

TE2100 action plan: **action zone 4** – east London downstream of Thames Barrier

Action plan for zone 4 – table A.4.

12 actions identified

Description of the policy units

- Thamesmead
- Barking & Dagenham
- Rainham Marshes & Mar Dyke

Table A.4. describes the 12 actions for zone 4 – east London downstream of Thames Barrier which have been identified through the TE2100 Plan. The actions are described under the following headings:

- TE2100 recommended actions (and whether or not costs for this have been included in the TE2100 Plan)
- Implementation partners
- How this will be achieved
- How your response can help us finalise the TE2100 Plan



Do you consider that we have identified the right strategic options for managing tidal flood risk in the Thames estuary, and do you agree with the final preferred options?



Do you agree with the actions identified in our action plans and the timing of those actions?



Do you agree with the mechanisms we have set out to deliver the action plans?



Have we identified the right partner organisations to deliver our action plans and are you, or your organisation, able to contribute to these actions?

Barking & Dagenham

Rainham Marshes & Mar Dyke

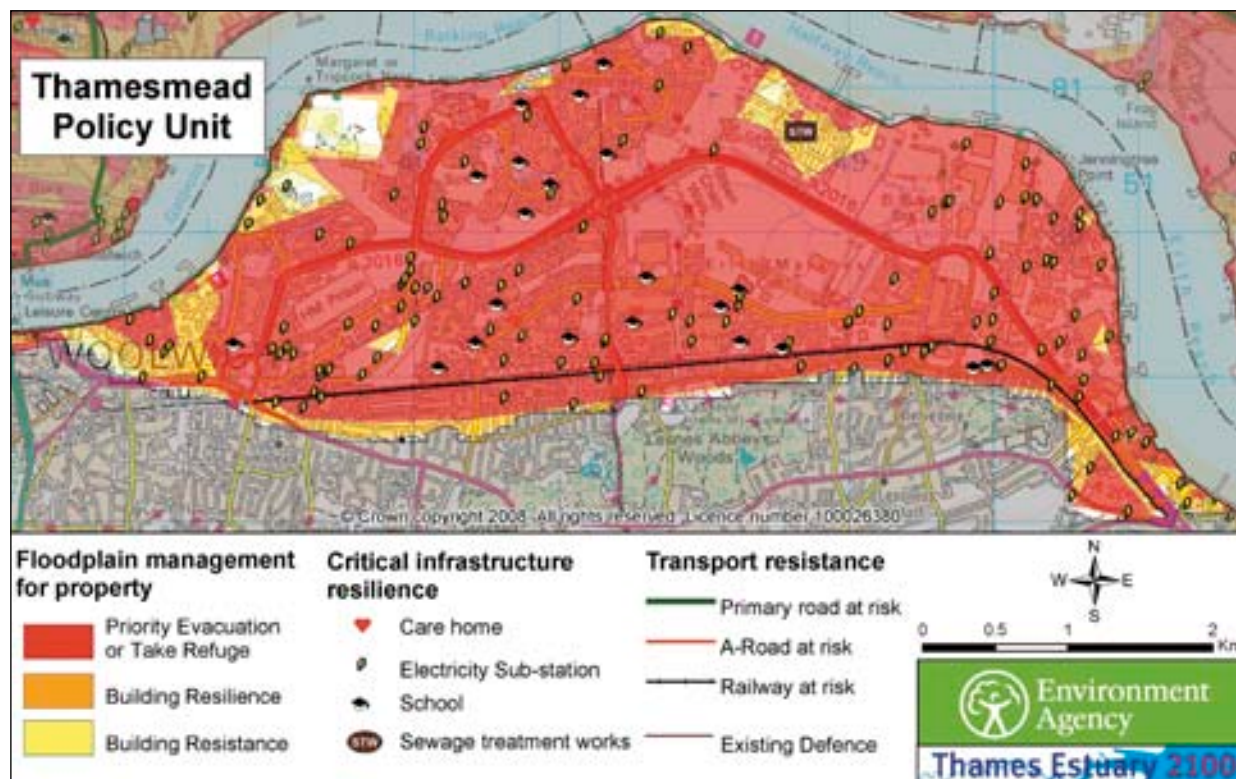
Policy unit – Thamesmead

Policy: Our recommended flood risk management policy for Thamesmead policy unit is policy **P4** to take further action to sustain the current level of flood risk into the future (responding to the potential increases in risk from urban development, land use change and climate change).

Description

The Thamesmead policy unit contains extensive development including the urban residential area of Thamesmead, the large industrial area west of Erith, and the Crossness Sewage Treatment Works. In the western sector of the Policy Unit, there is HM Prison Belmarsh.

A major road network serves the area and the main rail link to Dartford runs through the southern edge of the policy unit. The area is low lying, and ground levels are typically 2 m to 3 m below high water on spring tides. Flood depths in a surge tide event overtopping or breaching the defences could exceed 5 m. The area is therefore very vulnerable to tidal flood risk. In the tidal flood risk area there are 21 schools, six care homes and over 100 electricity sub stations. There are raised areas of landfill at the north west part of the policy unit where land has been set aside for a new east London river crossing (currently on hold).



At risk in Thamesmead policy unit

There is a substantial area of construction waste reprocessing in the same area which is part of the Tilfen site for proposed residential and parkland

use. In the same area there is a striking conical raised landscape feature formed of inert waste materials as part of the Thames Point development.

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Sources of flooding

- Tidal: from the Thames downriver of the Thames Barrier (probability 0.1% per annum or less frequent, flood depths up to 5 m but very variable).
- Fluvial: from the Marsh Dykes drainage system in Thamesmead (probability 1% per annum or less, flood depths <2 m).



Landscape feature at Thamesmead

- Fluvial: from the Plumstead and Erith Marshes drainage systems (probability >1% per annum, flood depths <2 m).
- There is a serious risk of pluvial and urban drainage flooding in this policy unit, particularly in areas where the capacity of the drainage system is low. One reason for this is that the Thamesmead policy unit is made from a large area of reclaimed land and is low lying and very flat.
- Groundwater: This is from rock aquifers (i.e. not related to the Estuary) is also a source of flooding.

The existing flood risk management system

- Tidal flood defences downriver of the Thames Barrier.
- Fluvial flood management is provided by a system of open channels with pumped and gravity outfalls into the Thames (the ‘Marsh Dykes’ and Plumstead & Erith Marshes drainage systems).
- Flood forecasting and warning is provided for tidal flooding via Flood Warning Direct (FWD). Fluvial flooding or surface runoff are more likely, the former is covered by FWD. Surface runoff can be predicted by our Extreme Rainfall alert service but this is an inexact science.

Policy context

Thamesmead forms part of the Thames Gateway regeneration area and is covered by Thames Strategy East in addition to the Thames Gateway Parklands Vision.

There are extensive areas of redevelopment planned in this policy unit including much of the Erith industrial area. Improved transport links to London are likely to add to the development pressure.

Vision

The Thamesmead policy unit is vulnerable to tidal and fluvial flooding. Large defences are always likely to be needed but to some extent these have been landscaped within new development areas. There is scope to further improve the frontage as development takes place. It is likely that much of the industrial area of Erith Marshes will be redeveloped in the next 50 years. This provides opportunities to improve flood risk management arrangements including floodplain management to achieve safer floodplains, and defences that enhance the riverfront environment. This might include resilient development and realignment of defences. Existing open space could be further enhanced to provide for tidal flood storage.

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If infrequently used this could also be enhanced to provide habitats and recreation opportunities. Erith Marshes may offer such an opportunity.

Wherever possible the estuary frontages should be enhanced to facilitate public access and improve the environment, particularly with such a large local population. During major reconstructions, setting back of defences would reduce the dependence on vertical walls and provide opportunities for sloping riversides and public amenity areas.

In view of the vulnerability of the area, flood awareness should be raised and flood risk management taken into account in new development and redevelopment. New buildings should be built so that people are safe and have a way to leave in an emergency. The risk of groundwater and surface runoff flooding are likely to increase. Property resilience could offset this increased risk.

Local issues and choices

Most of the ground level is very low (about 0 to 1 m AOD) but there is high ground near the defences in parts of Thamesmead. The main trunk sewer to the Crossness sewage treatment works divides the area into two parts. Development or redevelopment on the river frontage is almost continuous.



Canal at Thamesmead

The area is drained by the Marsh Dykes drainage system and the Plumstead and Erith Marshes drainage systems. These include system of canals, lakes, gravity outfalls and pumped outfalls. Whilst this provides an effective drainage system for much of the policy unit, there are some problem areas because of the large size and flat topography of the area.

Although Thamesmead is well defended, it is a vulnerable area because of the low ground level and size of the resident population. It is also vulnerable to pluvial and urban drainage flooding. The drainage systems in this area were state of the

art concepts when they were designed in the 1960s, but they are not sufficient for the current level of development. They will require improvements over the next 10 to 30 years as the sea level rises and fluvial flows increase. These could include control of runoff, enlargement of drainage channels, increases in flood storage and improvements to the outfall capacity.

Improvements will also be needed to the major Lake 4 pumping station if the defences are raised, as the outfall currently passes over the top of the defences. The vulnerability of the pumping station to fluvial flood and other hazards must also be investigated.

Erosion of the river bed is occurring at Thamesmead and Crossness. Accretion of the river bed is occurring elsewhere on most of the frontage. There are no reported problems with the defences (for example, erosion of the toe) or outfalls (for example, blockage by siltation).



Do you understand our assessment for the Thamesmead policy unit?



Do you agree with it?

Policy unit – Barking & Dagenham

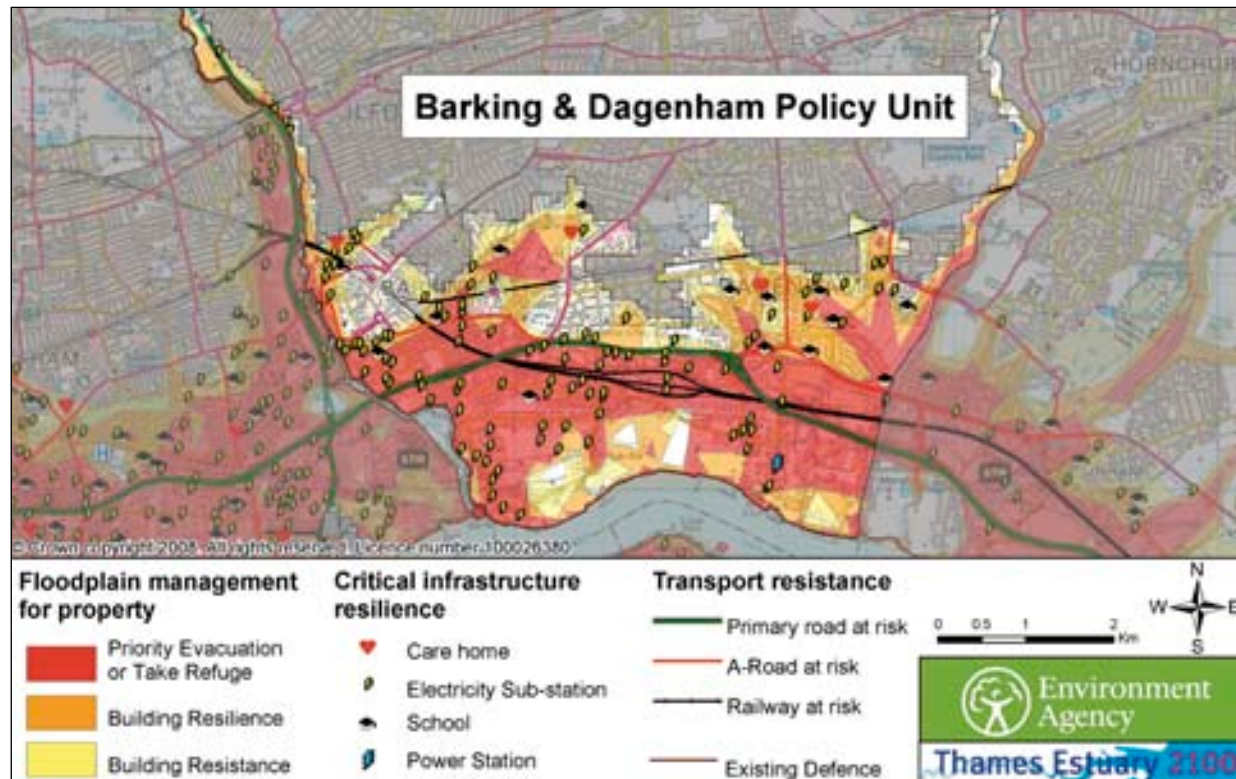
Policy: Our recommended policy for Barking & Dagenham is policy **P4** to either take further action to sustain the current level of flood risk into the future (responding to the potential increases in risk from urban development, land use change and climate change).

Description

The Barking & Dagenham policy unit contains major industrial areas, some of which are now redundant and land is available for redevelopment, and some dense residential development. The industrial areas are generally closer to the Thames but new residential areas are being developed on the river front. There are therefore opportunities to improve this area as new developments are implemented.

There are large areas of raised ground, and therefore a proportion of development in this policy unit is raised above flood level. There are also important transport links and two tributaries of the tidal Thames, the River Roding and the Beam River.

The River Roding forms the boundary with the Royal Docks policy unit, and the Beam River forms the boundary with Rainham Marshes policy unit.



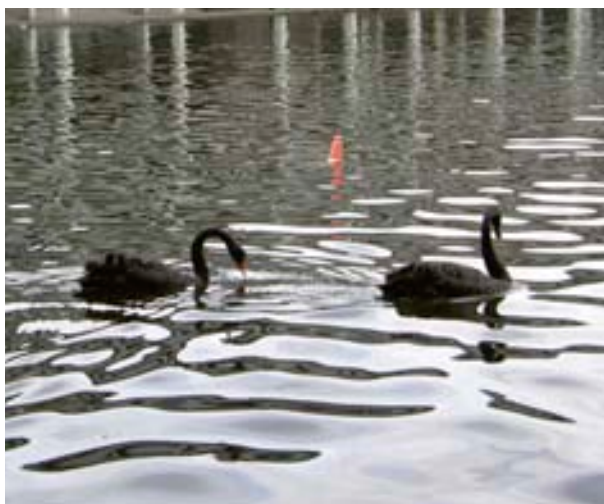
At risk in Barking & Dagenham policy unit

Consideration of the flood risk management for both tributaries are covered in the Rainham

Marshes & Mar Dyke policy unit. The River Roding and Beam River are both in this policy unit.

Sources of flooding

- Tidal: from the Thames downriver of the Thames Barrier (probability 0.1% per annum or less frequent), flood depths up to 5 m but very variable.
- Tidal: on the River Roding (probability about 0.1% per annum). Barrier controlled.
- Fluvial and tidal/fluvial: from the River Roding (probability >1% per annum), flood depths 0 m to 3 m. Inflow from Beckton STW when Thames levels are high.



Black swans – now a regular sight on the Thames

- Fluvial and tidal/fluvial: from the Beam River (West Bank) (probability 5% per annum), flood depths 0 m to 2 m.
- Fluvial from local watercourses: including Mayes Brook, Gores Brook and Buzzard Mouth Sewer (probability varies but >1% per annum in several cases), flood depths 0 to 3 m.
- Local drainage: This needs to be investigated further at a local level and is included in our action plan.

The existing flood risk management system

- Tidal flood defences downriver of the Thames Barrier.
- The Barking Barrier for tidal flood protection on the River Roding.
- Secondary tidal and tidal/fluvial flood defences on the River Roding.
- The Beam Washlands fluvial flood storage area on the Beam River.
- Fluvial flood storage on Mayes Brook.
- Local fluvial flood defences including the Beam River.

- Drainage system outfalls including Beam River, Mayes Brook, Gores Brook, Buzzard Mouth Sewer and Oakentrough Sewer.
- Flood forecasting and warning.

Policy context

Barking & Dagenham forms part of the Thames Gateway regeneration area and is covered by Thames Strategy East in addition to the Thames Gateway Parklands vision. There are extensive areas of redevelopment planned in this policy unit including the large Barking Riverside mixed use development and several Thames Gateway housing sites. These provide opportunities to improve flood risk management arrangements including floodplain management to achieve safer floodplains, and defences that enhance the riverfront environment.

Vision

Changes to the defences provide opportunities for local realignment and landscaping along the Thames frontage. This could provide amenity areas for the many people who live and work in the area. They also provide opportunities for the following: use of the Thames frontage to provide a public access route where possible, with associated facilities; creation of environmental

enhancements, taking account of likely accretion along the Thames frontage; reduced dependence on vertical walls where possible, thus providing more robust and sustainable flood defences with access for maintenance; and an improved river frontage on the River Roding, although there is little space for re-alignment of the defences.

In addition, resilient new development could reduce the flood risk to people and property, and provide a safer and more sustainable floodplain environment. For example, there is scope for the creation of open space in the same way as already implemented at Thamesmead, to provide both flood storage, environmental improvement and amenity areas.

Local issues and choices

Much of the Thames river frontage in this policy unit has relatively high ground as a result of landfill and fill for development. This area is therefore not as vulnerable as Thamesmead on the south bank. The river bed is accreting in front of the Thames defences. Not only does this mean that the defences are not threatened by erosion, but also that the accretion could contribute to enhancing the intertidal areas along the frontage.

Measures will be needed for tributary flooding from the River Roding. The River Roding is already protected from extreme tidal floods by the Barking Barrier. However, the River Roding is a tributary which has potentially serious flood risk management problems because: the flood risk is high; the River Roding is protected by the Barking Barrier but the volume of storage upriver is very limited; the storage problem is exacerbated by overflows from Beckton STW; and whilst there are tidal defences on the River Roding, there is very little space for improvement. For the River Roding our TE2100 Plan recommends that the tidal defences will be raised and fluvial flood storage will be provided. However a detailed study for the River Roding catchment is needed to develop a preferred approach at local level. This is covered in our action plan.

In addition to the River Roding and the Beam River, there are a number of important drainage channels including Mayes Brook and Gores Brook where responses and choices have been identified. There are already difficulties discharging drainage water at some outfalls, and improvement will be needed as the sea level rises and fluvial flows increase.



Reed beds on the River Roding



Do you understand our assessment for the Barking & Dagenham policy unit?



Do you agree with it?

Policy unit – Rainham Marshes & Mar Dyke

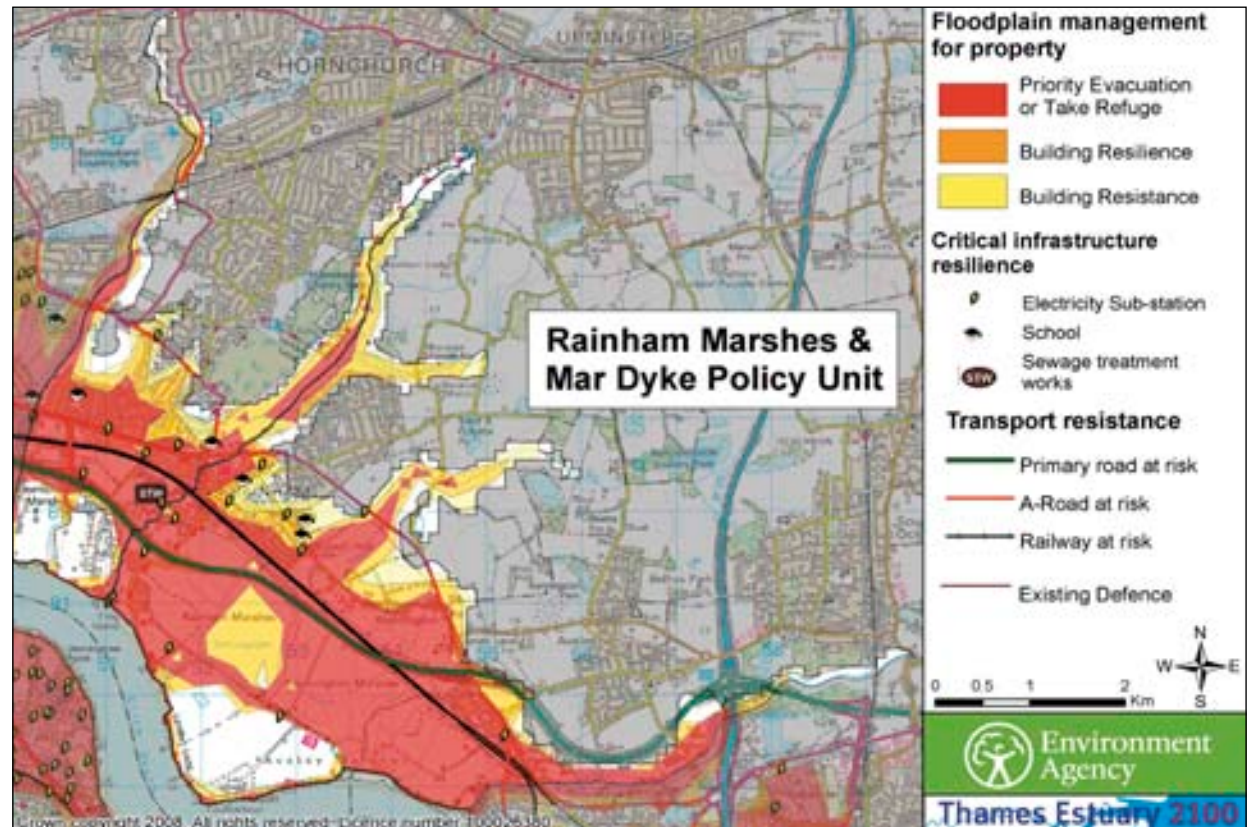
Policy: Our recommended flood risk management policy for Rainham Marshes and Mar Dyke is policy **P4** to take further action to sustain the current level of flood risk into the future (responding to the potential increases in risk from urban development, land use change and climate change).

Description

Rainham Marshes & Mar Dyke policy unit contains extensive freshwater marshes, a large landfill area, development and major transport links. The marshes are of particular importance. They already form a RSPB nature reserve and are included in a proposed community parkland in the Thames Gateway Parklands vision. They therefore provide a key area of green space on the Estuary.

This policy unit is within the Thames Gateway regeneration area, and new developments are planned. There are likely to be opportunities to improve this area as new developments are implemented.

The west boundary of this policy unit is the Beam River, and the east boundary is the Mar Dyke. Flood risk management for each tributary should be associated with a single policy unit. The Beam River is therefore covered by Barking & Dagenham



At risk in Rainham Marshes & Mar Dyke policy unit

policy unit, and the Mar Dyke is covered by the Purfleet, Grays & Tilbury policy unit.

Sources of flooding

- Tidal from the Thames downriver of the Thames Barrier (probability 0.1% per annum or less frequent), flood depths up to 5 m but very variable.
- Fluvial and tidal/fluvial from the Beam River (East Bank) (probability 5% per annum), flood depths 0 to 2 m.



High Speed One (CTRL) crossing Rainham Marshes on piled raft

- Fluvial and tidal/fluvial from the Ingrebourne River (probability 1% per annum), flood depths 0 to 2 m.
- Fluvial and tidal/fluvial from the Mar Dyke (West Bank) (probability >1% per annum), flood depths 0 to 2 m.
- Fluvial from local watercourses including Havering Sewer and the marsh drainage systems on Rainham, Aveley and Wennington marshes (probability generally about 1% per annum as development is on raised ground). The marshes inundate at lower flood probabilities.
- Local drainage.

The existing flood risk management system

- Tidal flood defences downriver of the Barrier on the Thames.
- The Beam Washlands fluvial flood storage area on the Beam River.
- Local fluvial flood defences on the Mar Dyke and Beam River.
- Drainage system outfalls including Havering Sewer and Rainham Marshes.

Policy context

Rainham Marshes & Mar Dyke policy unit forms part of the Thames Gateway regeneration area and is covered by Thames Strategy East in addition to the Thames Gateway Parklands vision. There is a large landfill between the marshes and the Estuary. When this reaches capacity and is landscaped, it will form part of proposed community parkland.

Vision

This policy unit can provide important green space in the middle of an otherwise heavily developed area. The parklands vision includes both the marshes and the landfill, and provides an opportunity for a key amenity, recreation and environmentally important area. Redevelopment is planned for other parts of this policy unit, particularly near the CTRL (Channel Tunnel Rail Link). Changes are likely to the industrial frontages. There is therefore scope to improve the overall environment as these changes take place.

Enhancement of the marshes in this policy unit could be carried out to improve their capacity to support freshwater and grazing marsh interest features in the Thames. This enhancement could contribute to compensation for losses of freshwater and grazing marsh features elsewhere

in the Thames. The Rainham, Aveley and Wennington Marshes and the Ingrebourne River Valley may provide these opportunities.

There is a need to work with planning authorities to create a plan that fully integrates flood risk management with new developments, new amenity areas and new/improved conservation areas.

Local issues and choices

Much of the frontage has raised ground or landfill, thus reducing vulnerability to tidal flood risk.

The river bed is accreting in front of the Thames defences. Not only does this mean that the defences are not threatened by erosion, but also that there may be environmental enhancement opportunities. In particular, there is an opportunity to set back the defence at the east end of the landfill near Coldharbour to create permit replacement intertidal and saltmarsh habitat.

Measures may be needed for tributary flooding from the Beam River, Ingrebourne River and Mar Dyke. The Beam River is covered under the Barking and Dagenham policy unit and the Mar Dyke under the Purfleet, Grays and Tilbury policy unit.

Flood risk from the Ingrebourne River is relatively low. Responses to manage fluvial flood risk on the

Ingrebourne River include local fluvial flood storage and upstream storage for fluvial flooding.

The marshes are drained by a system of open drains. This will require enhancement as the sea level rises and storm rainfall increases. Management measures for fluvial flood risk on the marsh drainage systems include outfall improvements (including pumps) and local fluvial flood storage.





Riverside at Rainham

Additional fluvial flood storage may be considered for some of the marsh areas, to store water from the Ingrebourne River, Beam River, smaller drainage systems and possibly the River Roding. The Beam Washlands scheme is a good example of what can be achieved at local level.

Works would be needed in the local drainage systems to mitigate changes in local flood risk if our end of the century option 2 the proposed storage area on Aveley and Wennington marshes is implemented – although this is not currently a preferred option.

Choices for local flood risk management have not been designed or assessed in detail, and must be the subject of consultation and subsequent appraisal.

 Do you understand our assessment for the Rainham Marshes & Mar Dyke policy unit?

 Do you agree with it?

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Table A.4 – Policy units


■ Thamesmead ■ Barking & Dagenham ■ Rainham Marshes & Mar Dyke

P4

P4


P4


[Note that all dates are based on government's current guidance on climate change – the TE2100 Plan will be reviewed and updated if these predictions change]

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.4.1. TE2100 Plan informs the development and revision of local authority strategic flood risk assessments (SFRAs) and flood plans.</p> <p><i>(Cost of implementing this action not included in TE2100 Plan, but TE2100 data and information will be available to assist)</i></p>	<p>Environment Agency</p> <p>London Boroughs in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering <p>North East Local Resilience Forum</p>	<p>TE2100 information is provided to LAs preparing Flood Plans and capability testing.</p> <p>TE2100 information is provided to LRF to inform Community Risk Registers and support exercises.</p> <p>Local Authority flood plans are developed with an understanding of TE2100 recommendations and data.</p> <p>A community engagement programme to ensure the public, businesses and other groups understand, are involved in and support the flood plans.</p>	<p>Implementation partners: Do your flood plans include the findings and recommendations from TE2100? Do you have enough information from us to develop your flood plans so that they can be informed by TE2100? Your response will guide the development of our implementation “blueprint” during 2009 and improve arrangements for partnership working.</p> <p>Landowners, the public, business and other interested groups: Downstream of the Thames Barrier, the river defences provide highly reliable protection to this area against surge tides. But should there be a failure of a defence or an extreme event which overtops the defences, low-lying areas of this zone would be at risk as shown on the policy unit At Risk maps. Flooding from non tidal sources is much more likely. The Flood Plans will set out arrangements for preparing for and managing these sort of emergencies. If you have views on this, please let us know and we will share your views with those responsible for preparing the flood plans.</p>

Barking & Dagenham




Rainham Marshes & Mar Dyke

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.4.2.</p> <p>To agree a programme to provide localised flood protection, resilience and local emergency plans for vulnerable key sites in action zone 4.</p> <p>[Note: The At Risk maps show that particular sites and key infrastructure which would be particularly vulnerable in the TE2100 area in the event of a failure or overtopping of the defences]</p> <p><i>(Cost of implementing this action not included in TE2100 Plan, but TE2100 data and information will be available to assist)</i></p>	<p>Environment Agency</p> <p>London Boroughs in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering <p>North East Local Resilience Forum</p> <p>Transport for London</p> <p>EDF Energy</p> <p>Thames Water</p> <p>CTRL</p> <p>Highways Authority</p> <p>RSPB</p> <p>Other owners and managers of vulnerable sites</p>	<p>We will discuss with our implementation partners to agree strategic scope of measures required.</p> <p>Agreement between implementation partners on the strategic approach, and roles and responsibilities for achieving it.</p> <p>All site owners must be supportive of approach and confidence of public and users maintained. Local floodplain management measures in place or planned within 25 years.</p>	<p>Implementation partners:</p> <p>Are you aware of the risks and particular vulnerability of key sites in this action zone? Do you have arrangements in place for initiating the discussion concerning scope of works required for the properties/ areas in which you have an interest? Can the Environment Agency assist with this through implementation of action A.4.2?</p> <p>Landowners, the public, business and other interested groups:</p> <p>We would be interested to hear your views to assist us in planning the implementation of this action A.4.2. particularly if you live, work or have interests in this area.</p>



	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.4.3. To agree partnership arrangements and principles to ensure that new development in this zone is safe, and that where possible, the application of PPS25 reduces the consequence flood risk – particularly in the areas where large numbers of people congregate or there is aggregation of flood risk.</p> <p>For flood risk management to be factored into the planning process at all levels for the first 25 years from 2010 to 2034.</p> <p>[Note: There is need for greater clarity over methods and procedures for safety in new development behind defences. We, along with local authority staff, are providing advice to Developers and responding to difficult Planning applications]</p> <p><i>(Cost of implementing this action not included in TE2100 Plan, but TE2100 data and information will be available to assist)</i></p>	<p>Environment Agency GLA, LDA, TGLP, Development Corporations</p> <p>Local Authority spatial and emergency planners in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering <p>Land Owners & Site managers Developers & Architects</p>	<p>TE2100 Plan and associated information informs London Plan and Local Development Frameworks (LDF) and future revisions.</p> <p>Local authority and our Planning staff require guidance for applying the principles of PPS25⁹ to the complexities of London defended tidal floodplain.</p> <p>This could be provided by local guidance for planning staff (Environment Agency and Local authority) and developers. The guidance could be a supplement to our Developers Pack.</p>	<p>Implementation partners: Are your LDFs supported by sustainability appraisals that include local tidal flood risk and the implications of climate change? If not, does the TE2100 Plan provide you with the information you need to do this? If local guidance is produced to provide interpretation of PPS25 in a defended area, what sort of information would be most helpful to you? Would you be able to assist the Environment Agency in preparing local guidance – and would it be useful to you?</p> <p>Landowners, the public, business and other interested groups: We would be interested to hear your views to assist us in planning the implementation of this action A.4.3, particularly if you have had experience (good or bad) of dealing with us and other authorities over planning and building by the river and in tidal floodplain in this east London downstream of Thames Barrier zone.</p>

⁹Planning Policy Statement No. 25 “Development and Flood Risk” (CLG 2006)

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	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.4.4.</p> <p>To review and maintain from 2035 to 2069, the partnership arrangements and principles for development and flood risk management established in the first 25 years of our Plan.</p>	As above	Local guidance is updated to reflect changing needs. The TE2100 10-yearly update to include review of action A.4.3 and recommend any changes or developments.	We cannot know what institutional arrangements will be in place during this period or what pressures there will be on the environment. We do know that for the east London downstream of Thames Barrier zone to continue to thrive, flood risk management must continue to be integrated into the spatial planning process. If you would like to help shape the development of these arrangements during the middle years (2035 to 2069) of our Plan, then please let us have your views.
	<p>A.4.5.</p> <p>To review and maintain from 2070 and into the 22nd century, the partnership arrangements and principles for development and flood risk management established in the middle years of the Plan.</p>	As above	TE2100 10-yearly update to include review of action A.4.4 and recommend further action. Local guidance is updated to reflect changing needs.	Flood risk management continues to be integrated into the spatial planning process into the 22nd century. If you have views on how the relationship between spatial planning and flood risk management should be developing in the east London downstream of Thames Barrier zone as we prepare for the 22nd century, then please respond to this action A.4.5.
	<p>A.4.6.</p> <p>To maintain, enhance and improve or replace, the river defence walls and active structures through the east London downstream of Thames Barrier zone over the first 25 years of the Plan from 2010 to 2034.</p>	<p>Environment Agency</p> <p>Local Authority spatial planners in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering 	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>Our Asset System Management teams will promote these schemes. However, the method of improving the defences is different from the present day approach.</p>	<p>This is the work which we do now in the Environment Agency. We will continue with our programme of operations, maintenance and replacement but we are looking for ways of working better and more effectively.</p> <p>We are also seeking opportunities for environmental and recreational enhancements which will create a better place through our east London downstream of Thames Barrier zone, and for partnerships which will help us achieve this.</p> <p>We would welcome any comments that you or your organisation can provide which assist us in these aims.</p> <p style="text-align: right;">(continued)</p>



TE2100 action plan: **action zone 4** – east London downstream of Thames Barrier

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
 First 25 years	<p>A.4.6. (continued)</p> <p>[Note: This is a continuation of our current activities to ensure that confidence in the Thames tidal flood risk management system is maintained and that opportunities for environmental enhancements and partnership through planning are actively sought and carried out]</p> <p><i>(Cost of implementing this action is included in TE2100 Plan)</i></p>	<p>GLA</p> <p>Land Owners</p> <p>Developers & Architects</p> <p>Thames Estuary Partnership</p>	<p>It involves greater maintenance and repair work in addition to replacement. Promotion of schemes through the capital programme may not be appropriate for maintenance and repair, and a different way of working may be required.</p>	<p>Our TE2100 Technical Report and local choices document for the policy units provide our assessment of the choices which are available in the east London downstream of Thames Barrier zone in the short term. If you would like to comment on these in more detail, please contact the project team.</p>
 Middle 35 years	<p>A.4.7.</p> <p>To maintain, enhance and improve or replace the defence walls and active structures through east London downstream of Thames Barrier during the 30 year period of the Plan from 2035 to 2069.</p> <p>[Note: Continuing our activities to ensure that confidence in the Thames tidal flood risk management system is maintained and that opportunities for environmental enhancements and partnership through planning are actively sought and carried out]</p> <p><i>(Cost of implementing this action is included in TE2100 Plan)</i></p>	<p>Environment Agency</p> <p>Local Authority spatial planners in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering <p>Land Owners</p> <p>Developers & Architects</p> <p>Thames Landscape Strategy</p>	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>Our Asset Systems Management teams will promote schemes through capital programme and they will form part of strategic and investment plans subject to replacement/repair working arrangements as A.4.6. above.</p> <p>There are major opportunities for reshaping the local landscape as part of these works.</p>	<p>Our aims remain as A.4.6 above, but during this period, there will be a major programme of rebuilding and refurbishment of the river walls and defences through our east London downstream of Thames Barrier zone. This provides many opportunities for creating a better place and to plan for a better riverside environment. If you would like to help shape the future environment in this area, then please let us have your views.</p> <p>During this period we will be preparing for the “end of the century” options – see A.4.8 below and any decisions made as part of action A.4.7 must recognise that there may be major changes from 2070.</p> <p>Our TE2100 Technical Report and local choices document for the policy units provide our assessment of the choices which are available in east London downstream of Thames Barrier in the medium term (2035 to 2069). If you would like to comment on these in more detail, please contact the project team.</p>



Barking & Dagenham

Rainham Marshes & Mar Dyke

TE2100 action plan: **action zone 4** – east London downstream of Thames Barrier

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	A.4.7. (continued)		The TE2100 Plan 10-yearly review and update will give a clear picture of the end of the century works to be recommended.	
	<p>A.4.8. To Implement our “end of the century” option in 2070.</p> <p>Our front runners at this stage for end of the century options are:</p> <p>Option 1.4 – Improve Existing system which includes improvements to the Thames Barrier and defence raising down river of the Thames Barrier.</p> <p>Option 3.2 – New Barrier at Long Reach.</p> <p>If a new downriver barrier is constructed in 2070 (option 3.2), further defence raising in this zone will not be needed in this zone and there will be an opportunity to lower the defences by up to a metre.</p> <p><i>(Cost of implementing this action is included in TE2100 Plan)</i></p>	<p>Environment Agency</p> <p>Landowners</p> <p>London Boroughs in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering <p>Developers & Architects</p> <p>The public</p> <p>Local interest groups</p> <p>GLA</p> <p>Floodplain users</p> <p>Thames Landscape Strategy</p> <p>Thames Gateway Parklands Vision</p>	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>Our Asset Systems Management teams will promote schemes through capital programme.</p> <p>There are major opportunities for reshaping the local landscape as part of these works and changing the relationship with the river.</p> <p>The TE2100 10-yearly update will include a review of action A.4.8. and recommend further whether the end of the century recommendations have changed.</p>	<p>2070 is a long way ahead but a decision needs to be made on the TE2100 “end of the century” option. This will enable us to finalise our Plan. The end of the century options (see estuary-wide action plan – action zone 0) affect the requirements for wall raising in this zone and could provide an opportunity for reducing wall levels upstream of a new Long Reach Barrier. This could provide the catalyst for a significant change in the riverside landscape in this area.</p> <p>So if you have views about the effect of raising (by +1 m) or lowering (by 1 m) the height of the defence walls in this area, or your views on a barrier at Long Reach, please share them with us in submitting your response to this action (A.4.8).</p> <p>We will make recommendations based on conditions now, in 2009, but the final decision on “end of the century” option to be adopted is likely to be made between 2050 and 2060, and our front runners may or may not change.</p> <p>It is important to send us your views because the responses we receive during this consultation will set the baseline for establishing public attitudes to the east London downstream of Thames Barrier riverside environment. This “2009 snapshot” of east London downstream of Thames Barrier stakeholder views will form a starting point for measurement of public attitudes in the future.</p>


TE2100 action plan: **action zone 4** – east London downstream of Thames Barrier

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.4.9. To maintain, improve and enhance or replace the river defence walls and active structures in east London downstream of Thames Barrier zone post 2070 and into the 22nd century.</p> <p>Whether or not there is a new barrier (i.e. option 3.2) all the defences in east London downstream of Thames Barrier zone raised will still require ongoing maintenance, repair and replacement (and hence engineering works) and this has been allowed for in our Plan investment profile.</p> <p><i>(Cost of implementing this action is included in TE2100 Plan)</i></p>	<p>Environment Agency</p> <p>Land Owners</p> <p>Developers</p> <p>London Boroughs in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering <p>Thames Landscape Strategy</p> <p>Thames Gateway Parklands Vision</p>	<p>Our Planning Liaison and Development Control staff will promote these works as part of ongoing development applications.</p> <p>We will promote schemes through capital programme and they will form part of strategic and investment plans subject to replacement/repair working arrangements as A.4.6. above.</p> <p>There are major opportunities for reshaping the local landscape as part of these works.</p>	<p>We cannot know what institutional arrangements there will be as we approach the 22nd century, but our TE2100 vision imagines an environment where the estuary environment downstream of the Thames Barrier continues to thrive and the riverside is increasingly enjoyed and respected by the people who live, work and visit. This means that the actions established in A.4.6. and A.4.7. will be continued by whoever is looking after our environment at that time. If you have views about the long-term future management of the east London downstream of Thames Barrier riverside, we would like to hear them. This consultation provides an opportunity for you to have these views recorded and presented as part of an ongoing vision statement to those who follow us 60 to 100 years from now.</p>
	<p>A.4.10. To agree a programme of managing flooding from other sources in the defended tidal floodplain.</p> <p>Large areas of east London downstream of Thames Barrier are low-lying, and there is potentially a high risk of pluvial and urban drainage flooding, particularly in areas where the urban drainage system has relatively low capacity and/or is prone to tide locking.</p>	<p>Environment Agency</p> <p>London Boroughs in action zone 4:</p> <ul style="list-style-type: none"> • LB Greenwich • LB Bexley • LB Barking & Dagenham • LB Havering 	<p>We will discuss with our implementation partners to agree strategic scope of measures required.</p> <p>Agreement between implementation partners on the development and implementation of a Surface Water Management Plan.</p>	<p>Implementation partners: Are you aware of the risks and particular vulnerability of people and property to flooding from sources other than tidal? Do you have arrangements in place for initiating the discussion concerning scope of works required for the properties/areas in which you have an interest? Can the Environment Agency assist with this through implementation of Action A.4.10?</p> <p style="text-align: right;">(continued)</p>



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TE2100 action plan: **action zone 4** – east London downstream of Thames Barrier

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
	<p>A.4.10. (continued)</p> <p>There is also fluvial flood risk from:</p> <ul style="list-style-type: none"> • Marsh Dykes • River Roding • Beam River <p>Some of the local choices to be investigated are listed in this action A.4.10. There are issues which must be better understood before schemes are promoted. For example, There are potential difficulties with any new structure on the River Roding because the river is an important fish migration route.</p> <p>Our TE2100 Technical Report provides further information on these matters and the choices which are available to assist with problems. If you would like to comment on these in more detail, please contact the project team.</p> <p><i>(Cost of implementing this action is not included in TE2100 Plan, but TE2100 data, information and recommendations are available to support the successful implementation of the action)</i></p>	<p>Internal Drainage Boards</p> <p>Thames Water</p> <p>Land Owners</p> <p>Developers & Architects</p>	<p>All site owners must be supportive of approach and confidence of public and users maintained. Local measures for management of flooding from other sources to be in place or the planned within 25 years.</p>	<p>We would be interested to hear your views to assist us in planning the implementation of this action A.4.10, particularly if you live, work or have interests in this area and are concerned about flooding from sources other than tidal. This includes pluvial and urban drainage and fluvial flooding from the Marsh Dykes, River Roding and Beam River.</p> <p>Responses to manage fluvial flood risk:</p> <p>Managing fluvial flood risk on the Marsh Dykes could include:</p> <ul style="list-style-type: none"> • increase in flood storage volume in the system; • managing surface runoff; • land raising; • improved outfalls including an increase in pumping capacity; • combinations of the above. <p>Local choices for the River Roding could include:</p> <ul style="list-style-type: none"> • raising the tidal defences; • a new flapped outfall upstream of the navigation area, to reduce the need for defence raising; • realignment of the tidal defences where improvement on the existing line would be difficult; • upstream fluvial flood storage. This is the response favoured in the Roding strategy for fluvial flood management, although its effectiveness has not been demonstrated; • diversion of fluvial flows. A provisional route has been identified, which could divert flows to Rainham marshes although the feasibility of this idea has not been investigated. <p style="text-align: right;">(continued)</p>



TE2100 action plan: **action zone 4** – east London downstream of Thames Barrier

	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
 First 25 years	<p>A.4.10. (continued)</p>			<p>Responses and choices for the Beam River could include:</p> <ul style="list-style-type: none"> • improvements to the outfall including possible pumping; • more local fluvial flood storage (in addition to the existing scheme); • local defence raising; • a combination of the above responses. <p>Other watercourses Responses to manage fluvial flood risk on drainage channels including Mayes Brook and Gores Brook could include:</p> <ul style="list-style-type: none"> • outfall improvements incl. pumps; • local fluvial flood storage; • local defence improvements; • a combination of the above responses.
 Up to 2100	<p>A.4.11. Understanding Local views on alternative end of the century options.</p> <p>In Thamesmead policy unit, Erith marshes have been identified as a suitable area for tidal flood storage in estuary-wide option 2, although there are strong development pressures in this area.</p> <p>Aveley Marshes in Rainham Marshes and Mar Dyke policy unit has also been identified as a suitable area for tidal flood storage.</p>	<p>RSPB</p> <ul style="list-style-type: none"> • LB Bexley • LB Havering 	<p>We will discuss with our implementation partners to review changes to flood risk drivers. Should options which, at this point in the TE2100 plan, are not considered ‘front runners’ become more viable in the future agree strategic scope of measures required.</p>	<p>We cannot now what how the drivers of flood risk, be they climate, environment or social/economic, will change in the future. We are interested to know your thoughts on the options that through the TE2100 appraisal process have not been identified as front runners for the plan. If you have views about the long-term future management of the east London downstream of Thames Barrier riverside, we would like to hear them. This consultation provides an opportunity for you to have these views recorded and presented as part of an ongoing vision statement to those who follow us 60 to 100 years from now.</p> <p style="text-align: right;">(continued)</p>

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	TE2100 recommended actions	Implementation partners	How this will be achieved	How your response can help us finalise the TE2100 Plan
 Up to 2100	<p>A.4.11. (continued)</p>		<p>Agreement between implementation partners on the strategic approach, and roles and responsibilities for achieving it.</p> <p>All site owners must be supportive of approach and confidence of public and users maintained. Local measures for management of flooding from other sources to be in place or the planned within 25 years.</p>	
 Middle 35 years	<p>A.4.12.</p> <p>To agree a programme for habitat enhancement and creation.</p> <p>In 2024 planning and, soon after, groundworks may need to be started in this policy unit to compensate for the loss of designated freshwater and grazing marsh interest features as a result of potential loss as a result of intertidal habitat creation. The following sites have been identified in this policy unit as having the potential to support the interest features that could be lost, either through enhancement of existing habitat features:</p> <ul style="list-style-type: none"> • Aveley, Wennington and Rainham Marshes • Ingrebourne River. 	<p>Environment Agency</p> <p>Natural England</p> <p>Land owners</p> <p>Local Authorities</p> <p>Public and local interest groups</p> <p>RSPB</p> <p>Wildlife Trusts</p>	<p>Planning and groundworks would take at least 5 years and there would be an additional 10 years before the habitat is fully established at the sites.</p> <p>We will be looking for partnership arrangements to manage these sites and get the best for the natural environment, for the local population and for visitors.</p>	<p>We would like to hear your views on our 2024 habitat creation proposal.</p> <p>It is important that we use this consultation to have a proper and effective airing of information and views regarding any land use change. In the Environment Agency we see habitat creation as a positive step toward the goal of sustainability and supporting the habitats and species that make the Thames estuary internationally important.</p> <p>Habitat creation also provides opportunities for enhancements for recreation, visitors centres and other facilities. In order to finalise our plans, we need to hear what you think – in general terms, or at a local level.</p>

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