

## WELCOME TO THIS CONSULTATION ABOUT OPTIONS FOR FLOOD ALLEVIATION

We, the Environment Agency, want to explain our ongoing study considering options for flood alleviation in Yate and Chipping Sodbury. Our study is at an early stage – there is no commitment or funding to take forward any scheme.

### Why consider options for flood alleviation in Yate and Chipping Sodbury?

We are considering options for flood alleviation that would reduce flood risk from the River Frome. (this risk is illustrated in the flood mapping shown on the next poster).

Major flooding from the River Frome and its tributaries affected Yate and Chipping Sodbury in 1968. We estimate that river flooding could affect as many as 100 homes and 40 businesses in a very large flood event (1% chance in each year).

In view of the flood risk we issue flood warnings for low-lying properties at the following locations:

- Yate: Bennetts Court, Station Road, Swan Field, Treeleaze, Orchard Close, Milton Road, Tyndale Avenue, Celestine Road, Blenheim Drive and Whitley Close
- Chipping Sodbury: Blanchards Farm area

River flooding occurs because the channel capacity is inadequate to carry flood flows. The channels of the River Frome and its tributaries have been modified over the years, alongside urban development adjacent to the river corridor. Without flood alleviation, flood risk is predicted to increase due to larger flood flows that a changing climate could create.

The flooding problems can be worsened by surface water runoff from heavy rainfall.

We would like your views on the options for flood alleviation so far considered and will use any feedback to inform our further study

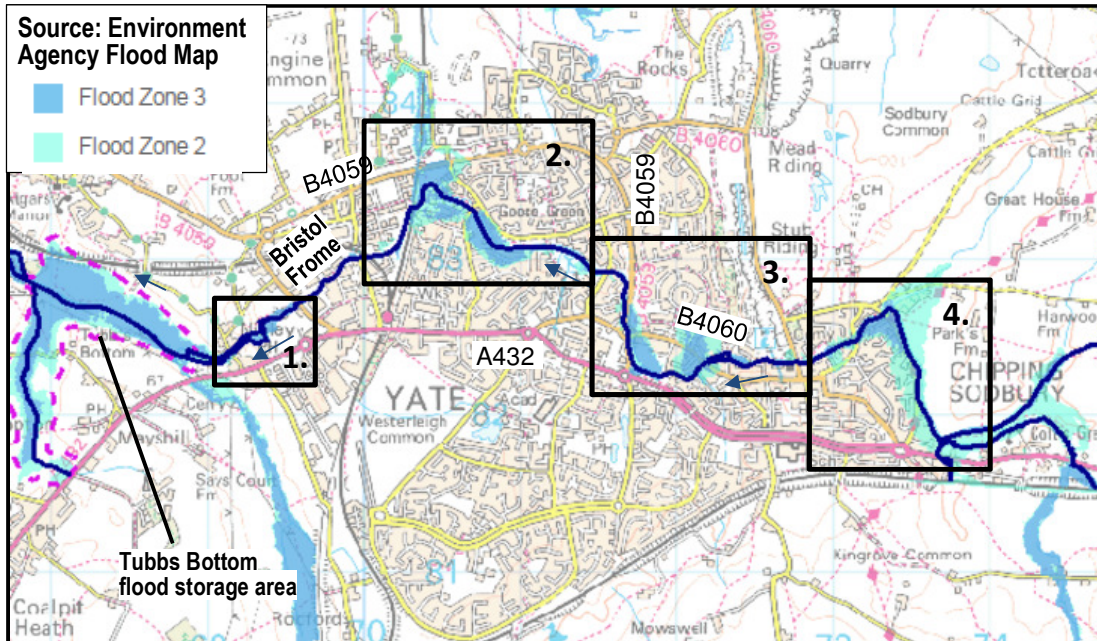


# Yate / Chipping Sodbury Flood Study

Working to make communities more flood resilient



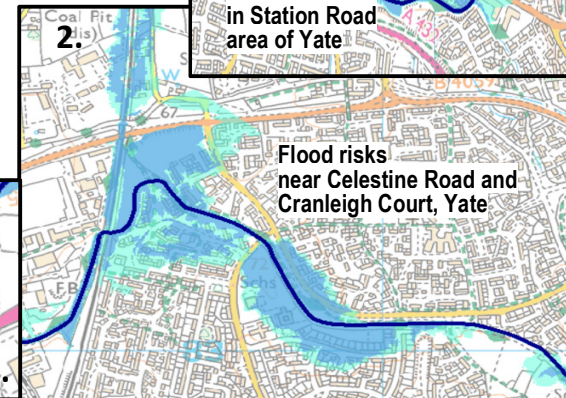
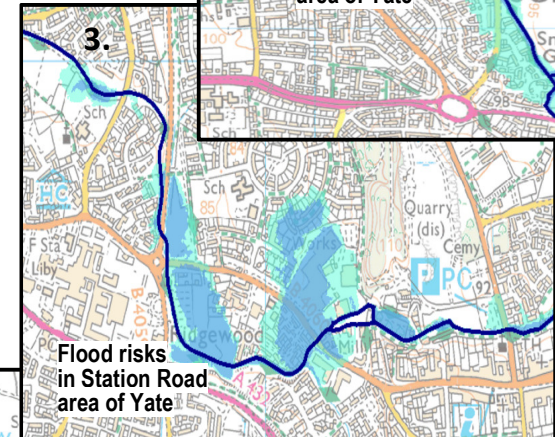
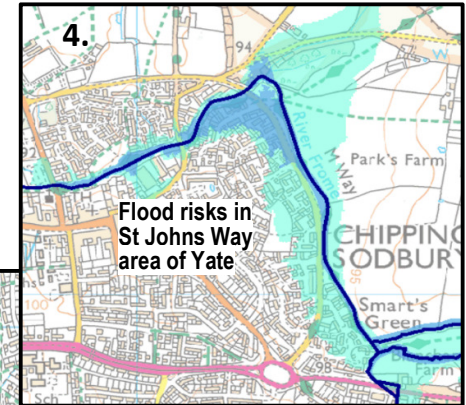
## FLOOD RISKS FROM THE RIVER FROME IN YATE / CHIPPING SODBURY



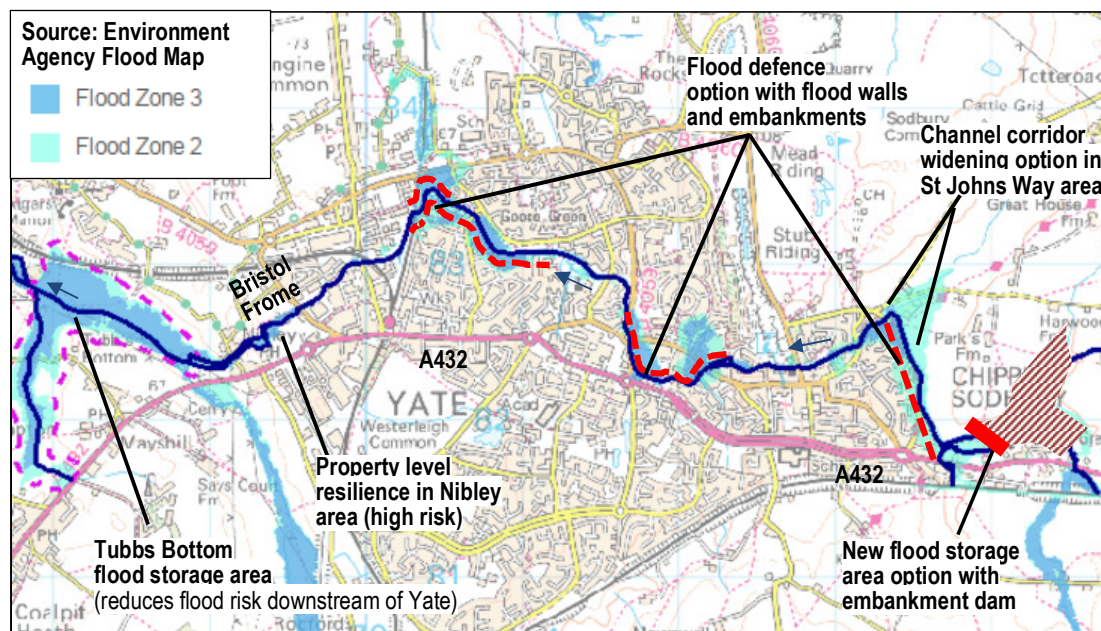
(Source: <http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=en&topic=floodmap>)

### Flood Zones indicate:

- Flood Zone 3: 'high risk' floodplain that could be flooded from a river by a flood with 1% (1 in 100) chance in each year.
- Flood Zone 2: 'medium risk' floodplain – additional extent of a more extreme flood with up to 0.1% (1 in 1000) chance in each year.



## OPTIONS FOR FLOOD ALLEVIATION THAT MAY BE FEASIBLE



### Main benefits:

- Community more resilient against flood risk
- Reduce flood risk to benefit up to 100 homes and 40 businesses
- Reduce flood risk on the A432, B4569, B4060
- Avoid flood damages of £10 Million (indicative estimate only)

### Important considerations for any option:

- Must be viable – benefits outweigh costs.
- Must be affordable – funding at this stage is available only to study options and to review funding sources.
- Must be sustainable, taking into account climate change.
- Must be acceptable to you, the community, and stakeholders
- Must be fully supported by our partners, including
  - South Gloucestershire Council
  - Chipping Sodbury Town Council
  - Yate Town Council.

## INTRODUCING THE OPTIONS FOR FLOOD ALLEVIATION

We are considering various options for flood alleviation in terms of:

- technical effectiveness to reduce flooding
- feasibility from an engineering perspective
- social and environmental impacts
- implementation and future maintenance costs

We shortlisted the following options for further study:

Option	Requirements
Flood Storage	High cost option to build an embankment dam to hold flood water in storage upstream, with a control structure to regulate river flows.
River Channel Corridor Widening	Medium cost option for widening the River Frome channel to benefit the St Johns Way area to increase flood flow capacity.
Property Level Resilience	Low cost option for making the most vulnerable properties more resilient.

The above options are being considered separately and in combination - total cost of about £4M\* (\*this is only a very indicative estimate of cost).

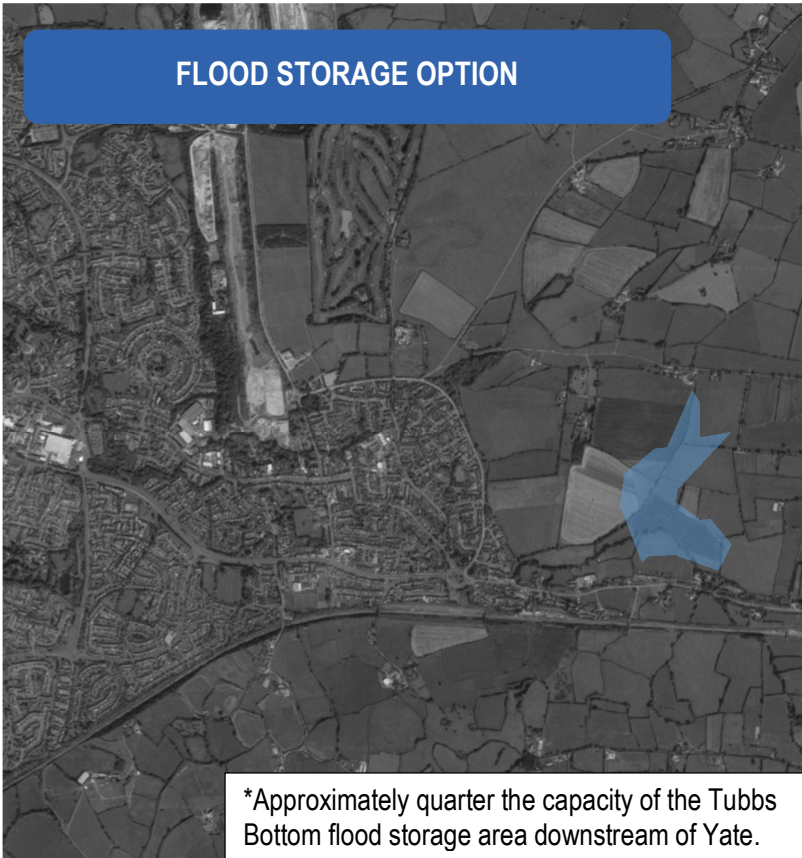
**Rejected option:** Early on in our study we rejected a Flood Defences option due to high cost and sustainability concerns. It would involve building flood walls and embankments along ~1.8km of the river banks at an estimated cost of around £10 Million – this simply would not be not economic (costs outweigh benefits). Refer to previous poster to see where defences would be required.



Flood alleviation downstream of Yate is provided by Tubbs Bottom flood storage area – photo to right shows the outlet structure



## FLOOD STORAGE OPTION



\*Approximately quarter the capacity of the Tubbs Bottom flood storage area downstream of Yate.

### Flood storage option technical data

- One possible area that covers up to 20 hectares indicated by blue shading.
- Outline approximately follows the 100m AOD contour line.
- Storage capacity up to 200,000 cubic metres (equivalent to 80x Olympic-size swimming pool).\*
- Embankment dam up to 300m long, 2-3m high with shallow 1 in 6 side slopes.
- River flow control via outlet culvert through embankment dam.
- Reinforced grass spillway in case of extreme flood overflow conditions.
- Out-of-bank flood storage only required during high flow events – most of the time farming can continue.
- Significant environmental opportunities if wetland habitats can be created (e.g. borrow area for embankment dam fill).

**No proposals are fixed at this stage and these images show only indicative extents for a site where it looks feasible to temporarily store water in a large flood event. For most of the time site conditions would not change and the land could continue to be farmed.**



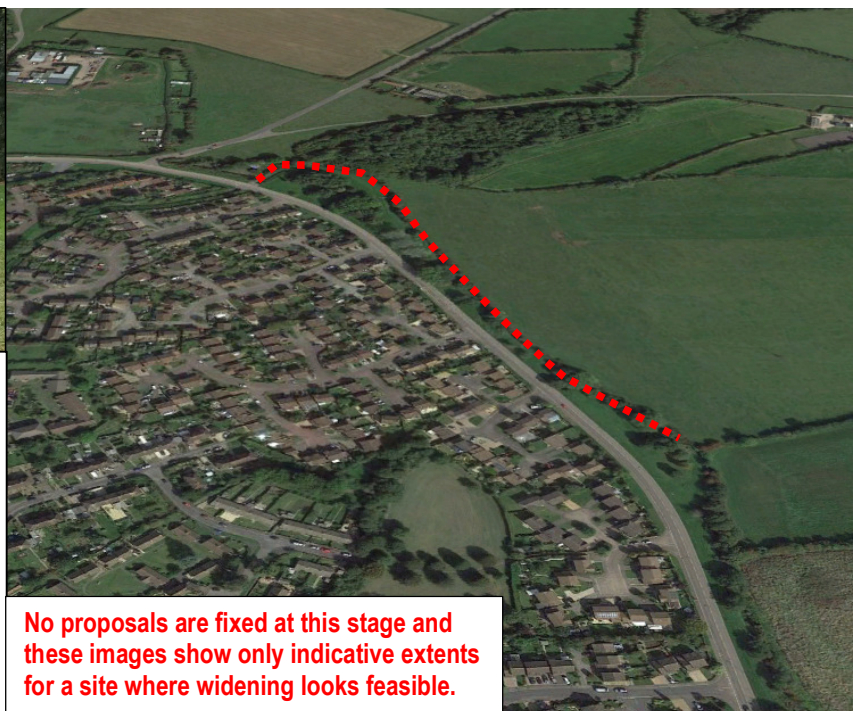
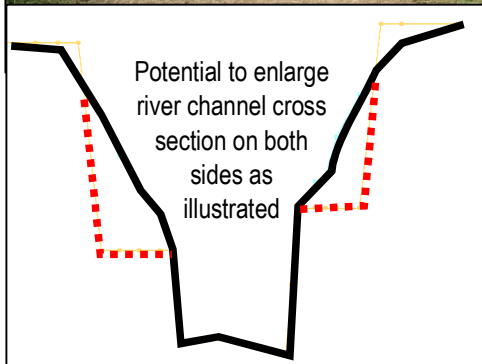
Flood storage schemes: In recent years we have built many similar schemes as they are such an effective way of providing flood alleviation. Examples include Tubbs Bottom that reduces flood risk downstream of Yate and Bruton in Somerset. Schemes are also being considered for Taunton and Wrington (near Bristol).

## RIVER CHANNEL CORRIDOR WIDENING OPTION



### River channel corridor widening option technical data

- One possible length of the River Frome, over ~500m indicated by dashed red line.
- No change in main channel section, which would be retained at approximately 2m wide.
- Channel corridor widening involves only cutting back the river bank to increase channel capacity for high flows.
- Aiming for at least a 20% increase in flood flow capacity to locally reduce flood risk in the St Johns Way area
- Need a solution that minimises impacts on mature trees and other natural features along the river banks.
- Significant environmental opportunities for soft engineering solutions to improve the river habitats.



## PROPERTY LEVEL RESILIENCE OPTION

Installing measures that make individual properties more flood resilient prevent or limit flood water getting in, or act to reduce the amount of damage caused if it does.

The off-the-shelf products available include replacement flood doors, flood barriers across door fronts, self-closing air bricks, non-return valves on any low level pipes, etc.

The Environment Agency website gives useful information on Kitemark products that are ‘...good products fitted to high standards...’ as well as links to other websites.

Flood barrier products, all under the Kitemark scheme:



Other products, all under the Kitemark scheme:



Self closing air brick



Waste pipe non-return valve



Foul chamber flap-valve



Foul chamber non-return valve

## HOW WE ARE ASSESSING THE OPTIONS

Our study follows a standard process set out by Defra in accordance to current guidance on Flood and Coastal Erosion Risk Management Appraisal and Adapting to Climate Change. Each option has been assessed against the criteria set out below.

- What level of protection against river flooding?
- What would it cost to implement and maintain?
- What environmental impact mitigation would it require?
- Is there an opportunity for environmental enhancement?
- Is it resilient against a changing climate? (projected increases in flood risk)

The appraisal findings are summarised in the table below.

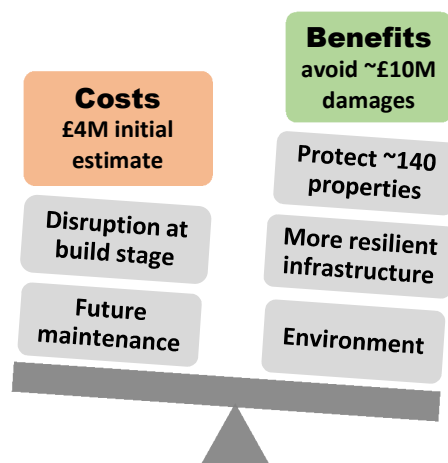
Option	Level of protection	Cost	Environmental enhancement	Environmental impact mitigation	Sustainability	Resilience
Flood Storage	High	£3.7M	√√	√	√	√
Channel Widening	Medium	£0.3M	√	√	√	√
Property Level Resilience	High but only specific areas	<£0.1M	N/A	No	X / √	√

The above options are being considered separately and in combination - total cost of about £4M (this is only a very indicative estimate of cost).

We estimate up to ~£10M benefits from a flood alleviation scheme by better protecting people, property, infrastructure and the environment.

Scheme benefit calculations look at what would happen if nothing is done (how much damage would occur and what would it cost to repair).

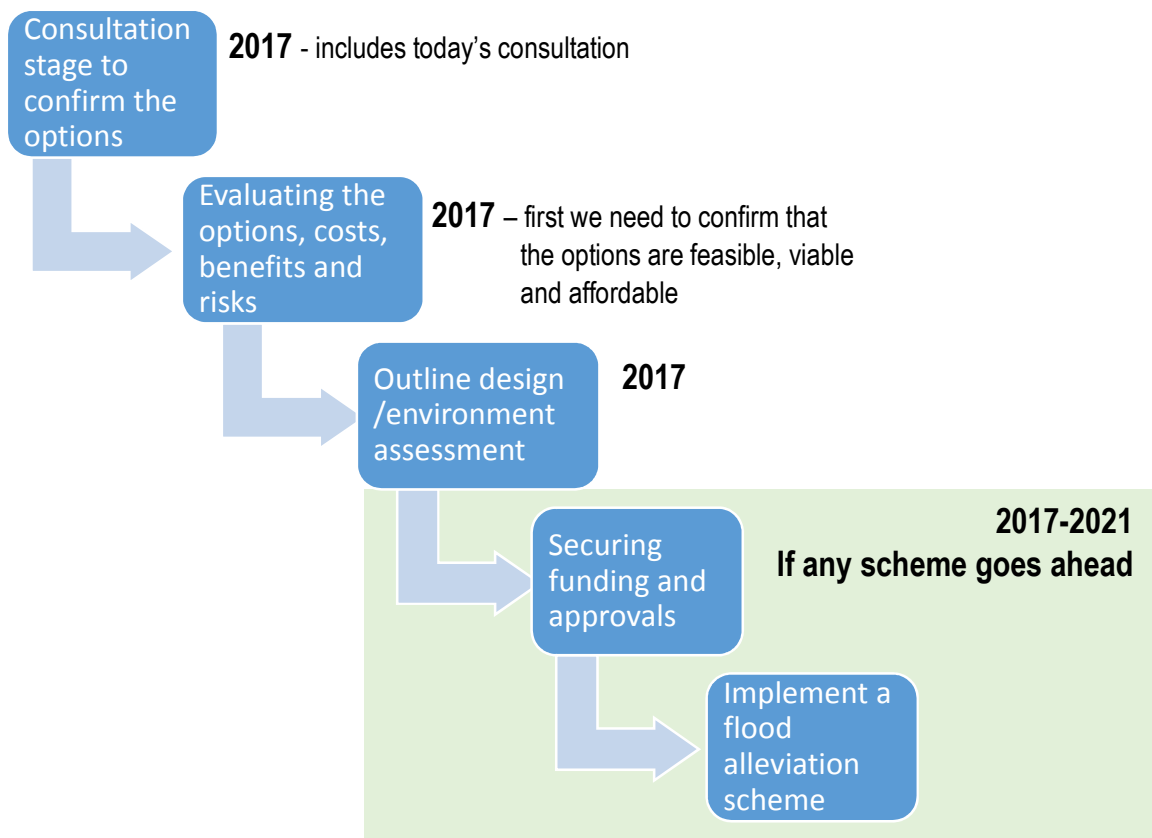
For funding of flood alleviation only a limited 'pot' of central government funding is available, so the majority of funding must come from other public and private sources (including developers). We will continue to look into this.





## NEXT STEPS IN DECIDING IF ANY OPTIONS CAN BE TAKEN FORWARD

We propose to further study the flood alleviation options, which must be cost-effective, environmentally sensitive and sustainable in order to qualify for government funding. As this is limited other funding sources need to be identified before any options can be taken forward.



Taking a partnership approach is critical. Any options taken forward will evolve in a manner that:

- aligns with the needs and business strategies of the organisations involved
- integrates with regional and national policy and strategic planning initiatives

### Our project partners:

- South Gloucestershire Council
- Chipping Sodbury Town Council
- Yate Town Council
- Wessex Water
- Network Rail
- Natural England
- Forestry Commission

### Policy and strategic planning initiatives relating to flood risk management include:

- DEFRA policy
- Environment Agency Corporate Plan
- Environment Agency Asset Management Plan
- Bristol Avon Catchment Flood Management Plan
- River Basin Management Plan – Severn River Basin District

## ENVIRONMENTAL ENHANCEMENTS

There are several environmental opportunities that we are considering with project partners.

### Environmental opportunities associated with the options:

- **Flood Storage just upstream of Yate / Chipping Sodbury**

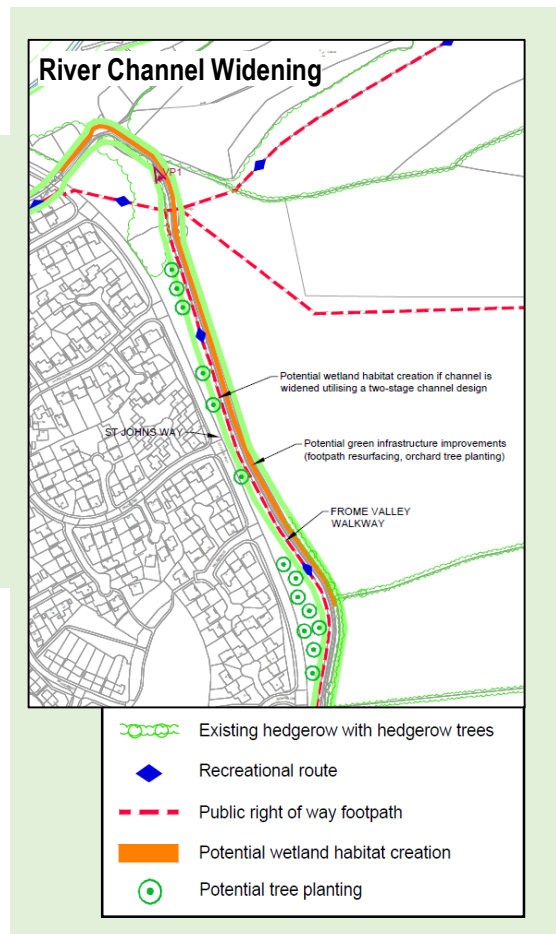
- Potential to improve public access by creating a 'country park' around the site, accessible from the Frome Valley Walkway
- Potential to create ponds/scrapes and plant reed beds, wet grassland and wet woodland in any borrow pit areas used to source fill material to build the embankment dam – this will attract wading birds, invertebrates and amphibians.
- Potential to plant woodland to create new habitat, strengthen landscape character in line with Forest of Avon objectives and visually screen embankment dam.
- Potential to plant hedgerow to retain a continuous hedgerow along river corridor and visually screen embankment dam.

- **River Channel Corridor Widening near St Johns Way**

- Potential to create ponds/scrapes and plant wetland reeds, marginal and emergent plants, and wet grassland – this will attract wading birds, invertebrates and amphibians.
- Potential to improve Green Infrastructure, e.g. footpath resurfacing, orchard tree planting, interpretative signage on natural environment.

### Other environmental opportunities:

- **River weir improvements for fish passage**  
Bristol Avon Rivers Trust and the Environment Agency are investigating ways to remove barriers to fish passage by modifying weir structures and considering funding options.



## WHAT DO YOU THINK?

We would like you to share your thoughts on the options proposed and the issues that you feel need considering in our further study.

### Key points of this consultation:

- **We are considering flood alleviation options to protect against river flooding**
- **Options under consideration:**
  - Flood Storage just upstream of Yate / Chipping Sodbury
  - River Channel Corridor Widening near St Johns Way
  - Property Level Resilience for most vulnerable properties
  - Environmental Enhancements
- **Options are being considered separately and in combination.**
- **No commitment or funding secured to take forward any options at this stage.**
- **It can take several years to promote a scheme – this is the very first step.**

Please ask our team any questions you have about the scheme options and then provide comments via the feedback forms. If you would like to send in your comments later please email them to: [mark.goldingay@environment-agency.gov.uk](mailto:mark.goldingay@environment-agency.gov.uk)

We will use the feedback from this consultation to inform our further study. We will produce a summary of the feedback which you can view on our website (no names or confidential details will be published).



South Gloucestershire Council (archives)