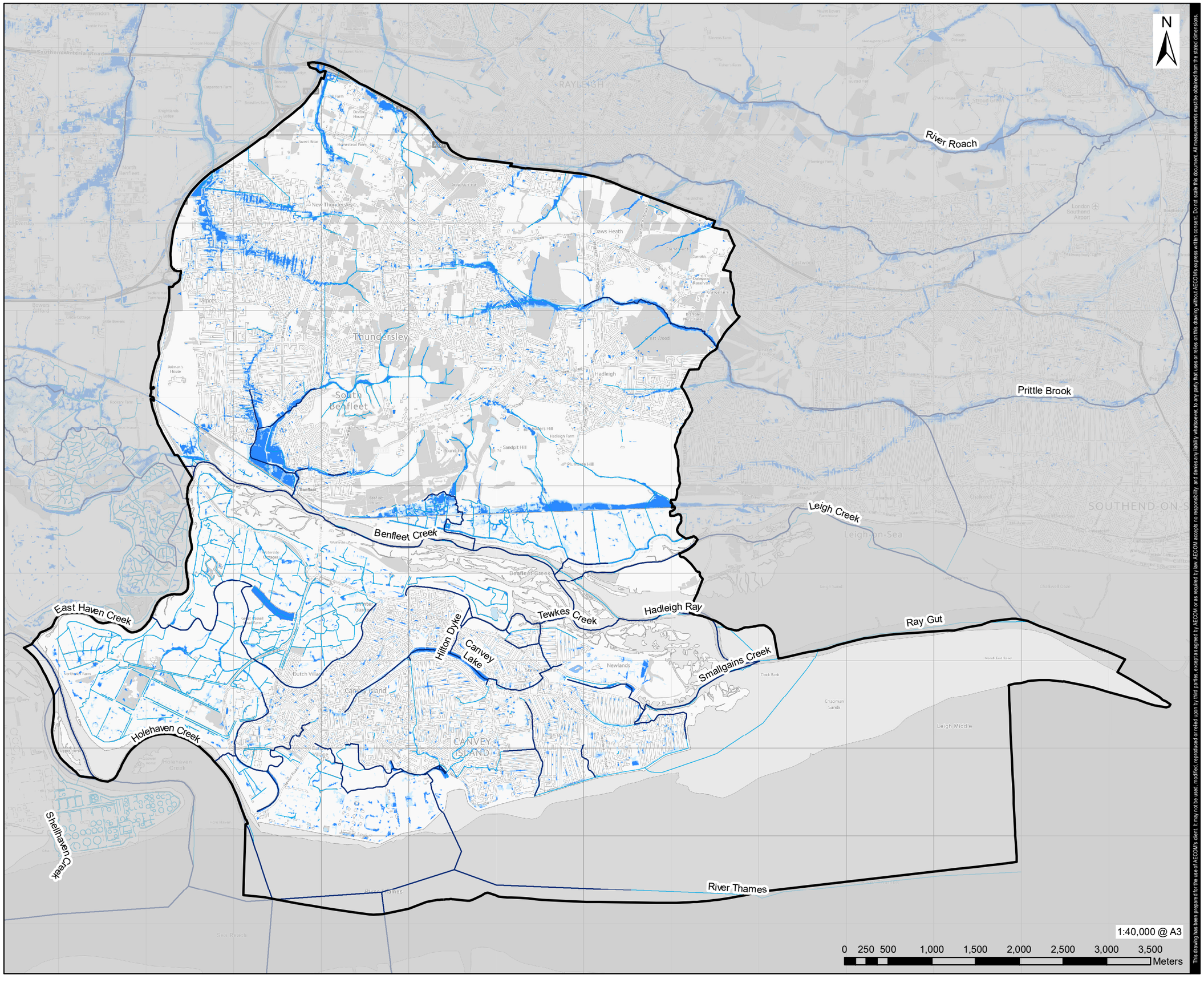
Appendix E Surface Water Modelling Mapping

Map 1: Modelled Surface Water Flood Risk – Present Day

Map 2: Modelled Surface Water Flood Risk – Climate Change

Revision: 2 Drawn: LL Checked: BW Approved: RM Date: 2024-11-13



AECOM

PROJECT

Castle Point Borough Council Level 1 Strategic Flood Risk Assessment

CLIENT

Castle Point Borough Council

CONSULTANT

AECOM Limited
Midpoint, Alencon Link,
Basingstoke, Hampshire
RG21 7PP
www.aecom.com

LEGEND

- Castle Point Borough Council
- EA Main River
- Watercourse

Modelled Surface Water Flood Risk Extents

- 3.3% AEP
- 1% AEP
- 0.1% AEP

NOTES

1: This map shows the predicted likelihood of suface water flooding based on modelling undertaken by AECOM for the 3.3%, 1% and 0.1% annual exceedance probability (AEP) events. Refer to the SFRA report for details on the surface water modelling methodology, assumptions and limitations.
2: This map displays results from two models; South Essex and Canvey Island. The Canvey Island model has superseeded the South Essex model across the Canvey Island area. This is due to the Canvey Island model being an integrated urban drainage model and therefore more detailed.
3: This map is intended to provide a strategic overview of surface water flood risk and should not be used to assess the flood risk for individual properties.

ISSUE PURPOSE

SFRA

PROJECT NUMBER

60725540

MAP TITLE

Modelled Surface Water Flood Risk - Present Day

MAP NUMBER

Appendix E Map 1

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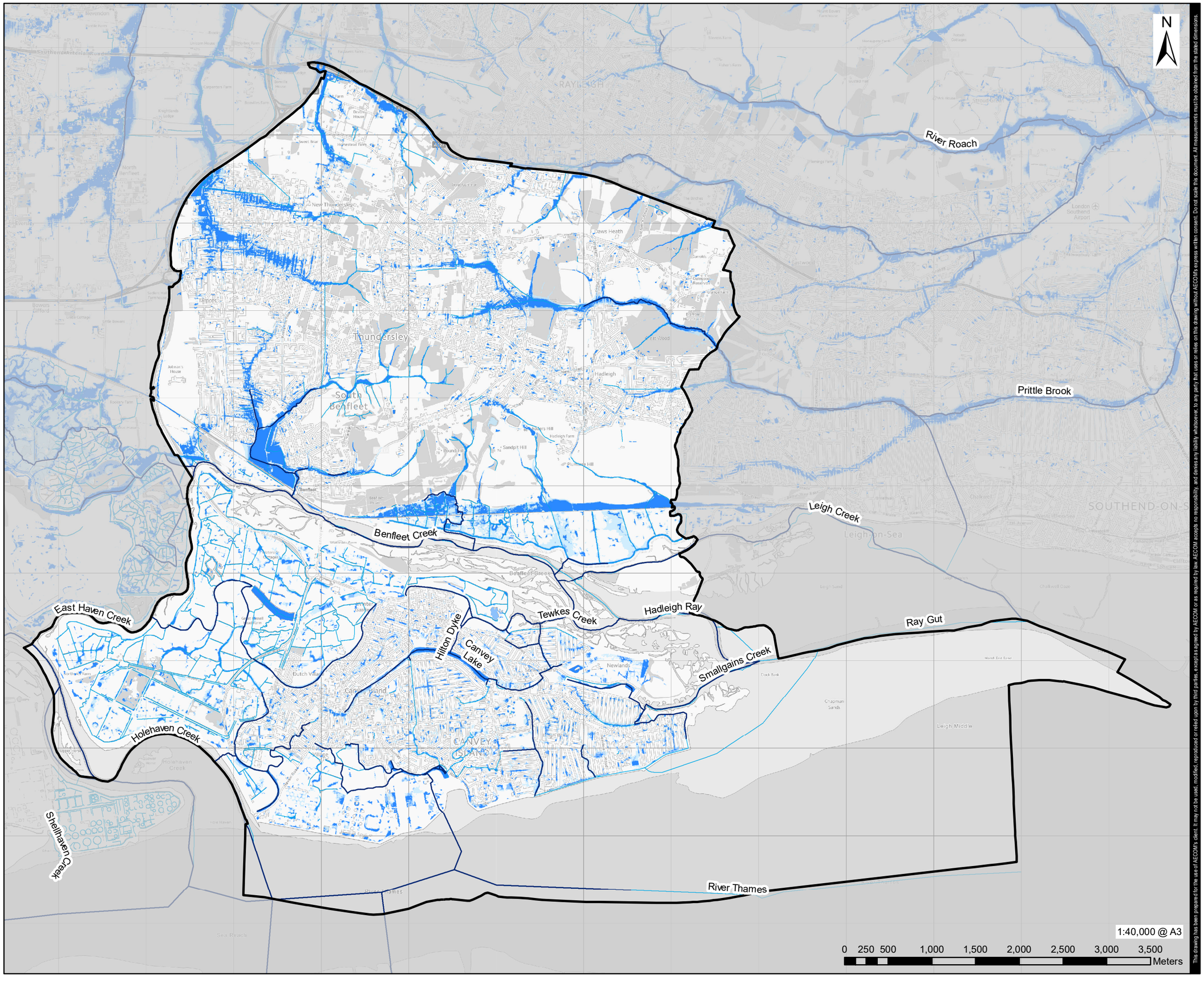

AECOM

PROJECT

Castle Point Borough Council Level 1 Strategic Flood Risk Assessment

CLIENT

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LEGEND

- Castle Point Borough Council
- EA Main River
- Watercourse

Modelled Surface Water Flood Risk Extents

- 3.3% AEP + 40% Climate Change
- 1% AEP + 40% Climate Change
- 0.1% AEP + 40% Climate Change

NOTES

1: This map shows the predicted likelihood of suface water flooding based on modelling undertaken by AECOM for the 3.3%, 1% and 0.1% annual exceedance probability (AEP) events inlcuding a 40% allowance for climate change. Refer to the SFRA report for details on the surface water modelling methodology, assumptions and limitations.
2: This map displays results from two models; South Essex and Canvey Island. The Canvey Island model has superseeded the South Essex model across the Canvey Island area. This is due to the Canvey Island model being an integrated urban drainage model and therefore more detailed.
3: This map is intended to provide a strategic overview of surface water flood risk and should not be used to assess the flood risk for individual properties.

ISSUE PURPOSE

SFRA

PROJECT NUMBER

60725540

MAP TITLE

Modelled Surface Water Flood Risk - Climate Change

MAP NUMBER

Appendix E Map 2

Appendix F Summary of Recommendations

The following recommendations are made throughout the SFRA report.

Recommendation 3-1 *CPBC should ensure communication between LPAs to make sure that action in one does not negatively impact upon another.* 28
Recommendation 4-1 *CPBC should ensure the Sequential Test is undertaken for all strategic land allocations and check that the vulnerability classification of the proposed land use is appropriate to the Flood Zone classification.* 31
Recommendation 4-2 *CPBC should pursue opportunities to move existing development from within the floodplain to areas with a lower risk of flooding. This should include consideration of the vulnerability of existing developments and whether there is potential for land swap with lower vulnerability uses.* 32
Recommendation 4-3 *CPBC should keep an up-to-date register of 'reasonably available' sites (for example as part of their housing and/or economic land availability assessments), clearly ranked in flood risk preference, and prepare guidance on the appropriate area of search for common development types.* 34
Recommendation 4-4 *Apply a sequential approach to the layout and design of individual development sites.* 34
Recommendation 5-1 *Safeguard the South Benfleet Flood Storage Area and prevent loss of storage as a result of redevelopment.* 38
Recommendation 5-2 *CPBC must work with communities to plan how the riverside will look in future and prepare a riverside strategy.* 42
Recommendation 5-3 *The Local Plan and associated allocations should facilitate the recommendations of the TE2100 plan and South Essex CFMP in maintaining, enhancing and replacing flood defences, and safeguarding riverside land.* 43
Recommendation 5-4 *Where new development is proposed adjacent to the Thames Tidal Defence, consideration should be given to the specific recommendations of the TE2100 plan, in requiring reduction of current and future flood risk through the following measures:* 43
Recommendation 5-5 *Safeguard land either side of the River Thames, Prittle Brook and Benfleet Hall Brook and their tributaries and promote the setting back of development to enable sustainable and cost effective flood risk management including upgrading of river walls and embankments. As a minimum, 8m and 16m should be maintained along fluvial and tidal watercourses respectively.* 44
Recommendation 5-6 *Safeguard land adjacent to the sea defences on Canvey Island to provide the space for taller defences with a larger footprint. As a minimum, 19m should be maintained along the sea defences. Only temporary development will be permitted on this land. Where land safeguarded for future flood defence works falls within a development site, opportunities should be taken to integrate future flood defence requirements into the landscaping and open space provision for the site.* 44
Recommendation 5-7 *Where buildings have been demolished within the functional floodplain (Flood Zone 3b) for a significant length of time (i.e. over a year), the land should be reverted back to functional floodplain and consequently, development should be avoided within these areas. Where a building(s) is already located in the functional floodplain, any proposals to regenerate/replace such building(s) should not increase the footprint any greater than the existing footprint. For areas around the upper reaches of the Benfleet Hall Brook, further discussion will need to take place with CBPC, and further hydraulic modelling may be required to determine Flood Zone 3b.* 44
Recommendation 5-8 *Safeguard land likely to be needed for green infrastructure.* 44
Recommendation 5-9 *Safeguard land for new flood storage areas.* 45
Recommendation 5-10 *Extend and enhance existing Green Infrastructure (GI) in the Borough including the implementation of floodplain and riparian woodland planting schemes. Land that is likely to be needed for natural flood management should be safeguarded (e.g. through the Prittle Brook and Benfleet Hall Brook catchments). Consideration should also be given to any necessary access to that land, and any additional land which may be needed temporarily during construction.* 47
Recommendation 5-11 *Through measures to manage and mitigate flood risk, CPBC should also seek opportunities to achieve wider environmental benefits.* 48
Recommendation 5-12 *Consult Anglian Water to determine constraints on drainage capacity and identify infrastructure requirements to support future growth.* 49
Recommendation 5-13 *All major developments and other development should not result in an increase in surface water runoff, and where possible, should demonstrate betterment in terms of rate and volumes of surface water runoff. Sustainable Drainage Systems (SuDS) should be used to reduce and manage surface water run-off to*

and from proposed developments as near to source as possible in accordance with the requirements of the Technical Standards and supporting guidance. 50
Recommendation 5-14 *Where proposed development results in a change in building footprint, land raising or other structures such as bunds, the developer must ensure that it does not impact upon the ability of the floodplain to store water and should seek opportunities to provide betterment with respect to floodplain storage.* 54
Recommendation 5-15 *Future development should assess the potential to impact on the risk of groundwater flooding as a result of sub-surface development or additional infiltration. Where required a Hydrogeological Risk Assessment should be undertaken to determine the potential for impact of groundwater flooding and appropriate mitigation measures.* 55
Recommendation 5-16 *Where development or redevelopment is proposed in areas at risk of flooding, flood resilience measures must be implemented to mitigate the risk of flooding.* 56
Recommendation 5-17 *Where developing in Flood Zone 2 and 3 is unavoidable, the recommended method of mitigating flood risk to people, particularly with More Vulnerable (residential) and Highly Vulnerable land uses, is to ensure internal floor levels are raised a freeboard level above the design flood level i.e. the known or modelled 1% AEP flood level for rivers or the 0.5% AEP flood level for tidal Thames, including an allowance for climate change.* 57
Recommendation 5-18 *Basement dwellings should not be permitted in areas at risk of flooding.* 57
Recommendation 6-1 *CPBC Emergency Planners should use the findings of the SFRA to inform the next planned review of the Multi-Agency Flood Plan.* 62
Recommendation 6-2 *For all developments (excluding minor developments and change of use) proposed in Flood Zone 2 or 3, an Emergency Plan should be prepared to demonstrate what actions site users will take before, during and after a flood event to ensure their safety, and to demonstrate their development will not impact on the ability of the local authority and the emergency services to safeguard the current population.* 62
Recommendation 6-3 *Where development is proposed or expected in flood risk areas with implications for emergency planning, local planning authorities should work with their emergency planning officers to produce local guidelines setting out requirements for flood warning, evacuation and places of safety, against which individual planning applications can then be judged. These should avoid additional burdens on emergency services, explore opportunities for development proposals to address any shortfall in emergency service and infrastructure capacity, and minimise the need for further consultation at planning application stage.* 63
Recommendation 6-4 *New development (excluding that on Canvey Island where safe access/escape is not possible) must have safe access/escape during design flood conditions including an allowance for climate change.* 64
Recommendation 6-5 *Where a failure of flood risk management infrastructure would result in flooding with a speed-of-onset that would not allow sufficient time for safe access and escape, an internally accessible place of safety, capable of accommodating the likely number of occupants or users of the proposed development should also be provided.* 64
Recommendation 6-6 *Emergency planning strategies should be reviewed in the light of this updated SFRA to determine the suitability of refuge centres and evacuation routes based on the updated flood risk mapping produced.* 65
Recommendation 7-1 *At all stages, CPBC, and where necessary the Environment Agency and/or the Statutory Water Undertaker may need to be consulted to ensure the FRA provides the necessary information to fulfil the requirements for planning applications.* 68