

APPENDIX L

RIPPLESIDE COMMERCIAL AREA

RIPPLESIDE COMMERCIAL AREA

Area Name: Rippleside Commercial Area

Location: Barking

River Catchment: Beam River, Gores Brook, River Thames

NPPF Flood Zone (majority of area): Flood Zone 3a

NPPF Flood Zone (worst case): Flood Zone 3a

Introduction

The Rippleside Commercial Area strategic development site covers an area of approximately 0.39km² and is located towards the south of Barking and Dagenham (refer to Appendix A). The area is bounded by the A13 in the north and west, Scrattons Terrace in the east and the railway line in the south.

The existing land use in the area is mixed commercial and industrial, with Alfreds Way and Renwick Industrial Estate located in the west of the area and Rippleside Commercial Estate and Maybells Commercial Estate in the east.

The proposals for the development of the Rippleside Commercial Area strategic development site involve re-zoning of the land for the development of c. 4,000 residential properties.

Description of Flood Risk

Fluvial and Tidal

The primary sources of flooding to the Rippleside Commercial Area strategic development site are tidal flooding from the River Thames and fluvial flooding from the River Roding and the Mayes Brook.

The majority of Rippleside Commercial Area (c. 50%) is located within the high risk Flood Zone 3a with c. 5% of the area is located within the medium risk Flood Zone 2. The remaining c. 45% of the area is within the low risk Flood Zone 1.

Analysis of local topography and Flood Zones indicates that flood depths are expected to reach up to 2m in areas of Flood Zone 3a. Land identified to be within Flood Zone 3a is predominantly along the southern half of the site, but also along Renwick Road through the centre of the site. In the Rippleside Commercial Area strategic development site the extents of Flood Zone 3a and Flood Zone 2 are very similar, with a small increase in extent throughout the site.

Fluvial and tidal flooding within the Rippleside Commercial Area strategic development site is illustrated in Figures L1 and L2A.

Surface Water

The Environment Agency Risk of Flooding from Surface Water map indicates that the Rippleside Commercial Area strategic development site is generally at low risk of surface water flooding, however two areas are identified as LFRZ's in the Barking and Dagenham SWMP. High risk areas (flooding with greater than a 1 in 30 (3.33%) annual probability) are identified at Renwick Road, in the centre of the strategic development site, and in Wayside Commercial Estate towards the western extent of the site. During a 1 in 100 (1%) annual probability event, surface water flooding to a depth of over 1.5m is predicted at both of these locations. Flooding of Renwick Road is due to the flow path from Castle Green across the Ripple Road (A13). The associated flood hazard at these locations for the 1 in 100 (1%) annual probability event is classified as being 'significant' (Danger for most).

Flood hazards associated with surface water flooding during the 1 in 100 (1%) annual probability event are illustrated in Figure L3.

Groundwater

The increased Potential for Elevated Groundwater map (iPEG), developed for the Barking and Dagenham SWMP, indicates the northern boundary of the area and a number of localised areas in the east are within an area identified as having an increased potential for groundwater to interact with or rise to within 2m of the ground surface. For details of the iPEG map refer to the Level 1 SFRA report Section 5.3 and Appendix I. Groundwater emergence could pose flood risk to basement or below ground structures, as well as generate overland flows that are likely to pond in areas of flat topography or be similar in location to those discussed as part of the surface water flood analysis.

Defence or Reservoir Failure

The Rippleside Commercial Area strategic development site benefits from flood defences on the River Roding and from the Thames tidal defences, including the Barking Barrier. Areas identified to benefit from existing flood defences are illustrated in Figures L4 and L5, but noting that these do not take the potential effects of climate change into account and that the mapping may not fully represent flooding from the Mayes Brook that is understood to have a lower Standard of Protection (SoP).

The Lower Roding Flood Risk Mapping study (undertaken by Capita Symonds in 2009) indicates that the defences along the River Roding provide a Standard of Protection (SoP) to the Rippleside Commercial Area equivalent to a 1 in 200 (0.5%) annual probability fluvial flood. This study only assessed the fluvial flood risk from the River Roding and no assessment was undertaken of a fluvial flood event occurring when the Barking Barrier is closed or when tide levels in the River Thames are high.

The River Thames tidal defences provide a present day SoP equivalent to a 1 in 2000 (0.05%) annual probability tidal flood event. It is believed that by 2030 the SoP will decrease to approximately 1 in 1000 (0.1%).

The Mayes Brook has designated areas of flood storage in the form of two reservoirs in Mayesbrook Park. In 2011 restoration works were undertaken in the reach upstream of the Mayes Brook reservoirs. However, it is understood that the scheme may only provide a standard of protection for up to the 1 in 30 (3.33%) annual probability flood event.

Site-specific flood risk assessments for developments within the areas benefitting from the defences along the River Roding and the River Thames should include an assessment of the risk of overtopping of the defences, as well as the risk of a breach in the defences. This should also consider the condition of flood defences as discussed in the Level 1 SFRA.

Review of the Environment Agency River Thames breach analysis published in 2017, and the breach analysis undertaken for the Barking and Dagenham SFRA published in 2008, indicates that the degree of flood hazard in a significant proportion of the Rippleside Commercial Area strategic development site would be 'very high' (Danger for all) should a breach in the Barking Creek or River Thames defences occur. In general the areas shown to be at risk of flooding following a breach are broadly similar to those areas identified to be at risk within the mapped Flood Zone 2 and 3, with the addition of land through the centre of the site meaning that c.90% of the site is deemed to be at risk in the event of a failure of the flood defences.

Mapped outputs of breach analysis relevant to the Rippleside Commercial Area strategic development site are provided in Figures L6 to L9.

Following a breach of the flood defences along the Barking Creek, flooding of the western extent of the Rippleside Commercial Area would occur rapidly, with a predicted rate of inundation of less than 5 hours. The remainder of the site would be inundated more slowly with a majority of the area that is at risk predicted to be inundated between 15 and 20 hours after the breach occurring. A breach of the River Thames tidal defences would result in a similar rate of inundation. During the most recent inspections undertaken by the Environment Agency in 2015-2016, generally, the flood defence assets protecting Barking and Dagenham are in good condition; of the 120 flood defence assets surveyed, 105 were classified as being 'Good' or 'Very Good'. However, four of the surveyed flood defence assets were classified as being 'Poor' or 'Very Poor'.

Two of the flood defence assets on the River Roding, approximately 6.5km upstream from the confluence with the Thames, were assessed as being in 'Poor' condition, (Environment Agency asset numbers 8742 and 15371). A failure of flood defence asset no. 15371 would be likely to affect the Rippleside Commercial Area strategic development site.

Part of the flood defences on the River Thames were also assessed as being in 'Poor' and 'Very Poor' condition during the Environment Agency's last inspections. These are located at the confluence with the River Beam (Environment Agency asset number 7391) and approximately 2.2km downstream of the confluence with the River Roding (Environment Agency asset number 14860) respectively. A failure of the 'Very Poor' flood defence asset (no. 14860) would be likely to affect the Rippleside Commercial Area strategic development site.

The Environment Agency Risk of Flooding from Reservoirs map indicates the area is not at risk of reservoir flooding.

Flood Warning Areas

The areas identified as being at fluvial or tidal risk within the Rippleside Commercial Area strategic development site are within the Environment Agency 'Tidal Thames from Mar Dyke to Barking Creek' Flood Warning Area.

Flood Warnings are issued to specific areas when flooding is expected. Flood Warnings apply to fluvial and tidal flooding, not to flooding from other sources such as sewer and surface water flooding.

Areas of the Rippleside Commercial Area strategic development site which benefit from Environment Agency Flood Warnings are illustrated in Figure L10.

Impact of Climate Change

Updated guidance for considering the potential effects of climate change for the 1 in 100 (1%) annual probability event has been considered within the fluvial modelling of the Mayes Brook that flows immediately to the west of the site, to the west of the A13 and railway line, as well as within the fluvial flood modelling of the Beam River and Gores Brook which are located over 1km to the east. The mapping, provided in Figures L2B and L2C, indicates increased flood risk within the west of the site associated with the Mayes Brook when the potential effects of climate change are considered. The mapping also indicates that fluvial flooding associated with the Gores Brook encroaches to within the east of the site during the 'upper end' climate change allowance.

Updated climate change analysis has not yet been undertaken for the Lower Roding that is also likely to affect the Rippleside Commercial Area strategic development site.

The effects of climate change will not only increase the risk of flooding posed to property as a result of river and/or tidal flooding, but it will also potentially increase the frequency and intensity of surface water flood risk within the Borough. A comparison of the Environment Agency 1 in 100 (1%) annual probability and 1 in 1000 (0.1%) annual probability predicted surface water flood extents, provided in the Level 1 SFRA report, indicates that the most significant increase would be towards the western extent of the Rippleside Commercial Area strategic development site in an area identified as a LFRZ in the SWMP. Further increases in flood risk may also be found along and adjacent to Renwick Road.

Planning Recommendations

Spatial Planning and Development Control

Development of the site should be undertaken in accordance with the principles as set out within Section 1 of this report and Section 7 of the Level 1 SFRA. It is understood that the proposed development within the Rippleside Commercial Area strategic development site involves the re-zoning of the land for the development of residential properties.

Proposed development within the Rippleside Commercial Area strategic development site should be located within areas identified as Flood Zone 1 wherever possible. A sequential approach should be

adopted that steers the most vulnerable types of development (i.e. residential) to those areas at lowest flood risk.

Residential development (excluding basement dwellings) would be considered acceptable in the medium probability Flood Zone 2 if necessary. Residential development may also be acceptable in the high risk Flood Zone 3a following the successful application of the Exception Test. However, it will be necessary to demonstrate that the suitability of all other sites at lower flood risk has been considered and, if so, that the location of development in Flood Zone 3a provides wider sustainability benefits to the community that outweigh flood risk. This could include the redevelopment of derelict sites, wider benefits to the local economy and the need to meet demanding housing needs.

The development of the Rippleside Commercial Area strategic development site should take into consideration the overland flow path entering the site from Ripple Road (A13) which is predicted to impact Renwick Road. Development in this area should ensure that it is resilient to the risk of surface water flooding including the consideration of alternative access routes should access along Renwick Road be unavailable.

Development in Flood Zones 2 and 3

A site-specific flood risk assessment is required to support any planning application in the Rippleside Commercial Area for development located within Flood Zone 2 or Flood Zone 3, including those areas that may benefit from flood defences. The site-specific flood risk assessment should be undertaken in accordance with Section 7.5 of the Level 1 SFRA.

The assessment of flood risk in areas that benefit from flood defences should include an assessment of risk following a breach in the flood defences, as informed by breach analysis completed by the Environment Agency.

For development in Flood Zones 2 and 3, it is recommended that floor levels within new development are situated a minimum of 0.3m above the predicted 1 in 100 (1%) annual probability design flood level for fluvial flooding scenarios, including an allowance for climate change effects. Within tidal areas, this should be taken as the 1 in 200 (0.5%) annual probability design flood level, including an allowance for climate change effects, calculated assuming a breach of the raised flood defences.

Development located within the defended flood zones may be at risk from sudden inundation following a breach of the flood defences, with an associated 'very high' flood hazard due to the predicted depth and velocity of flood waters in some areas. If it is not possible to locate the ground floor level of the development above the predicted 1 in 100 (1%) annual probability fluvial flood level or 1 in 200 (0.5%) annual probability tidal flood level, it is recommended that the developer strives to reduce the rate of inundation (i.e. through raising ground levels as high as practicable) to 10 hours or greater to provide sufficient time to facilitate evacuation of the site.

Dry access should be provided above the 1 in 100 (1%) annual probability fluvial flood level or 1 in 200 (0.5%) annual probability tidal flood level, calculated assuming a breach of the raised flood defences in those areas benefitting from flood defences. Where this is not possible, safe access with 'very low' flood hazard should be demonstrated. Only where neither of these is feasible, a dedicated 'safe haven' should be provided. This may be provided in the form of a sheltered communal space within the building, accessed via internal stairs. It will be necessary to ensure that the safe haven is sufficient in size to safely house all residents/users of the building.

Development proposed within Flood Zone 3a and/or development proposed in areas at 'very high' flood hazard, including that within areas identified to benefit from flood defences, should be supported by a flood evacuation plan and/or emergency response plan prepared in consultation with the local emergency planning department and emergency services.

Any loss of flood plain storage within the undefended fluvial Flood Zone 3a up to the 1 in 100 (1%) annual probability plus climate change event should be compensated for on a like-for-like basis to ensure no increased flood risk elsewhere as a result of development, unless detailed site assessment demonstrates that development within these areas causes no increased flood risk elsewhere. Whilst

the site is indicated to be defended during extreme flooding events, this should give consideration to the potential effects of climate change and also to the lower SoP provided for the Mayes Brook.

Compensation is not required for areas at tidal flood risk or that are indicated to benefit from flood defences up to the 1 in 100 (1%) annual probability fluvial flood level and allowing for the potential effects of climate change.

Any basement structures within the defended or undefended high risk Flood Zone 3a or medium risk Flood Zone 2 should provide safe internal access to a level 0.3m above the 1 in 100 (1%) annual probability fluvial flood level or 1 in 200 (0.5%) annual probability tidal flood level with an allowance for climate change. Basement structures within the defended Flood Zone 3a and in areas that are indicated to be at risk following breach of the flood defences should also be protected with a continuous secondary fixed flood defence. In practical terms, this may be a raised wall incorporated into the landscaping that will withstand the ponding of water (i.e. following a breach failure), and will prevent water surging into the basement area with little or no warning. Flood resilient design techniques should be adopted for all basement uses.

Basements in the defended Flood Zone 3a where the rate of inundation is less than 5 hours are not considered appropriate. Similarly, no basement that is to be used as a habitable dwelling is considered acceptable in Flood Zone 3a and it is advisable that basements used as a habitable dwelling are also not proposed in the medium risk Flood Zone 2.

Development in Flood Zone 1

A site-specific flood risk assessment is required for developments in Flood Zone 1 where the development is 1 hectare or greater or at significant risk of flooding from other sources (i.e. surface water, sewerage systems or reservoirs).

The need and scope of a site-specific flood risk assessment in Flood Zone 1 should be discussed and agreed with the Council. However, it is recommended that, at minimum, a site-specific flood risk assessment is provided for development at risk of surface water flooding up to the 1 in 30 (3.33%) annual probability event, or at risk of flooding to a depth greater than 300mm during the 1 in 100 (1%) annual probability event.

Within a development site, a sequential approach should be adopted that takes into account the potential effects of climate change on fluvial and tidal flood risk, and that takes into account flooding from other sources.

To ensure the flood resistance of a building, it is recommended that ground floor levels are situated 300mm above adjacent ground level, or above the estimated 1 in 100 (1%) annual probability flood depth.

Basement structures are considered acceptable in Flood Zone 1, although where possible they should be designed to prevent the overland flow of water entering the basement structure up to and including the 1 in 30 (3.33%) annual probability event.

Consideration should also be given to the impact of flooding from other sources to the ability to provide safe access and egress, similar to those recommendations made for sites at risk from fluvial and tidal flooding.







Sustainable Drainage Systems

SUDS techniques as discussed in Section 7.7 of the Level 1 SFRA should be promoted wherever possible. The site should seek opportunities to integrate SUDS within the design of the site and provide an exemplar of best practice techniques including good use of green space to accommodate a variety of SUDS features in order to control and treat runoff from the site, particularly where a site-wide masterplan is to be produced and/or a single developer takes on a significant proportion of the site.

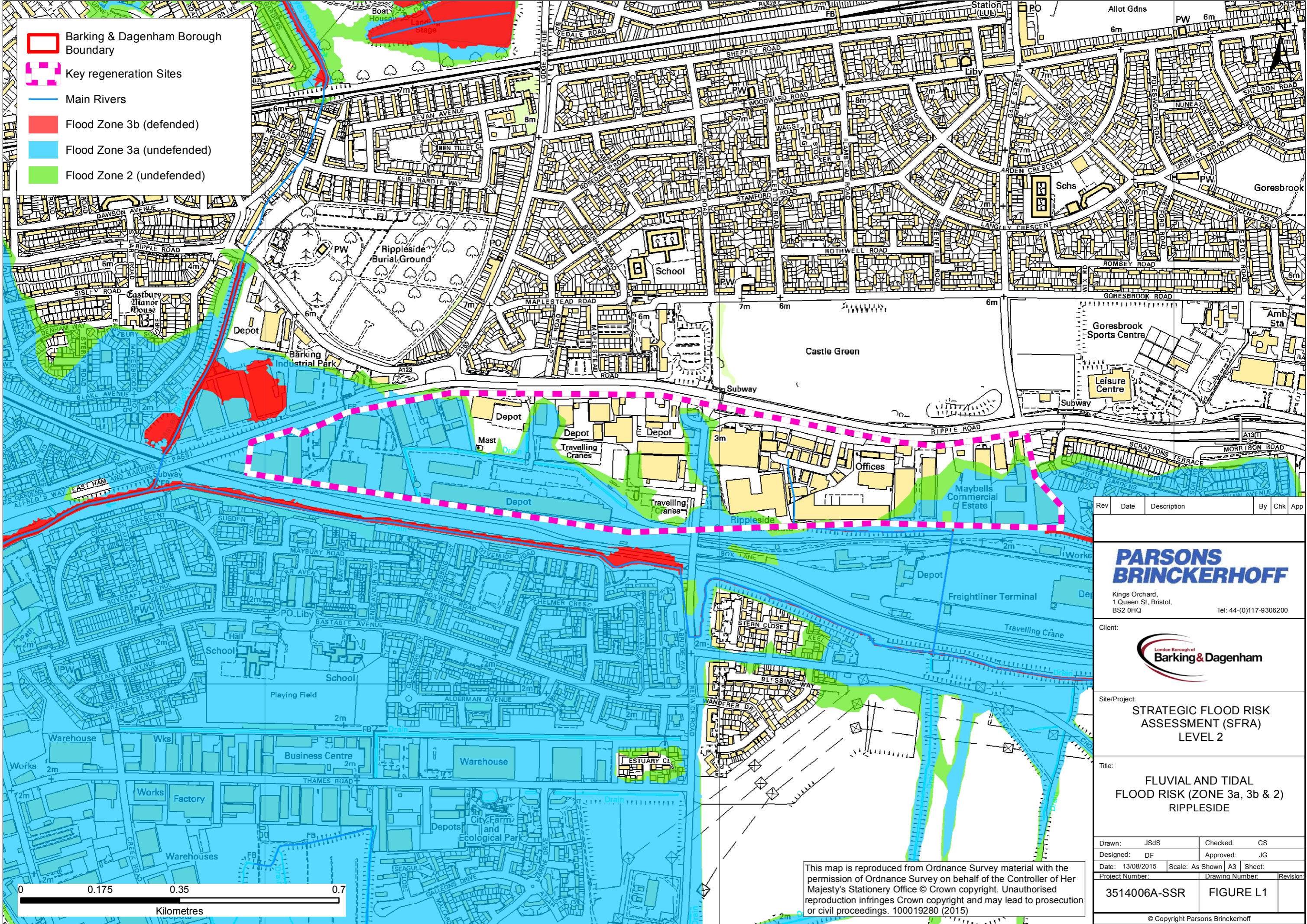
The development of the Rippleside Commercial Area strategic development site is likely to be completed in phases as plots of land are made available for development. The type of drainage system(s) adopted at the site could be constrained by the size of the development sites brought forward

at different times. However given the existing surface water flood risk to the site it is recommended that a strategic surface water drainage assessment for the site as a whole is completed to enable an overall drainage strategy to be formulated and then followed on a plot by plot basis.

As this is a previously developed site it should strive to achieve betterment over existing discharge rates. Minimum betterment of 20% is considered appropriate whilst also taking the potential effects of climate change into consideration, with developers striving to achieve pre-developed greenfield rates as far as practicable.

-  Barking & Dagenham Borough Boundary
-  Key regeneration Sites
-  Main Rivers
-  Flood Zone 3b (defended)
-  Flood Zone 3a (undefended)
-  Flood Zone 2 (undefended)

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

Site/Project:
STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

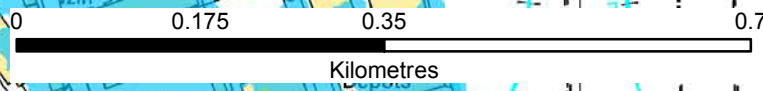
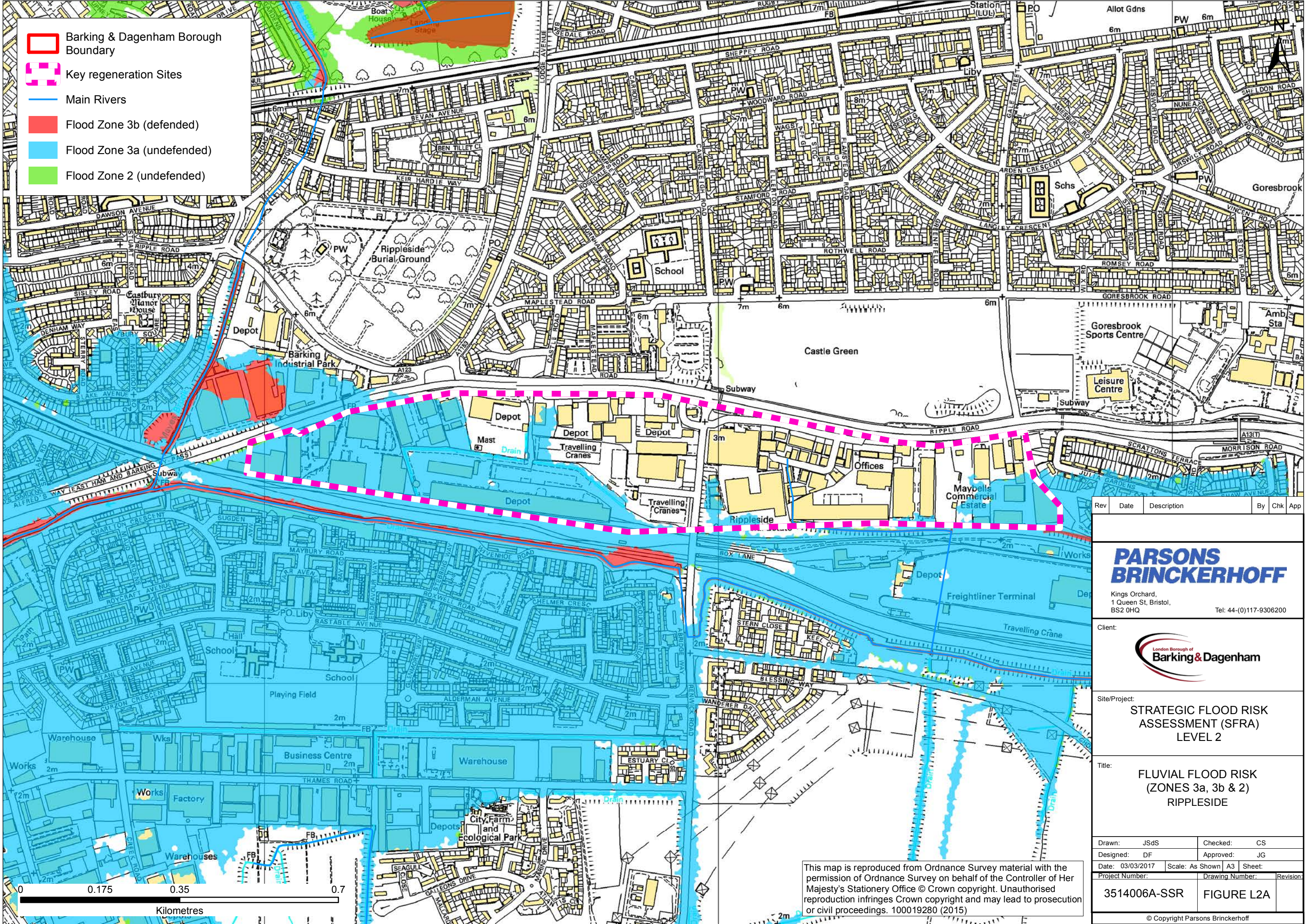
Title:
FLUVIAL AND TIDAL FLOOD RISK (ZONE 3a, 3b & 2) RIPPLSIDE

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Designed: DF	Approved: JG
Date: 13/08/2015	Scale: As Shown A3 Sheet:
Project Number: 3514006A-SSR	Drawing Number: FIGURE L1

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 Plot Date: 03/03/2017

-  Barking & Dagenham Borough Boundary
-  Key regeneration Sites
-  Main Rivers
-  Flood Zone 3b (defended)
-  Flood Zone 3a (undefended)
-  Flood Zone 2 (undefended)



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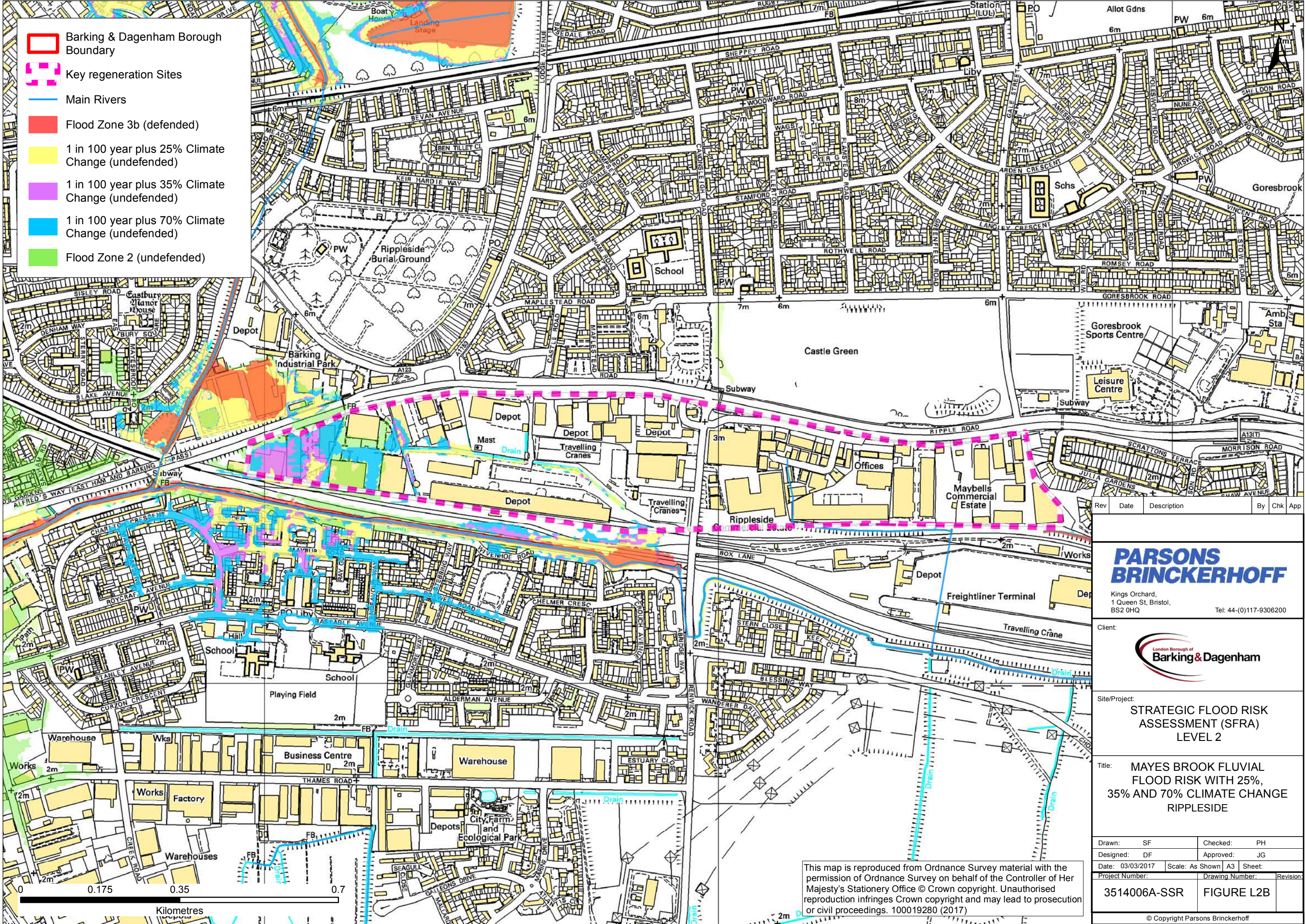
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 Site/Project:
STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
FLUVIAL FLOOD RISK (ZONES 3a, 3b & 2) RIPPLSIDE

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 Login: UKSLF003
 Plot Date: 03/03/2017

-  Barking & Dagenham Borough Boundary
-  Key regeneration Sites
-  Main Rivers
-  Flood Zone 3b (defended)
-  1 in 100 year plus 25% Climate Change (undefended)
-  1 in 100 year plus 35% Climate Change (undefended)
-  1 in 100 year plus 70% Climate Change (undefended)
-  Flood Zone 2 (undefended)



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Site/Project:
STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
MAYES BROOK FLUVIAL FLOOD RISK WITH 25%, 35% AND 70% CLIMATE CHANGE RIPPLSIDE







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Project Number:	Drawing Number: Revision:

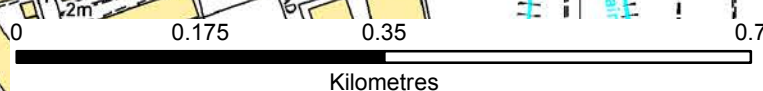
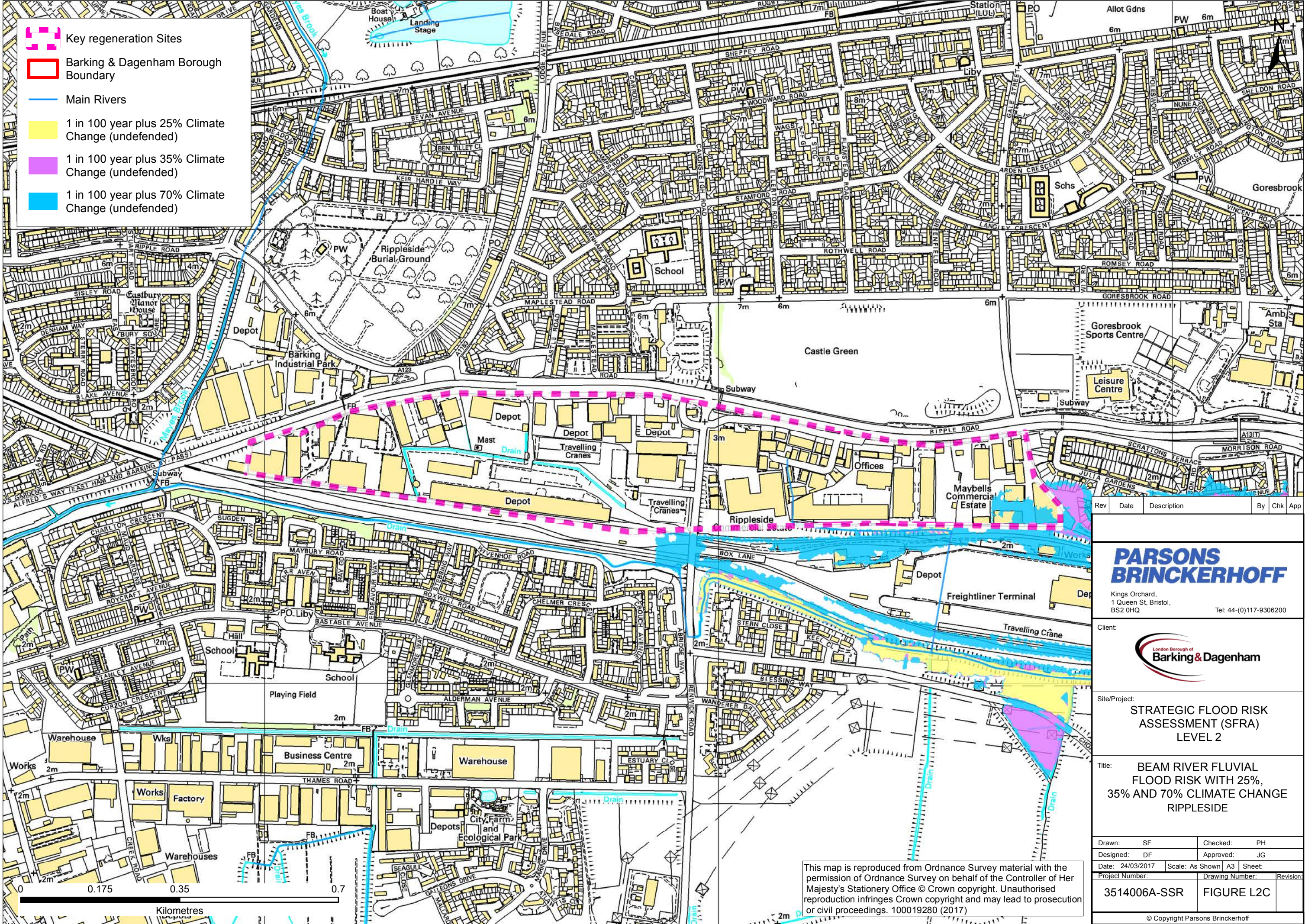
3514006A-SSR **FIGURE L2B**

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 Plot Date: 24/03/2017

-  Key regeneration Sites
-  Barking & Dagenham Borough Boundary
-  Main Rivers
-  1 in 100 year plus 25% Climate Change (undefended)
-  1 in 100 year plus 35% Climate Change (undefended)
-  1 in 100 year plus 70% Climate Change (undefended)



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STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
BEAM RIVER FLUVIAL FLOOD RISK WITH 25%, 35% AND 70% CLIMATE CHANGE RIPPLESIDE

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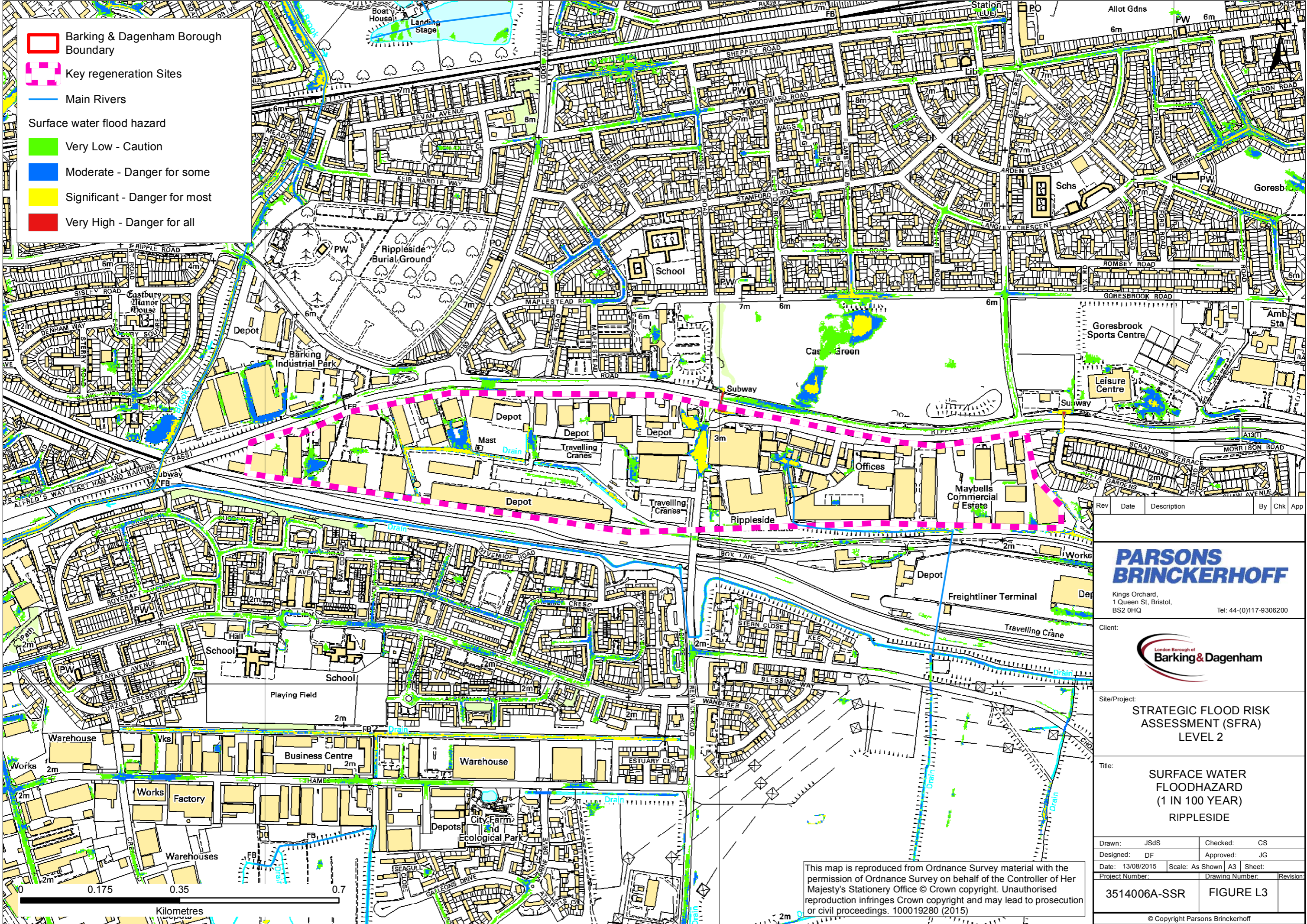
Barking & Dagenham Borough Boundary

Key regeneration Sites

Main Rivers

Surface water flood hazard

- Very Low - Caution
- Moderate - Danger for some
- Significant - Danger for most
- Very High - Danger for all



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STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
SURFACE WATER FLOODHAZARD (1 IN 100 YEAR) RIPPLESIDE





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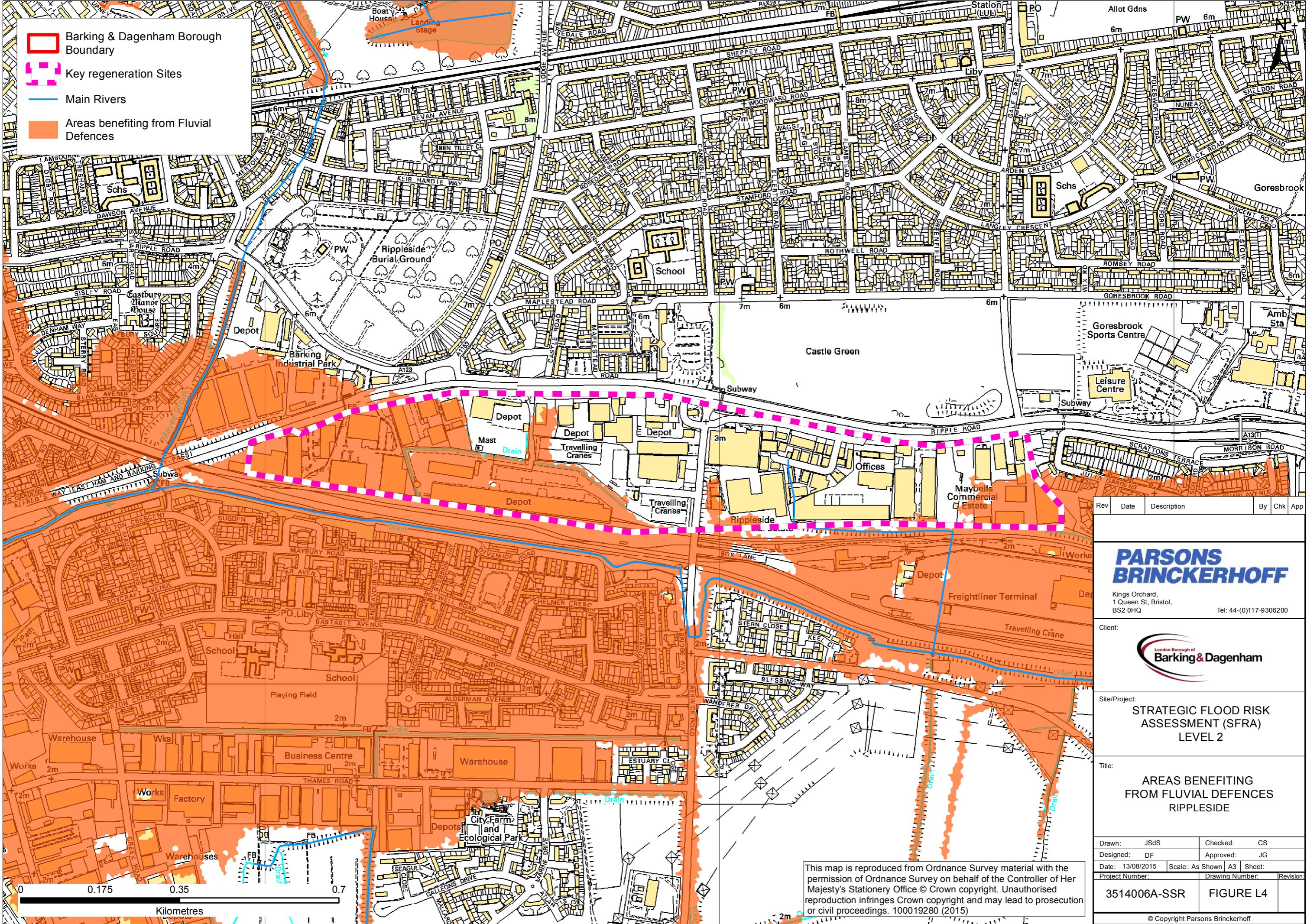
3514006A-SSR **FIGURE L3**

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-  Barking & Dagenham Borough Boundary
-  Key regeneration Sites
-  Main Rivers
-  Areas benefiting from Fluvial Defences



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STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
AREAS BENEFITING FROM FLUVIAL DEFENCES RIPPLESIDE





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3514006A-SSR **FIGURE L4**

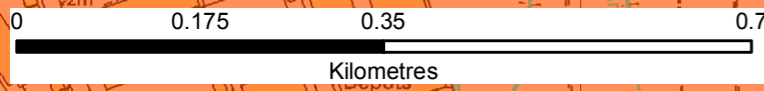
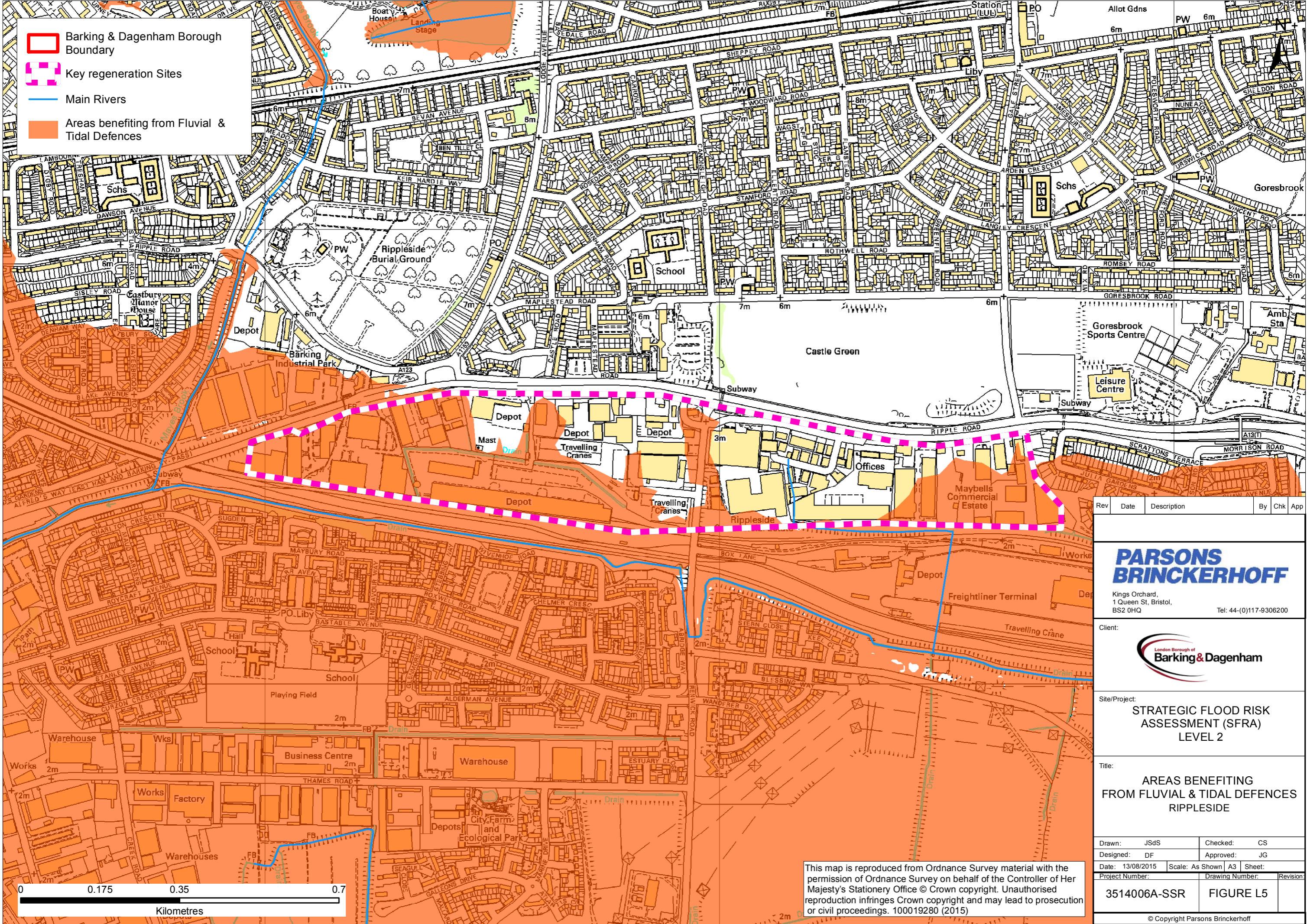
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-  Barking & Dagenham Borough Boundary
-  Key regeneration Sites
-  Main Rivers
-  Areas benefiting from Fluvial & Tidal Defences

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





Client:
STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

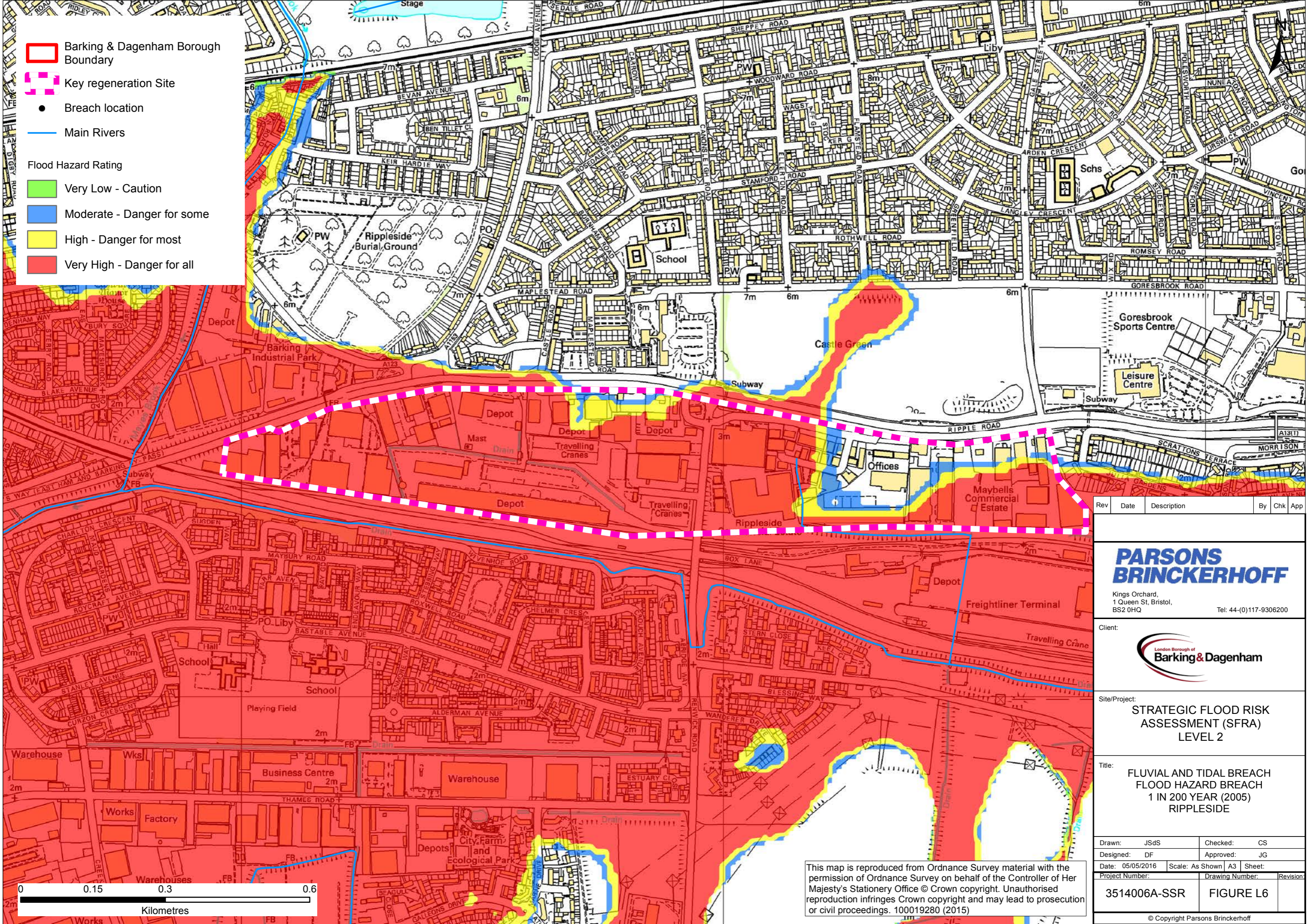
Title:
AREAS BENEFITING FROM FLUVIAL & TIDAL DEFENCES RIPPLSIDE

Drawn: JSdS	Checked: CS
Designed: DF	Approved: JG
Date: 13/08/2015	Scale: As Shown A3 Sheet:
Project Number:	Drawing Number: Revision:

3514006A-SSR **FIGURE L5**

File Name: N:\Water Engineering\3514006A - LBBD SFRA - Working Folder\GIS\Map\April 2016\3514006A-SSR-Phase_II_Flood_Hazard_2005.mxd
 Log in: DeSouzaJ
 Plot Date: 07/06/2016

-  Barking & Dagenham Borough Boundary
 -  Key regeneration Site
 -  Breach location
 -  Main Rivers
- Flood Hazard Rating
-  Very Low - Caution
 -  Moderate - Danger for some
 -  High - Danger for most
 -  Very High - Danger for all



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Rev	Date	Description	By	Chk	App

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




Client:
 London Borough of Barking & Dagenham

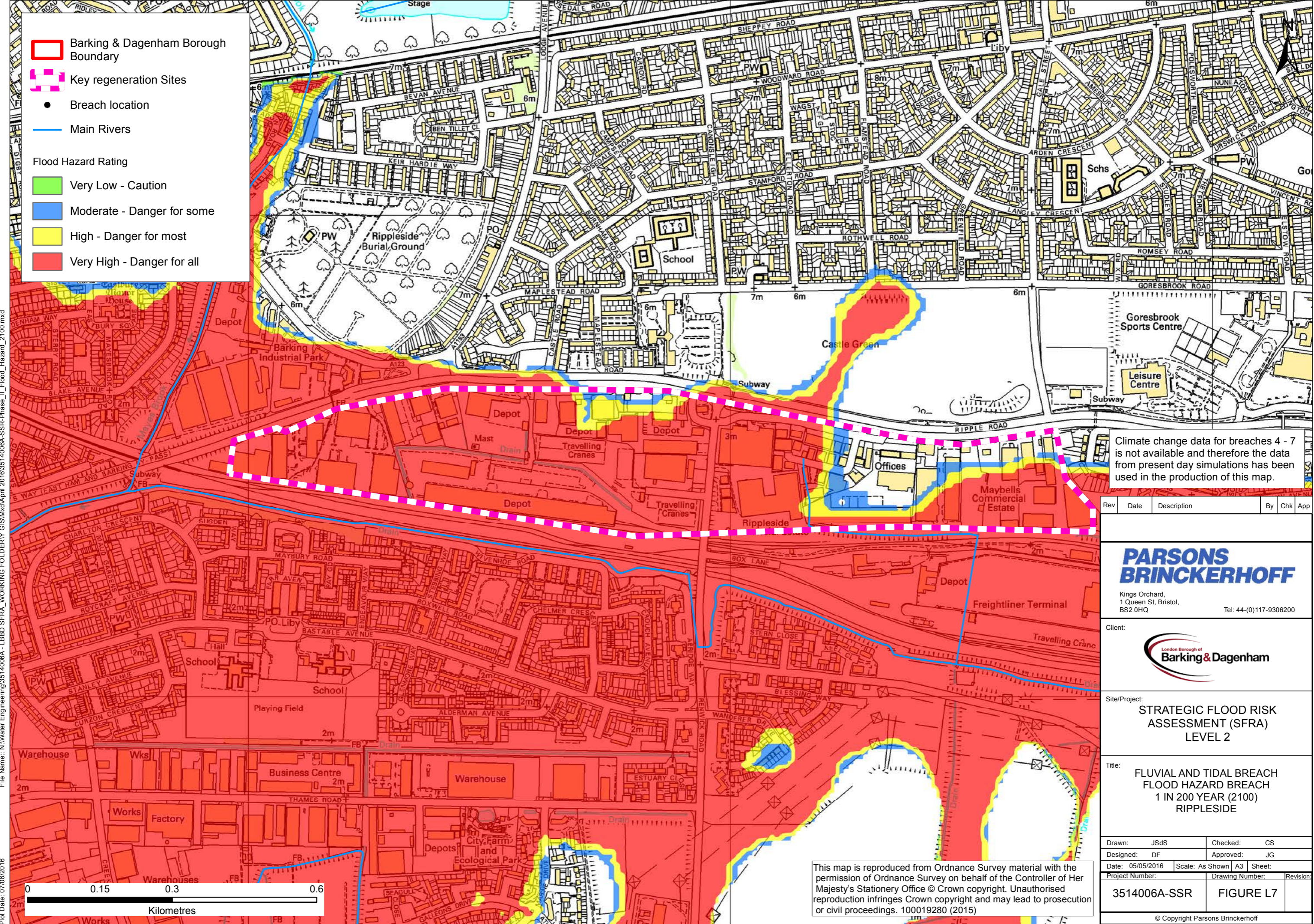
Site/Project:
 STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
 FLUVIAL AND TIDAL BREACH FLOOD HAZARD BREACH 1 IN 200 YEAR (2005) RIPPLESIDE

Drawn: JSdS	Checked: CS
Designed: DF	Approved: JG
Date: 05/05/2016	Scale: As Shown A3 Sheet:
Project Number:	Drawing Number: Revision:

3514006A-SSR FIGURE L6

-  Barking & Dagenham Borough Boundary
 -  Key regeneration Sites
 -  Breach location
 -  Main Rivers
- Flood Hazard Rating
-  Very Low - Caution
 -  Moderate - Danger for some
 -  High - Danger for most
 -  Very High - Danger for all



Climate change data for breaches 4 - 7 is not available and therefore the data from present day simulations has been used in the production of this map.

Rev	Date	Description	By	Chk	App

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Client:
STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
FLUVIAL AND TIDAL BREACH FLOOD HAZARD BREACH 1 IN 200 YEAR (2100) RIPPLESIDE









Drawn: JSdS	Checked: CS
Designed: DF	Approved: JG
Date: 05/05/2016	Scale: As Shown A3 Sheet:
Project Number:	Drawing Number: Revision:

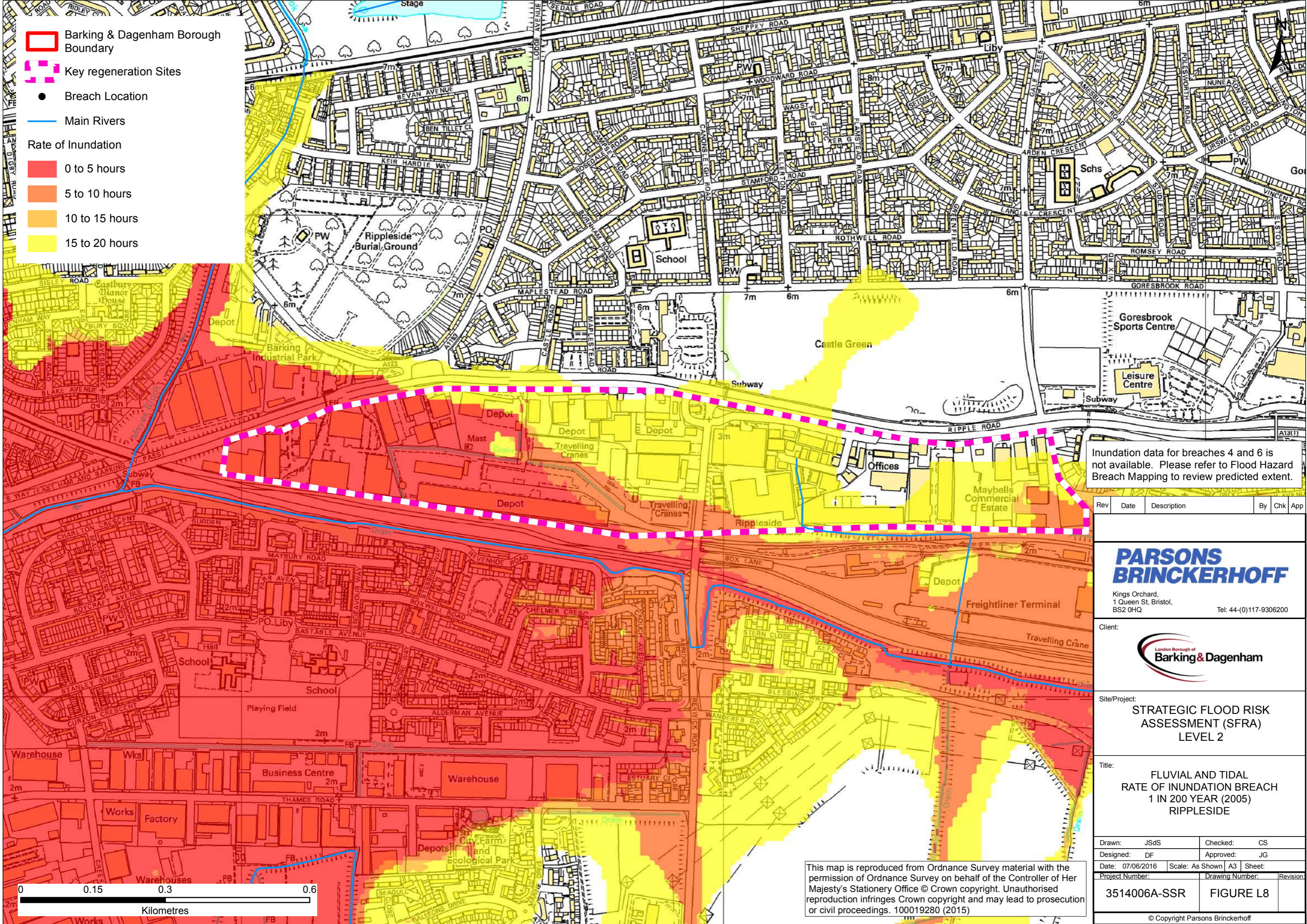
3514006A-SSR **FIGURE L7**

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File Name: N:\Water_Engineering\3514006A - LBBD SFRA - LBBB SFRA - WORKING FOLDER\GIS\Map\April 2016\3514006A-SSR-Phase_II_Flood_Hazard_2100.mxd
Plot Date: 07/06/2016
Login: DeSouzaJ

File Name: N:\Water Engineering\3514006A - LBBD SFRA - WORKING FOLDER\GIS\Map\April 2016\3514006A-SSR-Phase-11_Rate_of_Inundation_2005.mxd
 Plot Date: 07/06/2016
 Login: DeSouzaJ

-  Barking & Dagenham Borough Boundary
 -  Key regeneration Sites
 -  Breach Location
 -  Main Rivers
- Rate of Inundation
-  0 to 5 hours
 -  5 to 10 hours
 -  10 to 15 hours
 -  15 to 20 hours



Inundation data for breaches 4 and 6 is not available. Please refer to Flood Hazard Breach Mapping to review predicted extent.

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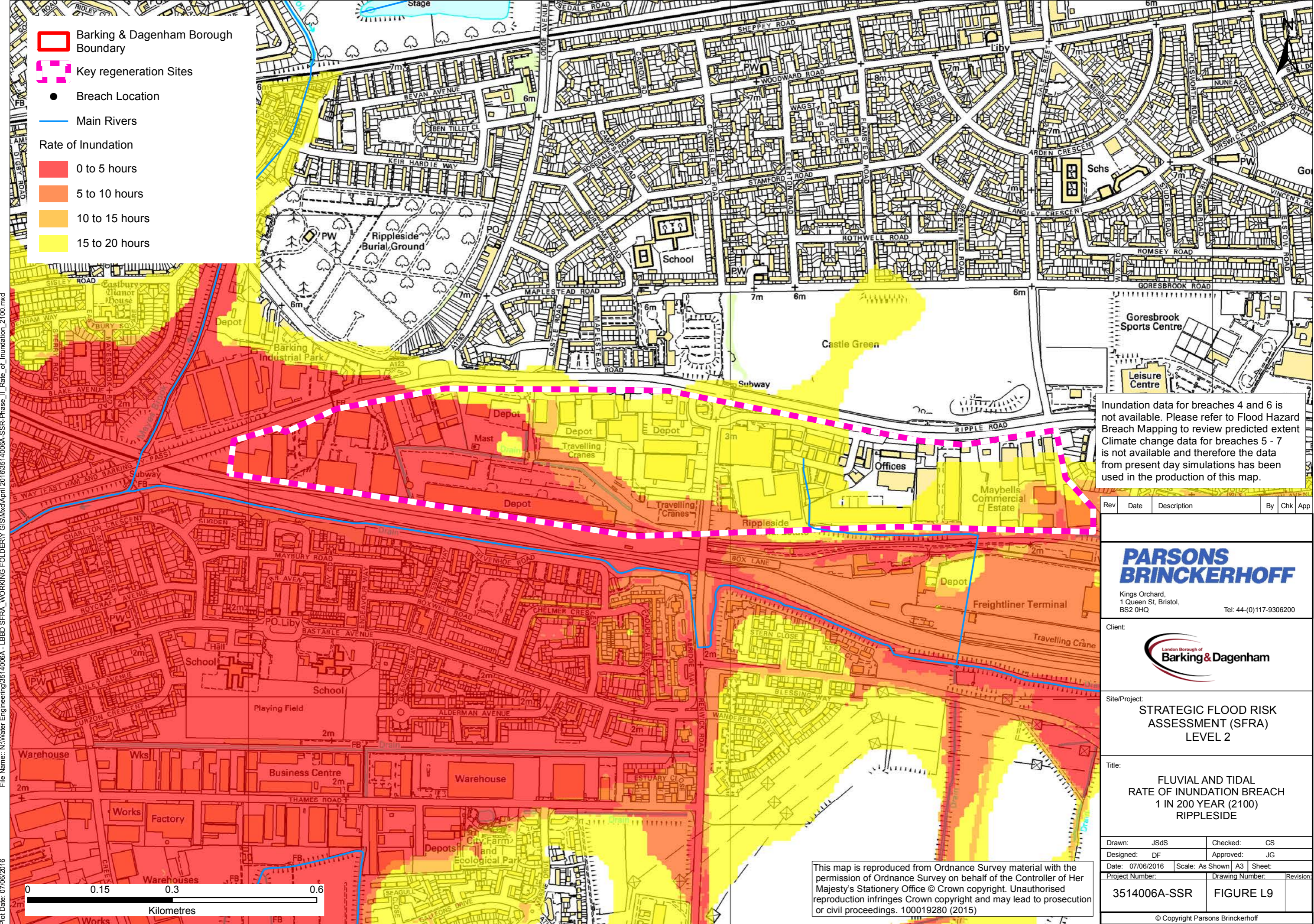
Site/Project:
 STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
 FLUVIAL AND TIDAL RATE OF INUNDATION BREACH 1 IN 200 YEAR (2005) RIPPLESIDE

Drawn: JSdS	Checked: CS
Designed: DF	Approved: JG
Date: 07/06/2016	Scale: As Shown A3 Sheet:
Project Number: 3514006A-SSR	Drawing Number: FIGURE L8

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-  Barking & Dagenham Borough Boundary
 -  Key regeneration Sites
 -  Breach Location
 -  Main Rivers
- Rate of Inundation
-  0 to 5 hours
 -  5 to 10 hours
 -  10 to 15 hours
 -  15 to 20 hours



Inundation data for breaches 4 and 6 is not available. Please refer to Flood Hazard Breach Mapping to review predicted extent Climate change data for breaches 5 - 7 is not available and therefore the data from present day simulations has been used in the production of this map.

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STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Site/Project:
FLUVIAL AND TIDAL RATE OF INUNDATION BREACH 1 IN 200 YEAR (2100) RIPPLESIDE

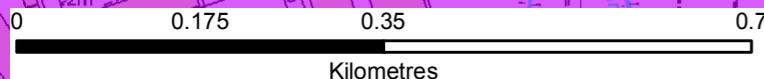
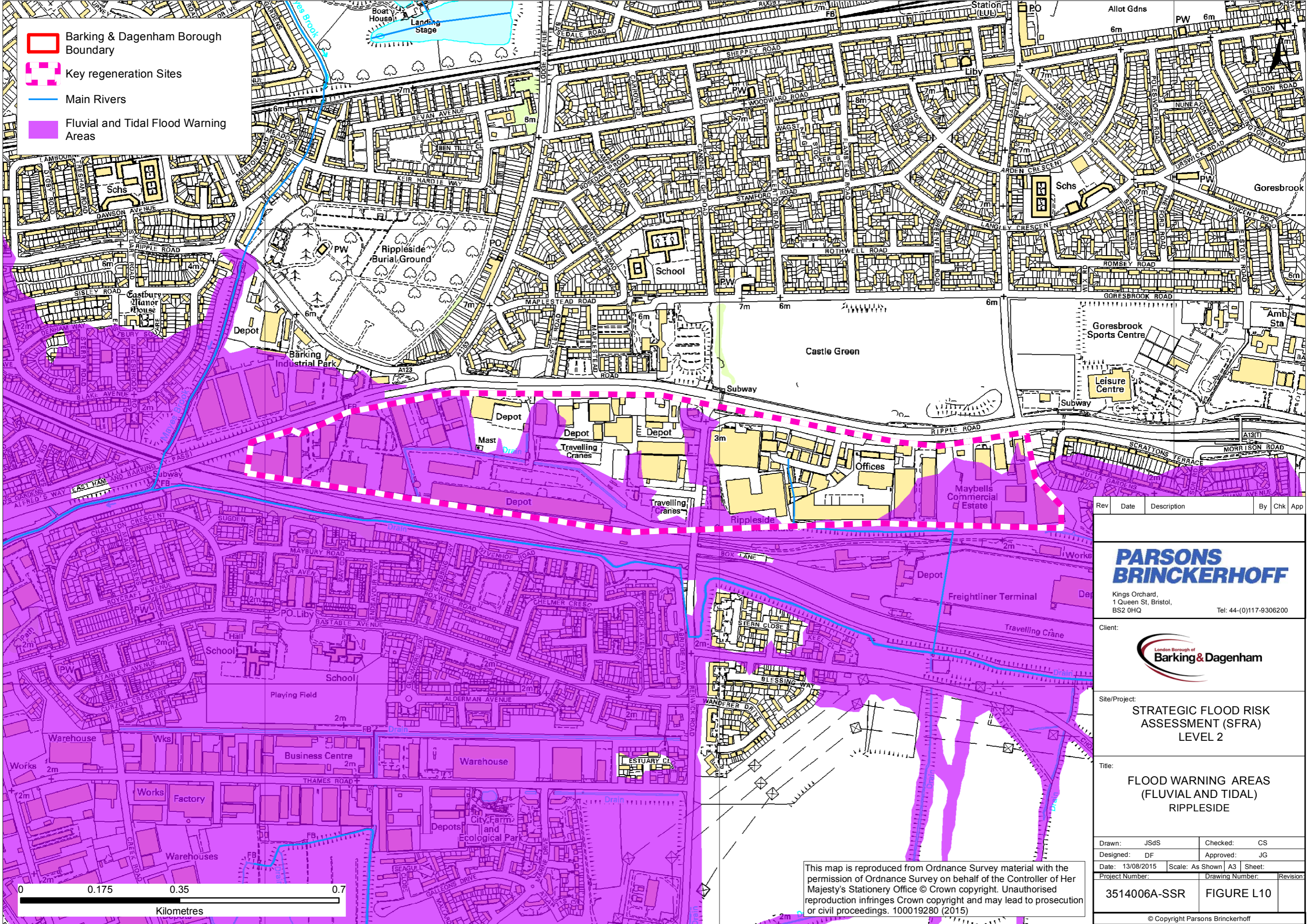
Drawn: JSdS	Checked: CS
Designed: DF	Approved: JG
Date: 07/06/2016	Scale: As Shown A3 Sheet:
Project Number: 3514006A-SSR	Drawing Number: FIGURE L9

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File Name: N:\Water Engineering\3514006A - LBBD SFRA - WORKING FOLDER\GIS\Map\April 2016\3514006A-SSR-Phase_II_Rate_of_Inundation_2100.mxd
Login: DeSouzaJ
Plot Date: 07/06/2016

-  Barking & Dagenham Borough Boundary
-  Key regeneration Sites
-  Main Rivers
-  Fluvial and Tidal Flood Warning Areas

File Name: N:\Water Engineering\3514006A - LBBD SFRA - WORKING FOLDER\GIS\Map\Phase 1\3514006A-SSR-Flood Warning Areas (F&T).mxd
 Login: desourzaj
 Plot Date: 13/08/2015



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Client:
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Site/Project:
STRATEGIC FLOOD RISK ASSESSMENT (SFRA) LEVEL 2

Title:
FLOOD WARNING AREAS (FLUVIAL AND TIDAL) RIPPLESIDE

Drawn: JSdS	Checked: CS
Designed: DF	Approved: JG
Date: 13/08/2015	Scale: As Shown A3 Sheet:
Project Number:	Drawing Number: Revision:

3514006A-SSR **FIGURE L10**