

**LEGEND**

-  Rail
-  Roads Tracks And Paths
-  Water
-  Borough Boundary
-  Grand Union Canal
-  Existing Flood Defences
-  The Serpentine
-  Lost Rivers
-  Flood Zone 3
-  Flood Zone 2

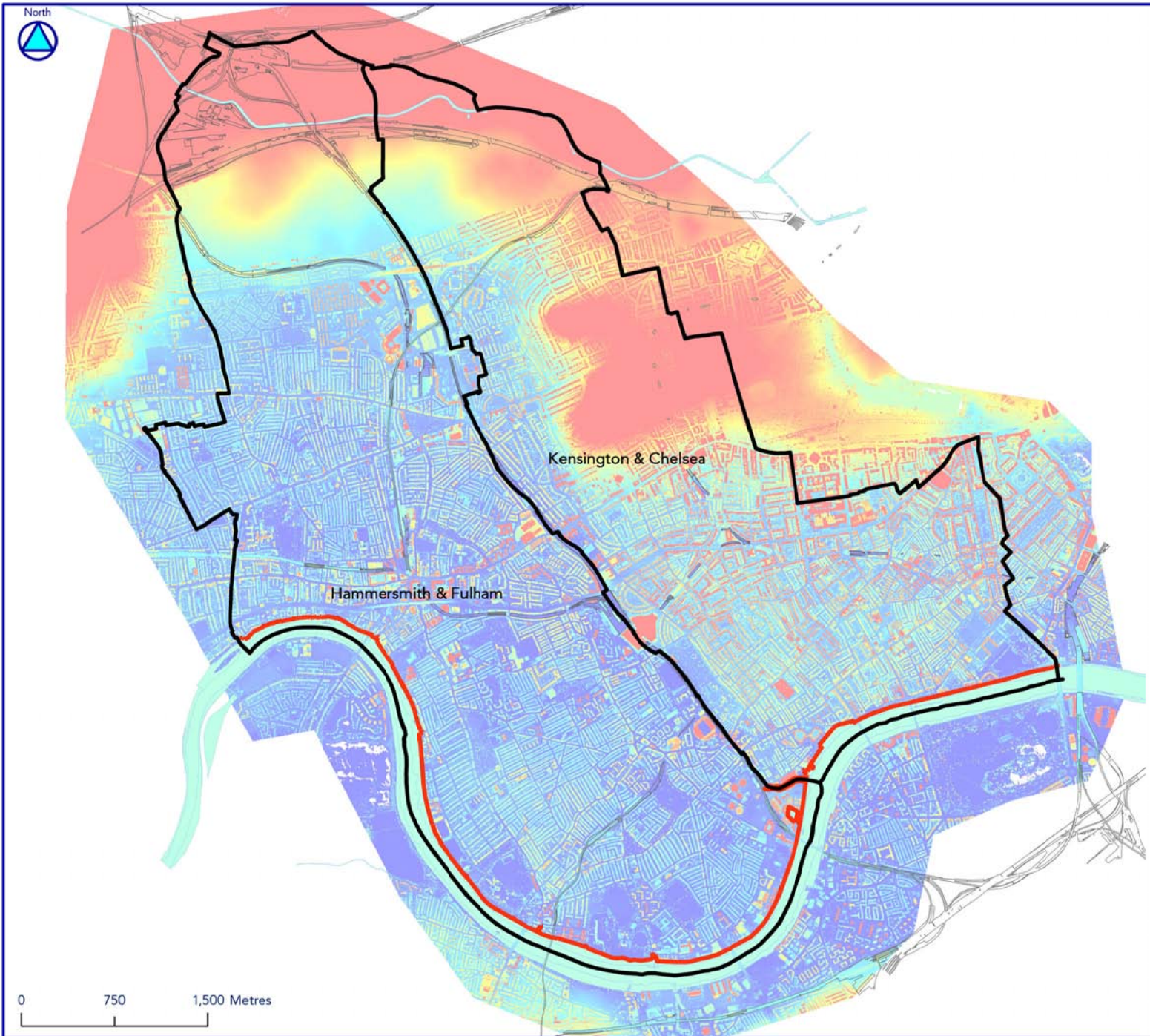
**Entec**

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MAP 1

Study Area

0 750 1,500 Metres



**LEGEND**

-  Borough Boundary
-  Existing Flood Defences
-  Rail
- Topography (Processed Lidar)
-  High : 111 (m)  
Low : 0 (m)

**Entec**

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**MAP 2**

**Topography**

# MAP 3 Breach Locations & Flood Defence Conditions

LONDON BOROUGH OF  
HAMMERSMITH  
AND FULHAM



The Tidal Thames is defended to a 1 in 1000 year standard (protection against an event with a 0.1% chance of occurring each year), by a series of walls, embankments, flood gates and barriers, with the Thames Barrier being the major protection for the study area. The statutory defence level (the level to which the defences must be maintained) within the study area is 5.41m downstream of Putney Bridge, and 5.54m upstream.

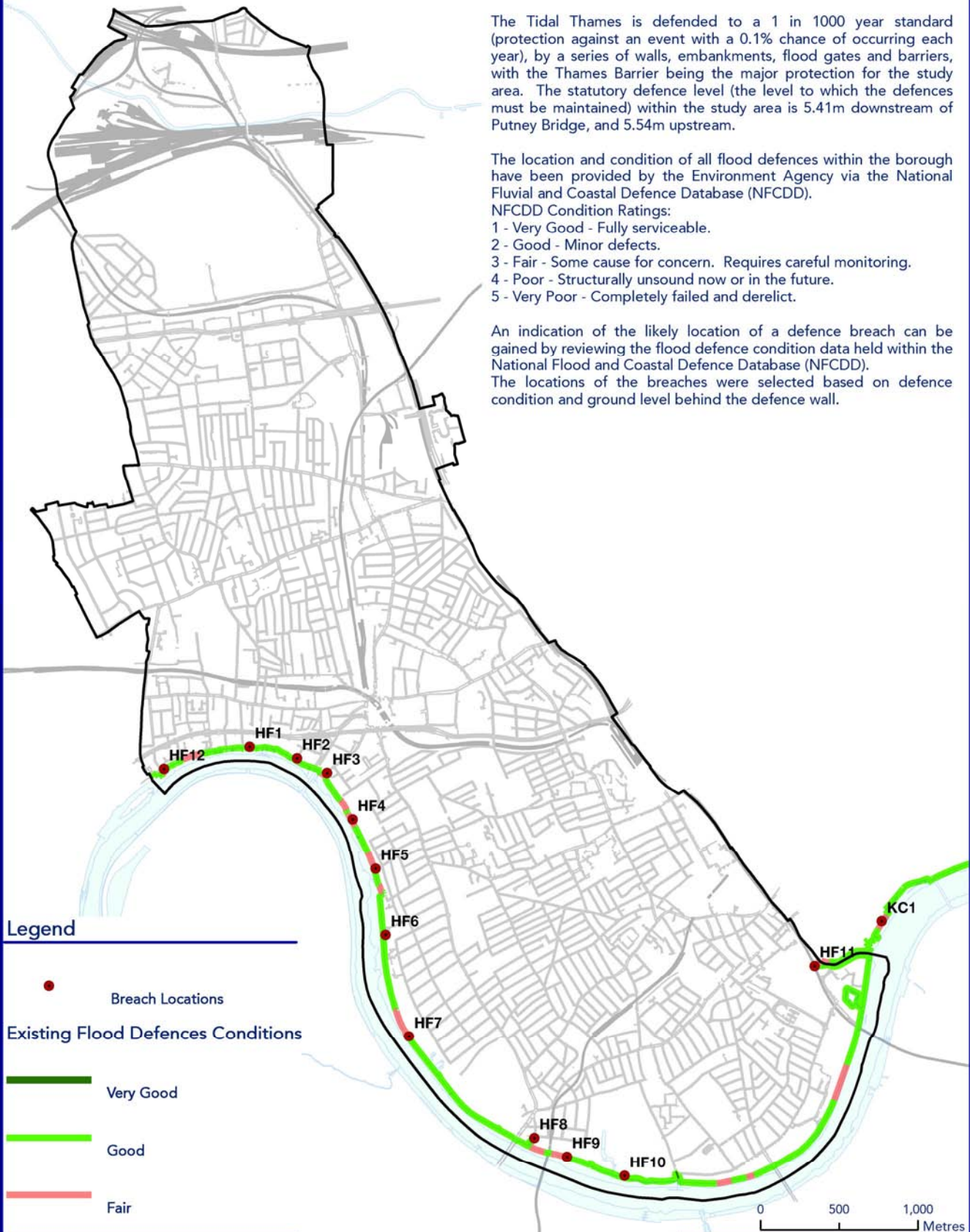
The location and condition of all flood defences within the borough have been provided by the Environment Agency via the National Fluvial and Coastal Defence Database (NFCDD).

NFCDD Condition Ratings:

- 1 - Very Good - Fully serviceable.
- 2 - Good - Minor defects.
- 3 - Fair - Some cause for concern. Requires careful monitoring.
- 4 - Poor - Structurally unsound now or in the future.
- 5 - Very Poor - Completely failed and derelict.

An indication of the likely location of a defence breach can be gained by reviewing the flood defence condition data held within the National Flood and Coastal Defence Database (NFCDD).

The locations of the breaches were selected based on defence condition and ground level behind the defence wall.



## Legend

- Breach Locations
- Existing Flood Defences Conditions**
- █ Very Good
- █ Good
- █ Fair

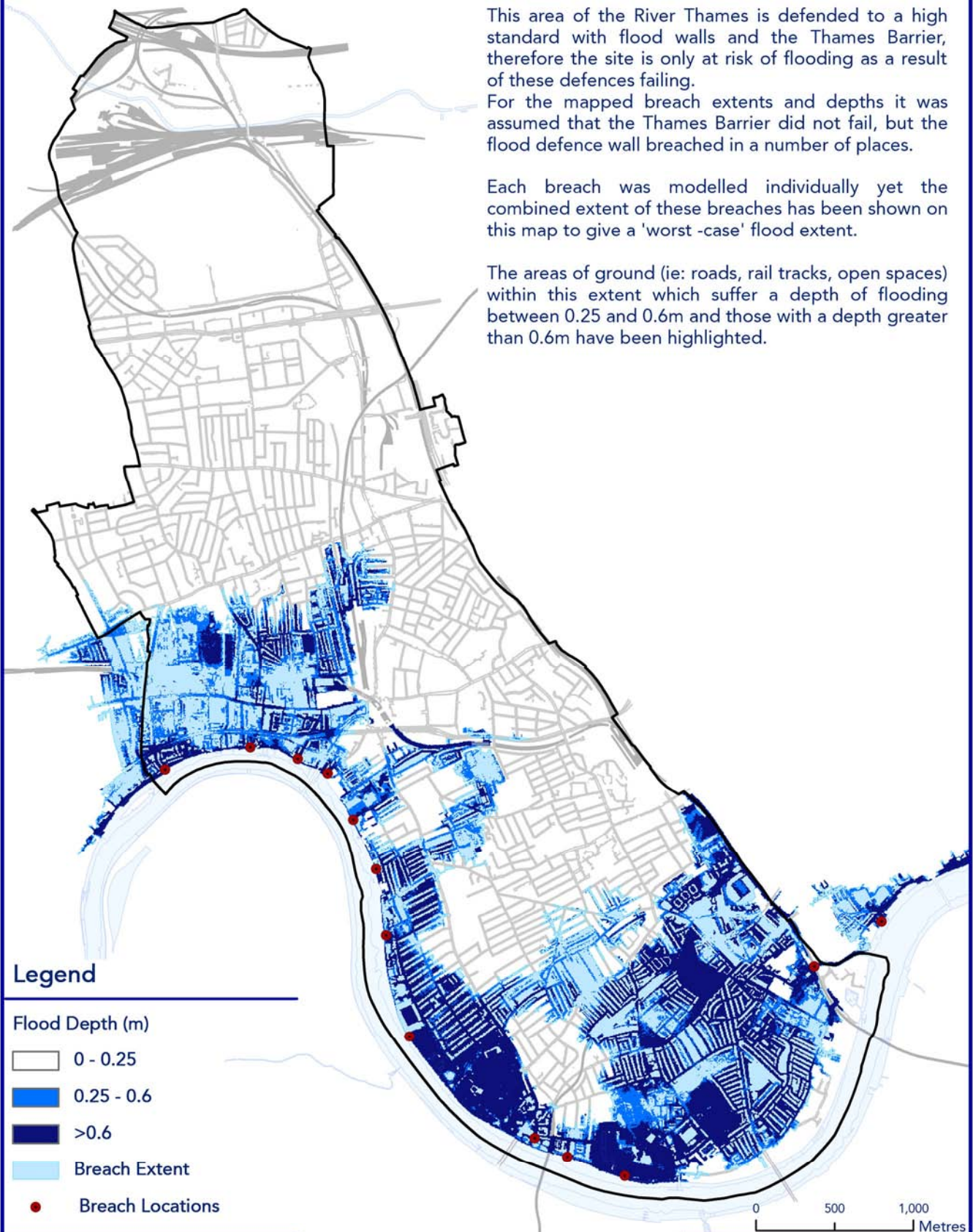
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# MAP 4 Breach Innundation (Flood Extent and Depth)

LONDON BOROUGH OF  
HAMMERSMITH  
AND FULHAM



This area of the River Thames is defended to a high standard with flood walls and the Thames Barrier, therefore the site is only at risk of flooding as a result of these defences failing.

For the mapped breach extents and depths it was assumed that the Thames Barrier did not fail, but the flood defence wall breached in a number of places.

Each breach was modelled individually yet the combined extent of these breaches has been shown on this map to give a 'worst -case' flood extent.

The areas of ground (ie: roads, rail tracks, open spaces) within this extent which suffer a depth of flooding between 0.25 and 0.6m and those with a depth greater than 0.6m have been highlighted.

### Legend

#### Flood Depth (m)

- 0 - 0.25
- 0.25 - 0.6
- >0.6

Breach Extent

Breach Locations

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# MAP 5 Boat Access Point Failure (Flood Extent)

## LONDON BOROUGH OF HAMMERSMITH AND FULHAM



In the west of the London Borough of Hammersmith and Fulham where it fronts the River Thames there are a series of small demountable flood defences which are utilised by private clubs to gain access to the river at Hammersmith.

It has been noted that the chance of these demountable defences being stolen, damaged, or left open was far more probable than the main wall failing. Consequently, an analysis was undertaken to assess the extent and severity of flooding which could occur if allowed to flow through one of these openings.

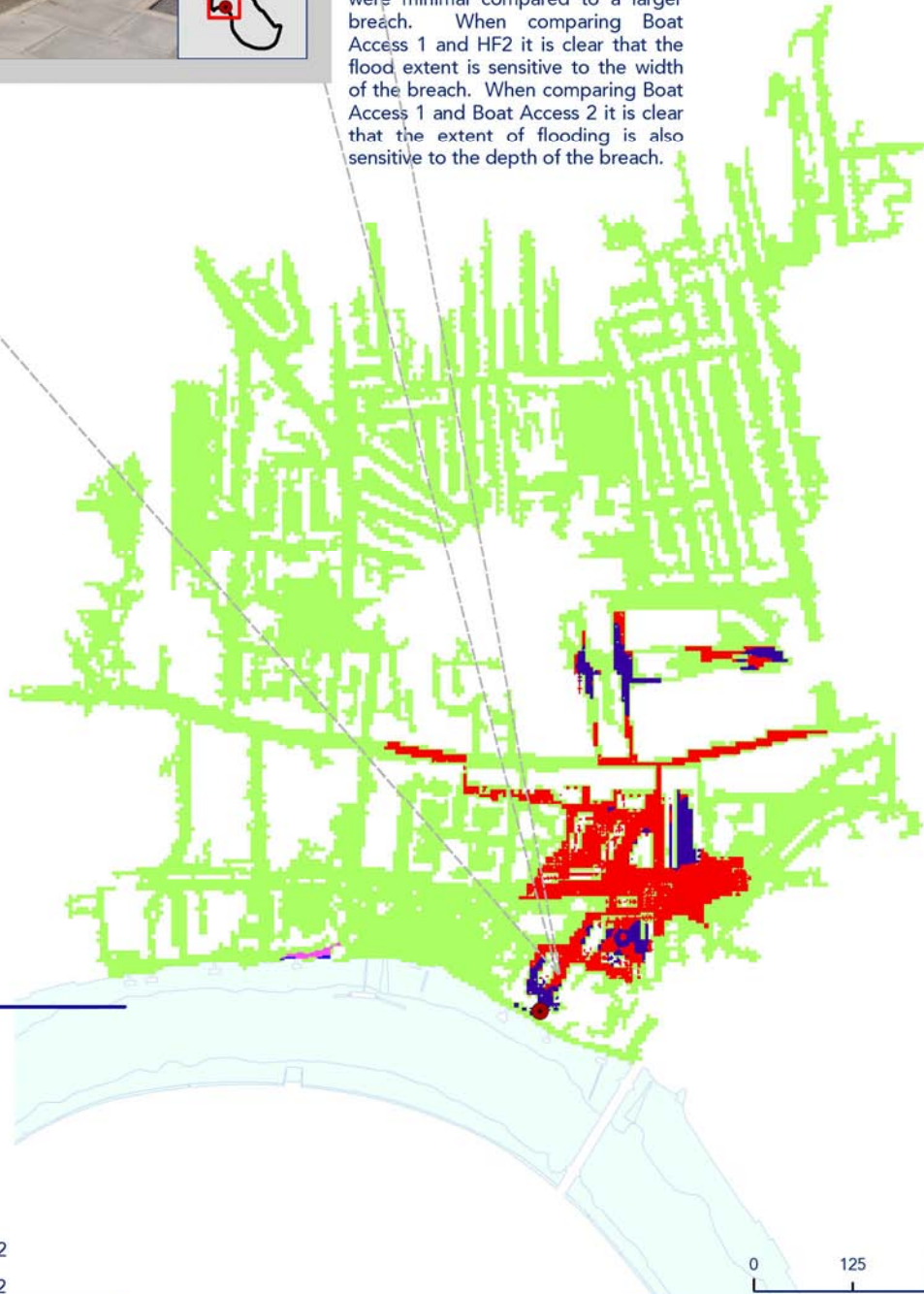
The Dimensions of the scenarios are:

Boat access 1: Top Height = 5.54m; Bottom Height = 4.59m; Width = 2m.

Boat access 2: Top Height = 5.54m; Bottom Height = 5.29m; Width = 2m.

These compare to the beach point HF2 with dimensions of: Top Height = 5.54m; Bottom Height = 4.5m; Width = 20m.

The extent to which the flood water travelled, and the depths it achieved, were minimal compared to a larger breach. When comparing Boat Access 1 and HF2 it is clear that the flood extent is sensitive to the width of the breach. When comparing Boat Access 1 and Boat Access 2 it is clear that the extent of flooding is also sensitive to the depth of the breach.



### Legend

#### Boat Access 1

0 - 0.6

>0.6 (m)

#### Boat Access 2

0 - 0.6

> 0.6 (m)

● Breach Location HF2

■ Breach Extent of HF2

# MAP 6 Overtopping Innundation Baseline (Flood Extent and Depth)

LONDON BOROUGH OF

HAMMERSMITH  
AND FULHAM

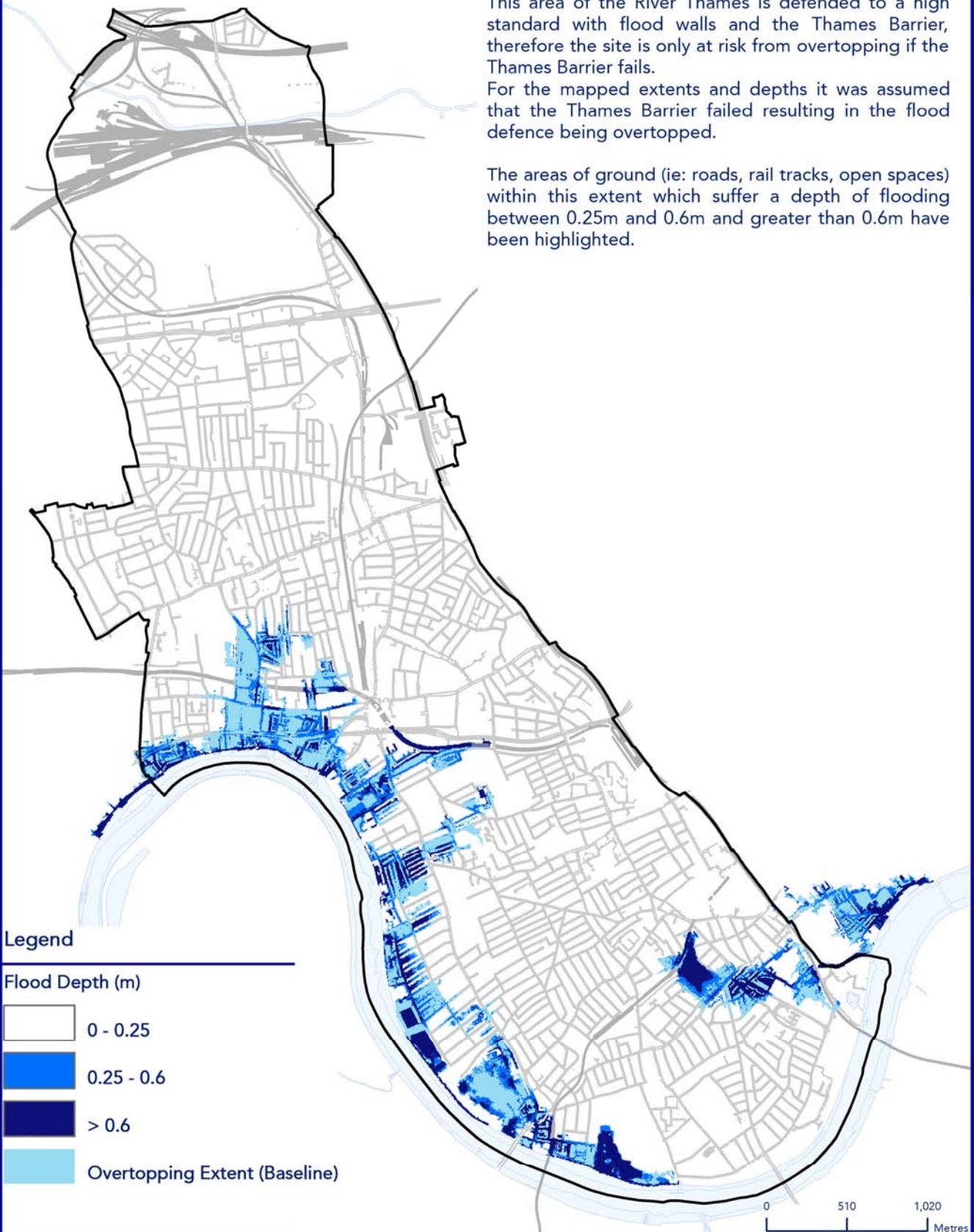
North



This area of the River Thames is defended to a high standard with flood walls and the Thames Barrier, therefore the site is only at risk from overtopping if the Thames Barrier fails.

For the mapped extents and depths it was assumed that the Thames Barrier failed resulting in the flood defence being overtopped.

The areas of ground (ie: roads, rail tracks, open spaces) within this extent which suffer a depth of flooding between 0.25m and 0.6m and greater than 0.6m have been highlighted.



### Legend

#### Flood Depth (m)

	0 - 0.25
	0.25 - 0.6
	> 0.6
	Overtopping Extent (Baseline)

# MAP 7 Overtopping Innundation Climate Change (Flood Extent and Depth)

LONDON BOROUGH OF  
HAMMERSMITH  
AND FULHAM

North



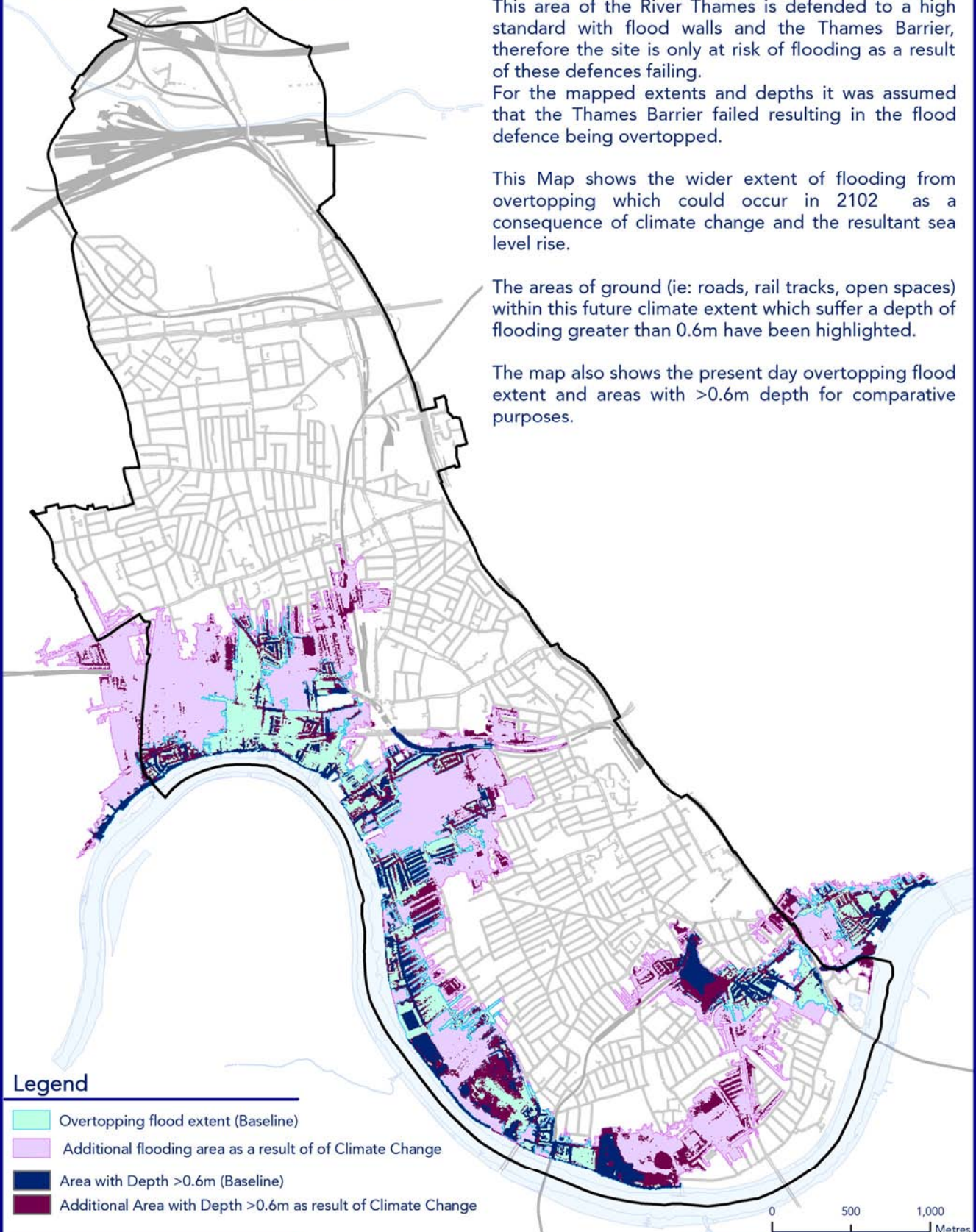
This area of the River Thames is defended to a high standard with flood walls and the Thames Barrier, therefore the site is only at risk of flooding as a result of these defences failing.

For the mapped extents and depths it was assumed that the Thames Barrier failed resulting in the flood defence being overtopped.

This Map shows the wider extent of flooding from overtopping which could occur in 2102 as a consequence of climate change and the resultant sea level rise.

The areas of ground (ie: roads, rail tracks, open spaces) within this future climate extent which suffer a depth of flooding greater than 0.6m have been highlighted.

The map also shows the present day overtopping flood extent and areas with >0.6m depth for comparative purposes.



## Legend

- Overtopping flood extent (Baseline)
- Additional flooding area as a result of of Climate Change
- Area with Depth >0.6m (Baseline)
- Additional Area with Depth >0.6m as result of Climate Change

# MAP 8 Residual Risk within Flood Zone 3

## LONDON BOROUGH OF HAMMERSMITH AND FULHAM

North



The Rapid Inundation Zone (RIZ) can be defined as the area that a flood will cover within half an hour of a breach occurring. The RIZ equates to the area within 500m of the defence line. The RIZ is often the area which suffers the highest depths and velocities.

For allocations where a development site is close to a defence (i.e. within 500m) consideration must be given to the risk to public safety. Development should not be sited where risk unduly threaten public safety and/or the structural integrity of buildings and infrastructure. Consideration of the depth of flooding, rate of inundation and safe access/egress is required to assess these risks. This assessment is applicable to areas at risk from both breach and overtopping.

### Residual Flood Risk Classification within Flood Zone 3

#### HH: High

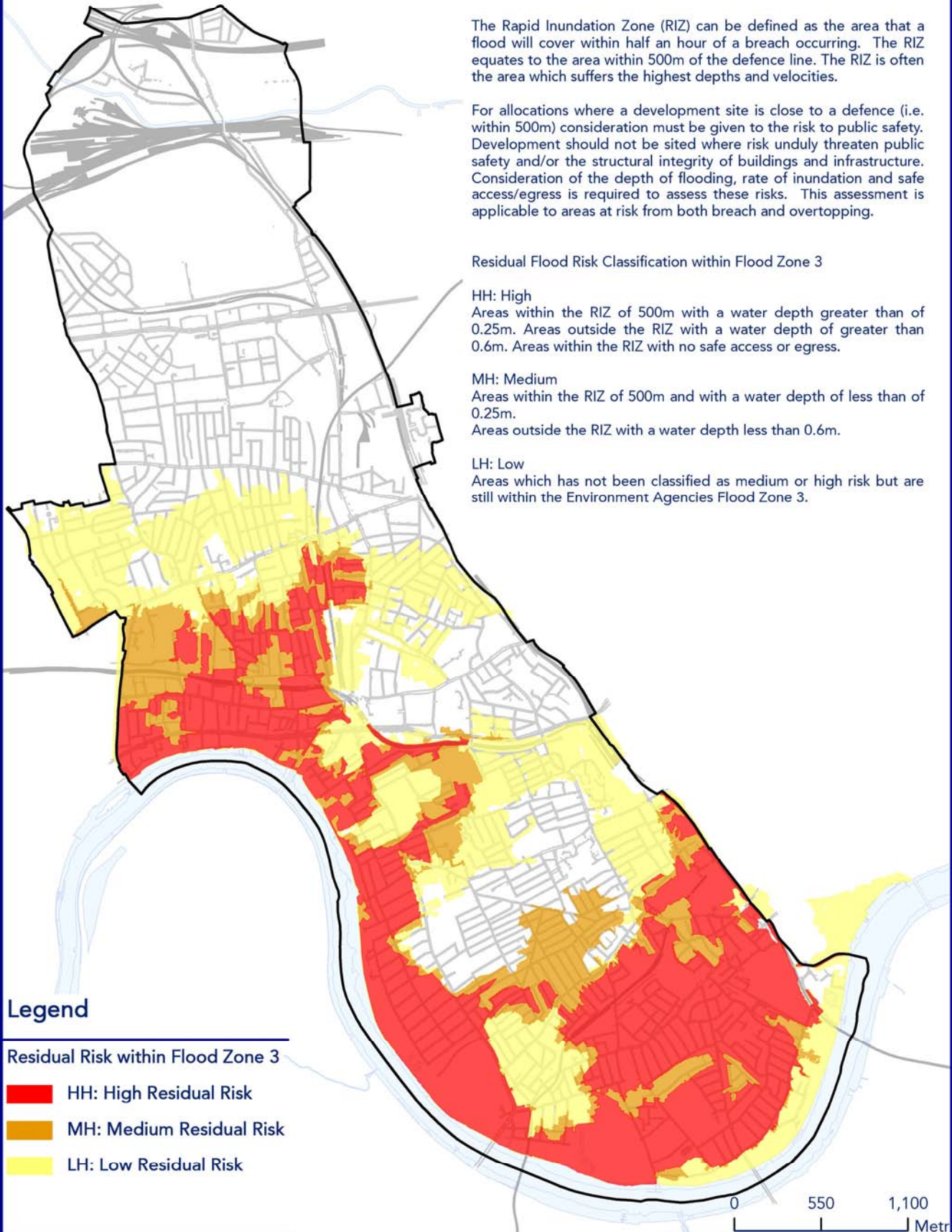
Areas within the RIZ of 500m with a water depth greater than of 0.25m. Areas outside the RIZ with a water depth of greater than 0.6m. Areas within the RIZ with no safe access or egress.

#### MH: Medium

Areas within the RIZ of 500m and with a water depth of less than of 0.25m. Areas outside the RIZ with a water depth less than 0.6m.

#### LH: Low

Areas which has not been classified as medium or high risk but are still within the Environment Agencies Flood Zone 3.



### Legend

#### Residual Risk within Flood Zone 3

- HH: High Residual Risk
- MH: Medium Residual Risk
- LH: Low Residual Risk



# MAP 9 Surface Water Flooding

LONDON BOROUGH OF  
HAMMERSMITH  
AND FULHAM

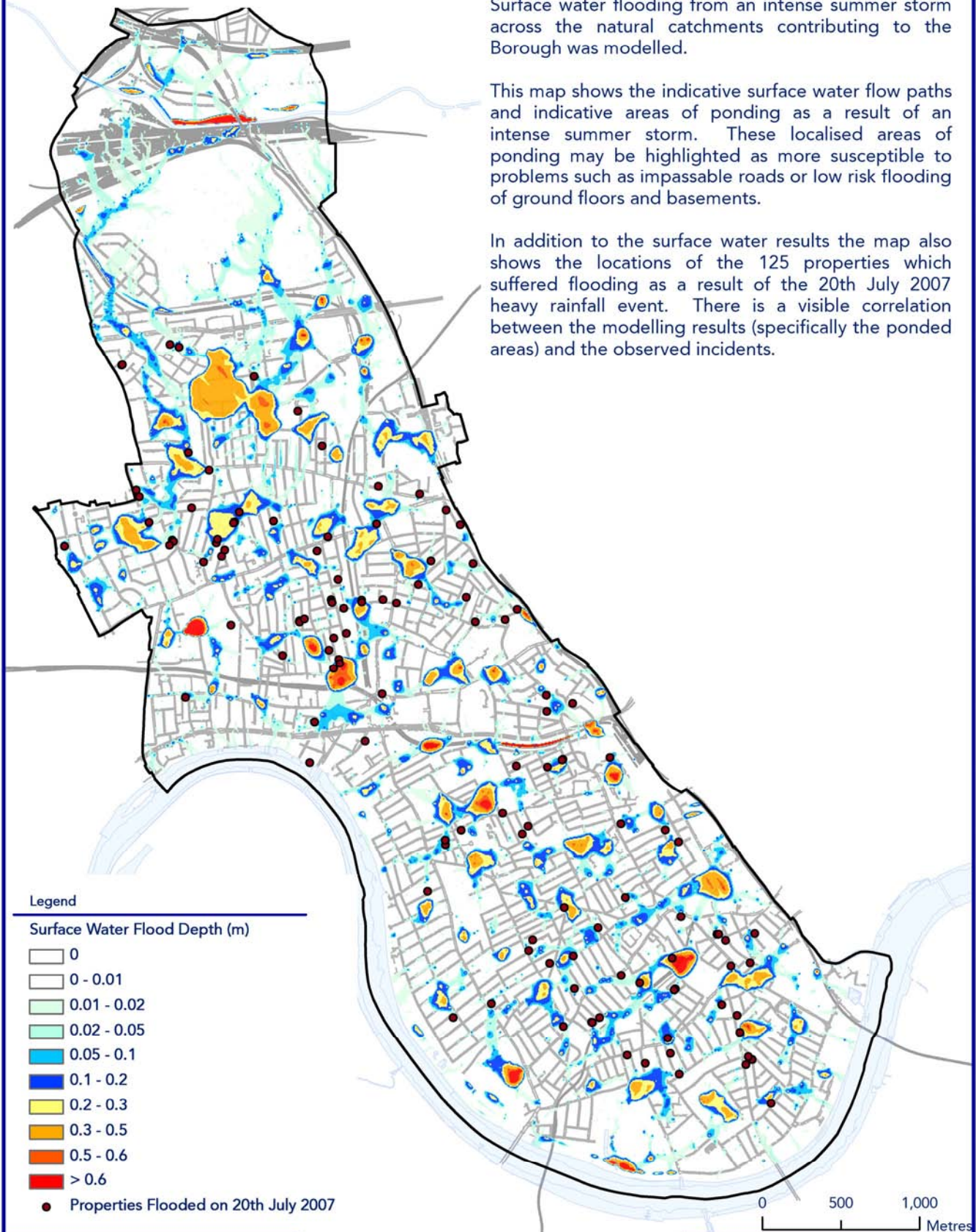
North



Surface water flooding from an intense summer storm across the natural catchments contributing to the Borough was modelled.

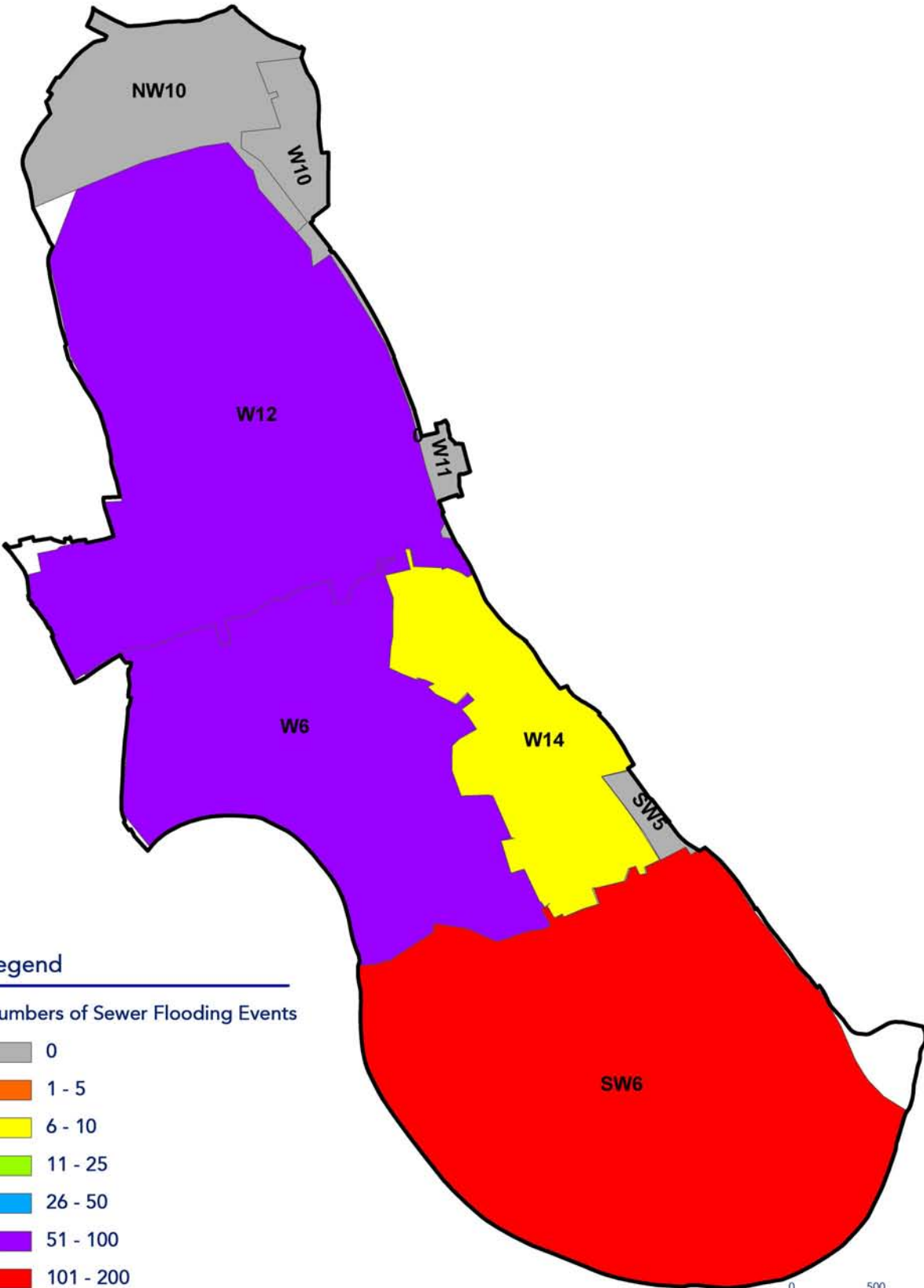
This map shows the indicative surface water flow paths and indicative areas of ponding as a result of an intense summer storm. These localised areas of ponding may be highlighted as more susceptible to problems such as impassable roads or low risk flooding of ground floors and basements.

In addition to the surface water results the map also shows the locations of the 125 properties which suffered flooding as a result of the 20th July 2007 heavy rainfall event. There is a visible correlation between the modelling results (specifically the ponded areas) and the observed incidents.



# MAP 10 Spatial Distribution of Sewer Flooding Events in the Past 10 Years

LONDON BOROUGH OF  
HAMMERSMITH  
AND FULHAM



## Legend

Numbers of Sewer Flooding Events

- 0
- 1 - 5
- 6 - 10
- 11 - 25
- 26 - 50
- 51 - 100
- 101 - 200



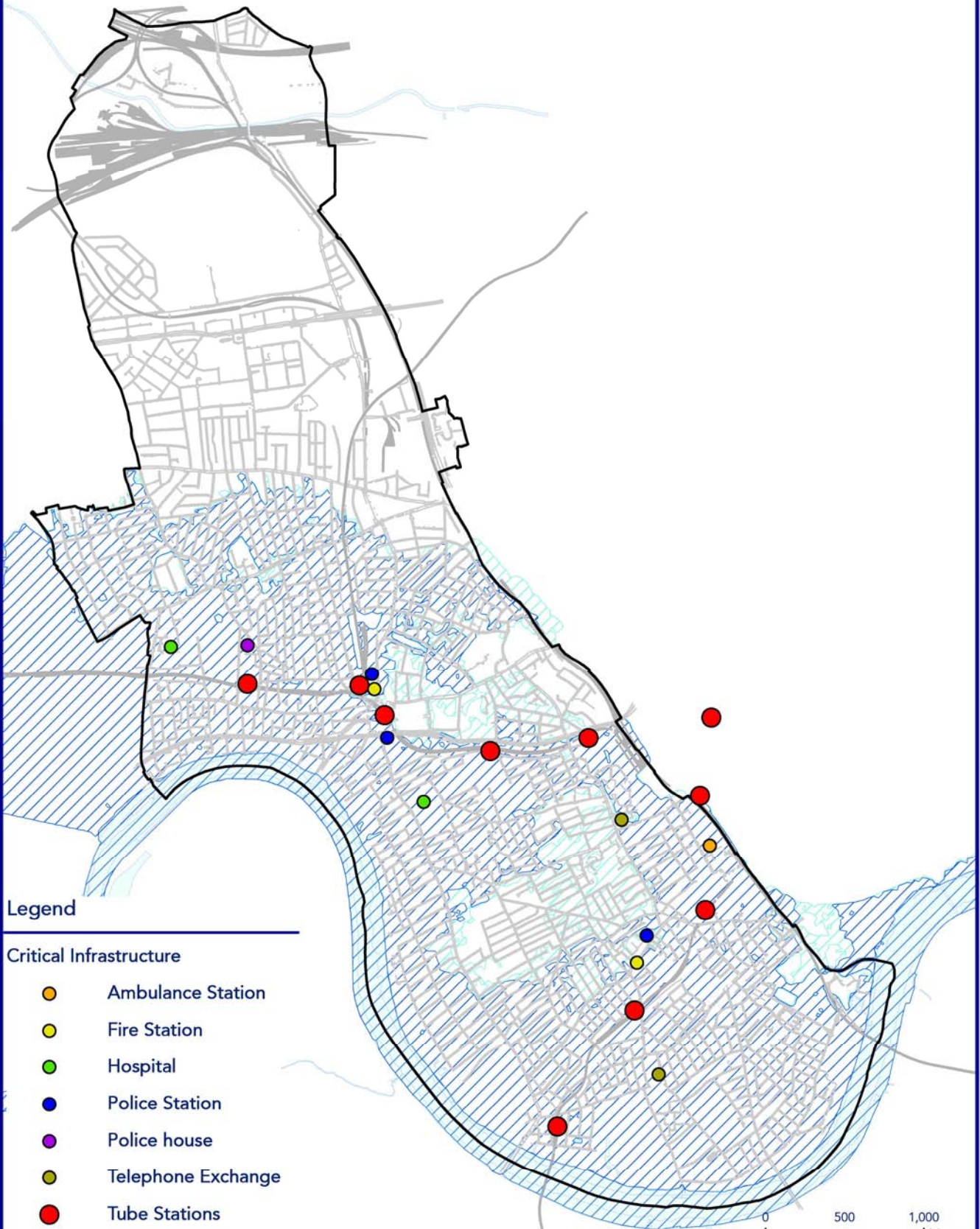
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# MAP 11 Critical Infrastructure at Flood Risk

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### Legend

#### Critical Infrastructure

-  Ambulance Station
-  Fire Station
-  Hospital
-  Police Station
-  Police house
-  Telephone Exchange
-  Tube Stations

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