Isle of Wight
Strategic Flood Risk Assessment MK2

Appendix H
Ventnor

June 2010

ISLE of WIGHT COUNCIL

Overview

Ventnor is a Smaller Regeneration Area and it is built on a relatively steep south east facing slope, elevation which rises quickly from the shoreline. Flood risk in the town is considered to only be small.

Please review this discussion along side the mapping provided in this Appendix.

Sustainability and Regeneration Objectives

Ventnor is a Smaller Regeneration Area. It is an area of need in terms of regeneration and therefore the Isle of Wight Council will be receptive to development proposals. Ventnor SRA 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

Ventnor has no fluvial Flood Zones and little in the way of tidal Flood Zones. All the potential development sites are located within Flood Zone 1

Climate Change

Figures 37 and 38, illustrate that the potential impact of climate change does little to increase the flood risk in Ventnor. This is due to much of the ground being above the predicted future extreme tide levels.

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 patterns of predicted surface water flow routes and ponding areas are primarily determined by two key model parameters, the topographic model and the rainfall hyetograph. In Ventnor the most significant influence is provided by the topographic model. The topography of Ventnor is generally characterised by a steeply sloping south facing slope with very few well defined flow routes. When the LiDAR is examined at the local level, it is apparent that there are a large number of small *rills* which follow the contours of the slope. The source of these features is not clear, although it is likely that the process of removing the buildings from the ground model has been an influence. The presence of rills that are aligned with the contours is that the down-slope flow of water is interrupted, resulting in a series of what appear to be lateral flow routes. In the east of the town, this phenomenon is replaced with broad, unconfined shallow flooding as this part of the hillside is devoid of any significant topographic features which would collect and channel the flows.

The form of the ground topographic model in Ventnor is such that it is likely that the surface flow routes and ponding areas predicted in figure 40 are potentially inaccurate. These results have been included for completeness, but they should not be used to guide site-specific flood risk assessments. A more detailed approach, in which the ground model is vertically adjusted using survey data, and through the inclusion of the Southern Water surface water drainage network, would be necessary to improve the definition of the surface water flood risks.

Surface Drainage and Infiltration SuDS Potential

The central area of Ventnor is characterised by soils with an SPR of about 47%, while the fringe areas of the town have a much lower SPR of about 2%. A Secondary Aquifer with an intermediate leaching potential follows the coastline through the town with a width of approximately 350m. A thin band of Principal Aquifer overlain by soils of intermediate leaching potential lies adjacent the Secondary Aquifer. The north of the town, up towards Lowtherville, is underlain by a Principal Aquifer overlain with soils of high leaching potential. A substantial area of mass movement is identified in the town which is associated with clay strata. Due to the presence of this band of mass movement and the Secondary Aquifer, infiltration potential over much of the town is classified as low. Due to the soils and mass movement along the coast, the use of infiltration SuDS techniques is considered unsuitable. The impact that surface water drainage might have on areas of geological instability should be considered. The presence of a SAC, along the coastline, requires precautions be taken to ensure that contaminants are not introduced into the environment in these areas. Consideration should be given to the potential for tide locked surface water drainage outfalls. On site attenuation and storage will need to be provided to ensure that high tides do not result in sites flooding.

Wave Exposure Risk

The coastline of Ventnor has been classified as being at medium risk of wave exposure (see Section 6 of the SFRA Report). It is recommended that for any site within the 50m buffer, where ground levels are less or equal to the predicted peak 1 in 200 year tide in 2115 level plus a 4m allowance for wave height, building design should consider the impact of being potentially exposed to airborne beach material and the corrosive effects of sea spray.

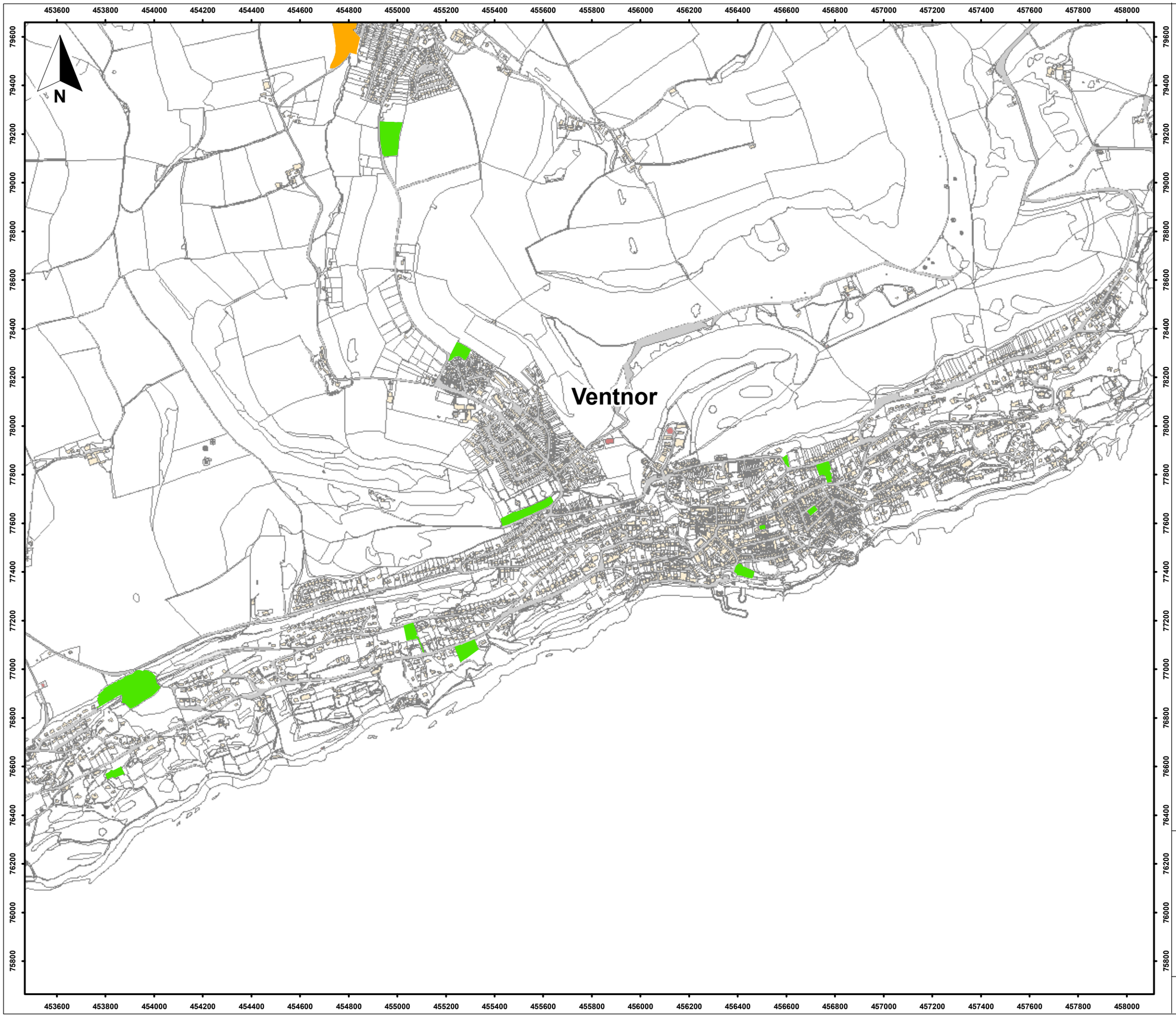
Flood Risk Management Guidance and Site Specific FRAs

The principal of avoidance should be applied when considering sites within Ventnor and given that the flood risk zones only impact a very small land area in the town, avoidance of risk should be pursued in spatial planning process.

Should a circumstance arrive where development is proposed in a flood risk zone, the following will apply. 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 200 year predicted tide levels for the year 2115. The Environment Agency should be consulted to confirm if the predicted tide levels in Figure 1 in Appendix B are still the most recent predictions and if not provide new ones. 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

0 200 400 600 800 Meters

Scale: 1:15,000 @ A3

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Isle of Wight SFRA MK2

Figure 35
Potential Development Sites
Qualitative Flood Risk
Ventnor

November 2009
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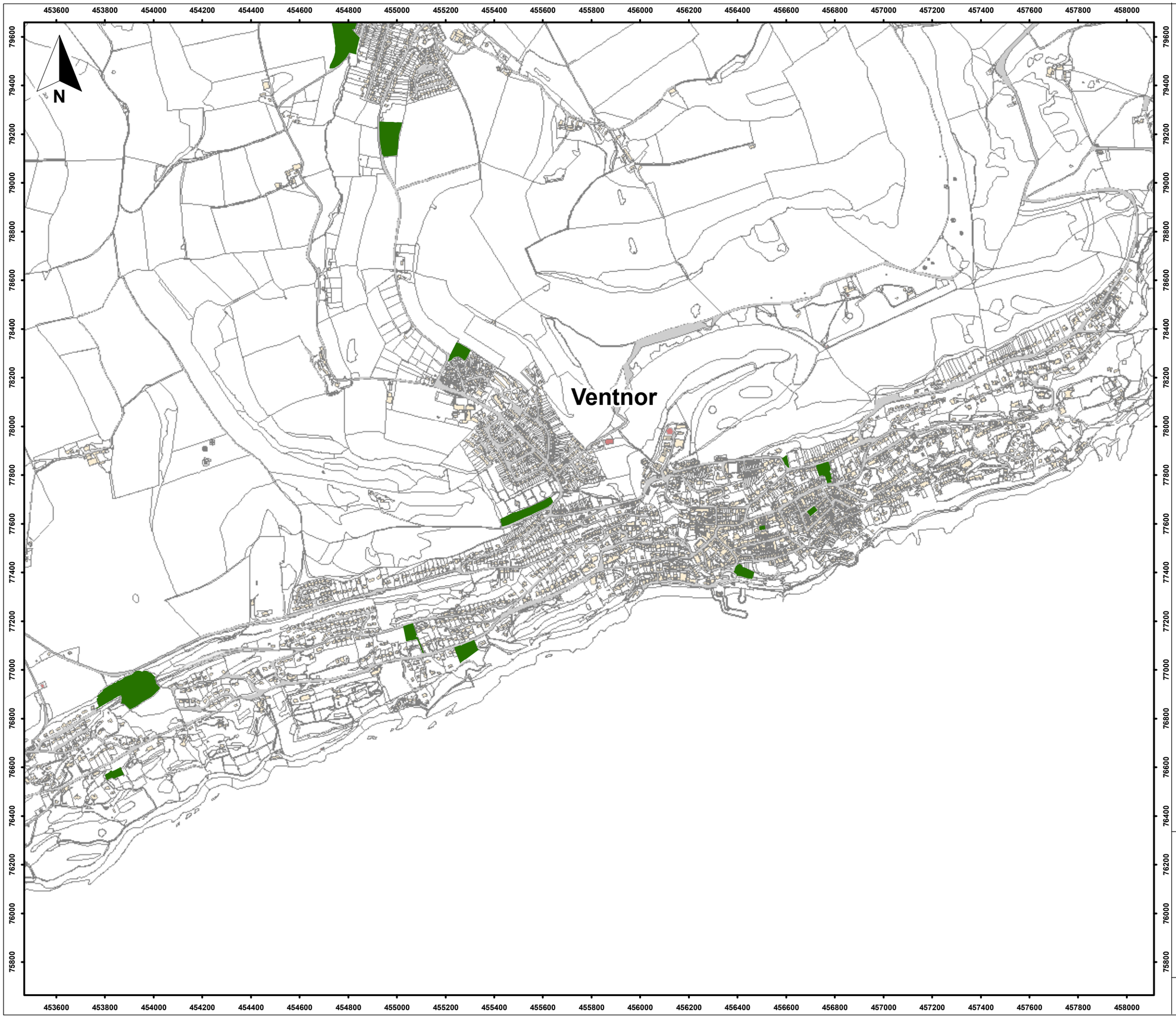

Key:

Main Rivers

Probability of Flooding

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

0 200 400 600 800 Meters

Scale: 1:15,000 @ A3

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Figure 36
Potential Development Sites
Site Specific Flood Risk Definition
Ventnor

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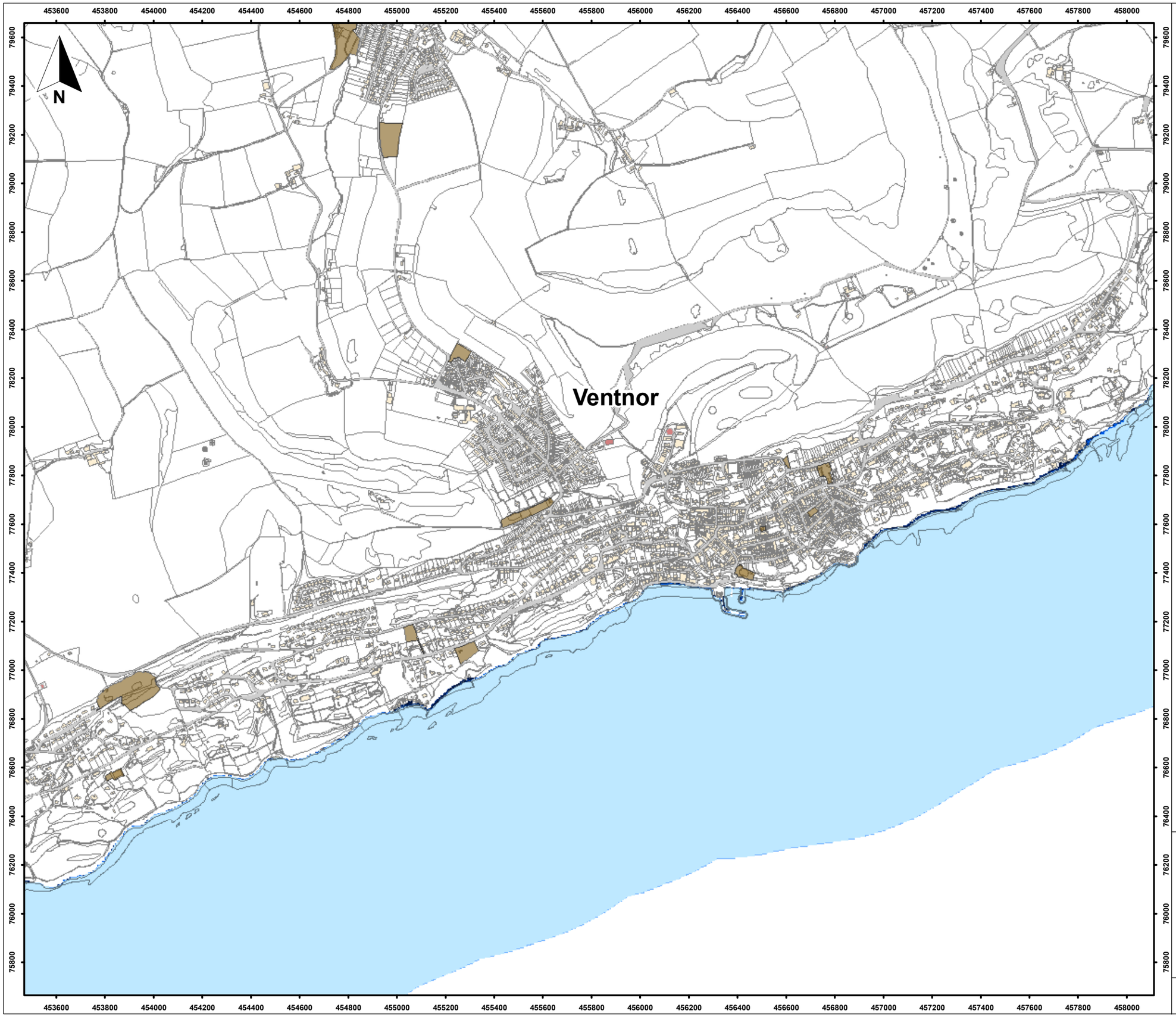

Key:

Predicted 1 in 1000 year Tidal Extents

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

- Potential Development Sites

0 200 400 600 800 Meters

Scale: 1:15,000 @ A3

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Figure 37
Potential Development Sites
Flood Zone 2
Climate Change Scenarios
Ventnor

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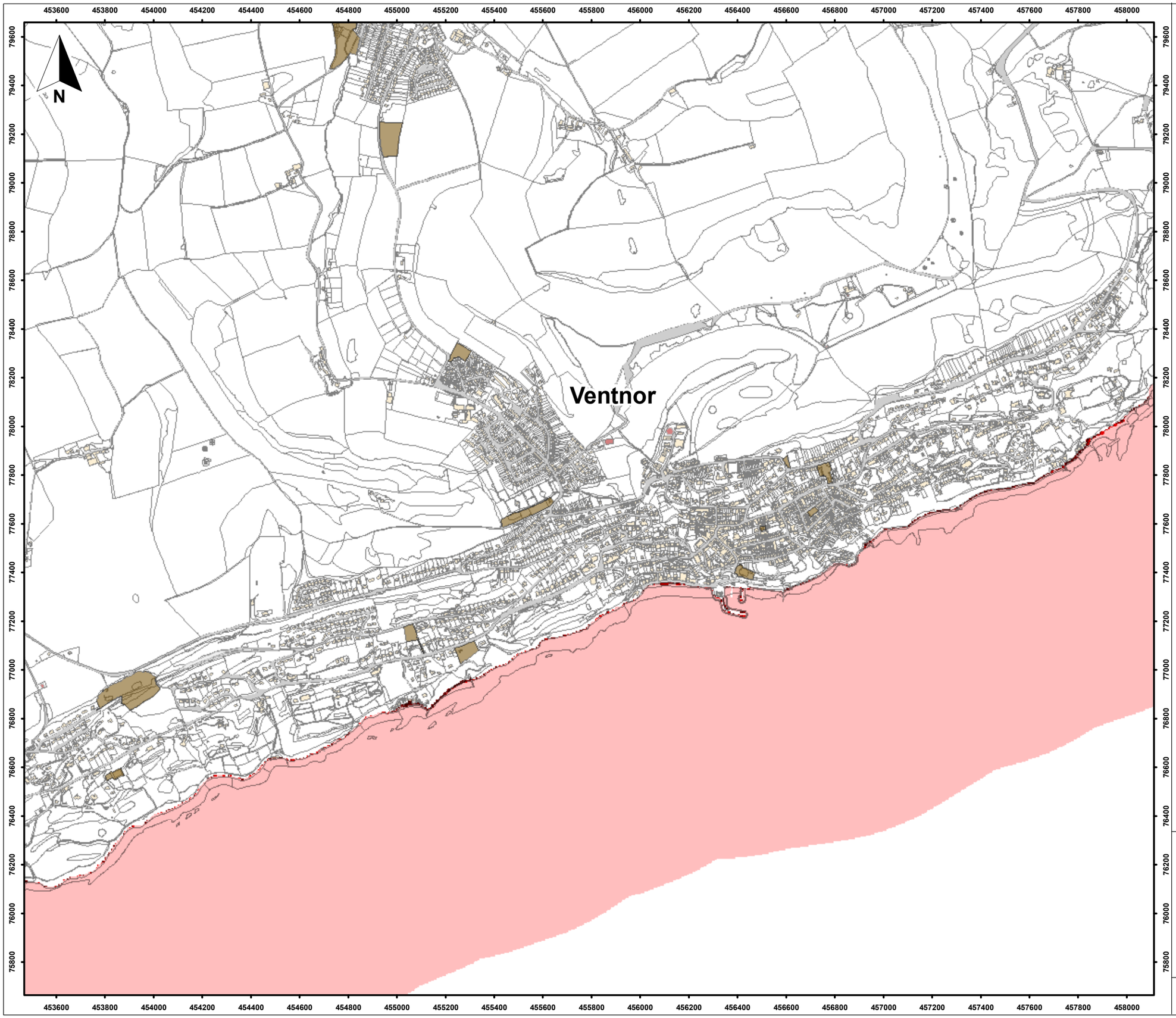

Key:

Predicted 1 in 200 year Tidal Extents

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

- Potential Development Sites

0 200 400 600 Meters

Scale: 1:15,000 @ A3

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Isle of Wight SFRA MK2

Figure 38
Potential Development Sites
Flood Zone 3
Climate Change Scenarios
Ventnor

November 2009
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Key:

Main Rivers

Potential Exposure Risk

High

Medium

Low

Environment Agency Flood Zone 2 (November 2009)

0 200 400 600 800 Meters

Scale: 1:15,000 @ A3

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Isle of Wight SFRA MK2

Figure 39
Qualitative Wind and Wave Exposure Risk - Ventnor

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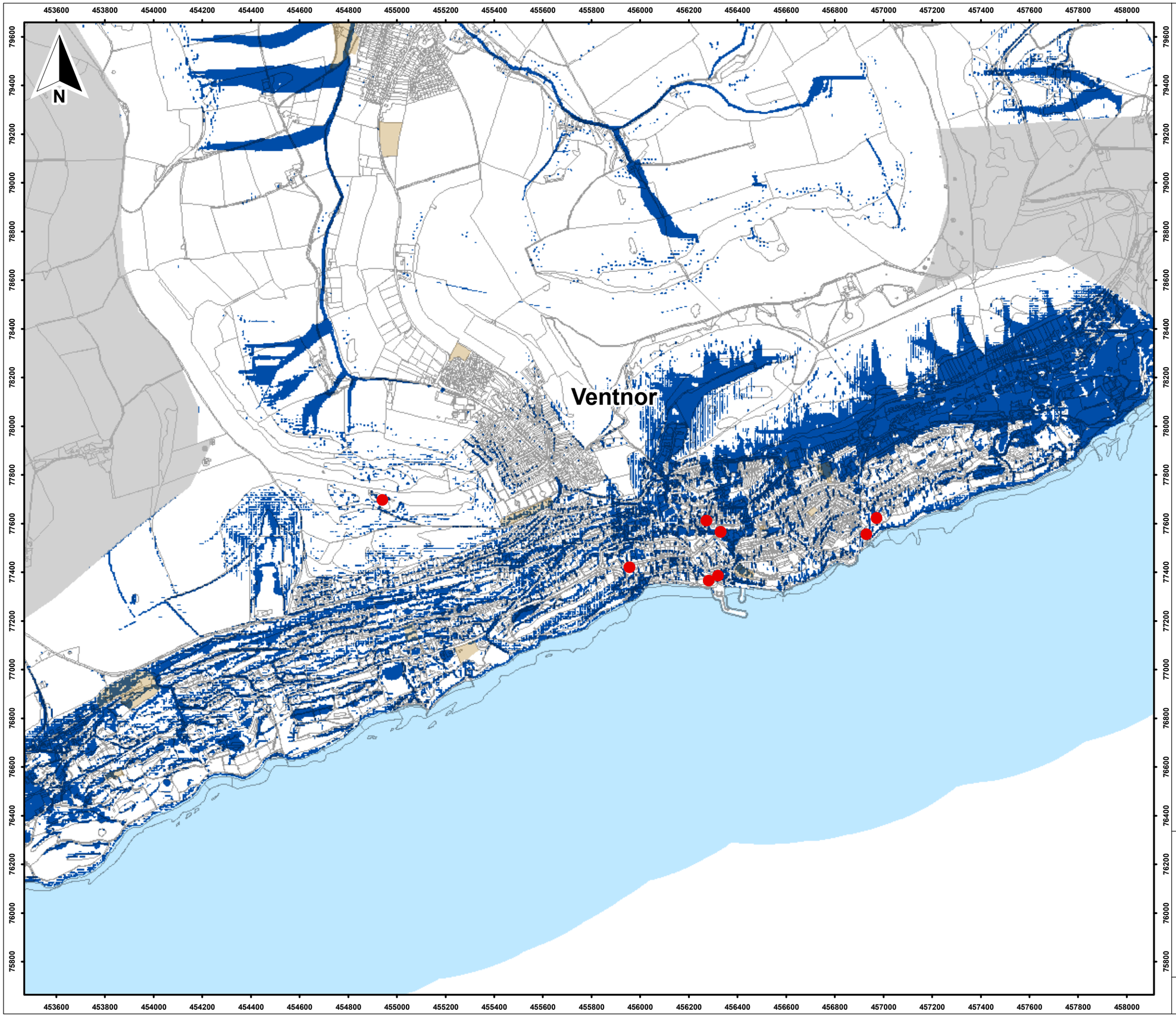

Key:

- 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

0 200 400 600 800 Meters

Scale: 1:15,000 @ A3

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Isle of Wight SFRA MK2

Figure 40
Potential Surface Water Flow Routes and Ponding Areas (1 in 100 year storm + climate change) - Ventnor

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