Statement of environmental particulars for Medway Estuary and Swale Strategy

Introduction

This statement of particulars indicates how environmental and consultee considerations were taken into account during the preparation of the plan and how the Environment Agency selected the approach adopted in the final plan. The statement goes on to set out the monitoring procedures that have been set in place to monitor the significant environmental effects of the implementation of the plan/programme.

The environment during the development of the plan

Integration of environmental considerations

Environmental considerations were integrated throughout the development of this plan by following the Environment Agency's Strategic Environmental Assessment (SEA) operational instruction. This document ensures the potential significant effects of the plan on the environment are considered throughout its development.

Influence of the environmental report

The environmental report that was open to public consultation influenced the development of the plan by identifying environmental enhancements and setting out requirements for mitigation, where significant negative effects were identified.

Environmental Topic	Agreed Mitigation/Enhancement activity	Responsibility for implementation
Biodiversity, Flora and Fauna	Provision of intertidal saltmarsh habitat through Managed Realignment sites.	Environment Agency
	Provide compensatory freshwater habitat.	Environment Agency
	Bioengineering techniques as part of the Managed Realignment sites such as using natural products like brash and low-level willow hurdles/fences to trap sediment.	Environment Agency
	Undertake Phase 2 botanical surveys of existing areas of saltmarsh and mudflat as well as freshwater/terrestrial habitats at risk of being lost.	Environment Agency
	Undertake protected species surveys in areas of terrestrial habitats at risk of being lost including: [redacted], bats, terrestrial invertebrates, dormouse, otter, water vole, great crested newt etc.	Environment Agency
	Hold the Line options to look to deliver innovative solutions through consideration of "Estuary Edges" solutions.	Environment Agency
Cultural Heritage	Where excavation is required, particularly for Managed Realignment sites and new embankments, an archaeological assessment will be required. Initial investigations are likely to involve a desk-based assessment or heritage assessment. These will then define the requirements for further surveys which may include remote-sensing geophysical surveys.	Environment Agency

	If further surveys are required trial pit/core surveys and watching briefs to be carried out.	
Landscape	Potential impacts upon landscape character – design of flood defences that minimise visual impacts and impacts on local character. Use of materials, where hard engineering is present, that reflect the vernacular and enhance local character where appropriate.	Environment Agency
	At Sheerness look to enhance biodiversity through the designs using pools/ texturisation on revetments.	Environment Agency
	Manged Realignment sites – focused community engagement around potential impacts of landscape change.	Environment Agency
Water	Ensure the “Clearing the Waters for All” Water Framework Directive (WFD) guidance is followed for the capital projects as they are progressed.	Environment Agency
Sustainability	Adopt a sustainable procurement strategy at scheme level.	Environment Agency
Climatic Factors	In areas of Hold the Line or Managed Realignment, crest levels of defences designed for 100-year sea level rise.	Environment Agency
	Managed Realignment sites implemented which encourages long term sustainability of estuary and will reduce wave energies and flood risk.	Environment Agency
Material Assets	Provision of a higher standard of protection with climate change to critical national infrastructure.	Environment Agency
	Protection from flooding and erosion to major centres of infrastructure and properties.	Environment Agency
Population and Human Health	Key areas of concentrated human population will continue to be protected from flood risk, with increased protection in many areas.	Environment Agency
	Stakeholder Engagement Plan in place for any areas where No Active Intervention will impact individuals.	Environment Agency
	Management Realignment sites have been modelled and sited and designed to not increase flood risk to any residential properties.	Environment Agency
	Coastal path to be rolled back along areas of No Active Intervention which are subject to erosion and flood risk to maintain a safe footpath.	Environment Agency
Soils	Ground Investigations to be undertaken for Managed Realignment sites to ensure no contamination is present. If present will be properly treated before breach is created on site.	Environment Agency
	Groundwater monitoring to be undertaken on Managed Realignment sites during scheme design to provide information allowing seepage requirements to identified and met.	Environment Agency

Consultation responses

Responses to consultation period (06/11/2017 to 05/02/2018)

44 consultation responses were received during the three-month consultation period on the draft Medway Estuary and Swale Strategy (MEASS) and the Environmental Report and Habitats Regulation Assessment (HRA) Appropriate Assessment Report. The majority of comments were focussed on requesting additional information and detail. Such issues were updated as appropriate. A Stakeholder Report has been produced which outlines the methods and processes used for the consultation and presents the results. Furthermore, a Summary of Consultation Responses was produced and sent to the consultees to provide specific answers to queries that had been raised. The table below indicates where consultation responses led to wider changes to the plan.

It should be noted that whilst Natural England provided official feedback during the consultation phase, Natural England was also part of the project team throughout development of MEASS and therefore provided ongoing feedback and input throughout the process at progress meetings and Project Board meetings. Furthermore, the MEASS Stakeholder Engagement Group (SEG) were engaged throughout development of the options and of MEASS and helped to develop the information which was then presented within the consultation period.

Consultee	Summary of comments	Action taken to finalise Plan
Historic England and Kent County Archaeologist	Heritage landscapes as well as historical assets are important at Strategy level.	Implementation Plan and SEA updated to ensure risks associated with heritage landscapes are highlighted and highlight where these cross over with different Benefit Areas.
Environment Agency Area Team	Focus of capital works in first 4 years of the Strategy.	Re-profiled the implementation programme following an agreed method of prioritising the works to provide a realistic 10-year implementation programme.
Natural England	Concerns that the Managed Realignment sites in Benefit Area 3 are too far removed from the current Special Protection Area (SPA) and Ramsar sites and therefore cannot provide coastal squeeze compensation for the designated sites.	The Managed Realignment site at Wouldham Marshes was reverted back to No Active Intervention as the driver for this site was no longer relevant. Additional No Active Intervention sites at Abbotts Court, Chetney and South Sheppey were updated to be formalised Managed Realignment sites.
Public/Lower Halstow Parish Council	Highlighted the importance of the Brickfields as a recreation site.	This importance has been highlighted in the implementation plan and risk mitigation to look at combining a scheme which includes this area and could unlock wider recreation benefits was included.
Natural England	Strategy does not highlight the impact on the Marine Conservation Area.	Added to text in relevant sections to highlight potential for impacts on estuarine rocky habitats, tentacled lagoon worm presence around piers and saltmarsh and mudflat habitat.
Landowners	Specific landowner consultation	The Implementation Plan was updated to

	events took place during the consultation period. Key concerns were around the processes landowners would need to go through and permissions required for them to be able to undertake their own maintenance on defences.	include further information about the processes required and early feedback and discussions on this with landowners was identified in the action plans.
RSPB	Particular concern around the likelihood of being able to carry out the Managed Realignment policy at Cleve Hill.	Additional engagement was undertaken to explain the process which had been identified and consultation with Cleve Hill which had been undertaken to date.

Trans-boundary consultation responses

The SEA did not identify any significant environmental effects that required trans-boundary consultation on this plan. Due to this, no consultation responses were received via this consultation route.

Reasons for selecting the adopted plan in light of reasonable alternatives

The approach adopted in the final plan was considered against a number of reasonable alternatives during its development. The preferred plan and the alternatives are presented in the following table, with commentary of the potential impacts the alternatives would have on SEA receptors. Only the key differentiating receptors for each Benefit Unit have been discussed within the table.

BA	All alternatives considered	Preferred Option	Description of why preferred option over alternatives
1.2	Do Nothing Do Minimum Maintain Sustain Upgrade Delayed Sustain	*Delayed Sustain:* Maintain until year 5. Then sustain.	Defences are required due to nationally critical infrastructure at risk from flooding.
1.3	Do Nothing Do Minimum Maintain Sustain Upgrade Setback Embankment and Maintain Setback Embankment and Sustain Setback Embankment and Upgrade	*Do minimum:* Maintain until year 25. Then NAI. *Freshwater habitat:* Freshwater habitat compensation *MR site:* MR site in year 11.	Majority of alternative options also cause flood risk impacts to freshwater habitat but preferred option also provides required compensatory intertidal habitat for the Strategy.
1.4	Do Nothing Monitoring Only	*Do Nothing:* NAI.	Ongoing cliff erosion reflects current management and supports natural coastal estuary processes.
2.1	Do Nothing Do Minimum Maintain Sustain Upgrade	*Sustain:* Sustain defences.	Do minimum and maintain options would not sufficiently protect properties, industry and infrastructure from rising sea levels.

2.2	Do Nothing Do Minimum Maintain Sustain Upgrade Localised Sustain	*Localised sustain:* Sustain defences in localised areas.	Do minimum and maintain options would not sufficiently protect properties, industry and infrastructure from rising sea levels. No requirement for additional structures where there is natural high ground.
2.3	Do Nothing Do Minimum Maintain Sustain Upgrade	*Sustain:* Sustain defences.	Do minimum and maintain options would not sufficiently protect properties, industry and infrastructure from rising sea levels.
3.1	Do Nothing Do Minimum Maintain Sustain	*Do Nothing:* NAI.	Limited assets or environmental features at risk and therefore natural processes preferred.
3.2	Do Nothing Do Minimum Maintain Sustain Upgrade Setback Embankment and Sustain Setback Embankment and Upgrade Localised Sustain	*Localised sustain:* Sustain defences in localised areas. *MR site:* MR site at Halling.	Some protection in strategic areas required to protect assets and residential properties. Other areas left as NAI if there are limited assets to reduce coastal squeeze. Managed realignment site to increase saltmarsh and mudflat habitat.
3.3	Do Nothing Do Minimum Maintain Sustain Upgrade Delayed Sustain	Delayed sustain: Maintain until year 20. Then sustain.	Do minimum and maintain options in the long term would not sufficiently protect properties, industry and infrastructure from rising sea levels.
3.4	Do Nothing Do Minimum Maintain Sustain Upgrade Setback Embankment and Sustain Setback Embankment and Upgrade Localised Sustain	Localised sustain: Sustain defences in localised areas.	Some protection in strategic areas required to protect assets and residential properties. Other areas left as NAI if there are limited assets to reduce coastal squeeze.
3.5	Do Nothing Do Minimum Maintain Sustain	Do Nothing: NAI.	Limited assets or environmental features at risk and therefore natural processes preferred which reduces coastal squeeze.
4.1	Do Nothing Do Minimum Maintain Sustain Setback Embankment and Maintain Setback Embankment and Sustain	Sustain: Sustain defences. MR site: MR site at Danes Hill.	Do minimum and maintain options in the long term would not sufficiently protect properties, industry and infrastructure from rising sea levels. Managed realignment site to provide coastal squeeze compensation.
4.2a	Do Nothing Do Minimum Maintain Sustain Upgrade	Do Nothing: NAI. Freshwater: Freshwater compensation.	Although NAI will impact freshwater habitat, it reduces coastal squeeze impacts and relocating freshwater will be more sustainable in the long term with sea level rise.

4.2b	Do Nothing Do Minimum Maintain Sustain Setback Embankment and Maintain Setback Embankment and Sustain	<u>Do minimum:</u> Maintain until year 15. Then NAI. <u>Freshwater:</u> Freshwater Compensation required.	Although NAI will impact freshwater habitat, it reduces coastal squeeze impacts and relocating freshwater will be more sustainable in the long term with sea level rise.
4.3	Do Nothing Monitoring Only	<u>Do Nothing:</u> NAI.	Limited assets or environmental features at risk and therefore natural processes preferred which reduces coastal squeeze.
4.4	Do Nothing Do Minimum Maintain Sustain Localised Sustain	<u>Localised sustain:</u> Sustain defences in localised areas.	For the majority of the frontage, there are limited assets or environmental features at risk and therefore natural processes preferred. Some protection in strategic areas required to protect assets and residential properties.
4.5	Do Nothing Do Minimum Adaptation Maintain Upgrade Setback Embankment	<u>Do Nothing:</u> NAI. <u>Freshwater:</u> Freshwater compensation.	Although NAI will impact freshwater habitat, it reduces coastal squeeze impacts and relocating freshwater will be more sustainable in the long term with sea level rise.
4.6	Do Nothing Adaptation Monitoring Only	<u>Do Nothing:</u> NAI.	Limited assets or environmental features at risk and therefore natural processes preferred which reduces coastal squeeze.
4.7	Do Nothing Do Minimum Maintain Sustain Upgrade Setback Embankment and Maintain Setback Embankment and Sustain Setback Embankment and Upgrade	<u>Do minimum:</u> Maintain until year 15. <u>MR site:</u> Habitat adaptation (MR) from year 15.	Although habitat adaption could impact freshwater habitat (which will require freshwater compensation), this is an important strategic area for developing saltmarsh habitat in the lower Medway estuary as part of the Ramsar and SPA site.
5.1	Do nothing Do minimum Maintain Sustain Upgrade Delayed sustain	<u>Delayed sustain:</u> Maintain until year 20. Then sustain	Do minimum and maintain options in the long term would not sufficiently protect properties, industry and infrastructure from rising sea levels.
5.2	Do nothing Do minimum Maintain Sustain Upgrade Setback embankments and sustain Setback embankments and upgrade	<u>Sustain:</u> Sustain defences. <u>MR site:</u> New MR site at Kemsley.	Do minimum and maintain options in the long term would not sufficiently protect properties, industry and infrastructure from rising sea levels. Managed realignment site to provide coastal squeeze compensation.
6.1	Do nothing Do minimum Maintain Sustain Setback embankments from year 20 and maintain	<u>Freshwater:</u> Maintain defences and raise with sea level rise – a moderation case to protect	Although a hold the line option will cause coastal squeeze, the large area of freshwater habitat at risk of flooding here will be very difficult to provide compensation for and therefore coastal squeeze compensation elsewhere will

	Setback embankments from year 20 and sustain	freshwater habitat.	be provided.
6.2	Do nothing Do minimum Sustain Setback embankments and maintain Setback embankments and sustain Setback embankments from year 20 and maintain Setback embankments from year 20 and sustain	<u>Do minimum:</u> Maintain for 20 years. <u>Freshwater:</u> Where not MR, HTL and raise with SLR to protect freshwater habitat. <u>MR site:</u> Managed Realignment from year 20.	Current short-term plans for site is relating to a solar farm. Longer term, this site will become a managed realignment site to provide coastal squeeze compensation – the topography of the site means there is large potential for saltmarsh creation here.
7.1	Do nothing Do minimum Maintain Sustain Upgrade	<u>Do minimum:</u> Maintain until year 30. Then NAI. <u>Freshwater:</u> Freshwater compensation.	Although NAI in the long term will impact freshwater habitat, it reduces coastal squeeze impacts and relocating freshwater will be more sustainable in the long term with sea level rise.
7.2a	Do nothing Do minimum Maintain Sustain Upgrade	<u>Sustain:</u> Sustain defences.	Do minimum and maintain options would not sufficiently protect properties, industry and infrastructure from rising sea levels.
7.2b	Do nothing Do minimum Maintain Sustain Delayed sustain	<u>Delayed sustain:</u> Maintain until year 20. Then sustain.	Do minimum and maintain options in the long term would not sufficiently protect properties, industry and infrastructure from rising sea levels.
8.2	Do nothing Do minimum Sustain Upgrade Setback embankment in year 50 and sustain	<u>Freshwater:</u> Maintain defences and raise with sea level rise – a moderation case to protect freshwater habitat.	Although a hold the line option will cause coastal squeeze, the large area of freshwater habitat at risk of flooding here will be very difficult to provide compensation for and therefore coastal squeeze compensation elsewhere will be provided.
8.3	Do nothing Do minimum Maintain Sustain Upgrade Setback embankment and maintain	<u>Freshwater:</u> Maintain defences and raise with sea level rise – a moderation case to protect freshwater habitat.	Although a hold the line option will cause coastal squeeze, the large area of freshwater habitat at risk of flooding here will be very difficult to provide compensation for and therefore coastal squeeze compensation elsewhere will be provided.
8.4	Do nothing Do minimum Maintain Setback embankments	<u>Freshwater:</u> Freshwater Compensation. <u>MR site:</u> MR site at Elmley.	Managed realignment site required to provide coastal squeeze compensation for the Strategy. Freshwater compensation will also be required.
8.5	Do nothing Do minimum Maintain Sustain	HTL as part of 11.2 option. Assessed under 11.2.	As per Benefit Area 11.2 – required to protect important infrastructure, assets and properties.
9.1	Do nothing Do minimum Maintain Maintain and property rollback	<u>Maintain:</u> Maintain (capital) defences.	Mostly an erosional area so no Sustain or Upgrade of defences required. Maintain is required to protect residential and commercial assets.

9.2	Do nothing Do minimum Maintain Sustain	<u>Maintain:</u> Maintain (capital) defences.	Mostly an erosional area so no Sustain or Upgrade of defences required. Maintain is required to protect residential and commercial assets.
10.1	Do nothing Monitoring Property rollback	<u>Property rollback:</u> NAI with roll back of properties.	A SSSI for geological cliffs and therefore continued No Active Intervention required. Property rollback to be assessed to reduce impact on local communities.
11.1	Do nothing Do minimum Maintain	<u>Maintain:</u> Maintain defences.	Mostly an erosional area so no Sustain or Upgrade of defences required. Maintain is required to protect residential and commercial assets.
11.2	Do nothing Do minimum Maintain Sustain Upgrade	<u>Sustain:</u> Sustain defences.	Large number of important infrastructures, residential and commercial properties, industry and heritage assets requiring flood protection in the long term with sea level rise.

In summary, the major reasons for selecting the adopted plan over the reasonable alternatives were:

- MEASS focuses defences where they will benefit and protect local populations, whilst allowing/promoting the ingress of seawater into other areas. If MEASS was not adopted, coastal flood and erosion risk within the Medway estuary and the Swale would not be managed in a coordinated manner, with a number of risks likely to be realised. Major flooding events would likely be uncontrolled and uncoordinated, with adverse effects on private properties, residential areas and infrastructure (the road and rail network, water supplies and sewerage, power etc.). As such, uncontrolled flooding events would likely present serious risk to human health and public safety as well as designated sites. Alongside this, the size of the MEASS area, and the population sizes and densities within it, mean that large flooding events would present notable adverse economic and social consequences.
- Currently, across the MEASS area, the standard of protection offered by the defences is low, with some rural areas having only a standard of protection to a 50% Annual Exceedance Probability (AEP). Aging defences, rising sea levels and climate change mean that coastal flood and erosion risk to people, properties, habitats, and agricultural land will significantly increase in the coming years. Over the next 100 years it is predicted that 17,226 properties will be at an increased risk of tidal flooding (up to a 0.1% AEP event) within the MEASS area. A further 979 properties are at risk of erosion over the next 100 years. The Hold the Line sections within MEASS are required to protect these properties which includes total estimated economic savings of £1,324 million over 100 years.
- Whilst adverse effects on the integrity of Natura 2000 sites are predicted, MEASS presents the most appropriate way to manage the defences in the MEASS area in an integrated and sustainable manner, given the constraints and pressures that inevitably affect them. It addresses the ongoing and unavoidable coastal squeeze, and serves to best manage this, such that its ecological functioning, and the effects on Qualifying Features are minimised. It identifies, alongside the SMP, that the overall approach of Managed Realignment where possible, to reduce coastal squeeze impacts, and relocate freshwater habitat further inland, is a sustainable approach to managing the designated sites within the estuaries.

Further details on the selection of the preferred option, which was developed into the adopted plan, are presented in its environmental report. Information on how to access a copy of the environmental report can be found in the post-adoption statement, which can be found at www.environment-agency.gov.uk/SEApublicity.

Environmental monitoring measures during Plan implementation

The table below sets out the indicators that will be monitored to ensure that unforeseen significant environmental effects are not generated during implementation. These indicators will also monitor the success of mitigation measures and environmental enhancements in the adopted plan. Developments implemented as a result of the plan will be assessed for environmental impacts at a project level using the Environment Agency's internal Environmental Impact Assessment (EIA) operational instruction.

The MEASS SEA and Implementation Plan provide a structure and process to ensure that at all stages of the implementation of MEASS, potential adverse effects are being monitored and assessed. This will enable the Environment Agency or Local Authority to take remedial or mitigatory actions as son as possible if they are required. The overall responsibility for this sits with the Environment Agency Local Area Team.

Environmental effect/mitigation/ enhancement	Indicator	Monitoring method	Responsibility
Coastal Squeeze Compensation through Managed Realignment sites.	Hectares of saltmarsh habitat created.	Annual monitoring following the scheme implementation.	Environment Agency.
Providing an appropriate standard of flood protection to residential and commercial properties as well as important assets, with consideration of climate change.	Number of properties and assets protected.	Coastal defence monitoring.	Environment Agency, Medway Council, Tonbridge and Malling Borough Council and Swale Borough Council.
Provide freshwater compensation where required.	Hectares of freshwater habitat developed.	Annual surveys.	Environment Agency.
Reducing impact to ecological or geological sites.	Condition and extent of areas.	Annual monitoring data from Environment Agency and Natural England.	Environment Agency.
Opportunity for increases in green infrastructure.	Location and successful implementation of green infrastructure.	Environment Agency NEAS team review of designs at Scheme stage.	Environment Agency, Medway Council, Tonbridge and Malling Borough Council and Swale Borough Council.
Increase in access to geological and ecological sites.	Visitor numbers. Updated assets including the coastal footpath.	Visitor centre numbers. Reporting from individual scheme designs.	Environment Agency and Natural England.
Mitigation against	Water quality	Part of the ongoing	Environment Agency.

adverse impacts to WFD objectives.	indicators.	data collected under the WFD.	
Choice of materials and designs which reduce carbon use.	Whole life carbon of the scheme.	Comparison of carbon calculators through the scheme and comparison with the Strategy Carbon Calculator.	Environment Agency.
Promotion of regeneration and investment in towns.	New jobs created. Area of land regenerated. Economic output.	Study to be undertaken five years and ten years following a scheme implementation.	Medway Council, Tonbridge and Malling Borough Council and Swale Borough Council.

Related documents

Links

- 246_04 Strategic Environmental Assessment (SEA) – internal plans and strategies
- Internal environmental assessment diagram