainage systems, swales (shallow, broad and vegetated channels designed to store and/or convey runoff and remove pollutants ⁱⁱ), wetlands, rivers, canals (and their banks) and other watercourses ⁱⁱⁱ
Bund	See flood bund

Candidate Potentially Vulnerable Area (PVAc)	Candidate PVAs are those areas identified after the National Flood Risk Assessment (2011) as a result of new information where the impact of flooding is potentially sufficient to justify further assessment and appraisal. They will be considered for inclusion as new PVAs in the next flood risk management planning cycle.
Catchment	All the land drained by a river and its tributaries.
Category 1 and 2 Responders (Cat 1 / 2)	Category 1 and 2 responders are defined as part of the Civil Contingencies Act 2004 which seeks to minimise disruption in the event of an emergency. Category 1 responders are 'core' responders: local authorities, police, fire and rescue services, ambulance service, NHS health boards, SEPA and the Maritime and Coastguard Agency. IV Category 2 responders are key co-operating responders in support of Category 1 responders. These include gas and electricity companies, rail and air transport operators, harbour authorities, telecommunications providers, Scottish Water, the Health and Safety Executive and NHS National Services Scotland
Channel (capacity) improvement	Where work has been carried out on a river channel allowing an increase in the volume of water it can carry.
Characterisation	Provides a description of the natural characteristics of catchment, coastlines and urban areas in terms of hydrology, geomorphology, topography and land use. It also includes the characterisation of existing levels of flood risk and existing flood risk management activity.
Coastal flooding	Flooding that results from sea level rise or a combination of high tides and stormy conditions. The term coastal flooding is used under the Flood Risk Management (Scotland) Act 2009, but in some areas it is also referred to as tidal flooding and covers areas such as estuaries and river channels that are influenced by tidal flows.
Combined sewer (overflow) (CSO)	Combined sewers transport sewage from homes and industry as well as carrying surface water runoff from gutters, drains and some highways. Heavy or prolonged rainfall can rapidly increase the flow in a combined sewer until the amount of water exceeds sewer capacity. Combined sewer overflows are purposely-designed structures to ensure any excess water from sewerage systems is discharged in a controlled way and at a specific managed location.

Community facility	Within the FRM Strategies this term includes care homes, nursing homes, schools, nurseries, universities, police stations, health centres, hospitals, fire stations, GPs and dental surgeries.
Competent Authority	SEPA's designation
Confluence	Where two or more rivers meet.
Cultural heritage site	Sites of particular cultural significance may be designated. The highest level of designation is a World Heritage Site. Historic Environment Scotland maintains lists of buildings of special architectural or historic interest; these buildings are referred to as 'listed buildings'.
Culvert	A conduit used for the conveyance of a watercourse or surface drainage water under a roadway, railroad, canal or other impediment.
Damages	See 'Annual Average Damages', 'direct damages', 'indirect damages'.
Demountable defences	A temporary flood barrier is one that is only installed when the need arises, that is, when high flood levels are forecast. A demountable flood defence is a particular form of temporary defence that requires built-in parts and therefore can only be deployed in one specific location
Deposition	A natural process leading to an accumulation of sediment on a river bed, floodplain or coastline.
Direct damages	Defined in the appraisal process as immediate damages to the receptor as a result of flooding (e.g. damages to the fabric or content of buildings, clean-up costs). ^{iv}
Floods Directive	European Directive 2007/60/EC on the Assessment and Management of Flood Risks builds on and is closely related to the Water Framework Directive (see river basin management planning). It was transposed into Scots Law by the Flood Risk Management (Scotland) Act 2009. The Directive requires Member States to assess if all watercourses and coastlines are at risk from flooding, to map the flood extent, assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk
Economic impact	An assessment of the economic value of the positive and negative effects of flooding and the actions taken to manage floods.
Embankment	Flood embankments are earthfill structures designed to contain high river levels. They are commonly grass-covered, but may need additional protection against erosion by swiftly flowing water, waves or overtopping

Environmental impact	A change in the environment that could have a negative or positive effect on the ecosystem.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment (EIA) is a process which identifies the potential environmental effects, both negative and positive, of a proposal.
Environmental sites / environmental designated areas/ environmentally designated sites	Areas formally designated for environmental importance, such as Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA) or Special Areas of Conservation (SAC).
Episodic erosion	Erosion induced by a single event such as a storm.
Erosion	A natural process leading to the removal of sediment from a river bed, bank or floodplain or coastline.
Estuarine surge attenuation	How an estuary influences the dissipation of coastal surges caused by tides or weather.
Estuary	A coastal body of water usually found where a river meets the sea; the part of the river that is affected by tides.
Fault (fault line)	A break or fracture in the ground that occurs when the Earth's tectonic plates move. In Scotland the Highland Boundary Fault is the major geological fault line cutting diagonally across the Highlands from Fort William to Inverness. It is also known as the Great Glen.
Fetch	The distance travelled by wind or waves across open water.
Flash flood	A flash flood is a flood that occurs in a short period of time after high intensity rainfall or a sudden snow melt. A sudden increase in the level and velocity of the water body is often characteristic of these events. Rising water levels in the river network can reach a peak within minutes to a few hours of the onset of the flood event, leaving a short time for warning or actions.
Flashy watercourse	A 'flashy' river or watercourse has a short lag time (the delay between peak rainfall intensity and peak river discharge), high peak discharge, and quickly returns to average flow. Rivers with these characteristics can be more likely to flood and leave a short time for warning or actions.
Flood	A flood can be defined as the period of time flooding is expected, occurs and drains away. It causes significant adverse impacts on people, property, environment or infrastructure and is not a result of regular weather or infrastructure drainage.
Flood bund	A constructed retaining wall, embankment or dyke designed to prevent flooding.

Flood defence	Infrastructure, such as flood walls and embankments, intended to protect an area against flooding to a specified standard of protection.
Flood extent	The area that has been affected by flooding, or is at risk of flooding from one or more sources.
Flood frequency	How often we expect a flood to happen (see likelihood).
Flood gate	An adjustable, sometimes temporary, barrier used as a flood defence to control the flow of water within a water system or during a flood.
Flood hazard	In terms of the FRM Act, hazard refers to the characteristics (extent, depth, velocity) of a flood.
Flood hazard map	Required by the FRM Act to show information that describes the nature of a flood in terms of the source, extent, water level or depth and velocity of water, where appropriate.
Flood Prevention Scheme / Flood Protection Scheme (FPS)	Flood defence measures (flood prevention schemes) formerly promoted under the Flood Prevention (Scotland) Act 1961 can now be taken forward under the FRM Act by a local authority to reduce flood risk. A flood protection scheme, as defined by the FRM Act, is a scheme by a local authority for the management of flood risk within the authority's area.
Flood protection study	A detailed assessment of an area for flood risk. The study may assess what is at risk of flooding with more accuracy and provide options for dealing with the risk of flooding.
Flood protection works	Flood protection works can include the same flood defence measures that would make up a flood protection scheme but without the legal requirements, process and protections that would come by designating the works as a scheme.
Flood risk	A measure of the combination of the likelihood of flooding occurring and the associated impacts on people, the economy and the environment.
Flood Risk Assessment (FRA)	Flood Risk Assessments are detailed studies of an area where flood risk may be present. These are often used to inform planning decisions, develop flood schemes and they also contributed to the National Flood Risk Assessment.
Flood Risk Management (Scotland) Act 2009 (FRM Act)	The flood risk management legislation for Scotland. It transposes the EC Floods Directive into Scots Law and aims to reduce the adverse consequences of flooding on communities, the environment, cultural heritage and economic activity.
Flood risk management cycle	Under the FRM Act flood risk management planning is to occur in six year cycles. The first cycle is 2015 – 2021.

Flood Prevention (Scotland) Act 1961	The Flood Prevention (Scotland) Act 1961 gave local authorities discretionary powers to make and build flood prevention schemes. It was superseded by the Flood Risk Management (Scotland) Act 2009.
Flood Risk Management Local Advisory Groups	FRM Local Advisory Groups are stakeholder groups convened to advise SEPA and lead local authorities in the preparation of Flood Risk Management Plans. SEPA and lead local authorities must have regard to the advice they provide.
Flood Risk Management Plans (FRM Plans)	A term used in the FRM Act. FRM Plans set out the actions that will be taken to reduce flood risk in a Local Plan District. They comprise Flood Risk Management Strategies, developed by SEPA, and Local Flood Risk Management Plans produced by lead local authorities.
Flood Risk Management Strategy (FRM Flood Risk Management Strategy)	Sets out a long-term vision for the overall reduction of flood risk. They contain a summary of flood risk in each Local Plan District, together with information on catchment characteristics and a summary of objectives and actions for Potentially Vulnerable Areas.
Flood risk map	Builds on flood hazard maps providing detail on the impacts of flooding on people, the economy and the environment.
Flood wall	A flood defence feature used to defend an area from flood water.
Flood Warning area (FWA)	A Flood Warning area is where SEPA operates a formal Flood Monitoring Scheme to issue targeted Flood Warning messages for properties located in the area. ^{vi}
Flood warning scheme	A flood warning scheme is the network of monitoring on a coastal stretch or river, which provides SEPA with the ability to issue Flood Warnings.
Floodplain	Area of land that borders a watercourse, an estuary or the sea, over which water flows in time of flood, or would naturally flow but for the presence of flood defences and other structures where they exist.
Floodplain storage	Floodplains naturally store water during high flows. Storage can be increased through natural or man-made features to increase flood depth or slow flows to reduce flooding elsewhere.
Fluvial flooding	Flooding from a river or other watercourse.
Gabion	A metal cage filled with rocks to walls often used in river bank protection.

Green infrastructure	The European Commission defines green infrastructure as “the use of ecosystems, green spaces and water in strategic land use planning to deliver environmental and quality of life benefits. It includes parks, open spaces, playing fields, woodlands, wetlands, road verges, allotments and private gardens. Green infrastructure can contribute to climate change mitigation and adaptation, natural disaster risk mitigation, protection against flooding and erosion as well as biodiversity conservation.” See also ‘blue infrastructure’x
Floodplain storage	Floodplains naturally store water during high flows. Storage can be increased through natural or man-made features to increase flood depth or slow flows to reduce flooding elsewhere.
Groundwater flooding	This type of flooding is caused by water rising up from underlying rocks or flowing from springs. Groundwater is generally a contributing factor to flooding rather than the primary source.
Hydrometric areas	These are either whole river catchments having one or more outlets to the sea or tidal estuary, or they may include several connected river catchments having similar surface features but with separate tidal outlets.xi There are 107 hydrometric areas in the UK, 45 of which are in Scotland.
Indirect damages	Defined in the appraisal process as damages incurred due to the knock on effects of flooding such as disruption, evacuation, costs to emergency services, loss of income or earnings/industrial production. (See also ‘direct damages’).
Integrated catchment study (ICS)	In urban areas, the causes of flooding are complex because of the interactions between rivers, surface water drainage and combined sewer systems and tidal waters. Scottish Water works with SEPA and local authorities to assess these interactions through detailed studies.
Land use planning (LUP)	The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups.

Likelihood of flooding	<p>The chance of flooding occurring. High likelihood: A flood is likely to occur in the defined area on average once in every ten years (1:10). Or a 10% chance of happening in any one year.</p> <p>Medium likelihood: A flood is likely to occur in the defined area on average once in every two hundred years (1:200). Or a 0.5% chance of happening in any one year.</p> <p>Low likelihood: A flood is likely to occur in the defined area on average once in every thousand years (1:1000). Or a 0.1% chance of happening in any one year.</p>
Local Development Plans	<p>Each local authority area in Scotland is covered by a Local Development Plan, which sets out where most new developments are proposed and the policies that will guide decision-making on planning applications. The four main city regions in Scotland (Aberdeen, Dundee, Edinburgh and Glasgow) are also covered by a Strategic Development Plan which sets out the long-term development of the city region and deals with region-wide issues such as housing and transport.</p>
Local Flood Risk Management Plans (Local FRM Plan)	<p>Local Flood Risk Management Plans, produced by lead local authorities, will take forward the objectives and actions set out in Flood Risk Management Strategies. They will provide detail on the funding, timeline of delivery, arrangements and co-ordination of actions at the local level during each six year FRM planning cycle.</p>
Local Nature Reserve	<p>Local nature reserves are areas of at least locally important natural heritage, designated and managed by local authorities to give people better opportunities to learn about and enjoy nature close to where they live. Local authorities select and designate local nature reserves using their powers under the National Parks and Access to the Countryside Act 1949</p>
Local Plan District	<p>Geographical areas for the purposes of flood risk management planning. There are 14 Local Plan Districts in Scotland.</p>
Local Plan District Partnerships	<p>Each LPD has established a local partnership comprised of local authorities, SEPA, Scottish Water and others as appropriate. These partnerships are distinct from the FRM Local Advisory Groups and they retain clear responsibility for delivery of the FRM actions set out in the Local Flood Risk Management Plans. It is the local partnership that makes decisions and supports the delivery of these plans.</p>

Montane habitat	This habitat encompasses a range of natural or near-natural vegetation occurring in the montane zone, lying above or beyond the natural tree-line.
National Flood Management Advisory Group (NFMAG)	The National Flood Management Advisory Group provides advice and support to SEPA and, where required, Scottish Water, local authorities and other responsible authorities on the production of FRM Strategies and Local FRM Plans.
National Flood Risk Assessment (NFRA)	A national analysis of flood risk from all sources of flooding which also considers climate change impacts. Completed in December 2011 this provides the information required to undertake a strategic approach to flood management that identifies areas at flood risk that require further appraisal. The NFRA will be reviewed and updated for the second cycle of FRM Planning by December 2018.
Natural flood management (NFM)	A set of flood management techniques that aim to work with natural processes (or nature) to manage flood risk.
Non-residential properties	Properties that are not used for people to live in, such as shops or other commercial or industrial type buildings.
Objectives	Measurable goals relating to managing flood risk. The Flood Risk Management Strategies for each of the 14 Local Plan Districts in Scotland will set out objectives to reduce flood risk and actions to achieve those objectives.
One in 200 year flood	See 'likelihood of flooding' and 'return period'.
Potentially Vulnerable Areas (PVA)	Catchments identified as being at risk of flooding and where the impact of flooding is sufficient to justify further assessment and appraisal. There were 243 PVAs identified by SEPA in the National Flood Risk Assessment and these will be the focus of the first FRM planning cycle.
Probability	The chance of a flood occurring within a given time. This is also expressed as likelihood of flooding as in the SEPA flood maps.
Property level protection	Property level protection includes flood gates, sandbags and other temporary barriers that can be used to prevent water from entering individual properties during a flood.
Property level protection scheme	Some responsible authorities may have a formal scheme to provide, install and maintain property level protection for properties.
Ramsar sites	Ramsar sites are wetlands of international importance designated under the Ramsar Convention.

Receptor	Refers to the entity that may be impacted by flooding (a person, property, infrastructure or habitat). The vulnerability of a receptor can be modified by increasing its resilience to flooding.
Residual risk	The risk that remains after risk management and mitigation. This may include risk due to very severe (above design standard) storms or risks from unforeseen hazards.
Resilience	The ability of an individual, community or system to recover from flooding.
Responsible	Designated under the FRM (Scotland) Act 2009 and associated legislation as local authorities, Scottish Water and, from 21 December 2013, the National Park Authorities and Forestry Commission Scotland. Responsible authorities, along with SEPA and Scottish Ministers, have specific duties in relation to their flood risk related functions.
Return period	The average period of time between occurrences of a flood event. The longer the return period, the rarer the event. (See also 'likelihood of flooding'.)
Revetment	Sloping structures placed on banks or at the foot of cliffs in such a way as to deflect the energy of incoming water.
Riparian	The riparian area is the interface between land and a river or stream. For the purposes of FRM this commonly refers to the riparian owner, which denotes ownership of the land area beside a river or stream.
River basin district	Geographic areas over which River Basin Management and Flood Risk Management Plans are prepared. In Scotland there are two River Basin Districts identified under the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act) - one for the Solway/Tweed area and one covering the rest of Scotland.
River basin management planning (RBMP)	The Water Environment and Water Services (Scotland) Act 2003 transposed the European Water Framework Directive into Scots law. The Act created the River Basin Management Planning process to achieve environmental improvements to protect and improve our water environment. It also provided for regulations to control the negative impacts of all activities likely to have an impact on the water environment.
Runoff reduction	Actions within a catchment or sub-catchment to reduce the amount of runoff during rainfall events. This can include intercepting rainfall, storing water, diverting flows or encouraging infiltration.

Scottish Advisory and Implementation Forum for Flooding (SAIFF)	The stakeholder forum on flooding set up by the Scottish Government to ensure legislative and policy aims are met and to provide a platform for sharing expertise and developing common aspirations and approaches to reducing the impact of flooding on Scotland's communities, environment, cultural heritage and economy.
Scottish Government's Rural Payments and Inspections Directorate	Part of the Scottish Government which has the most direct dealings with Scotland's land managers, including processing grant applications and payments, carrying out inspections, plant health visits and estate management.
Sediment balance	Within a river where erosion and deposition processes are equal over the medium to long-term resulting in channel dimensions (width, depth, slope) that are relatively stable.
Sewer flooding (and other artificial drainage system flooding)	Flooding as a result of the sewer or other artificial drainage system (e.g. road drainage) capacity being exceeded by rainfall runoff or when the drainage system cannot discharge water at the outfall due to high water levels (river and sea levels) in receiving waters.
Shoreline Management Plan (SMP)	A Shoreline Management Plan is a large scale assessment of the coastal flood and erosion risks to people and the developed, historic and natural environment. It sets out a long-term framework for the management of these risks in a sustainable manner.
Site of Special Scientific Interest (SSSI)	Sites of Special Scientific Interest are protected by law under the Nature Conservation (Scotland) Act 2004 to conserve their plants, animals and habitats, rocks and landforms.
Source of flooding	The type of flooding. This can be coastal, river, surface water or groundwater.
Special Area of Conservation (SAC)	Special Areas of Conservation are strictly protected sites designated under the European Habitats Directive. The Directive requires the establishment of a European network of protected areas which are internationally important for threatened habitats and species.
Special Protection Areas (SPA)	Special Protection Areas are strictly protected sites classified in accordance with the European Birds Directive. They are classified for rare and vulnerable birds (as listed in the Directive), and for regularly occurring migratory species
Standard of protection (SoP)	The flood event return period above which significant damage and possible failure of the flood defences could occur.

Storage area	A feature that can be used to store floodwater, this can be natural in the form of low lying land or manmade such as a large reservoir or modified landform.
Strategic Environmental Assessment (SEA)	A process for the early identification and assessment of the likely significant environmental effects, positive and negative, of activities. Often considered before actions are approved or adopted.
Strategic Flood Risk Assessment (SFRA)	A Strategic Flood Risk Assessment is designed for the purposes of specifically informing the Development Plan Process. A SFRA involves the collection, analysis and presentation of all existing and readily available flood risk information (from any source) for the area of interest. It constitutes a strategic overview of flood risk.
Surcharge	Watercourses and culverts can carry a limited amount of water. When they can no longer cope, they overflow, or 'surcharge'.
Surface water flooding	Flooding that occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead
Surface water management plan (SWMP)	A plan that takes an integrated approach to drainage accounting for all aspects of urban drainage systems and produces long term and sustainable actions. The aim is to ensure that during a flood the flows created can be managed in a way that will cause minimum harm to people, buildings, the environment and business.
Surface water runoff	The flow of water from rain, snow melt or other sources over land.
Sustainable flood risk management	An approach which involves taking actions now to manage the risk of flooding that are robust enough to stand the test of time. There are three pillars of sustainability that must be considered - environmental, social and economic.
Sustainable drainage systems (SuDS)	A set of techniques designed to slow the flow of water. They can contribute to reducing flood risk by absorbing some of the initial rainfall and then releasing it gradually, thereby reducing the flood peak and helping to mitigate downstream problems. SuDS encourage us to take account of quality, quantity and amenity / biodiversity.
Training wall	A wall, bank or jetty built to confine and direct the flow of water.
UK Climate Change Projections (UKCP09)	The leading source of climate change information for the UK. It can help users to assess their climate risks and plan how to adapt to a changing climate.

Utility assets	Within the FRM Strategies this refers to electricity sub stations, mineral and fuel extraction sites, telephone assets, television and radio assets.
Vulnerability	A measure of how likely someone or something is to suffer long-term damage as a result of flooding. It is a combination of the likelihood of suffering harm or damage during a flood (susceptibility) and the ability to recover following a flood (resilience).
Wave energy dissipation	Process by which a wave loses its mechanical energy.
Wave overtopping	Wave overtopping takes place when waves meet a submerged or emerged reef or structure and pass over it.