

## **Appraisal criteria**

All options are assessed against a number of appraisal criteria, which include: Flood risk; Health & safety; Constructability; Economics; Environment; Stakeholder considerations; and Sustainability.

## **Benefit cost ratio**

The ratio of the benefits of a scheme option or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms. If the benefit cost ratio is greater than 1 the benefits outweigh the costs.

## **Berms**

Berms are simply mounded hills of soil. They contain dense sediment materials that decrease water velocity, control flow rates and absorb excess water in the event of a flood.

## **Biodiversity**

A term used to describe the variety of life on Earth. It can refer more specifically to all the species in one region or ecosystem. Biodiversity refers to every living thing, including plants, bacteria, animals and humans.

## **Biodiversity net gain**

An approach to development that leaves biodiversity in a better state than before. Developers are encouraged to bring forward schemes that provide an overall increase in natural habitat and ecological features. Its aim is to minimise losses of biodiversity and help to restore ecological networks.

## **Carbon**

Carbon is in all living things. When we talk about carbon (carbon footprint, carbon emissions), we are referring to a range of greenhouse gases that trap heat close to the earth. It is this act of trapping the heat which explains why such gases (including carbon dioxide (CO<sub>2</sub>) and methane) are labelled a 'greenhouse gas'. Fossil fuels contain carbon which were previously stored in living things, and when burned it releases CO<sub>2</sub> into the atmosphere.

## **Capital Carbon (tCO<sub>2</sub>e)**

These are the anticipated carbon emissions associated with construction of the different options. This includes manufacture of components such as new gates, transportation of materials to the river and construction activities on the river such as removing and installing gates, construction of new weirs, construction of fish passes and repairing damage to the existing banks. This does not include carbon associated with the final disposal of waste.

## **Fish pass**

Any form of conduit, channel, lift, other device or structure which facilitates the free passage of migrating fish over, through or around any dam or other obstruction, whether natural or man-made, in either an upstream or a downstream direction.



## **Fixed Crest Weir**

A weir is a barrier across a river that alters the flow characteristics of water, usually resulting in a change in height of the river level. There are a range of weir designs, but generally water flows freely over the top of a weir, before cascading down to a lower level. The top of the weir, where the water flows over, is also called the weir crest. A type of weir that is commonly seen is a fixed crest weir, meaning that the elevation or height of the weir does not change as it is designed and built to stay in a static position.

## **Flood and Coastal Erosion Risk Management Aid Grant (FCERM GiA)**

The funding from central government for managing flood risk in England.

## **Flood and Coastal Erosion Risk Management Appraisal Guidance**

This Government guidance sets out the steps that we need to follow throughout the project appraisal, which we must comply with in order to receive funding.

The appraisal process uses a range of information, for example, river modelling, costs, economic benefits, condition surveys of the assets along the Lower Mole, historical information, habitat surveys and feedback from stakeholders. This is used to understand both the opportunities and constraints present. All of these are taken into account when determining the preferred option for updating the scheme.

## **Flood Relief Channel**

A channel that has been constructed to divert water when discharge is high. They take the pressure off the main channel(s) when floods are likely, therefore reducing flood risk.

## **Groynes**

A groyne, built perpendicular to the river bank, is a rigid hydraulic structure built from a bank that interrupts water flow and limits the movement of sediment. It is usually made out of wood, concrete or stone.

## **Hydraulic model**

A hydraulic model is a mathematical model of a water system and is used to analyse the way water behaves in different conditions. We use this to predict water levels and flows within the river, and the depth of flooding when water leaves the river channel.

## **Impoundment**

An impoundment occurs as a result of water being backed up by structures, such as sluices, on a river. This results in the river having a static, deep, lake like appearance.



## **Large Projects Review Group**

This is a group within the Environment Agency independent from the Project Board which provides assurance and confidence that the project will achieve the planned benefits and outcomes and adhere to HM Treasury guidelines.

## **Naturalisation**

Naturalisation is any process by which a non-native organism or species spreads into the wild and its reproduction is sufficient to maintain its population.

## **Partnership Funding Calculator and Partnership Funding Score**

The partnership funding calculator is used to generate a Partnership Funding (PF) score. This score determines the proportion of a project's costs which can be paid for using **Flood and Coastal Erosion Risk Management Aid Grant (FCERM GiA)**, with any shortfall in funding needing to be found from other sources. These other sources can include local authorities, water companies, private businesses and individual land or property owners.

## **Present value benefits and costs; and discounting**

The present value of the benefits/costs are how much they are worth today. Present value uses an approach known as discounting and is used to convert costs over the appraisal period (100 years in this case) to a present value for each option. This will reflect the total value of all future costs in today's prices.

Discounting is used to reflect peoples' preferences for benefits today rather than benefits tomorrow. The impact for appraisal is that future benefits and costs are worth less in present value terms than costs and benefits that occur today. Discounting is used to convert all costs and benefits into Present Values. This allows the timing of costs and benefits to be taken into account. As a result, options with very different interventions or that deliver benefits over different timescales can be compared.

## **Project Board**

The Project Board is made up of senior decision makers at the Environment Agency, and they will make a decision on how to proceed with updating the scheme.

## **Radial gate**

Sluice gates that lift up and water flows underneath.

## **River Basin Management Plans**

River basin management plans (RBMPs) set out how organisations, stakeholders and communities will work together to improve the water environment.

These are legal requirements under the Water Framework Directive. These plans can be found here: <https://www.gov.uk/government/collections/river-basin-management-plans-2015>.



## **River Morphology**

A scientific field that is concerned with river channels and how they change in shape and direction over time.

## **Sluice gate / structure**

A sliding gate or other device for controlling the flow of water. The sluices we refer to in this scheme are Molembur, Island Barn, Viaduct, Zenith, Wilderness and Royal Mills.

## **Standard of protection**

A flood defence standard specifies the protection offered to a specific area from flooding from the sea or rivers.

For example, a flood embankment could be described as providing a 1 in 100 probability standard of protection. This, in its simplistic form, means that in any given year there is less than a 1 in 100 probability that the design standard of the defence would be exceeded and properties flooded due to water overtopping the defence.

## **Stop logs**

Hydraulic engineering control elements that are used in floodgates to adjust the water level or discharge in a river, canal or reservoir.

## **Tilt gate**

Sluice gates that are fixed at river bed level and water flows over the top

## **Weir**

A weir or low head dam is a barrier across the width of a river that alters the flow characteristics of water and usually, but not always, results in a change in the height of the river level. They are also used to control the flow of water for outlets of lakes, ponds, and reservoirs. There are many weir designs, but commonly water flows freely over the top of the weir crest before cascading down to a lower level.

## **Whole life cash costs**

For each option these include the costs for design and construction of any works carried out to the scheme now and future operation and maintenance costs over a 100 year period. All options are assessed over a 100-year period as required by the appraisal guidance. Sluice gates such as those at Molembur, Island Barn and Viaduct have a typical design life of 30 years, therefore options that involve replacement of sluice gates allow for their replacement at the anticipated time in the future. All options include an allowance for risk and uncertainty. As the design of any option develops, and as risks become better understood this allowance can change.

