Isle of Wight
Strategic Flood Risk Assessment MK2

Appendix P
Newport

June 2010

ISLE of WIGHT COUNCIL

Overview

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

Newport has the greatest density of watercourses of any town on the Island, all of which are classified as Main Rivers and a significant number of these have got Agency Flood Zones associated with them. There exists both tidal and fluvial flood risks in Newport. The tidal flood risk, as defined by the Flood Zone extends as far up the Medina Estuary as the bridge where the A3020 crosses the River Medina. However, the tidal mapping of the Medina Estuary carried out for this SFRA indicates that the tidal flood risk may extend further upstream. This discrepancy is likely to be due to different methodologies used. Section 5 details the flood mapping methodology used in this SFRA and notes how the extents were determined solely on the basis of the LiDAR topographic data and the extreme sea levels. No site specific information relating to the location of weirs or other control structures was included.

Fluvial Flood Zones exist for the River Medina, Lukely Brook, Pan Stream and Gunville Stream. Parkhurst Stream and the tributaries of Pan Stream however, which are designated as main rivers, do not have Flood Zones.

The Isle of Wight Autumn 2000 Flood Investigation Study –(*Newport Isle of Wight Council Flood Report*) found that although parts of Newport are in the Medina and Lukely Brook floodplains, only St Cross Mill was reported as flooding due to high river levels. Through Newport channel improvement works designed in the 1960s were sufficient to prevent more extensive flooding, although the standard of protection will diminish with time. No tidal flooding was reported during the winter of 2000 / 2001.

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

- 47 Garden Way was flooded due to excess water coming down the slope off adjacent Downside School playing fields and pooling against the side of the house.
- 185 Fairlee Road was flooded due to water pooling of water in the road and overflowing the driveway and into the property. This location is a low point in the road that will accumulate water from both sides. In addition surface water would come down from Mews Lane. Insufficient capacity of road and footpath drains has been attributed as the cause of the flooding.
- 2 New Close Farm Cottages, Nunnery Lane. This property lies at the base of a short valley with high ground on three sides. The accumulation of excess runoff entering the property from the slopes must have resulted from saturated areas or areas of low permeability.
- Lukely Mill which is situated adjacent to Lukely Brook flooded when the capacity of Lukely Brook was exceeded.
- 239 Gunville Road, Gunville. The capacity of Gunville Brook was exceeded which caused flooding of the property

Sustainability and Regeneration Objectives

The Spatial Strategy for the Medina Valley area is to plan for housing and employment growth, accommodating the planned urban extensions at East Cowes and Newport. Sites to meet the supply requirement of PPS3 will be allocated in the Medina Valley Area Action Plan.

To deliver the broad distribution of housing required within the Medina Valley, housing will be developed on the existing allocations and on sites with extant permission. Should there be a need to allocate further sites over the plan period they will be identified through the AAP process.

Within the Medina Valley, the focus for employment will be to provide a range of sites for appropriate growth sectors, office and general workspace needs. Existing employment sites and buildings will be safeguarded where they are important to sustaining the local economy and meeting the Council's regeneration led development objectives.

To ensure that there is an adequate supply of sites for businesses which require access to water frontage, employment sites with deep water frontage will be safeguarded for uses which require deep water. The Council will seek to safeguard and maintain the function and facilities of appropriate existing wharf sites.

The assessment of flood risk in Newport, Cowes and East Cowes and the classification of flood risks for each of the proposed sites will aid in the land allocation decision process due to take place as part of the Medina Valley AAP.

Sites at Risk

The sites assessed to be at risk are those which intersect the Flood Zones present within Newport. Figure 79, highlights quite a number of large sites that are assessed as being at risk of flooding, however Figure 80 illustrates that only a small portion of each of these sites are with Flood Zones 2 and 3. This is because the topography rises quickly from the edge of the floodplain. The large potential development sites adjacent to Gunville Stream are examples of this. In line with the LPAs approach to managing the predicted climate change induced impacts of sea level rise, the 2115 climate change epoch has been used to assess tidal risk to the potential development sites. The sites most significantly impacted sites are those along side the Medina Estuary downstream of where the A3020 crosses the river.

Parkhurst Stream, which flows down Horsebridge Hill to the North West of Newport, and the tributaries of Pan Stream to the east of the town have no Flood Zones. Does not have an associated fluvial flood zone, this is likely to be because the watercourse's drainage area falls below the 3km^2 applied by the Environment Agency. Owing to the presence of the Pan Stream, there is likely to be an associated fluvial flood risk, this potential risk should be assessed and appropriately managed in accordance with PPS25 as part of any future development.

Climate Change

The potential sites most vulnerable to the impact of climate change, and the associated increase in sea level, are:

- those on both banks of the Medina between Seaclose Park and the crossing of the A3020
- The region of adjacent to the River Medina in the Coppin's Bridge and East Street
- Along the lower reaches of Lukely Brook just upstream of its confluence with the River Medina.

In these areas there is potentially significant increase in the predicted extent of the tidal flood risk zones when the predicted impacts of climate change are accounted for. In line with e LPAs approach to managing the predicted climate change induced impacts of sea level rise, the 2115 climate change epoch has been used to assess tidal risk to the potential development sites.

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

Newport has a relatively large upslope catchment area, which means that the surface water generated from outside the town boundary flows through the town. The modelling predicts a series of potential flow routes and ponding areas throughout the urban area. The modelling has routed the surface water run-off into the topographic low points (valleys), these areas are clearly evident in those locations where there is currently no Flood Zone designation. Potential flow routes can be observed in almost all the valleys which lead down towards the town.

These flow routes are predicted to impact a large number of the potential development sites, this is a risk which should be further investigated to ensure that the risk is sustainably managed and the situation not exacerbated to downstream areas as a result of any future development. The incorporation of Southern Water's surface water drainage network and information relating to the tidal influence on the outfall of surface water drains would be useful additions to further work.

Much of the topography of Newport is comprised of high resolution LiDAR data which includes the representation of small topographic features. In all urban areas the LiDAR has been edited to remove the buildings. This editing process results in a slightly uneven surface profile, which can result in the production of small depressions that fill with water. It is likely that this has been the situation in the densely built urban parts of the modelled catchments where there are many small isolated areas of predicted flooding.

In the south west of the town, Figure 90 depicts large unconfined extents of shallow flooding, this pattern of flooding is the product of SAR (Synthetic Aperture Radar) topographic data being used as there is currently no available LiDAR coverage in this area. The modelling indicates a potential risk in the south east of the town, the predictions could be refined through the use of LiDAR data as and when it becomes available.

Surface Drainage and Infiltration SuDS Potential

Newport's soils for the most part, have a high runoff potential with SPR values between 47% and 50%. Only the southern edge of town has low SPR values of between 15% and 30% (low/medium runoff potential). The southern edge of the town associated with lower runoff potential soils is also underlain by a Principal Aquifer with soils of an intermediate leaching potential. The majority of the rest of the town is predominantly underlain by a Secondary Aquifer with intermediate to high leaching potential. Infiltration Potential is classified as being medium in the centre of the town and low around the edges. Figures 8, 9 and 10 in Appendix A should be consulted.

A small area covered by SPZ 1, 2 and 3 (See Figure 7 in Appendix A) is located in the Lukely Brook area of the south western part of Newport. This area is coincident with a Principal Aquifer and the potential for groundwater contamination requires additional consideration. Infiltration SuDS techniques should be avoided in areas where land contamination is identified as being an issue. The impact of sea level rise on the high water level should be considered when designing the outfall levels of any future surface drainage systems. The Environment Agency will be pushing for an integrated urban drainage scheme is the Pan Extension Project in Newport.

Flood Risk Management Guidance and Site Specific FRAs

The principal of avoidance should be applied when considering sites within Newport. 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.

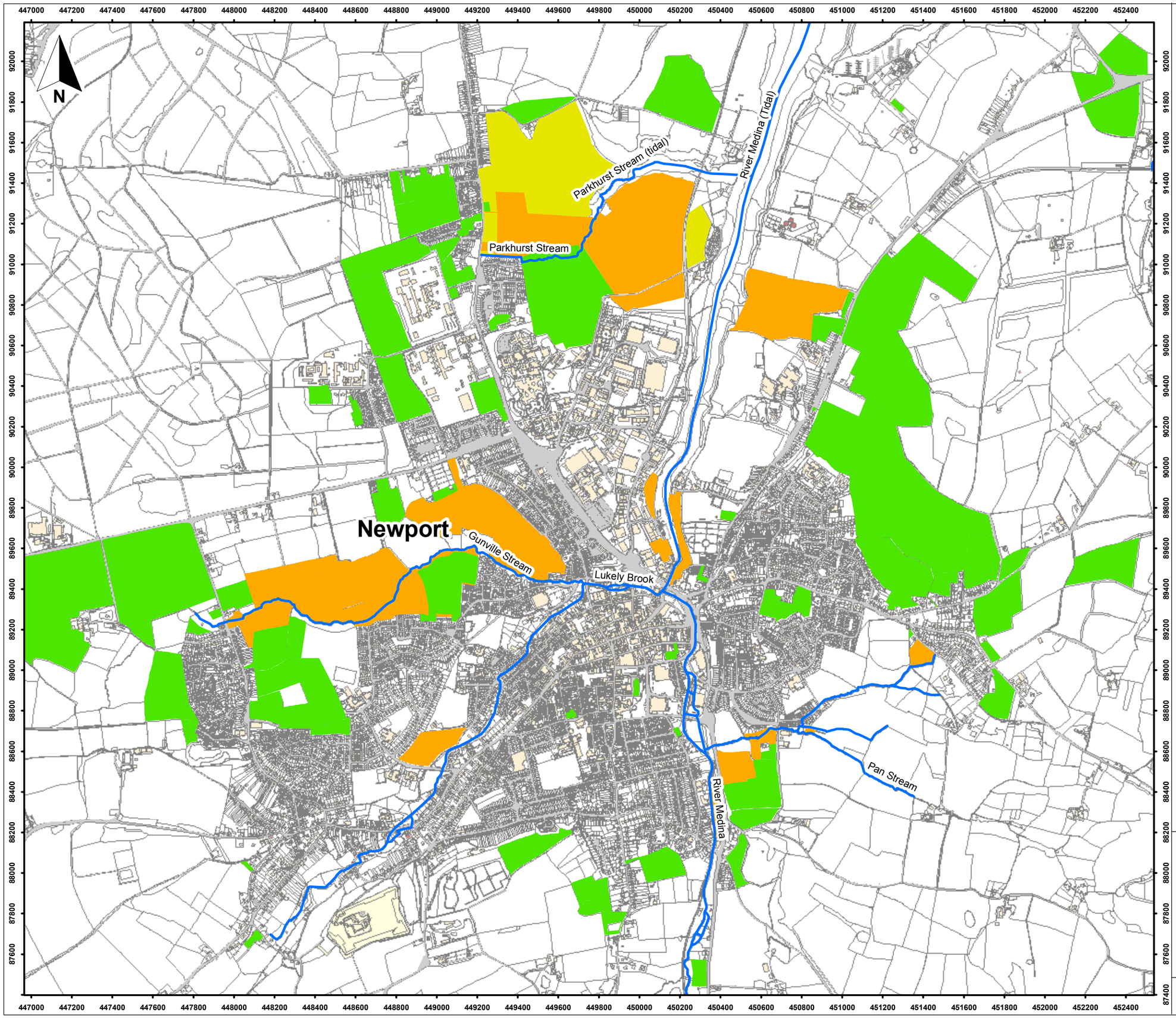
- Finished first floor levels should be set above the predicted 1 in 100 year fluvial flood levels, plus a climate change allowance and above the 1 in 200 year predicted tide levels for the year 2115. The Environment Agency should be consulted for fluvial flood levels and the Environment Agency should 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

0 200 400 600 800 Meters

Scale: 1:18,000 @ A3

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IoW SFRA Draft Output

Figure 79
Potential Development Sites
Qualitative Flood Risk
Newport

November 2009
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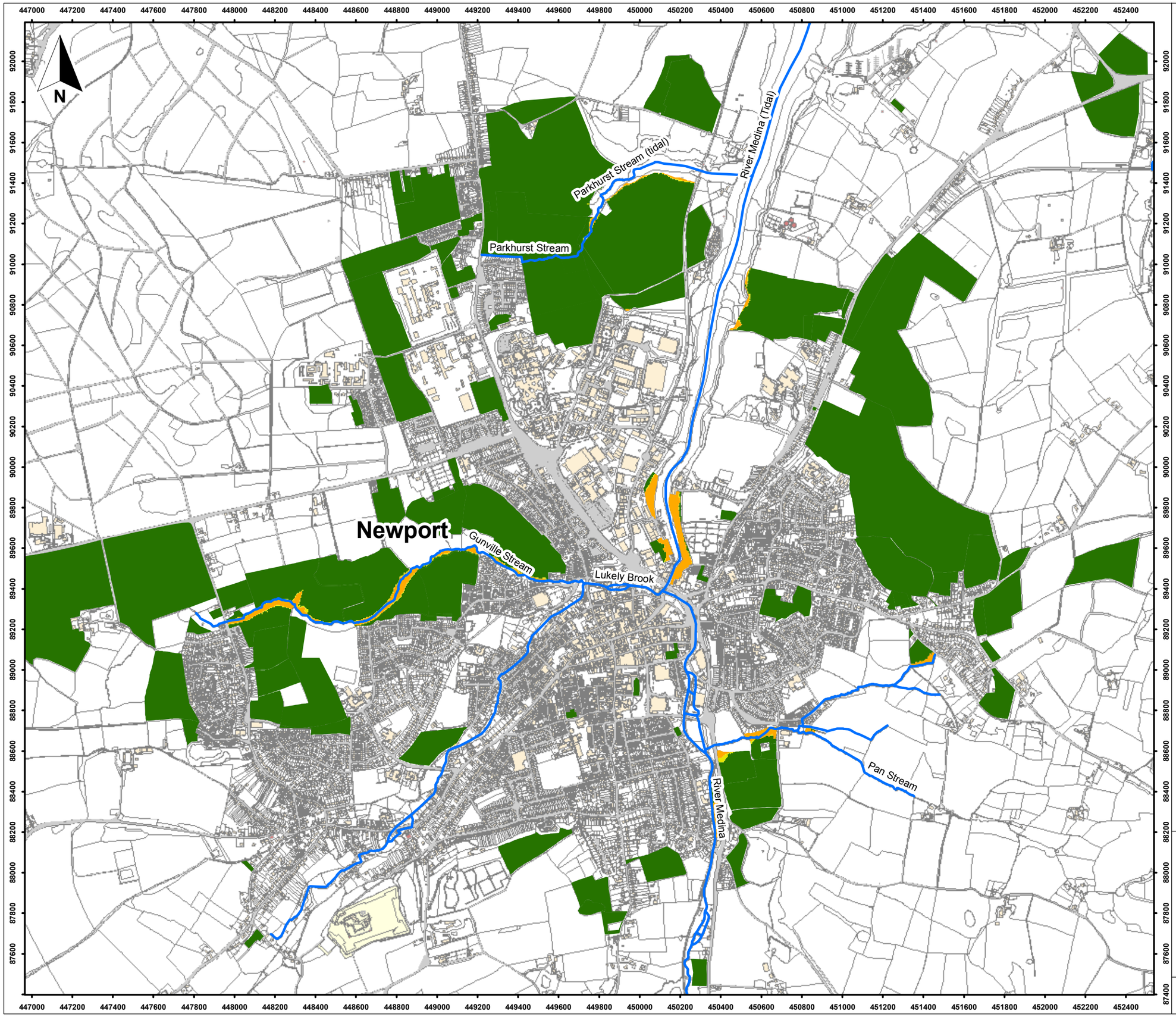

Key:

Main Rivers

Probability of Flooding

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

0 200 400 600 800 Meters

Scale: 1:18,000 @ A3

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Isle of Wight SFRA MK2

Figure 80
Potential Development Sites
Site Specific Flood Risk Definition
Newport

November 2009
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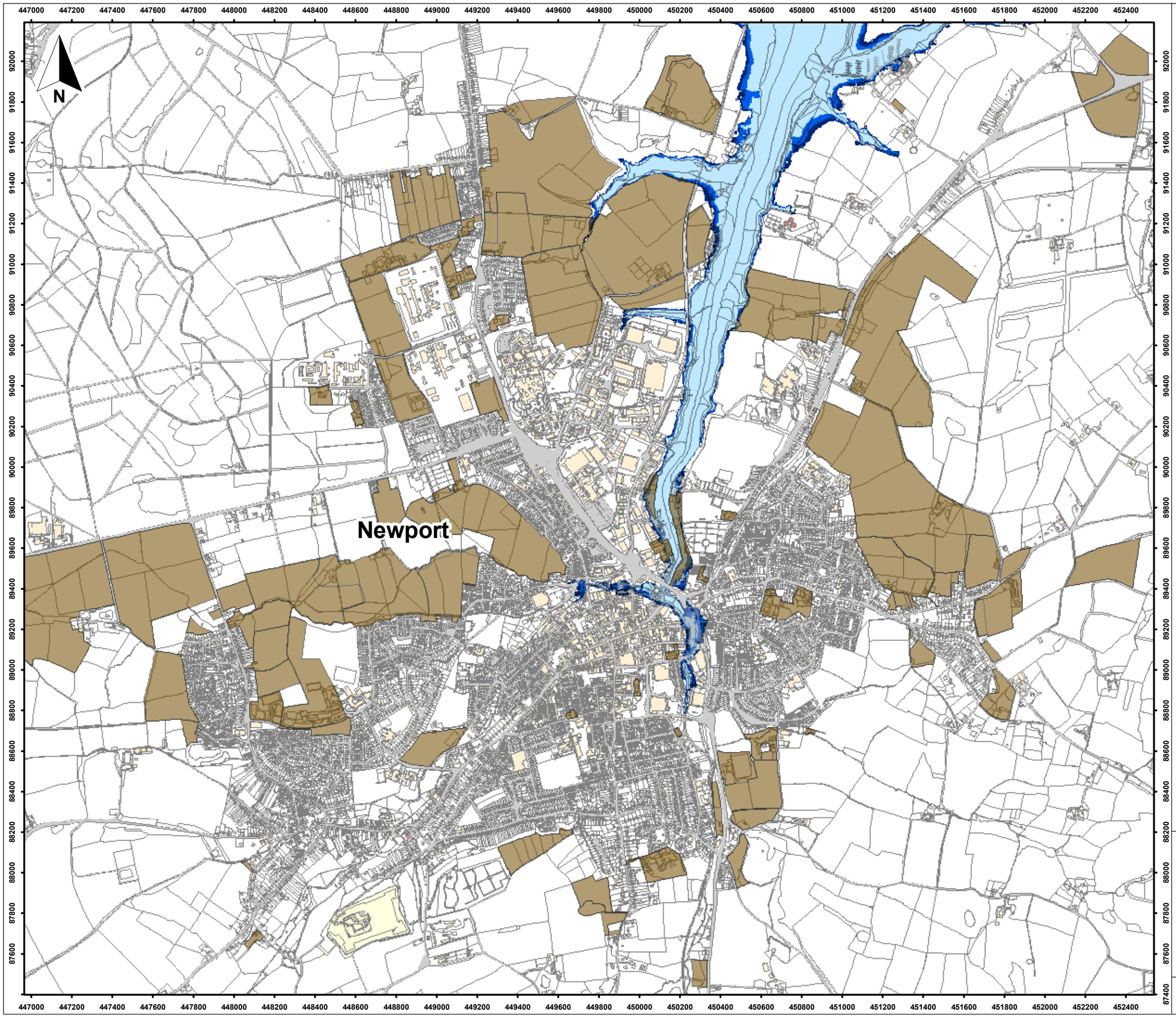

Key:

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: 1:18,000 @ A3

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Isle of Wight SFRA MK2

Figure 81
Potential Development Sites
Flood Zone 2
Climate Change Scenarios
Newport

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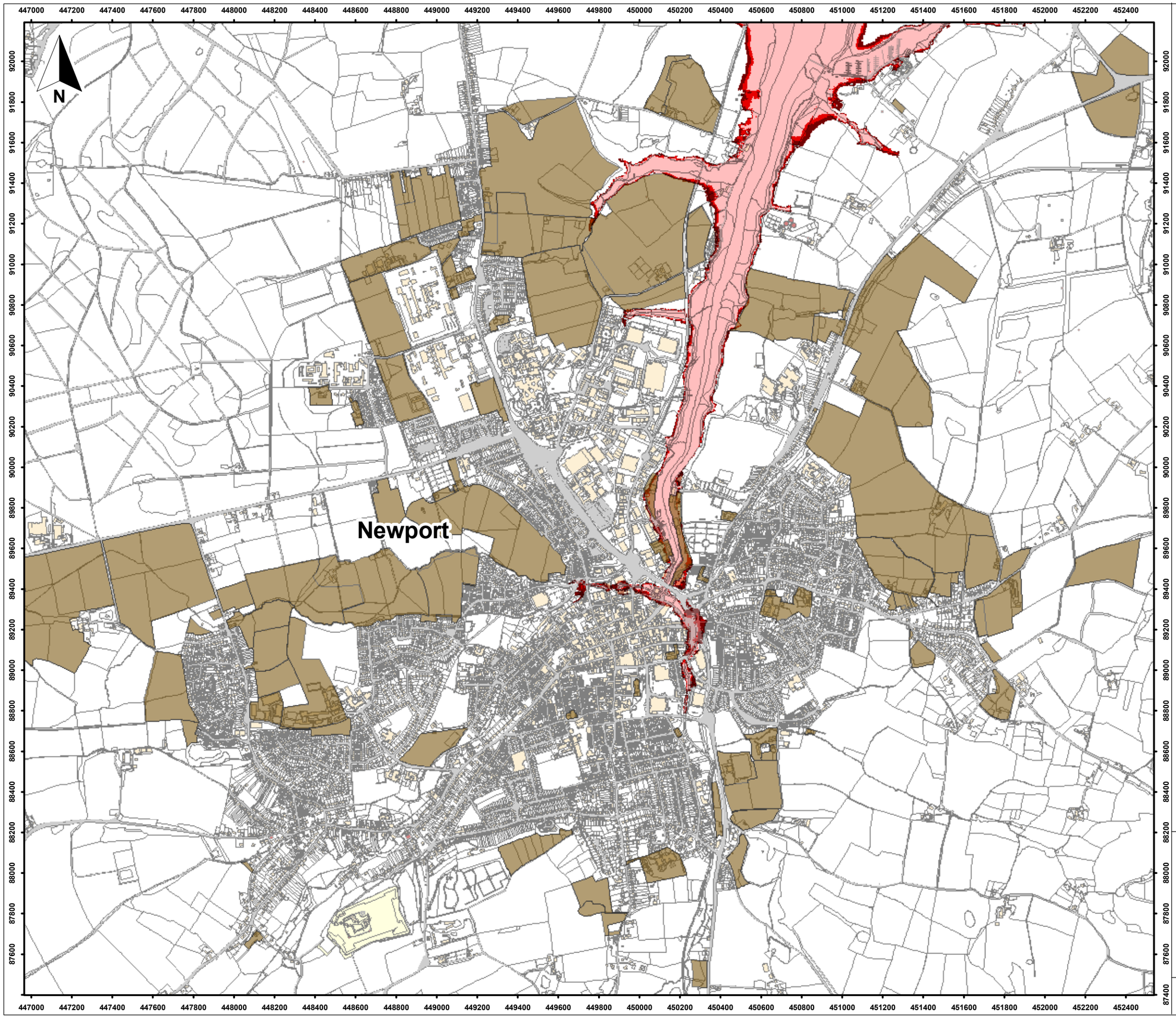

Key:

Predicted 1 in 200 year Tidal Extents

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

- Potential Development Sites

0 200 400 600 800 Meters

Scale: 1:18,000 @ A3

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IoW SFRA Draft Output

Figure 82
Potential Development Sites
Flood Zone 3
Climate Change Scenarios
Newport

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Newport

Parkhurst Stream (tidal)

Parkhurst Stream

River Medina (Tidal)

Gunville Stream

Lukely Brook

River Medina

Pan Stream

Key:

Main Rivers

Potential Exposure Risk

High

Medium

Low

Environment Agency Flood Zone 2 (November 2009)

0 200 400 600 800 Meters

Scale: 1:18,000 @ A3

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Isle of Wight SFRA MK2

Figure 83
Qualitative Wind and Wave Exposure Risk - Newport

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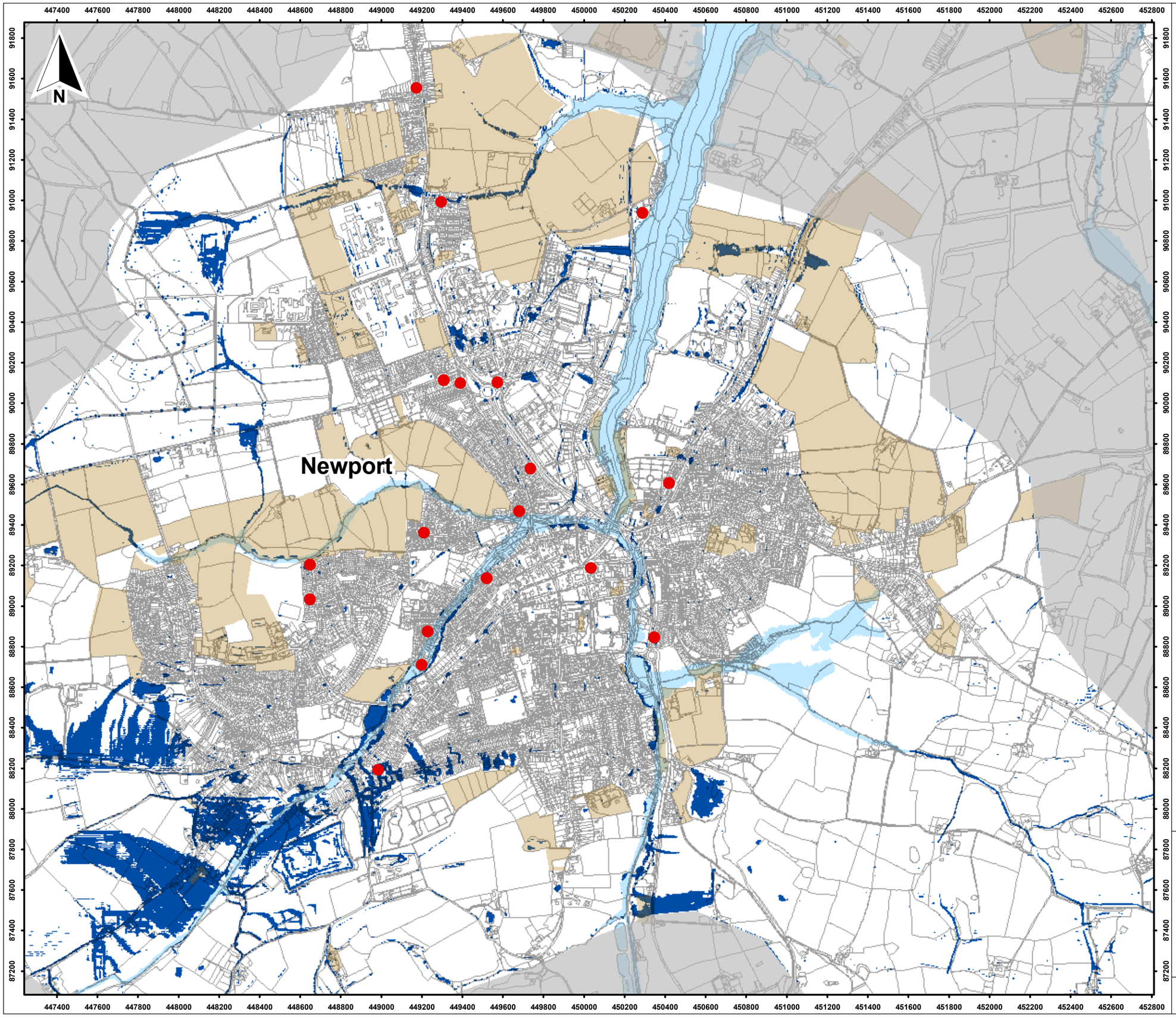

Key:

- 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: 1:18,000 @ A3

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Isle of Wight SFRA MK2

Figure 84
Potential Surface Water Flow Routes and Ponding Areas (1 in 100 year storm + climate change) - Newport

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