Isle of Wight
Strategic Flood Risk Assessment MK2

Appendix K
Brading

June 2010

ISLE of WIGHT COUNCIL

Overview

Please review this discussion in conjunction with the mapping provided in this Appendix.

Brading is classified as a Rural Service Centre, it is situated on the north western side of the Eastern Yar floodplain on the eastern limb of the Brading Downs. The Brading Downs follow the central ridge of chalk which runs across the Island. This chalk stratum is present under the middle of the settlement. Despite the Brading's inland location, flooding from extreme tides is a real risk to the settlement. Historic flood outlines are held by the Agency for two events which occurred in 2000 and 1974. The 2000 outline shows the floodwaters not to have crossed the railway line, which runs between the edge of the floodplain and the town. However, the 1974 event was more extensive and a couple of the potential development sites lie within this extent. The Sites Database indicates which of the potential development sites are affected.

The Isle of Wight Autumn 2000 Flood Investigation Study – (*Brading Town Council Report*) identified several site specific flooding incidents. These are listed below:

- Groundwater inundation from the Bagshot Beds is attributed for the cause of basement flooding at 63a High Street, Brading as no other method of flooding was obvious with the threshold being well above the road level.
- Nicholas Close is built on a peat marsh at a low elevation of between 1.5 to 3m AOD. A ditch is described to run parallel to the railway bank, which is culverted under the railway and then joins the Eastern Yar. Flooding is caused by excess water levels in the ditch and water backing up through the culvert from the Eastern Yar.

Sustainability and Regeneration Objectives

Development within the wider countryside will be focused on the Rural Service Centres such as Brading and should support their role as wider centres for outlying villages, hamlets and surrounding countryside. For the rural service centres development will be expected to ensure their future viability. Within the rural service centres and outlying rural areas, development will be expected, in the first instance, to meet a rural need and maintain or enhance the viability of local communities and will be subject to local considerations.

Brading RSC has been identified as having the potential to accommodate further development to meet the regeneration aims and needs of the local community, through improving local services and strengthening public transport. Development will be encouraged on brownfield sites in the first instance and tourism will be promoted.

Sites at Risk

The floodplain of the Eastern Yar forms the eastern boundary of this settlement. Essentially all sites to the east of the A3055 have some degree of potential flood risk. In this location the risk is posed by both fluvial and tidal sources, with the tidal risk presenting the greater flood water levels and thus greater extents. Development sites on

the west of the town are considered to provide more sustainable, from a flood risk perspective, development prospects.

Climate Change

The climate change outlines, modelled with LiDAR topographic data, are more extensive and indicate that a number of the potential sites situated between the railway line and the A3055 may become within a flood zone over the next 100 years. The sites which have been identified are attributed, in the Sites Database with details of which climate change horizon is likely to impact each site.

This is one of the areas where the greatest extent changes are predicted between the present day and future extreme flood extents. Any site that comes forward for development should ensure that the proposed development has accounted for the potential increase in flood extent and will remain safe.

Potential Surface Water Flow Routes and Ponding Areas

Method

The potential surface water flow routes and ponding areas presented in the SFRA, illustrate areas of predicted flooding greater than 25m^2 in spatial extent and only flooding which is more than 0.1m deep. This refinement of the TuFLOW model output is necessary so as to establish the primary areas of predicted flood risk. The modelling approach utilises a 5m resolution ground model grid. The TuFLOW model does not incorporate the Southern Water surface water drains or sewers, which during a storm event would provide storage capacity. Southern Water advised that the modelling should assume that the surface water sewer network could accommodate the 1 in 20 year storm. Therefore, the 1 in 20 year rainfall depths for the critical storm were subtracted from the 1 in 100 year (plus climate change) rain fall depths.

The 1 in 100 year (plus climate change) winter profile storm hyetographs (hyetograph refers to a graph presenting rainfall depth over time) were generated by deriving catchment descriptors from the Flood Estimation Handbook CD-ROM (FEH) and applying the FEH Rain Profile Method. The storm durations were determined by the critical drainage pathway lengths in each of the model areas. The model boundaries were determined by the topography, the local watersheds were traced to ensure that all contributing parts of the catchments were included in the model.

Results

The topography of Bading is dominated by a finger of high ground which extends from the west, which almost divides the drainage catchment into two. The modelling results clearly pick this up as water is gathered and routed off either the north east facing slope of the south west facing slope. Once the water has flowed off the high ground, the model predicts that it will be routed into and along the topographic low points. In Brading these appear to be either highways or field edges and/or agricultural drainage ditches. The main urban area of Brading is not predicted to be at a significant risk, nor are the potential development sites. The recorded incidents of surface

water flooding do not appear to correlate to the predicted flow routes and ponding areas, which may suggest that these incidents were not directly related to overland flows and possible the product of Nonetheless, surface water flood risk should be reviewed as part of any subsequent FRA.

Surface Drainage and Infiltration SuDS Potential

Soils in the south of Brading have a high SPR (50%), whilst soils in the north have much lower SPR values in the order of 2%. The area around the sewerage works in the north east of Brading has SPR values of around 25%. Therefore, runoff potential is low in the southern half of the town and higher in the north part of the town. The potential for infiltration SuDS in the Brading is low in the south and higher in the north. To areas of medium suitability exist near the sewerage works and in the Morton Old Road area in the south west of Brading. The groundwater vulnerability map reflects this suitability distribution.

The volume of discharge, through SuDS or conventional drainage systems, into the tidally influenced river need not be strictly controlled. Although the levels of drain outfalls need to take into account high tide levels and consider the implications of discharge being inhibited by high tides.

Brading Marshes SSSI and Solent and Southampton Water SPA are the only ecological designation in the immediate vicinity of the town. The location of ecologically designated areas suggests that the use of SuDS techniques which attenuate or remove pollutants would be aspirational.

Flood Risk Management Guidance and Site Specific FRAs

The principal of avoidance should be applied when considering sites within Brading. The development of any previously undeveloped site in Flood Zones 2 and 3 is considered by PPS25 as an increase in flood risk and should be avoided. The redevelopment of any previously developed sites within the Flood Zones will require the PPS25 Sequential test to be passed and the Exception Test satisfied where necessary.

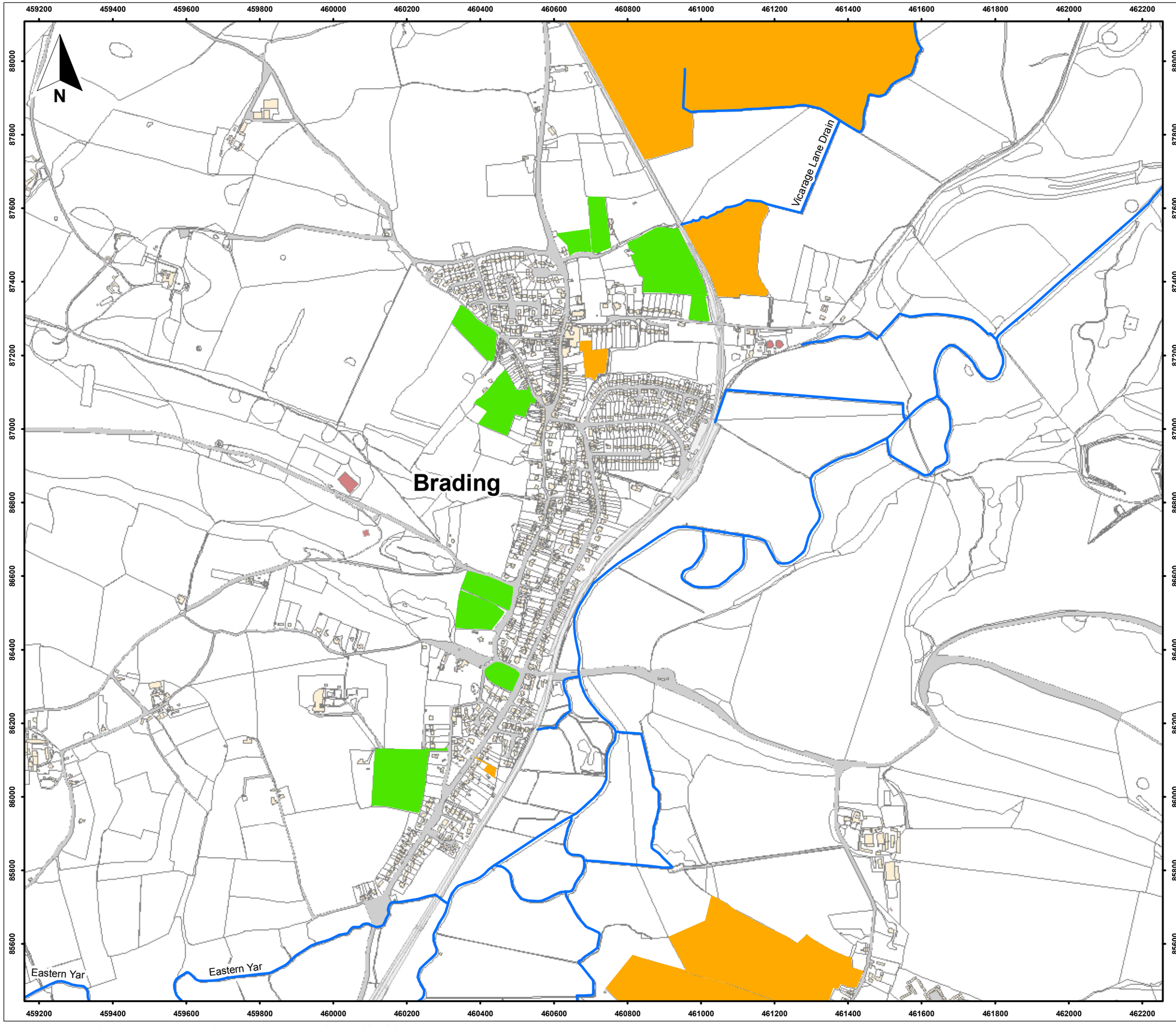
Factors to be considered in safe development could include:

- Ensuring that the sequential approach to landuse planning is, where possible, applied on site. This approach would see more and highly vulnerable landuse types being placed in the lower risk zones.
- Finished first floor levels should be set above the predicted 1 in 100 year fluvial flood levels, plus a climate change allowance and above the 1 in 200 year predicted tide levels for the year 2115. The Environment Agency should be consulted for fluvial flood levels and the Environment Agency should be asked to confirm if the predicted tide levels in Figure 1 in Appendix B are still the most recent predictions. A freeboard allowance should be applied, again the Environment Agency should be consulted on this aspect of the design.
- Buildings should be designed so that safe access and egress can be facilitated in the event of the 1 in 100 year (plus climate change) and 1 in 200 year tidal event (plus climate change).

- Development should not increase the risk of flooding elsewhere. As such, the potential for displaced flood water to impact adjacent areas should be considered. This typically applies if an existing building footprint is being increased in fluvial floodplains and defended tidal floodplains. The displacement of water aspect of development along an undefended coastline is not necessarily a concern.

- Building design should account for the potential depths of water that might occur and appropriate flood resilient and or resistant design features should be incorporated.

- Surface water generated by development should be managed using sustainable techniques. The FRA or drainage assessment should explore the Environment Agency and CIRIA SuDS hierarchy. Discharge rates and volumes should not increase post development, in addition to this PPS25 requirement, the Council and the Environment Agency want to see developers seeking to reduce run-off rates and volumes.



Key:

Main Rivers

Probability of Flooding

- Functional Floodplain
- High Probability
- Medium Probability
- Low Probability

Notes:
Site is attributed with the flood probability associated with the highest probability flood zone the site intersects

The mapped extent of Flood Zone 3b has been used to identify Functional Floodplain
The 1 in 100 year fluvial flood zone for the present day and the 1 in 200 year tidal extent predicted for the year 2115 has been used to identify sites at a High Probability. The 1 in 1000 year fluvial flood zone for the present day and the 1 in 1000 year tidal extent predicted for the year 2115 has been used to identify sites at a Medium Probability. Sites only in Flood Zone 1 have been assigned a Low Probability

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 50
Potential Development Sites
Qualitative Flood Risk
Brading

November 2009
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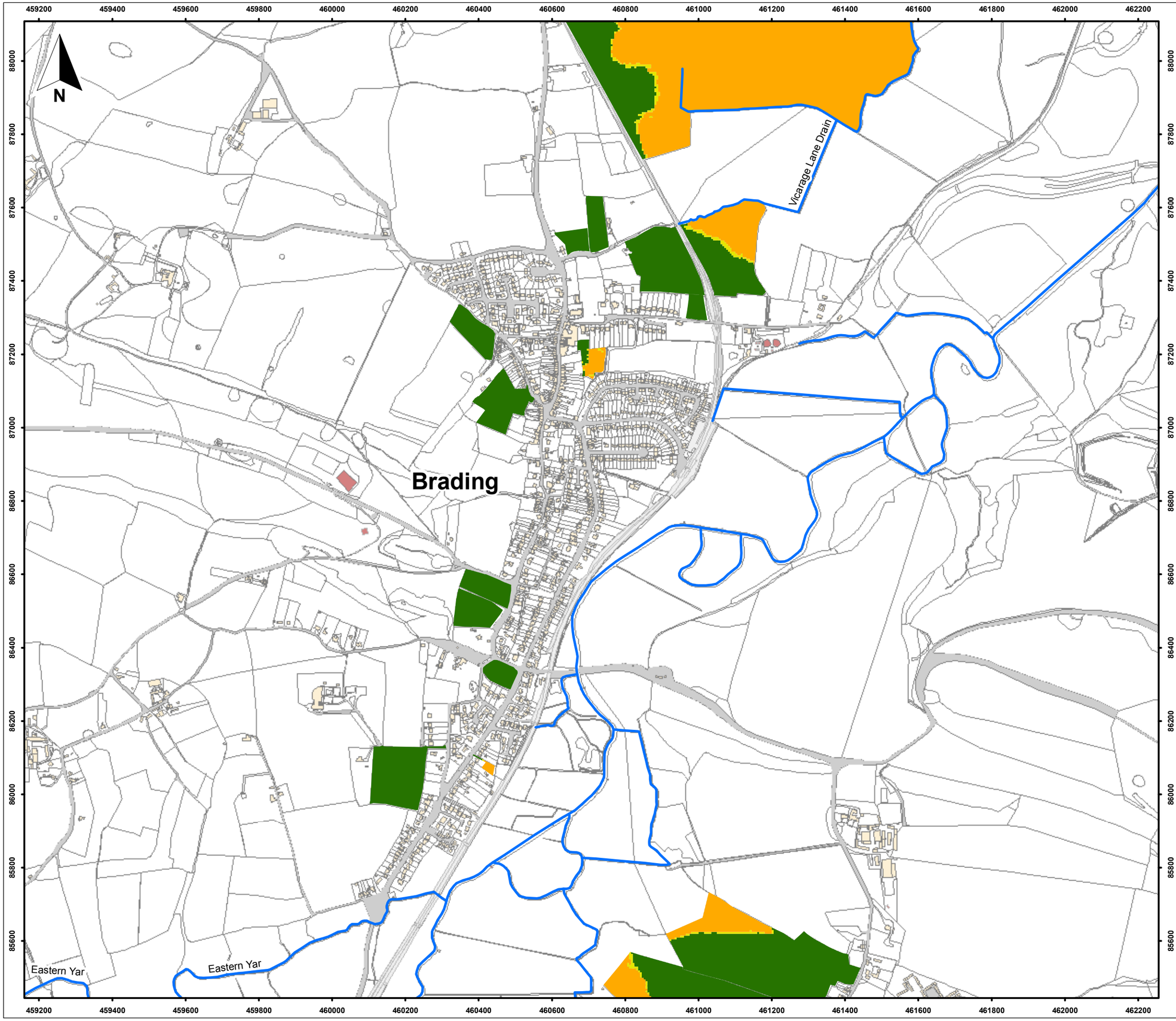

Key:

Main Rivers

Probability of Flooding

- Functional Floodplain
- High Probability
- Medium Probability
- Low Probability

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 51
Potential Development Sites
Site Specific Flood Risk Definition
Brading

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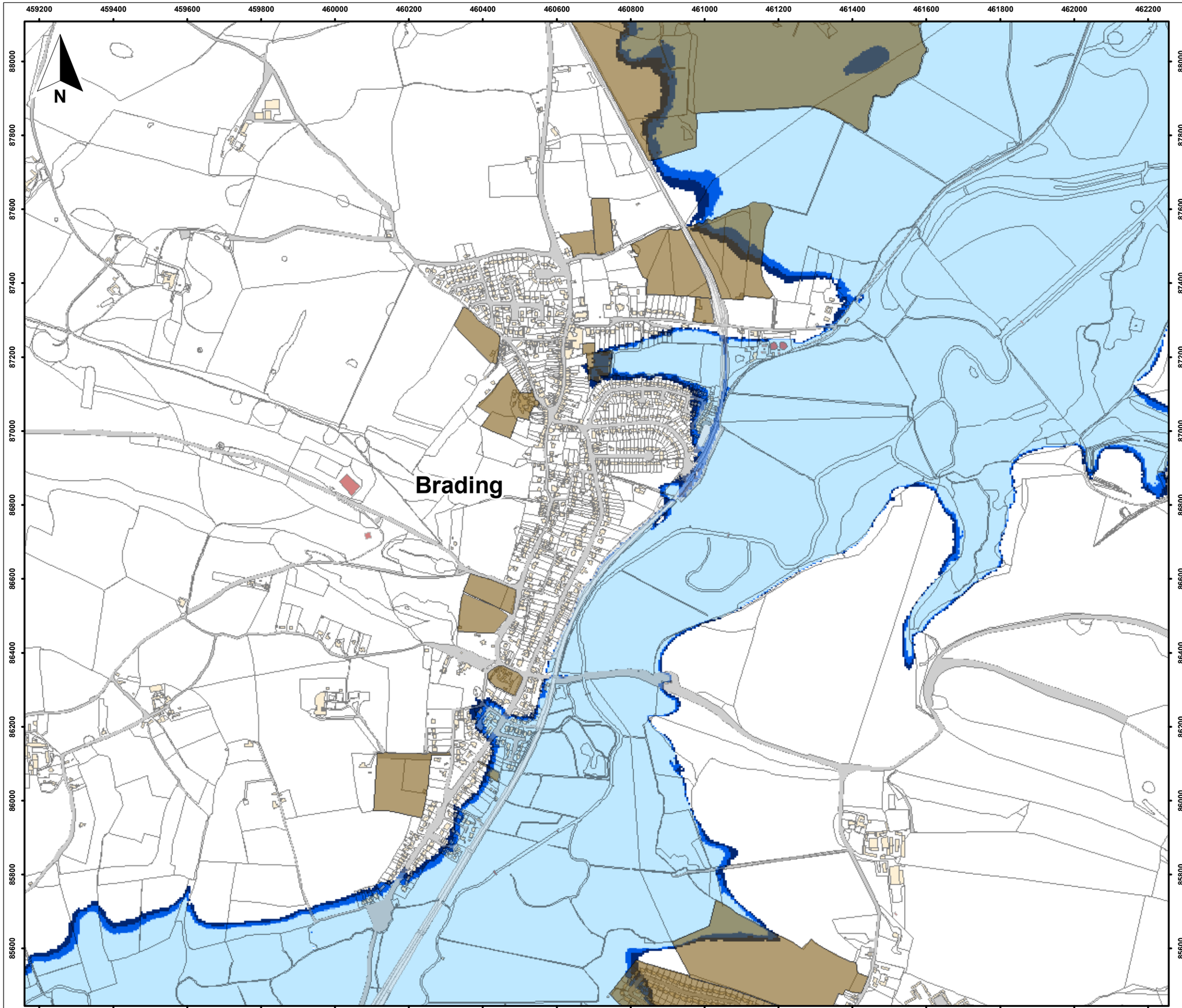

Key:

Predicted 1 in 1000 year Tidal Extents

- Year 2010
- Year 2045
- Year 2080
- Year 2115

- Potential Development Sites

0 200 400 Meters

Scale: 1:22,000 @ A3

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Figure 52
Potential Development Sites
Flood Zone 2
Climate Change Scenarios
Brading

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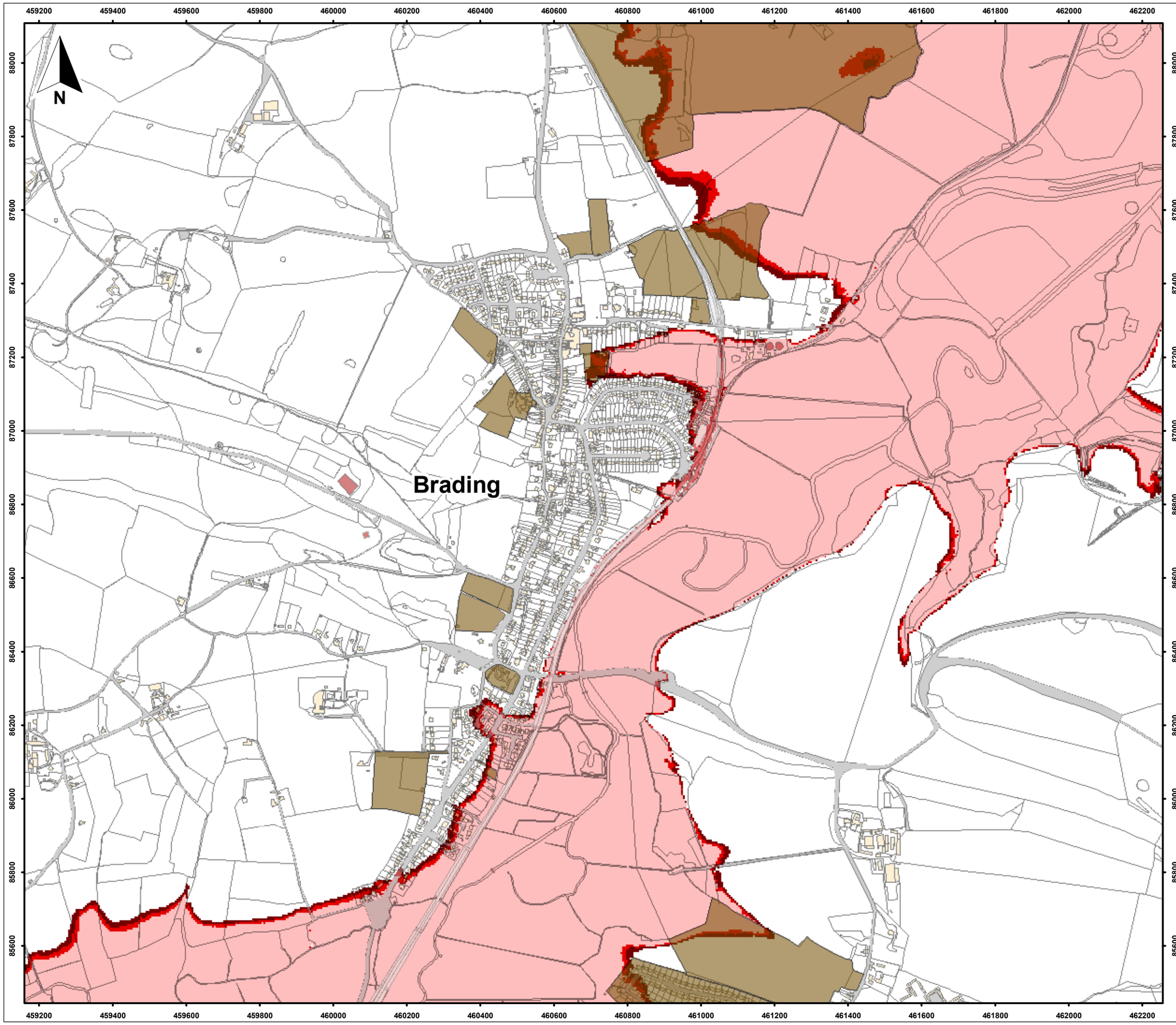

Key:

Predicted 1 in 200 year Tidal Extents

- Year 2010
- Year 2045
- Year 2080
- Year 2115

- Potential Development Sites

0 200 400 Meters

Scale: 1:10,000 @ A3

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Isle of Wight SFRA MK2

Figure 53
Potential Development Sites
Flood Zone 3
Climate Change Scenarios
Brading

November 2009
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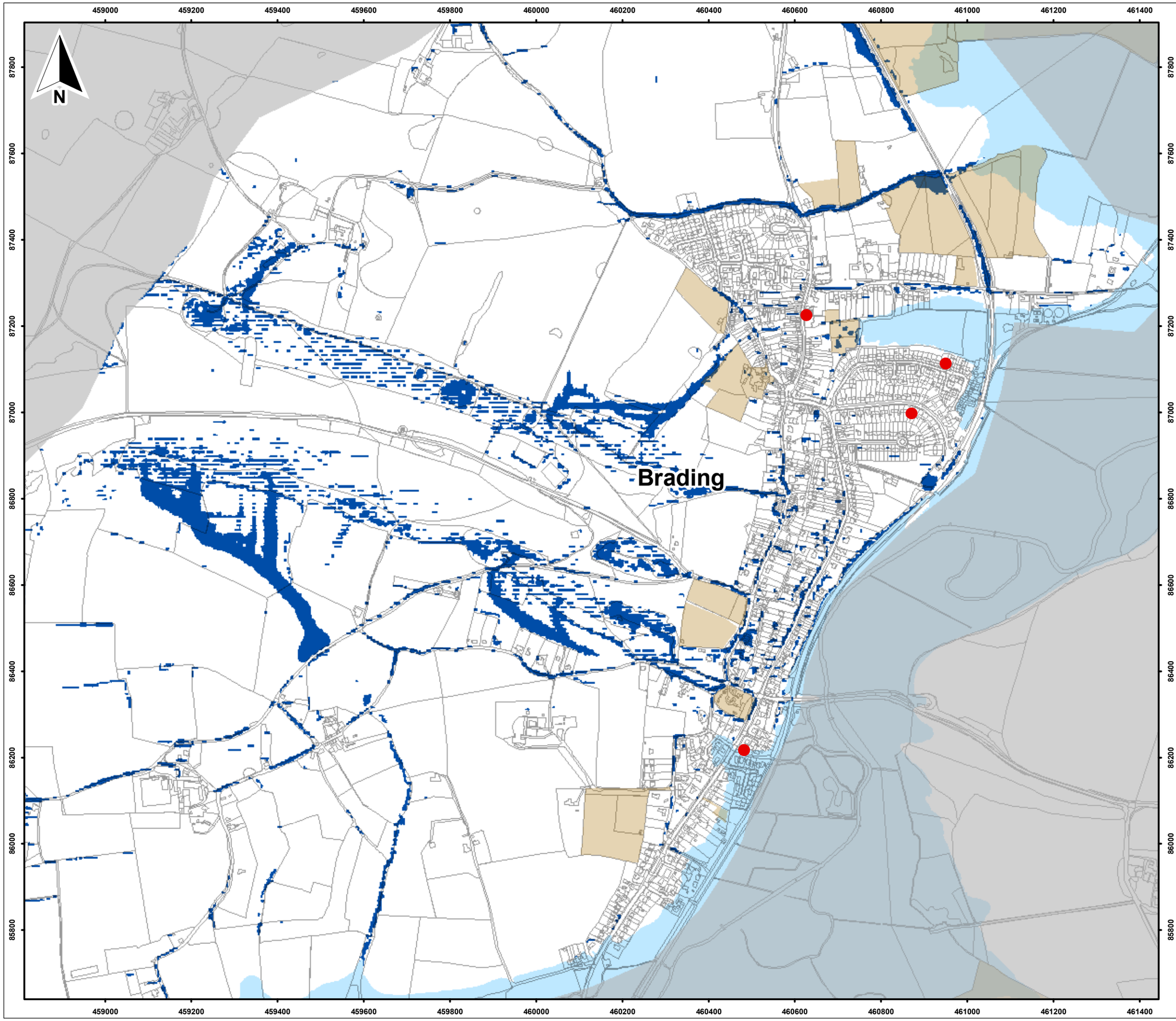

Key:

- Location of reported surface water flooding issues. Supplied by Southern Water for the period upto and including 2006.
- Environment Agency Flood Zone 2 (November 2009)
- Potential Surface Water Flow Routes and Ponding areas (1:100+cc) Over 0.2m deep
- Potential Development Sites
- Outside the Limits of the Surface Water Model

Notes:
Only predicted surface water flow routes and ponding areas, over 0.1m deep and greater than 25m2 in areas are shown

0 200 400 Meters

Scale: 1:8,500 @ A3

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Isle of Wight SFRA MK2

Figure 54
Potential Surface Water Flow Routes and Ponding Areas (1 in 100 year storm + climate change) - Brading

November 2009
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