

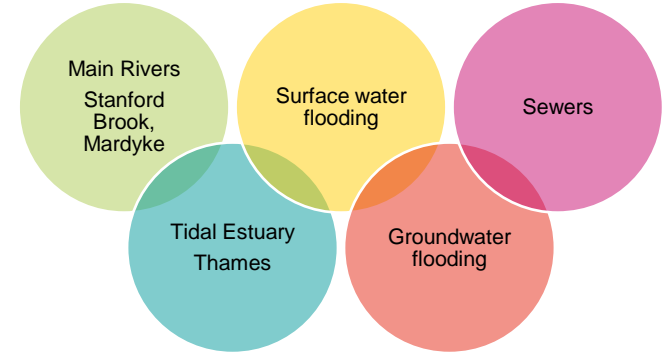
Strategic Flood Risk Assessment

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AECOM

National Planning Policy Framework Section 14

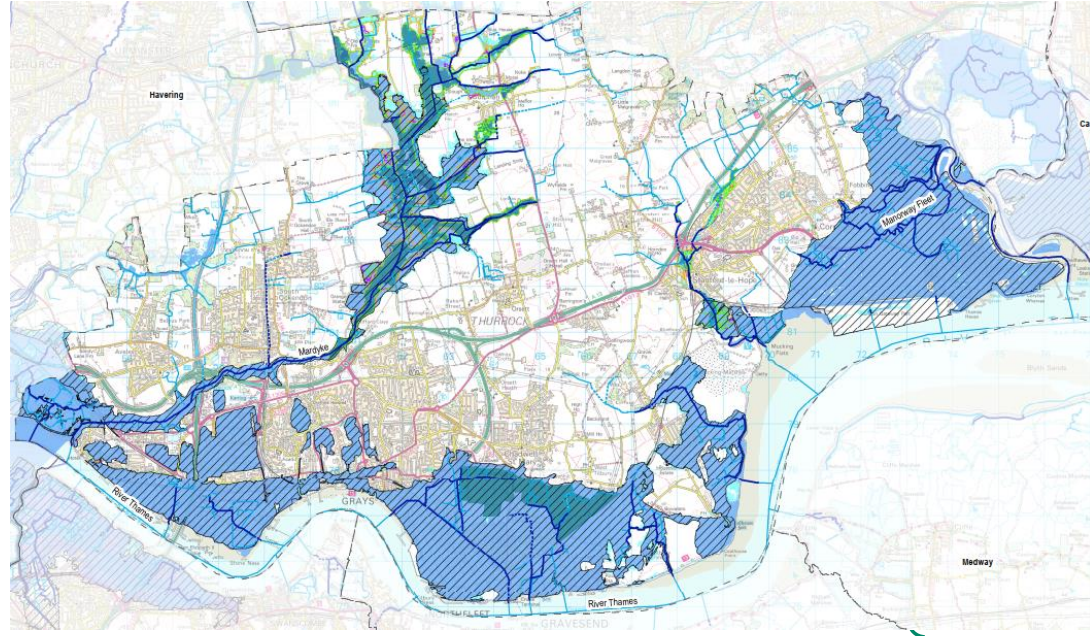
Plans and strategic policies should be informed by a **Strategic Flood Risk Assessment:**

- all sources of flooding
- cumulative impacts in areas susceptible to flooding
- impacts of climate change
- land that needs to be safeguarded for future flood risk management (FRM)
- opportunities to reduce the causes and impacts of flooding (green infrastructure, natural flood management (NFM))
- locations where climate change could increase flood risk so that development may not be sustainable in the long term



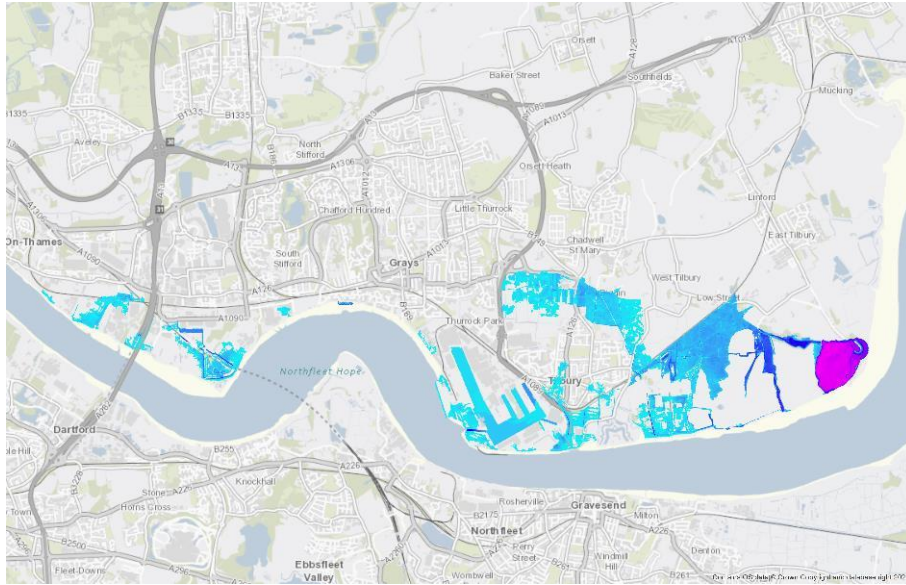
— Flooding from **sea/estuary**: Thames Estuary

- Large areas of Flood Zone 3
'high probability' of flooding.
*doesn't account for defences
- Shown to benefit from **defences**.
- So, what is the risk?
 - Risk of **overtopping** of the defences in the future due to climate change
 - 'Residual' risk of **breach** in defence

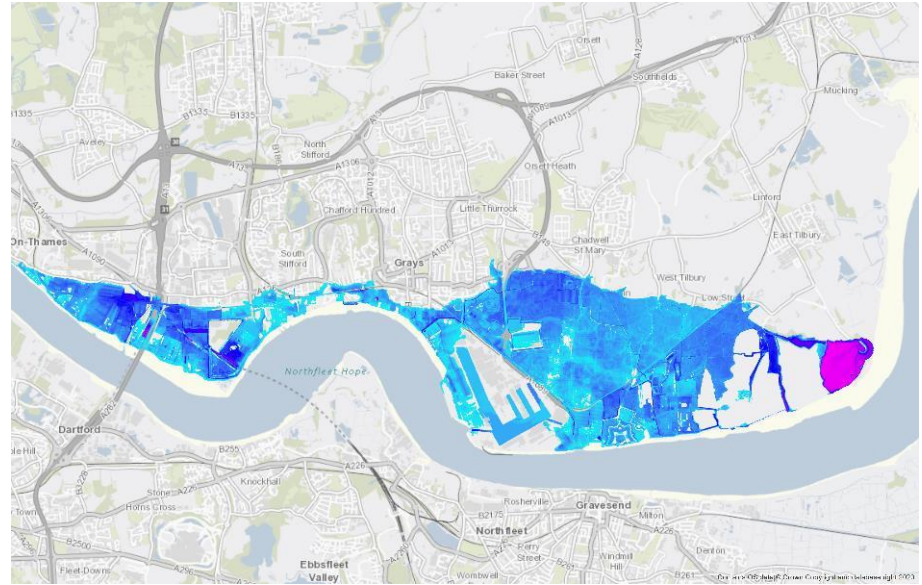


Flooding from **sea/estuary**: Risk from overtopping

- Example Outputs, Year 2125, 1 in 200 Year Event



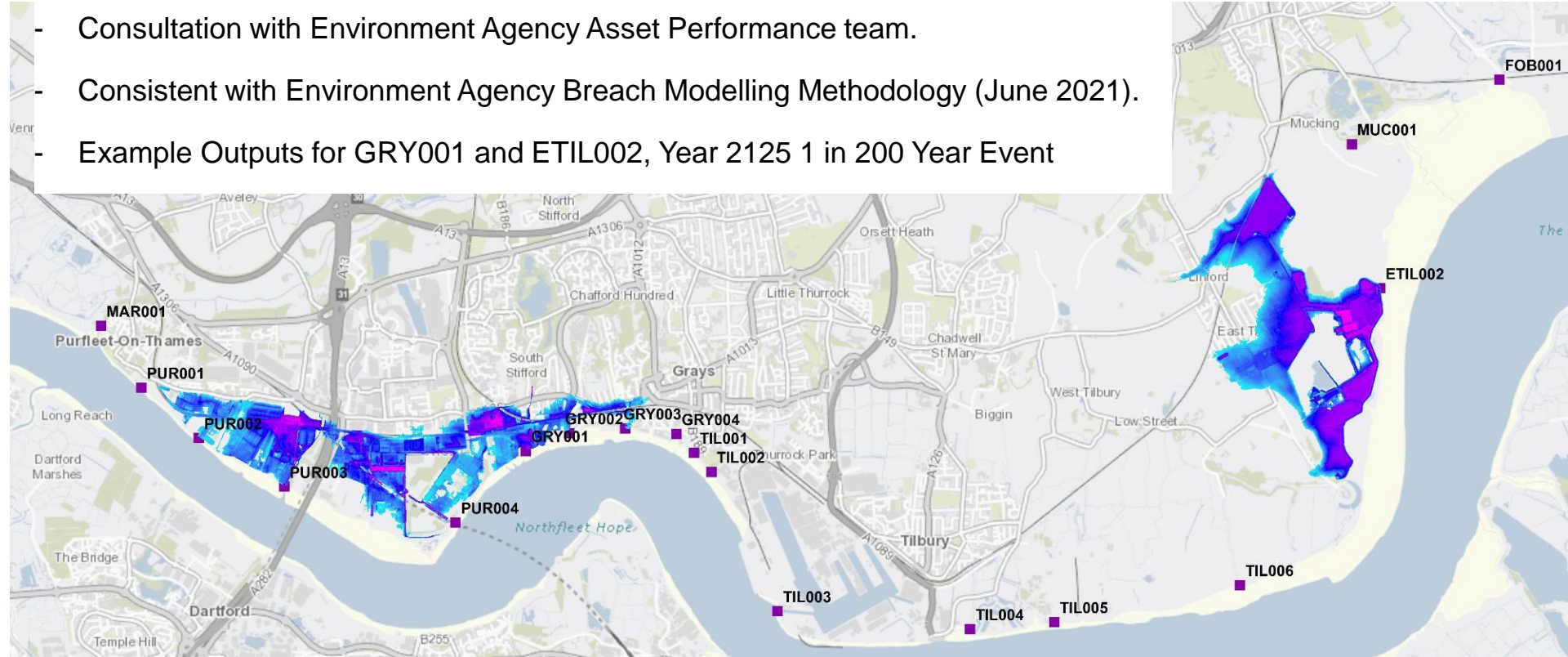
- Example Outputs, Year 2125, 1 in 1000 Year Event



- This modelling assumes no change to the existing flood defence levels. The Thames Estuary 2100 Policy most of the Thurrock frontage is to improve defences in line with climate change. Therefore, this provides a conservative understanding of the risk, should defences remain as they are.

Flooding from **sea/estuary**: Residual risk of a breach in Thames defences

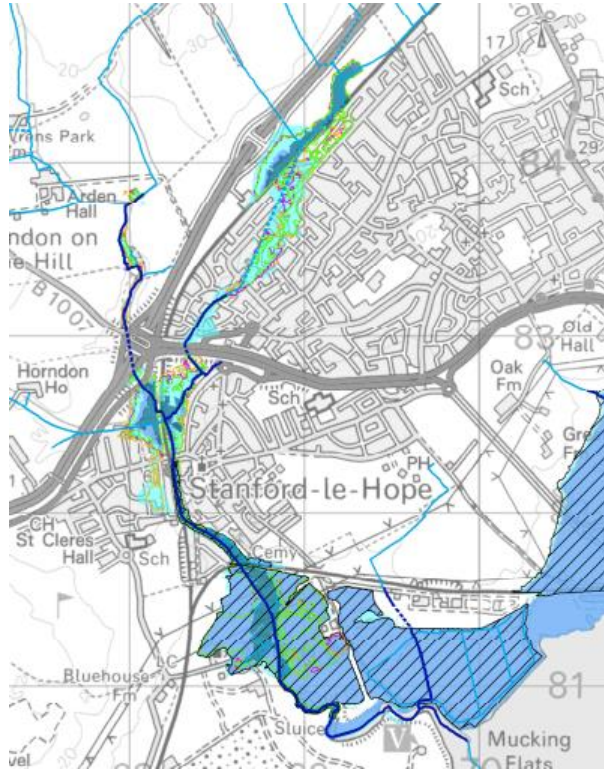
- 21 Breach locations
- Consultation with Environment Agency Asset Performance team.
- Consistent with Environment Agency Breach Modelling Methodology (June 2021).
- Example Outputs for GRY001 and ETIL002, Year 2125 1 in 200 Year Event



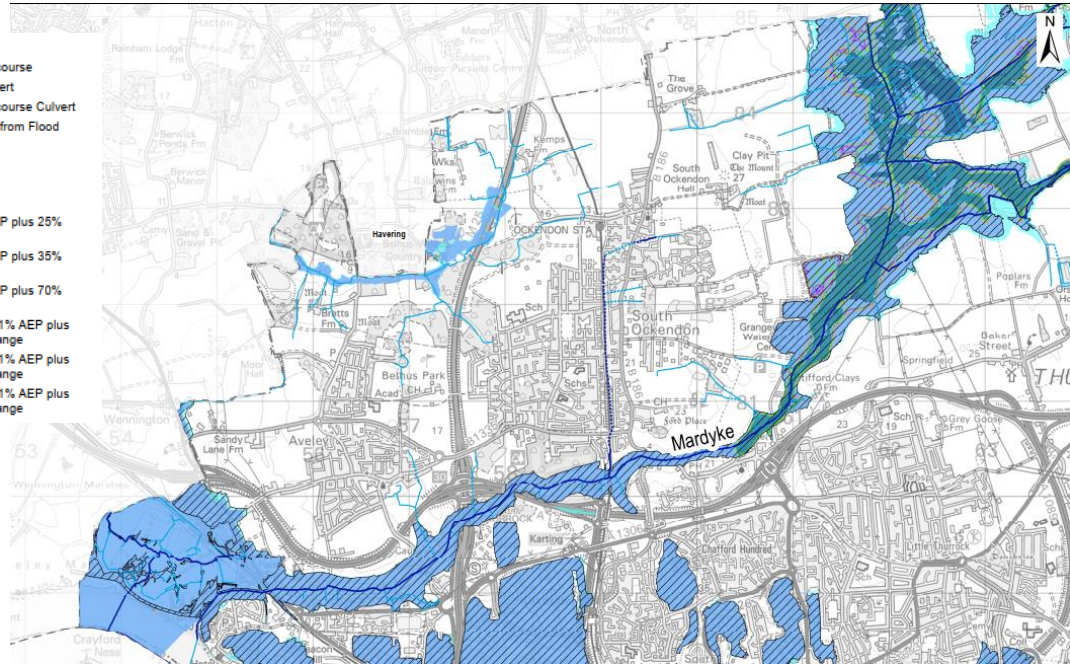
Flooding from rivers: Mardyke, Stanford Brook

Hydraulic models, latest climate change allowances.

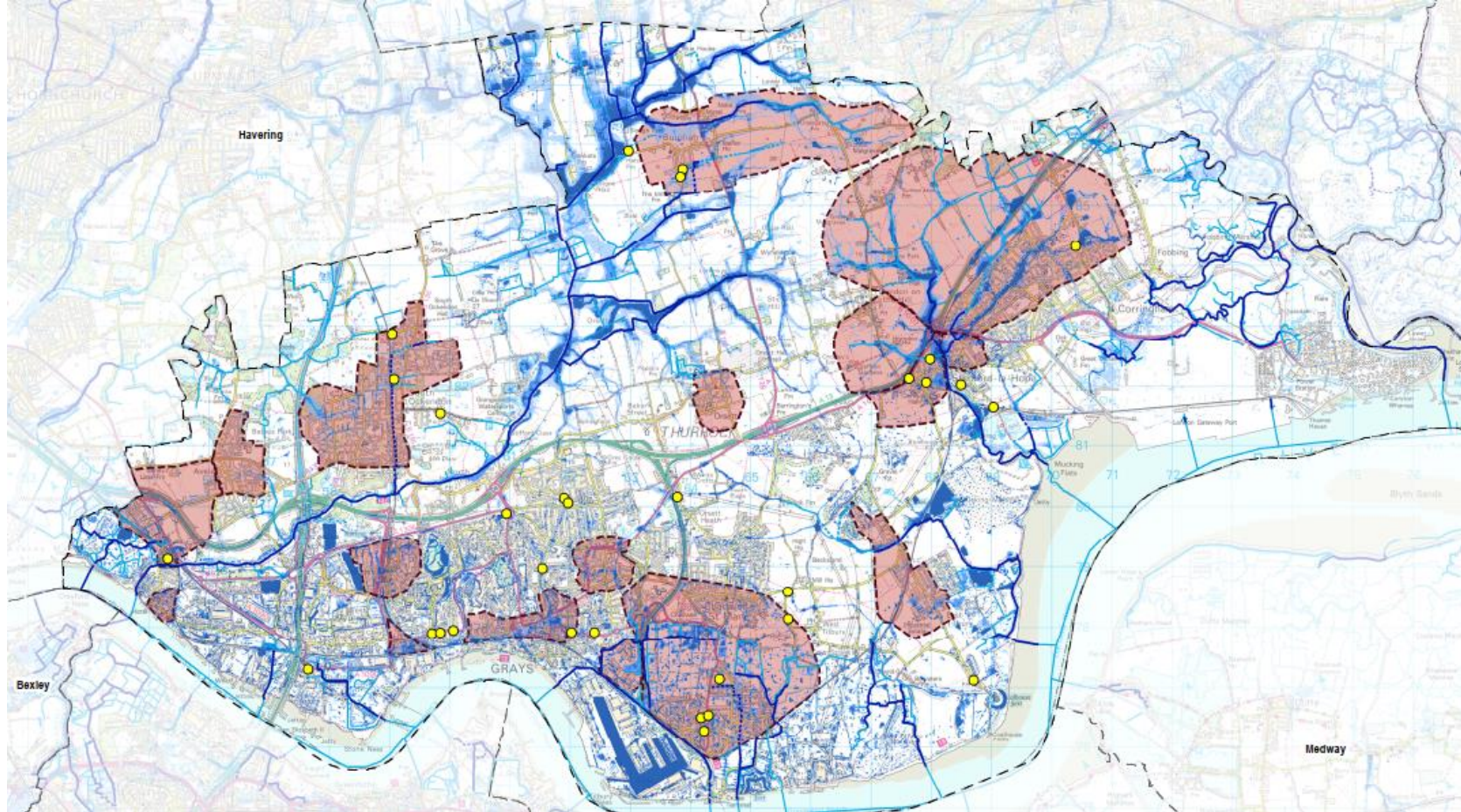
Additional sensitivity analysis study for Mardyke model, to determine potential for cumulative impact of development on flood risk.



- Main River
- Ordinary Watercourse
- Main River Culvert
- Ordinary Watercourse Culvert
- ▨ Area Benefiting from Flood Defence
- Flood Zone 2
- Flood Zone 3a
- Flood Zone 3b
- Mardyke 1% AEP plus 25% climate change
- Mardyke 1% AEP plus 35% climate change
- Mardyke 1% AEP plus 70% climate change
- Stanford Brook 1% AEP plus 25% climate change
- Stanford Brook 1% AEP plus 35% climate change
- Stanford Brook 1% AEP plus 70% climate change

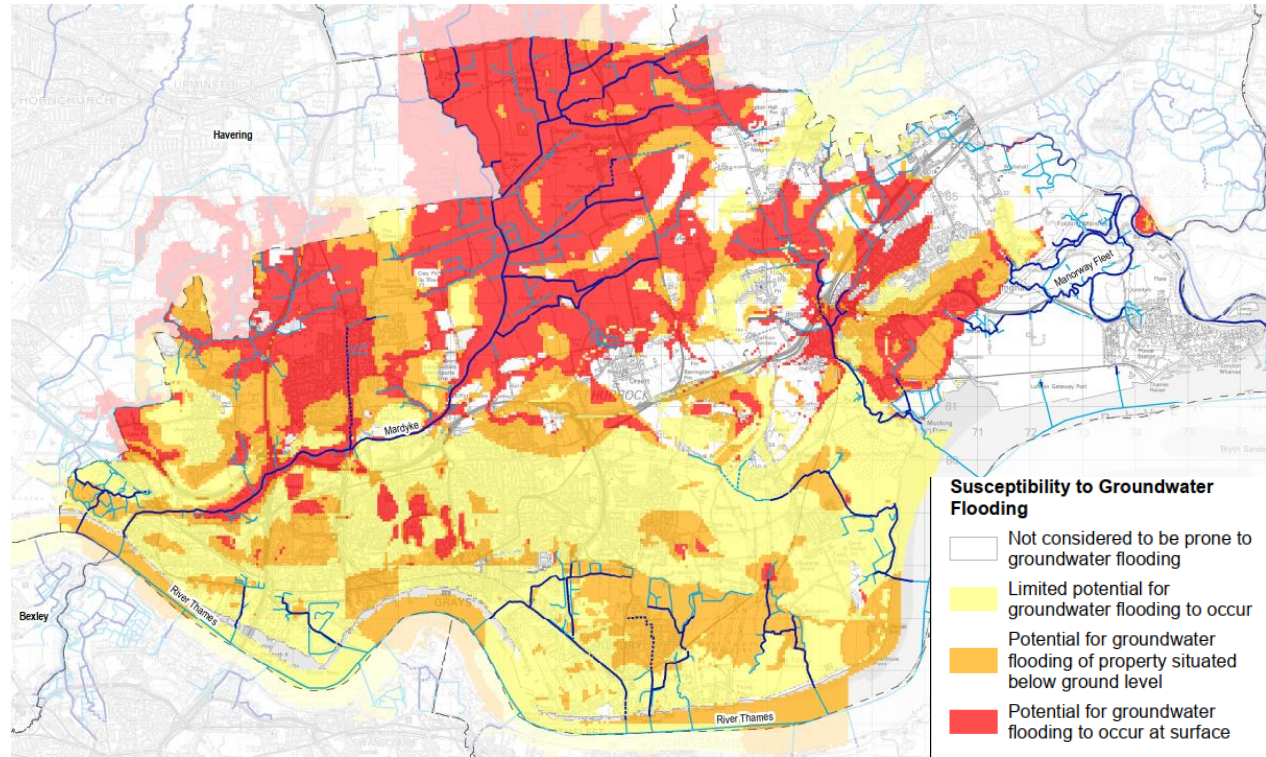


— Flooding from surface water



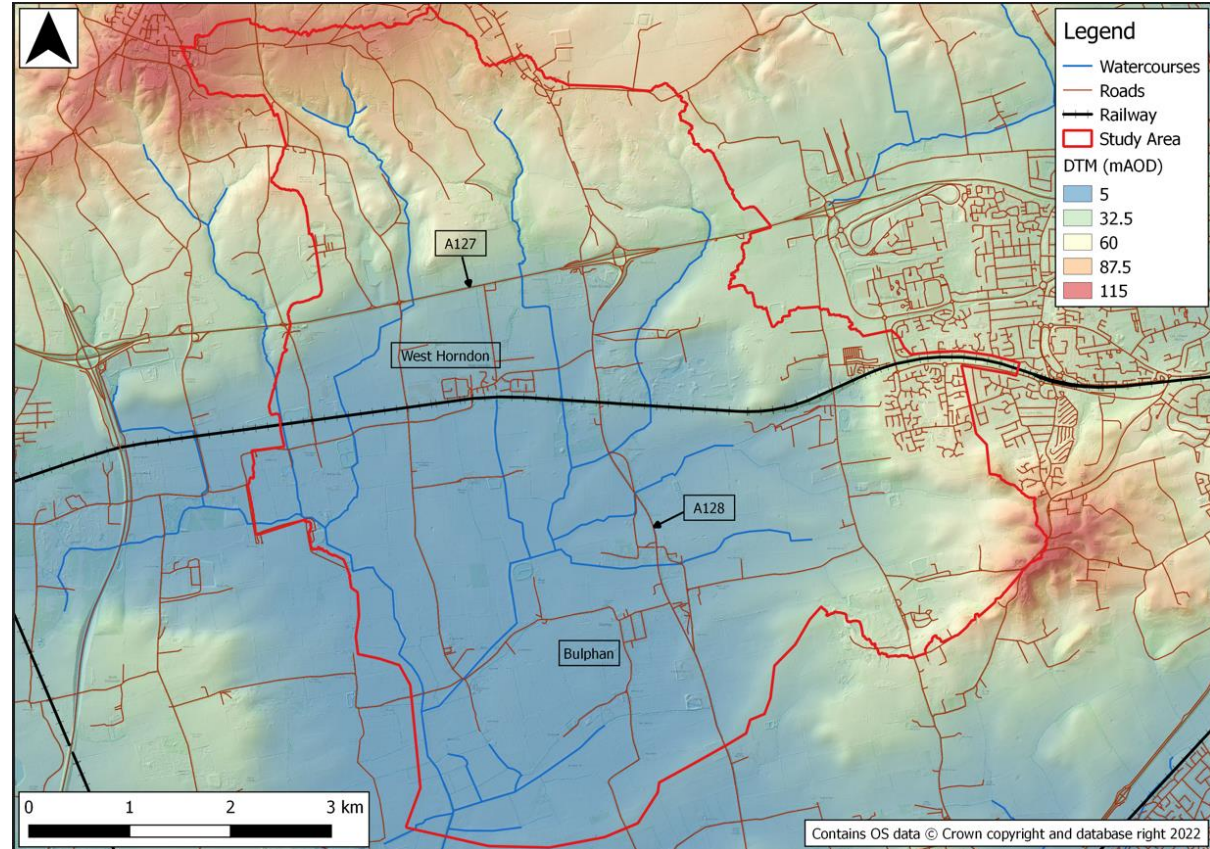
Flooding from groundwater

- BGS dataset which provides an overview of susceptibility to groundwater flooding.
- Can be used in connection with historical records to understand risk.



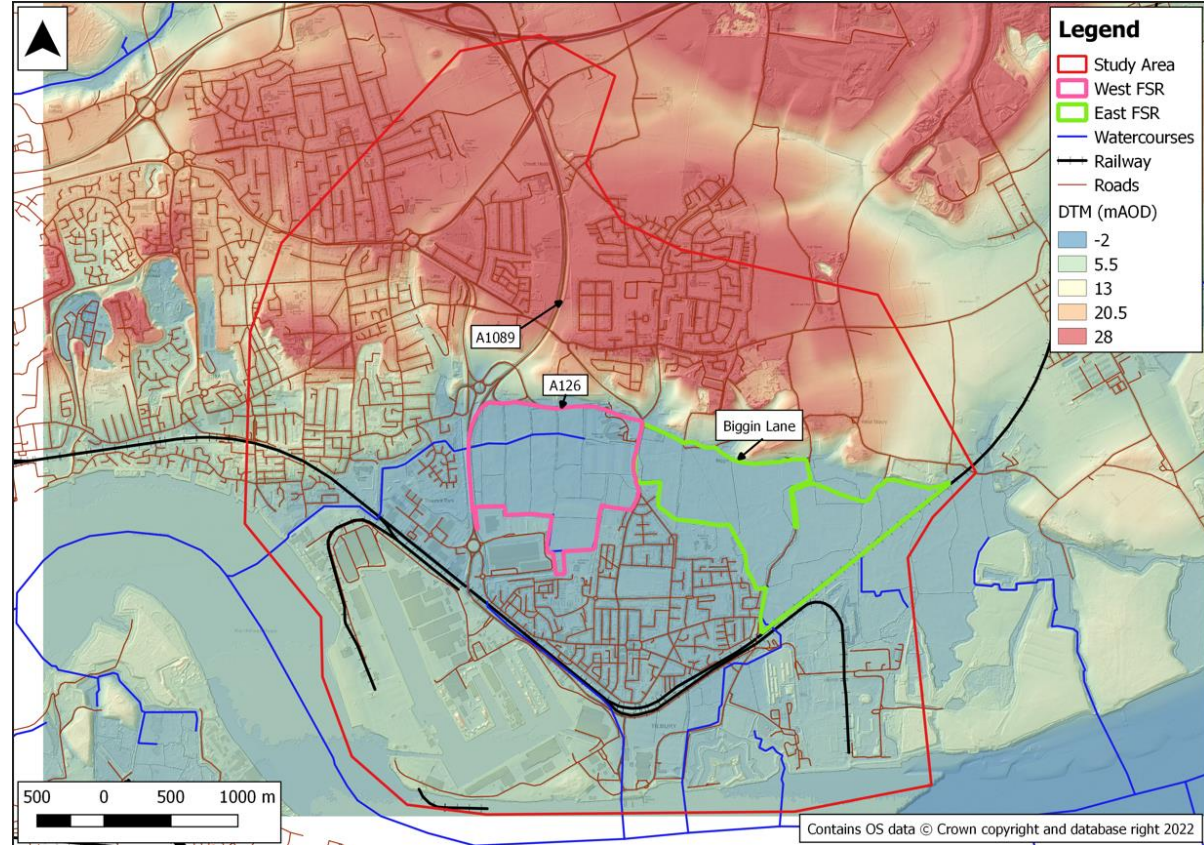
Local Study: West Horndon

- Interconnected sources of flooding (surface water, sewers, river)
- Integrated Catchment Model
- High level assessment of potential cumulative impact of multiple development sites
- Sensitivity of catchment and existing flooding to future development



Local Study: Tilbury

- Interconnected sources of flooding (surface water, sewers, flood storage areas)
- Integrated Catchment Model
- High level assessment of potential cumulative impact of multiple development sites
- Sensitivity of catchment and existing flooding to future development



Development management considerations

Appropriate development types

Sequential approach to site layout

Flood resilient design

Emergency plans

Safe access/escape

Safe refuge

Policy recommendations

Types and location of development

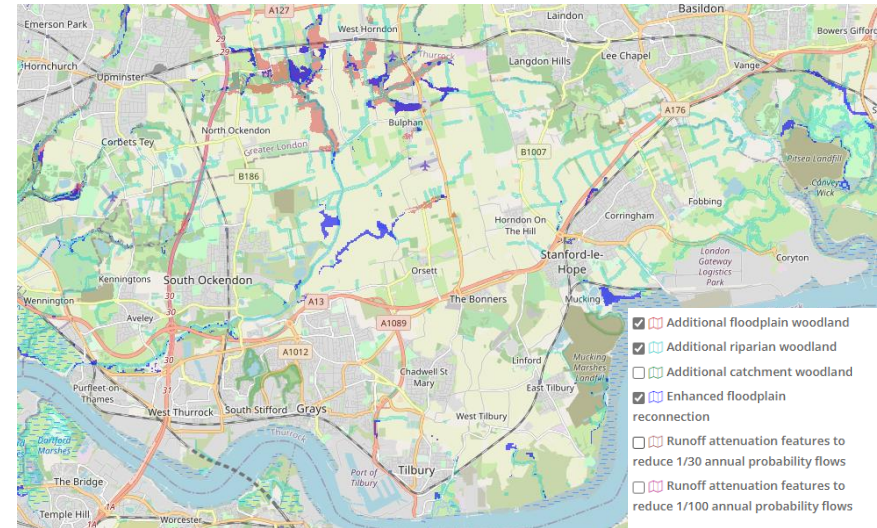
Land that needs to be safeguarded for FRM; set back distances

Management of surface water runoff

Development management

Emergency planning

Opportunities to reduce the causes and impacts of flooding through green infrastructure – working with natural processes.



Screen shot from: <https://naturalprocesses.jbahosting.com/Map>

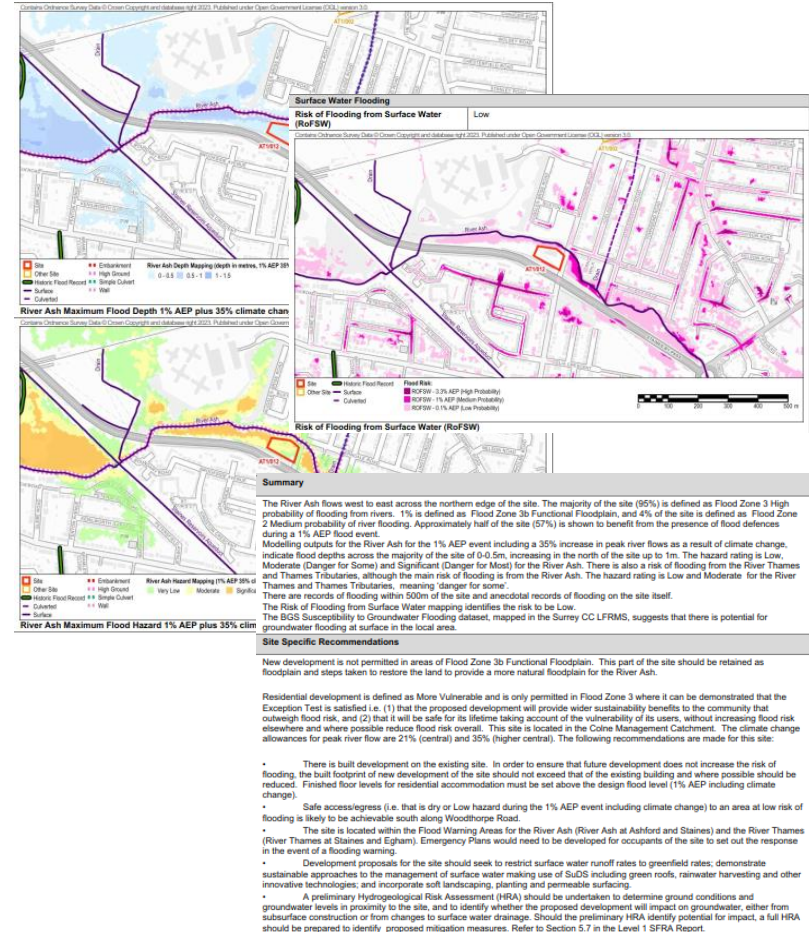
Level 2 SFRA Site Assessments

Some sites in Thurrock will require application of the Exception Test, e.g., any residential development proposed in Flood Zone 3.

NPPF para. 164: To pass the exception test it should be demonstrated that:

- the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
- the development will be **safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.**

Example extracts of a Level 2 SFRA Site Assessment Sheet:



Summary: Considering flood risk in plan making and site selection



- Strategic Flood Risk Assessment (AECOM)

- Site Assessment Database (AECOM)
- Document Sequential Test Process & Decisions (Thurrock Council)

- Outcome from Site Selection Decisions (Thurrock Council)

- Level 2 SFRA Site Assessments to inform part (2) of the Exception Test (AECOM)

LURB NPPF Proposed Amendments

- ❑ Minor modification to the presumption in favour
- ❑ Removal of the justified test of soundness
- ❑ Additional text relating to Green Belt
- ❑ Emphasis on design has been strengthened further, with a focus on 'beautiful design' throughout and the requirement for LPAs to bring forward design codes for their area
- ❑ Greater weight to energy efficiency improvements in existing buildings and there is also increased support for applications for the repowering and life-extension of existing renewable sites.

'Green Belt boundaries are not required to be reviewed and altered if this would be the only means of meeting the objectively assessed need for housing over the plan period.'