preparing for emergencies

London Prepared

Multi-Agency Flood Plan

For

London Borough of Havering

August 2017

METROPOLITAN POLICE
Working together for a safer London

Havering
LONDON BOROUGH

Met Office

Environment Agency

PORT OF LONDON AUTHORITY

LFB
LONDON FIRE BRIGADE

Document Control

This Multi Agency Flood Plan is prepared, maintained and updated by the **Havering Emergency Planning and Business Continuity Service**

The intended audience of this plan is to all Category 1 and Category 2 Responders under the Civil Contingencies Act 2004 and key voluntary response organisations.

This plan will be updated on an annual basis. However new risk assessment, lessons identified from incidents or exercises, restructuring of organisations or changes in key personnel should also prompt updates to the plan. Therefore all responders must advise the team of any changes in circumstances that may materially affect the plan in any way.

Any updates and modifications of this plan will be approved by all members of the Borough Resilience Forum:

- London Fire Brigade
- Metropolitan Police Service
- London Ambulance Service
- Environment Agency
- NHS E (L)
- London Borough of Havering
- Barking, Havering & Redbridge University Trust
- North East London Foundation Trust
- Public Health England
- Port of London Authority
- Military
- British Transport Police
- Salvation Army
- British Red Cross
- Essex and Suffolk Water

Notification will be given by the Havering Emergency Planning and Business Continuity Service

This document has been compiled in consultation with all members of the Borough Resilience Forum and the following:

Thames Water.

Distribution:

Distributed from	Distributed to		Date of distribution	Method of receipt
	Name	Department		
EP and BC	HESLP	Members	Nov 2008 (CD)	Personal response
EP and BC	HBRF	Members	April 2012 (e-mail/CD)	By e-mail response
EP and BC	HBRF	Members	Jan 2016 (e-mail/CD)	By e-mail response
EP and BC	HBRF	Members	Aug 2017 (e-mail/CD)	By e-mail response

Amendment details:

All changes will be tracked and marked by the **Havering Emergency Planning and Business Continuity Service**
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Amendment no	Inserted by		Date of amendment	Date of insertion
	Name	Signature		
1: Full plan revision	Trevor Meers		March 2012	March 2012
2: Plan update/Reservoir data	Trevor Meers		Feb 2014	Feb 2014
3. Plan update/new flood maps added	Trevor Meers		Jan 2016	Jan 2016
4. Plan update/new flood maps and data	Trevor Meers		Aug 2017	Aug 2017

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Flood Warning Maps

1. Introduction

The London Borough of Havering is potentially vulnerable to flooding from three sources:

- A proportion of the London Borough of Havering is situated in close proximity to the River Thames, River Rom, River Beam and River Ingrebourne which are all key features of the Borough, and all pose (to some degree) a potential risk of flooding to local homes and businesses.
- The London Borough of Havering is also potentially vulnerable to tidal flooding along the Thames downstream of the Thames Barrier.
- Lastly the London Borough of Havering is vulnerable to surface water flooding. More information can be found in Section 4.

Due to the potential risks a Multi-Agency Flood Plan is needed. This plan will cover the requirements for a multi-agency borough based flood plan in the London Borough of Havering.

This plan covers the requirement for a multi-agency response to a flood incident in the London Borough of Havering. This plan does not have regard for actions to be taken during any other type of emergency. This plan will not include emergency contact numbers and activation arrangements which responding organisations already maintain.

This Multi Agency Flood Plan includes a community-level assessment of flood risk which includes risk from rivers, tides, reservoirs and defences. The plan does not include flood risks from foul sewage, burst water mains, and private lakes.

This plan covers a borough based response; however floods will not have regard for political and administrative boundaries. As such **this plan must be shared and liaison arrangements made** with other neighbouring boroughs.

2. Aim and Objectives

The aim of this MAFP is to provide a coordinated multi-agency response framework to mitigate the impact of a large-scale flood event in the London Borough of Havering. It provides guidance on a strategic multi-agency response to deliver the following objectives:

- Prepare key parts of the community susceptible to flooding through the provision of advice and information.
- To prioritise the identification and required responses to protect the vulnerable within the community
- To support the Environment Agency in the provision of warnings to communities at flood risk, where technically feasible.
- Manage precautionary actions to preserve life for the highest impact flood risks.
- Provide accurate and timely information to public and local business on flood response.
- Manage the wider impact of borough flooding events to reduce disruption to the utilities, communities and environment.
- Lead recovery activity to support the recovery of communities and business.
- Maintain critical services within each organisation as part of business continuity arrangements.

3. Ownership and Audience

This plan is owned by the Havering Borough Resilience Forum and it is the responsibility of the Emergency Planning and Business Continuity Manager for the London Borough of Havering as the Chair of that group. The Chair also has the responsibility for updating and maintaining the plan.

A number of agencies contributed to and jointly own this multi-agency plan. The Havering Borough Resilience Forum (HBRF) is accountable for the plan with the HBRF as the joint custodian body. The plan is next due for full review and update in 2019/20 as part of the HBRF Business Plan. New risk assessment, lessons identified from incidents or exercises, restructuring of organisations or changes in key personnel should also prompt updates to the plan as and when required.

4. The Risk of Flooding

4.1 Overview

There is a long and established history of the Thames flooding with records dating as far back as 1236. More recently Central London flooded in 1928 when 14 people drowned, and in 1953 the Thames Estuary flooded killing 300 people. Havering is potentially vulnerable to flooding from the following three sources: tidal, fluvial and pluvial water.

4.2 Flooding Threat

The risk of tidal flooding from the River Thames arises from increasing tide levels from geological causes, global warming and sea level rise. There is also an increased risk at times of spring tides due to the special threat caused by a surge tide. It is important to recognise that the London Borough of Havering is downstream to the tidal defences being the Thames Barrier. This could (on closure) cause some tidal flooding in the south of the Borough adjacent to Rainham and Barking and Dagenham Borough boundary Area. To mitigate this, all the defences downstream of the Thames Barrier all the way out to the estuary are raised to a higher level to give a 1in 1000 year protection (See maps 2,3,4,5 and 6 in Section 4).

The danger of fluvial flooding in Havering is as a result of freshwater flows in a tributary that exceeds the capacity of the channel. This can be due to a lack of defence, overtop of the defences, or through a breach in the defences during high flows caused by prolonged or intense rainfall (See maps 2,3,4, 5 and 6 in section 4).

The major topographical features of the London Borough of Havering are the River Thames, River Rom, River Beam, River Ingrebourne and the River Ravensbourne. A considerable proportion of the urban area of the borough is situated on relatively low to high ground adjacent to these river systems, and as such do not have a district that would potentially be affected by flooding (See map 1 in Section 4).

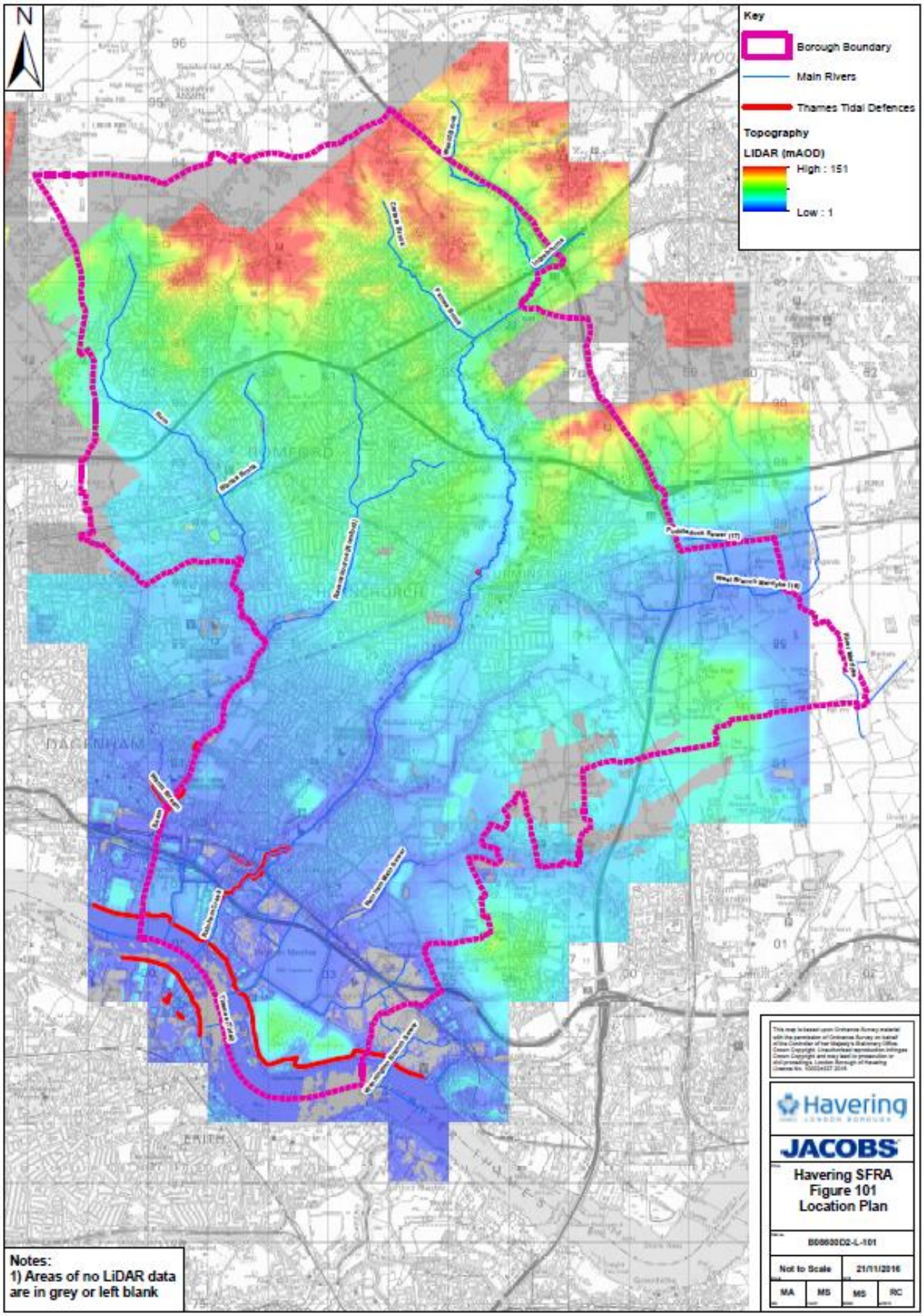
Surface water flooding as a result of rainwater not being able to drain away at the rate at which it is accumulating can occur anywhere in the London Borough of Havering. Clearly flatter and low lying places are vulnerable, but these areas are not limited to river corridors or floodplains. The cause can be either a blocked drain or very high intensity rainfall of the type most usually associated with thunderstorms. Both causes are relatively unpredictable and so may result in flooding with very little warning,(See figure 109 in Section 4, the critical drainage areas (CDA's) liable to surface water flooding in section 14.6, and the Havering Surface Water Management Plan) \\Romford\shareddata\data01\EP & BCU\EMERGENCY PLANNING\PLANS\Flood Plan & Info & Guidance\LBH 2017 Essential flood documents\SWMP Havering Final Report August 2013.pdf

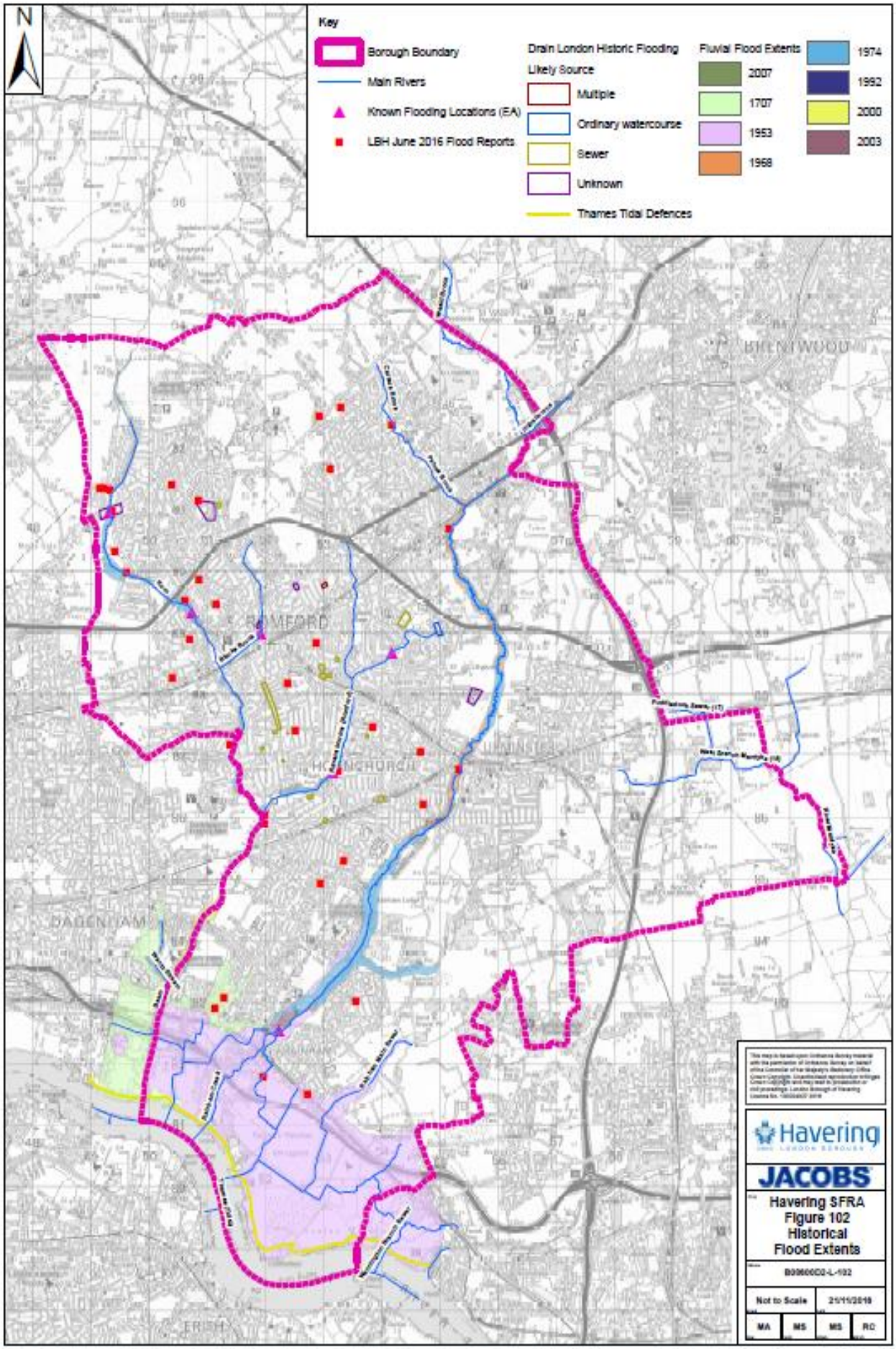
Flooding may also result from high river levels preventing the discharge of drains. Local circumstances may give rise to significant water velocities. Surface water flooding, when unaccompanied by fluvial or tidal flooding, is likely to trigger a major incident only when widespread occurrence causes significant traffic disruption or strains the response capability.

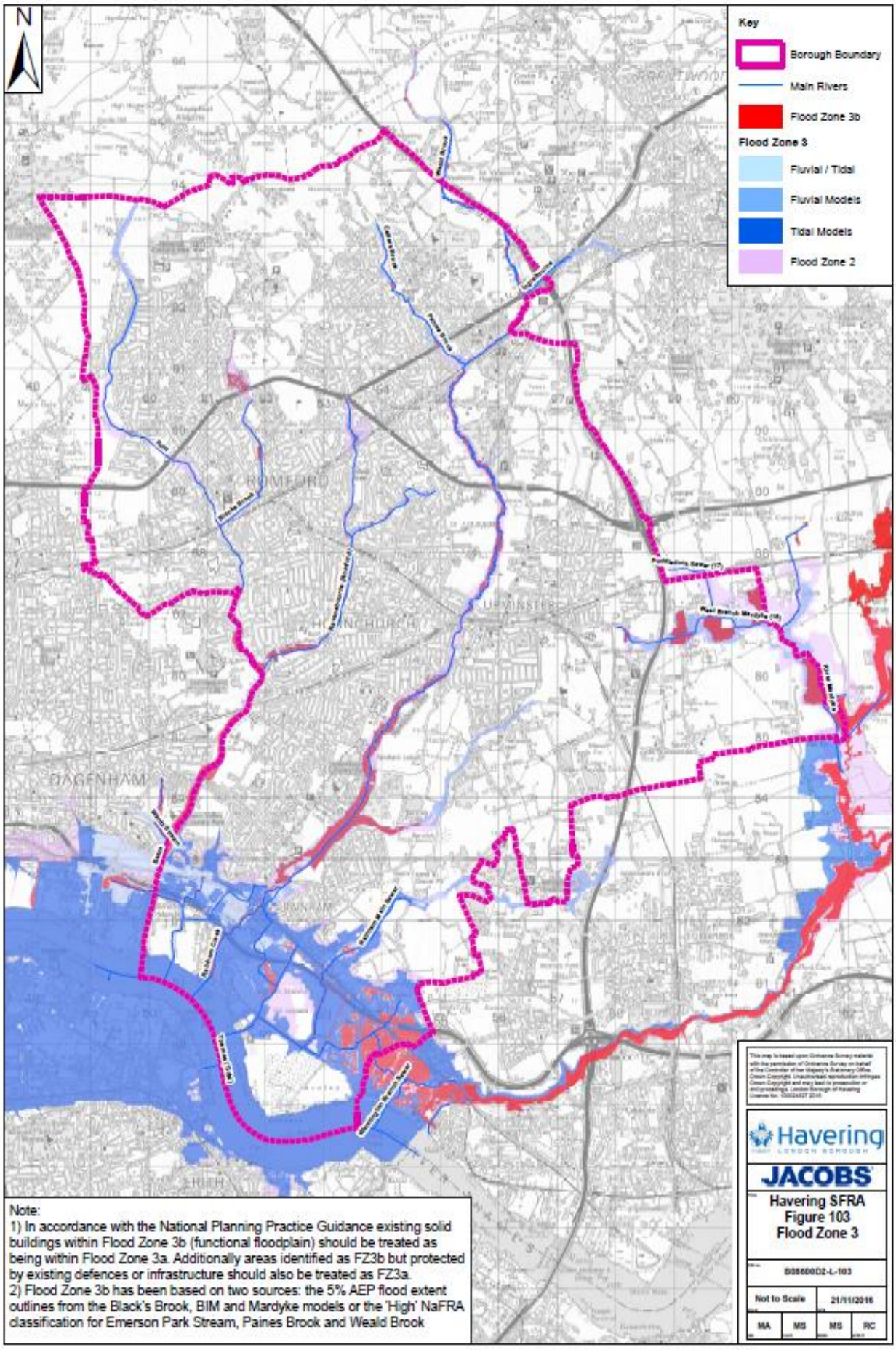
The Havering Borough Risk Register identifies that the risk rating for tidal flooding is high, and fluvial flooding is very high. It also identifies that surface water will occur from these events and heavy rainfall. Havering suffered extensive surface water and fluvial flooding in June 2016, as a result of approximately 1 month's rainfall falling on the borough in under 24 hours. The full Section 19 Investigation can be viewed using the following link: https://www.havering.gov.uk/download/downloads/id/675/havering_2016_flood_investigation_report.pdf

Overview maps showing the risk of flooding across the borough of Havering can be found within this plan, and the Havering Strategic Flood Risk Assessment carried out and reported in November 2016. However, to provide meaningful responses, and for ease of reference, the London Borough of Havering has been broken down into specific areas. These areas have been taken from the Strategic Flood Risk Assessment where areas have been delineated largely on the basis of geographical location, and incorporate only those areas in which there is risk of flooding.

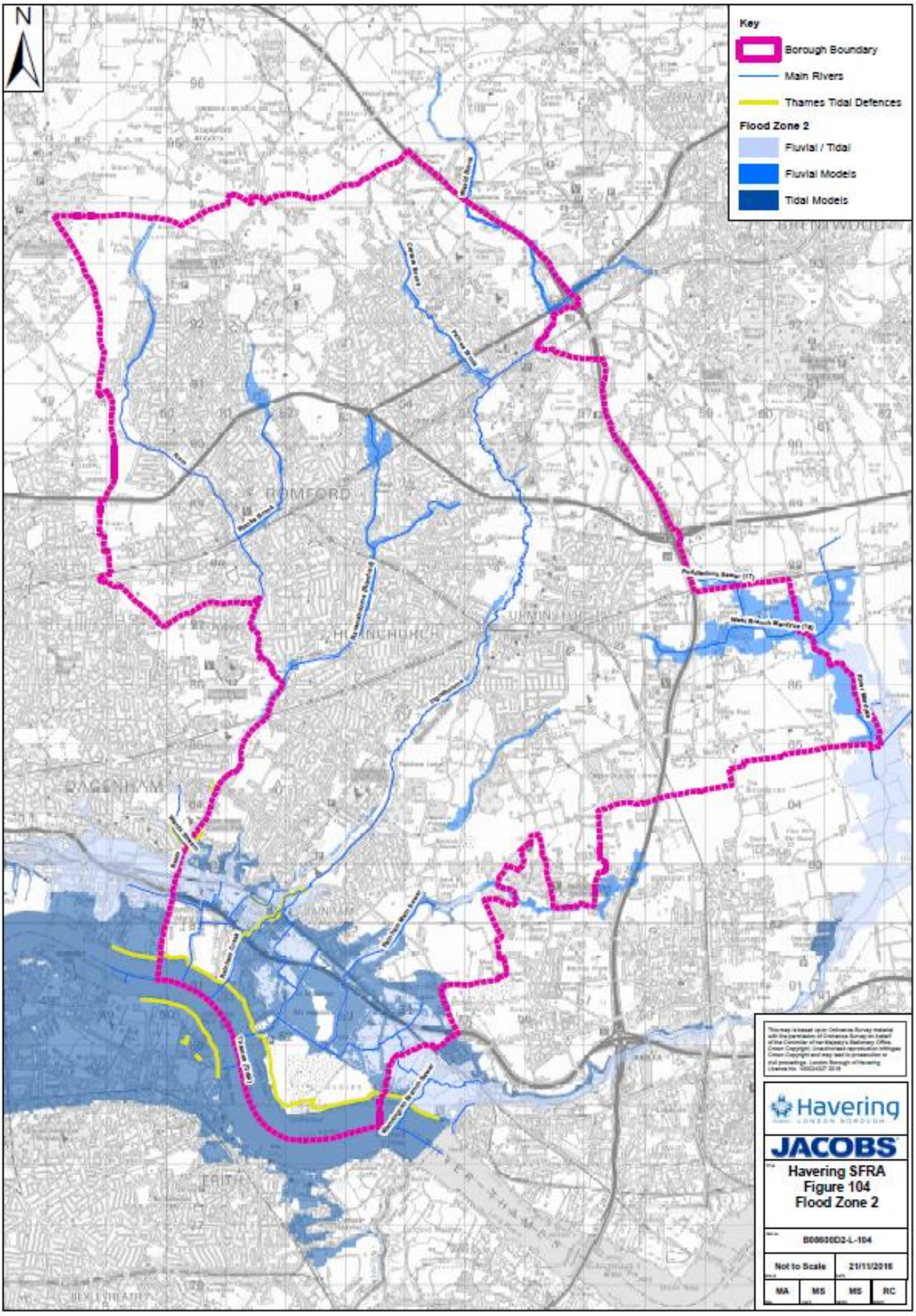
Essex and Suffolk Water have two underground storage reservoirs in Lower Bedfords Road, Harold Hill. These reservoirs are sealed, but as they are in an elevated position any major leak caused by unnatural means could cause some localised flooding downhill of the site.

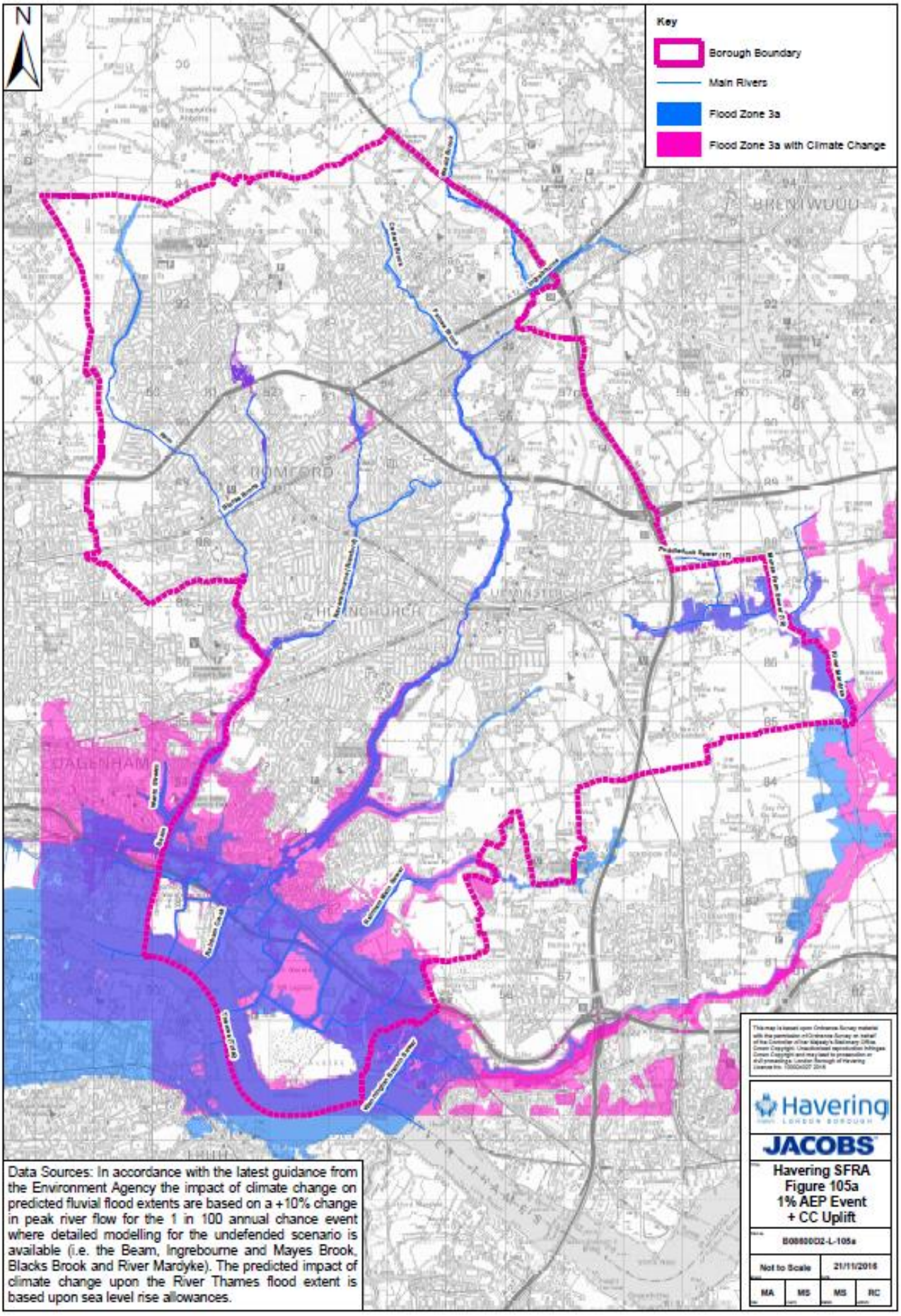

N
Key
Borough Boundary
Main Rivers
Thames Tidal Defences
Topography
LIDAR (mAOD)
High : 151
Low : 1
Notes:
1) Areas of no LiDAR data are in grey or left blank
Havering
JACOBS
Havering SFRA
Figure 101
Location Plan
B08630D2-L-101
Not to Scale
21/11/2016
MA
MS
MS
RC

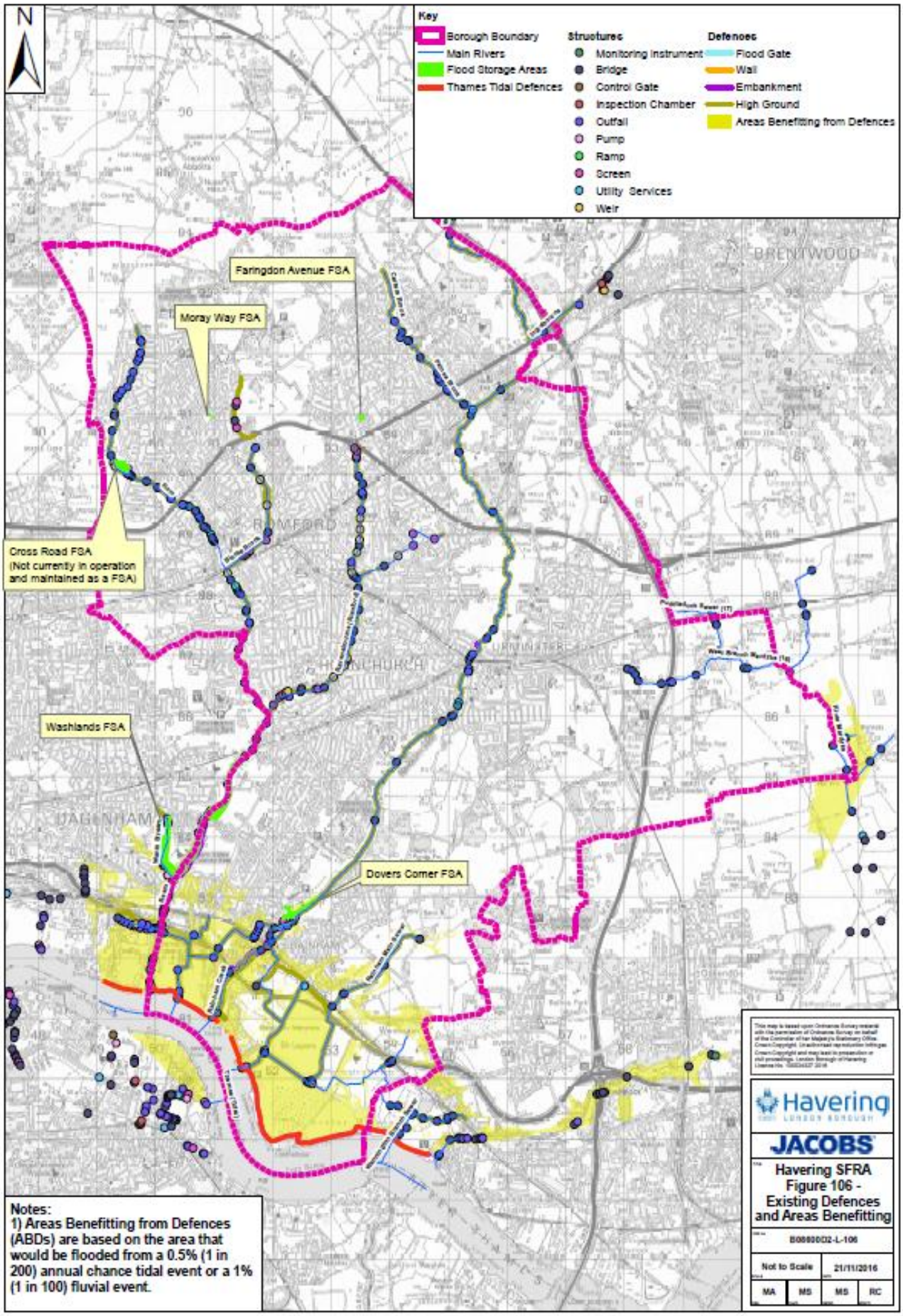

N
Key
Borough Boundary
Main Rivers
Known Flooding Locations (EA)
LBH June 2016 Flood Reports
Drain London Historic Flooding
Likely Source
Multiple
Ordinary watercourse
Sewer
Unknown
Thames Tidal Defences
Fluvial Flood Extents
2007
1707
1953
1968
1974
1992
2000
2003
BRENTWOOD
ROMFORD
HORNCHURCH
DAGENHAM
ERITH
Havering
JACOBS
Havering SFRA
Figure 102
Historical
Flood Extents
B30600C0-L-102
Not to Scale
21/11/2016
MA
MS
MS
RC

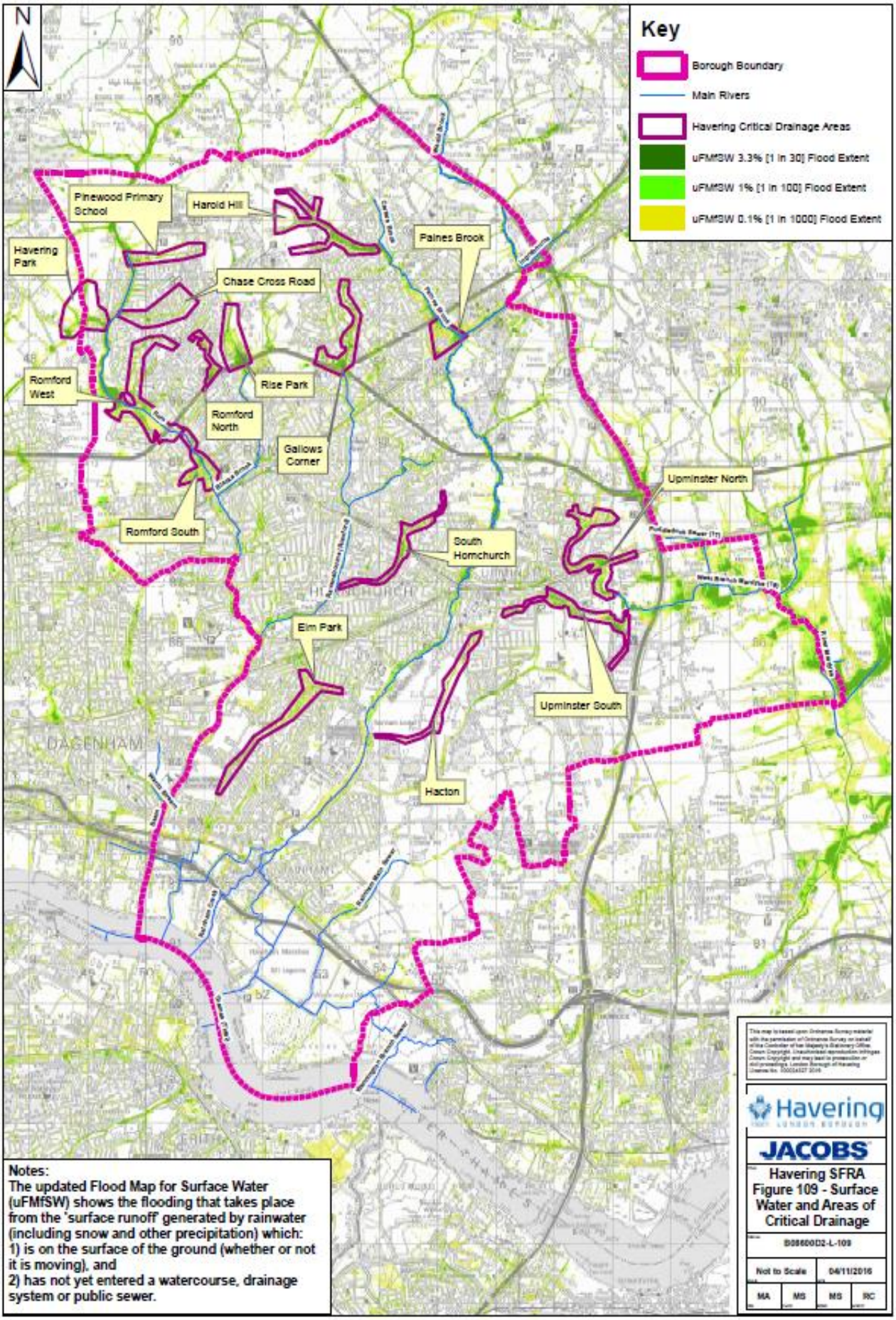


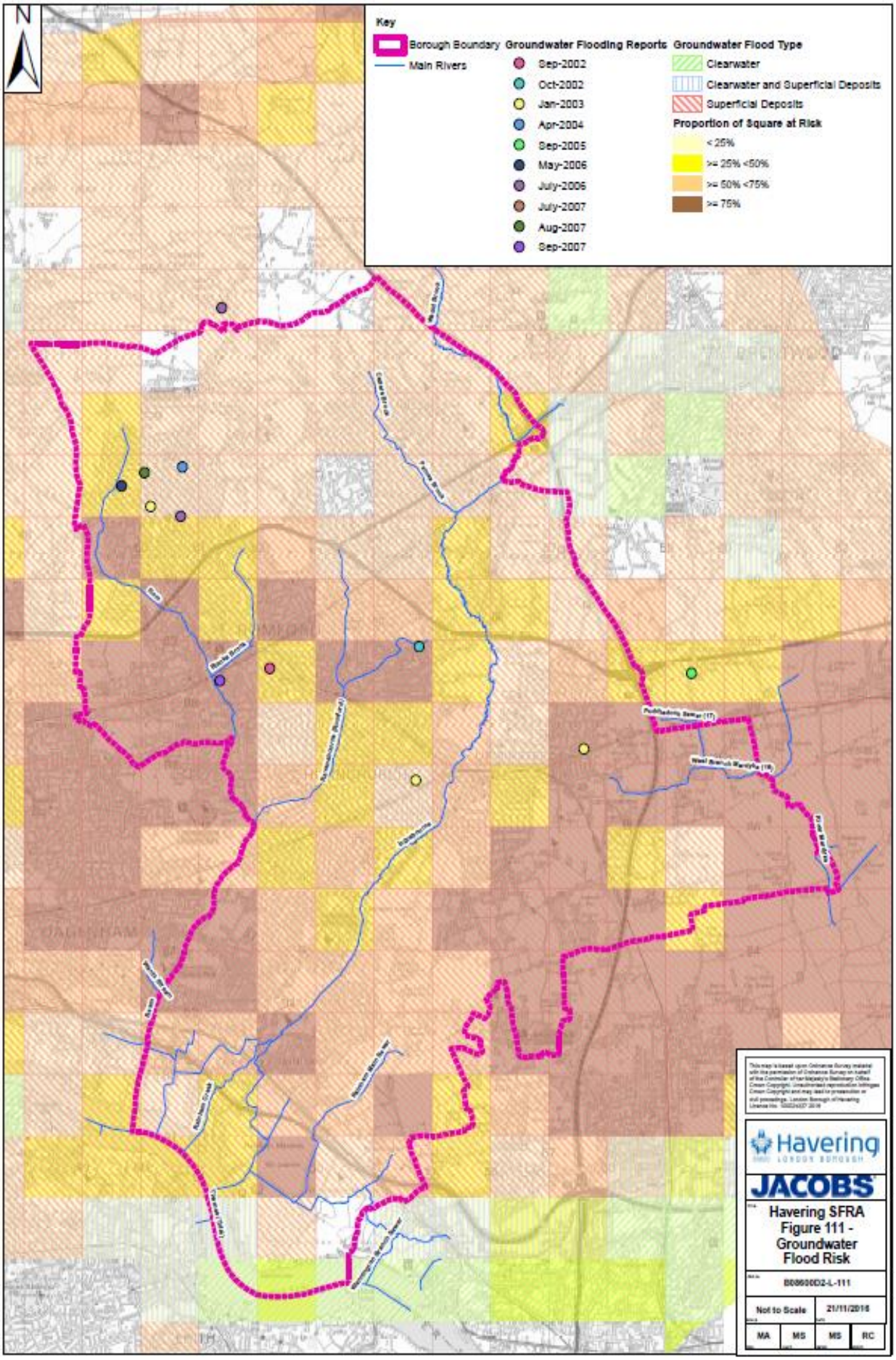
Note:
1) In accordance with the National Planning Practice Guidance existing solid buildings within Flood Zone 3b (functional floodplain) should be treated as being within Flood Zone 3a. Additionally areas identified as FZ3b but protected by existing defences or infrastructure should also be treated as FZ3a.
2) Flood Zone 3b has been based on two sources: the 5% AEP flood extent outlines from the Black's Brook, BIM and Mardyke models or the 'High' NaFRA classification for Emerson Park Stream, Paines Brook and Weald Brook


N
Key
Borough Boundary
Main Rivers
Thames Tidal Defences
Flood Zone 2
Fluvial / Tidal
Fluvial Models
Tidal Models
ROMFORD
HORNCHURCH
RAINHAM
Havering
JACOBS
Havering SFRA
Figure 104
Flood Zone 2
B08930D2-L-104
Not to Scale
21/11/2016
MA
MS
MS
RC


N
Key
Borough Boundary
Main Rivers
Flood Zone 3a
Flood Zone 3a with Climate Change
Data Sources: In accordance with the latest guidance from the Environment Agency the impact of climate change on predicted fluvial flood extents are based on a +10% change in peak river flow for the 1 in 100 annual chance event where detailed modelling for the undefended scenario is available (i.e. the Beam, Ingrebourne and Mayes Brook, Blacks Brook and River Mardyke). The predicted impact of climate change upon the River Thames flood extent is based upon sea level rise allowances.
Havering
JACOBS
Havering SFRA
Figure 105a
1% AEP Event
+ CC Uplift
B08800/02-L-105a
Not to Scale
21/11/2016
MA
MS
MS
RC


N
Key
Borough Boundary
Main Rivers
Flood Storage Areas
Thames Tidal Defences
Structures
Monitoring Instrument
Bridge
Control Gate
Inspection Chamber
Outfall
Pump
Ramp
Screen
Utility Services
Weir
Defences
Flood Gate
Wall
Embankment
High Ground
Areas Benefitting from Defences
Faringdon Avenue FSA
Moray Way FSA
Cross Road FSA
(Not currently in operation and maintained as a FSA)
Washlands FSA
Dovers Corner FSA
BRENTWOOD
ROMFORD
HORNCHURCH
DAGENHAM
Notes:
1) Areas Benefitting from Defences (ABDs) are based on the area that would be flooded from a 0.5% (1 in 200) annual chance tidal event or a 1% (1 in 100) fluvial event.
Havering
JACOBS
Havering SFRA
Figure 106 -
Existing Defences
and Areas Benefitting
B0880C02-L-106
Not to Scale
21/11/2016
MA
MS
MS
RC


N
Key
Borough Boundary
Main Rivers
Havering Critical Drainage Areas
uFMfSW 3.3% [1 in 30] Flood Extent
uFMfSW 1% [1 in 100] Flood Extent
uFMfSW 0.1% [1 in 1000] Flood Extent
Pinewood Primary School
Harold Hill
Havering Park
Chase Cross Road
Paines Brook
Romford West
Rise Park
Romford North
Gallows Corner
Romford South
Upminster North
South Hornchurch
Elm Park
Upminster South
Hacton
DAGENHAM
Notes:
The updated Flood Map for Surface Water (uFMfSW) shows the flooding that takes place from the 'surface runoff' generated by rainwater (including snow and other precipitation) which:
1) is on the surface of the ground (whether or not it is moving), and
2) has not yet entered a watercourse, drainage system or public sewer.
Havering
JACOBS
Havering SFRA
Figure 109 - Surface Water and Areas of Critical Drainage
B08600D2-L-109
Not to Scale
04/11/2016
MA
MS
MS
RC


N
Key
Borough Boundary
Main Rivers
Groundwater Flooding Reports
Sep-2002
Oct-2002
Jan-2003
Apr-2004
Sep-2005
May-2006
July-2006
July-2007
Aug-2007
Sep-2007
Groundwater Flood Type
Clearwater
Clearwater and Superficial Deposits
Superficial Deposits
Proportion of Square at Risk
< 25%
>= 25% <50%
>= 50% <75%
>= 75%
Havering
LONDON BOROUGH
JACOBS
Havering SFRA
Figure 111 -
Groundwater
Flood Risk
B09600D2-L-111
Not to Scale
21/11/2016
MA
MS
MS
RC

5. Related and Interdependent Plans

There are a number of different plans and protocols relevant in preparing a local flood plan for the London Borough of Havering. It is vital that it is understood how these plans fit with this Multi Agency Flood Plan. Rather than duplicate any of their content within this plan, areas will be clearly signposted.

Plans and protocols that are related and interdependent to this Multi Agency Flood Plan are listed below, and figure 5a shows how these plans can be fitted together.

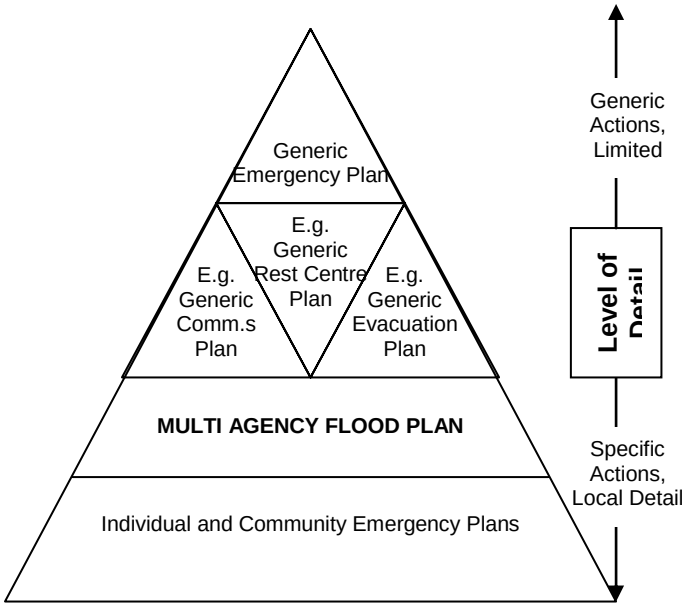
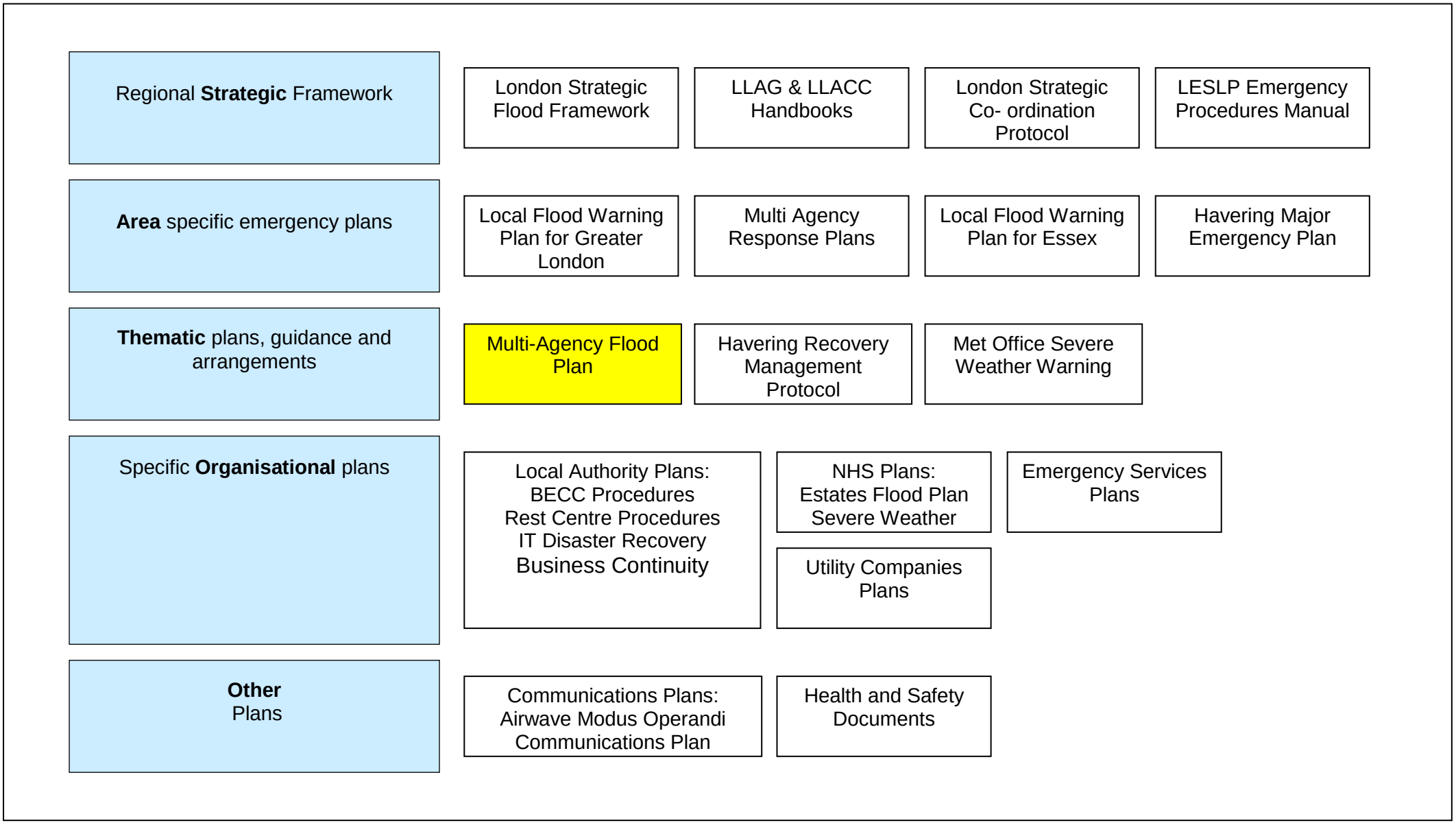


Figure 5a Interdependent Plans

Figure 5b Related and Interdependent Plans

Title	Owned By
London Strategic Flood Framework	LRG
LLAG & LLACC handbooks	LRG
London Strategic Coordination Protocol and Associated Specific Plans	LLRF
LESLP Emergency Procedures Manual	LESLP Panel
Local Flood Warning Plan for Greater London	Environment Agency
Local Flood Warning Plan for Essex	Environment Agency
Major Emergency Plan	LB Havering EP & BC Service
Havering Recovery Management Protocol	LB Havering EP & BC Service
Met Office Severe Weather Warning	Met Office
BECC Activation & Operating Procedures	LB Havering EP & BC Service
Rest Centre Activation & Operating Procedures	LB Havering EP & BC Service
IT Disaster Recovery Plan	LBH ICT
Business Continuity Corporate Plans	LB Havering EP & BC Service
Service Level Business Continuity Plans	LB Havering Service Managers
Airwave Modus Operandi	LB Havering EP & BC Service
Estate Plans	NHS Partners
Utility Company Emergency Plans	Utility Companies(UKPN, Nat Grid etc)
Communications Failure Plan	LB Havering Communications Dept

Figure 5c– Fitting Emergency Plans Together



6. Communication Plan

Communication will be vital in helping the response to any major flooding event.

6.1 Internal Escalation Procedures

Contact details of key personnel are not held within this plan, but within the Major Emergency Plan contacts list. If flood warnings given by the Environment Agency are relevant to this borough the Borough Emergency Planning and Business Continuity Service will contact the SLT On Call Officer who will (if necessary) cascade the information to the Chief Executive, Executive Directors, relevant Councillors, and any other internal staff as necessary.

6.2 Members

It is essential that in the build up, during flooding and after a flooding incident that Council Members are informed. As a minimum the Leader, Deputy Leader and appropriate Cabinet Members should be provided with a situation report. The Leader or Deputy will be the conduit for advising the ward members of key information. In time all Councillors should be informed.

6.3 Council Staff

Employees must be kept up-to-date with the latest information. The frequent updating of the Communications Service will be key to keeping staff informed. Out of Hours it may be necessary for Service Managers to contact their staff at home to update them of the incident and regarding the need for them to support or maintain the continuity of service provision.

6.4 Multi-Agency Partners and Mutual Aid

Where an incident has resulted in the BECC being operated the Communications Service will work with the Havering Borough Resilience Forum and other Local Authorities to deliver a clear and unified multi-agency statement and regular follow ups including well into the recovery phase.

6.5 Media

Working with the media will be the role of the Communications Team and this role and provisions are all set out in the Council Major Emergency Plan. There needs to be a consistent single message in consultation with the other agencies. More information about working with the media can be found within the communications strategy. The Media Manager has the responsibility for communication with the press and media in accordance with the Media Strategy. Where the incident requires the Police lead as per the LESLP manual then this strategy will be followed on a joint partnership approach.

6.6 Voluntary Sector

The voluntary sector provide an extremely valuable resource in the provision of welfare services, and as such are likely to be needed during a severe flood incident. It is therefore important that they are given an early heads up as to events as they materialise e.g. the Salvation Army as they have an agreement with Havering to support the Rest Centre Plan.

6.7 General Public

Information leaflets can be found on the Environment Agency website and in Appendix A of this document which give guidance on before, during and after flooding. The Environment Agency states that anyone who is at risk of flooding is advised to develop a flood plan and make sure everyone is aware of what to do should the need arise to use it.

The Council in consultation with the Metropolitan Police, will provide up to date and consistent information to the Community. Local TV and radio will also be used to inform the community of different flood warnings. The Council website will be important for these messages as well as the setting up of an information line via the Public Advice and Service Centre (PASC).

6.8 Public Helpline

The Environment Agency has a 24 hour telephone information service called Floodline. Contact details of this service can be found in the Environment Agency leaflets in Appendix A. Customers trying to contact the council should call the Council contact centre number.

6.9 Vulnerable People

More information on vulnerable persons can be found in Section 9, and on the Community Flood Risk Sheets in Section 14. It will be the Emergency Services and Incident Controllers decision as to the support to be given to these persons on a priority basis.

6.10 Schools

It is recommended that all schools are signed up to the Environment Agency Floodline Warnings Direct. All decisions made by the Head Teachers must be recorded and coordinated by Children's Services. It is imperative that Children's Services keep the BECC updated as to whether schools are evacuated, open or closed. The Council's BECC and Incident Controller are on hand to assist with evacuation of any schools affected by flooding or those where pupils are retained for any length of time.

6.11 Faith/Minority Groups

Where necessary faith and and minority groups may be asked to assist with communicating information to their communities. This will enable appropriate religious and minority ethnic community leaders to ensure warning and information messages are passed to the community and to ensure customs and beliefs are respected.

6.12 Door Knocking

As can be seen from figure 6a, literal door knocking may not be successful due to constraints on time and staff. Therefore we cannot confirm that LB Havering will always knock on doors in the flood zone areas where identified. We may knock on one door of a road and ask those persons to inform the rest of their street. We may prioritise vulnerable persons (if applicable) in a flood zone area. We suggest that those people in flood zones sign up to the Environment Agencies Floodline Warnings Direct, as they will then be informed of any potential threats.

The only time door knocking will be used is to communicate with vulnerable people in circumstances of a public network failure.

6.13 Public Network Failure

This plan does not take into account a public network failure, but should the public network fail, contingency arrangements can be found in the Communications Plan held by the Borough Communications Service and the Communications section of the Major Emergency Plan. If the public network failed, the emergency services and the local authority have use of airwave radios.

Contact for the council can be made by the following methods:

The council's website: www.havering.gov.uk – which include details of the Environment Agency

LBH Switchboard: 01708 434343 - daily 09.00 hrs– 17:00 hrs
Out of Hours: 01708 433999 – evenings & weekends 17:00 hrs – 09.00
The Borough Emergency Control Centre (BECC) - 01708 434605/431942
or email: BECC@havering.gov.uk

Figure 6a **Door Knocking**

If:
D = number of doors to knock on
T= time spent at each door in minutes
S= number of staff available
((D x T) / (S / 2)) / 60 = hours needed to knock on all doors **EXCLUDING** time to collate staff, time to reach area, breaks, time to move between houses/roads etc.

[Note: staff numbers are divided by 2 because of safe working policy – if this is not relevant take this division out]

Example:
D= 14,974 doors T= 7 mins/door S= 239
((14,974 x 7) / (239 / 2)) / 60 =
((104,818) / (119.5)) / 60 =
(104,818 / 119) / 60 =
[rounded down to 119 because of whole people]
880.82352 / 60 = 14.68 hours

7. Warning and Informing - Plan Activation

Further information about each of the Environment Agencies flood risk definitions can be found at http://www.environment-agency.gov.uk

7.1 Flood Warning Service

The Environment Agency is responsible for issuing warnings to the general public, businesses, emergency responders and media relating to tidal and fluvial flooding. The warning codes are issued using their Flood Warning Service which can send bulk messages to a mass audience via several formats. The formats are email, SMS text message and voice message. People and organisations have to register their details on FWS in order to receive the messages. It is a free service and each individual/organisation can register up to 10 contacts. Messages issued through FWS also update flooding information on the Environment Agency website and the Floodline (0845 988 1188) service.

Figure 7a Environment Agency Flood Warning Codes

Warning Code	Meaning
	**Flooding is possible. Be prepared** The impact on the ground will be flooding to roads, gardens, fields, recreation grounds, etc. Detail included with each Flood Alert will indicate the likelihood of escalating to Flood Warning.

	**Flooding is Expected. Immediate action required** Impacts on the ground will be flooding to homes and businesses, infrastructure (roads / underground stations / utilities etc) which will have a major impact. Expect significant transport disruption and a high level of local media interest.
	**Severe Flooding. Danger to life** Impacts on the ground include deep and fast flowing water, potential collapse of structures, critical resources disabled, large towns/communities isolated, large volumes of evacuees. Expect significant transport disruption and a high level of local and national media interest. These are only issued in exceptional circumstances and are likely to only be issued once a certain level of flooding has already occurred.
Flood Alert / Flood Warning / Severe Flood Warning, no longer in force *(No icon)*	The flood alert / warning / severe flood warning is no longer in force for this area. Used to inform that the situation is improving. Even when a Flood Warning or a Severe Flood Warning is removed it may still mean that there are flooded properties, damaged infrastructure and standing water where flooding has occurred.

The Flood Forecasting Centre (FFC) is responsible for issuing weather warnings that relate to conditions that could cause flooding. The primary product aimed at emergency responders is the daily Flood Guidance Statement.

7.1.1 Flood Guidance Statements

The joint EA/Met Office Flood Forecasting Centre produces a Flood Guidance Statement (FGS) which provides a daily flood risk assessment for Category 1 and 2 responders to assist with tactical planning decisions.

This assessment of risk is shown by county across England and Wales over five days. It identifies developing situations that could cause flooding and significant disruption to normal life. The FGS assesses the risk for all types of natural flooding – river, coastal, groundwater and surface water flooding.

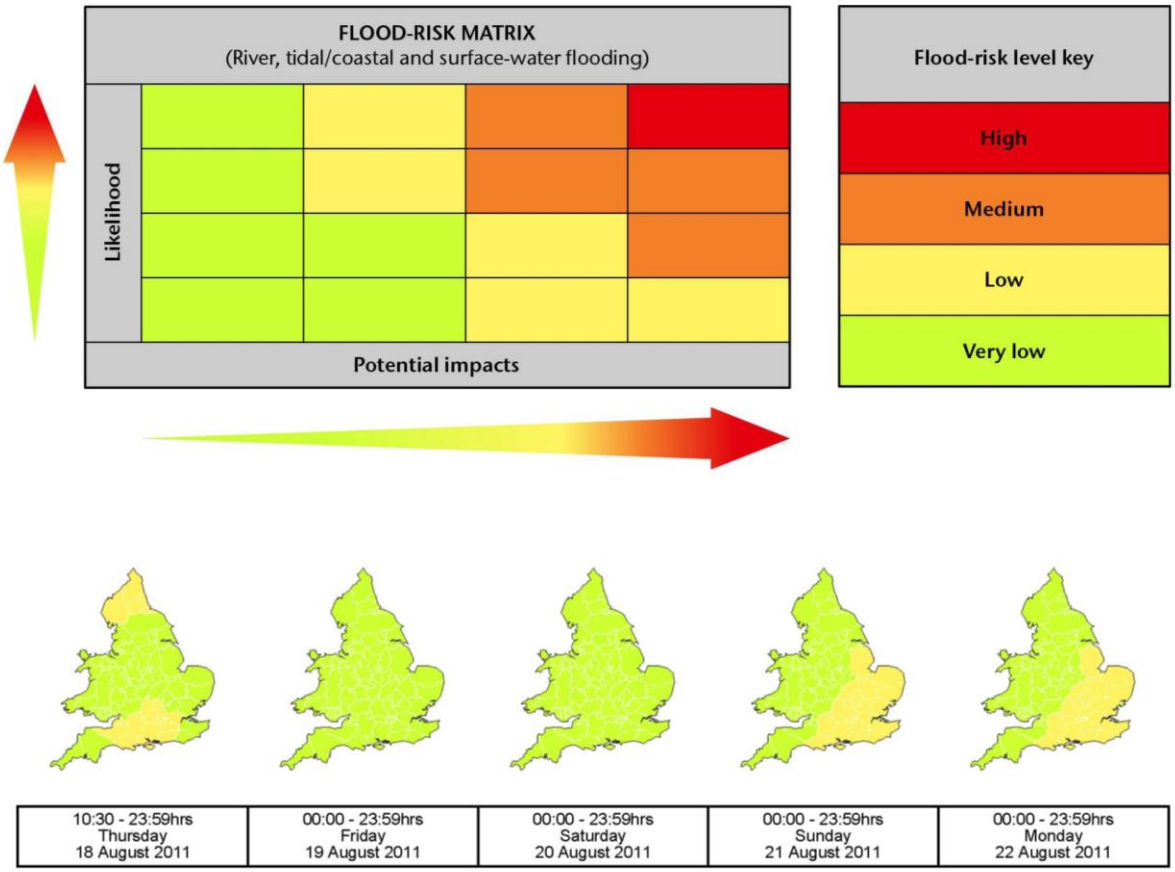
It presents a collated assessment by the FFC and the local EA flood forecasting teams of the best understanding of risk based on weather forecasts, flood forecasts and catchment conditions on the ground.

The FGS is issued by the FFC every day at 10:30am. It will also be issued at other times through the day and night, if the situation warrants and/or the flood risk changes.

To assess the level of risk, the FFC takes into account a large number of weather and catchment factors. Assessments are made in different ways for coastal, river, surface water and groundwater. These are then presented on a coloured risk basis. For many reasons the ability to assess flood risk varies across England and Wales.

The following is reviewed for each Flood Guidance Statement:

- The likelihood of an adverse flood event where likelihood bands are described as very low <20%, low 20-40%, medium 40-60%, high 60% or greater.
- Recent weather conditions-is the event shortly after an earlier period of prolonged rain or other high impact weather.
- Area and duration – is it expected to be short and localised or will it affect a large geographical area over several hours?
- Knowledge about the condition of the catchments within the counties – how saturated are the catchments, how high are the rivers and what are the underlying conditions?
- Detailed flood forecast models for the coast, showing surges and large waves, and flood flows for rivers are evaluated.
- Seasonal factors, for example snow cover or leaf fall.
- The combined effect of river flow and high tides – if a river flood is being assessed, does this coincide with high tides, which could cause problems?



Example graphic from a Flood Guidance Statement

The FGS risk matrix and key shows the assessment of likelihood against impacts that form the basis of the county map colouring.

Flood Guidance Statements are issued by email to Category 1 and 2 responders. Organisations have to register with the FFC to receive them. A version of the FGS is published for the general public on the Environment Agency website called the Three Day Flood Risk Forecast.

Flood Guidance Statements will generally be the only warning partners will receive regarding potential surface water flooding. They contain a yellow, amber, red scale to highlight risk to allow partners to take necessary action to prepare in advance of flooding occurring. The FGS risk scale is based on the risk of disruption from all sources of flooding though, not just surface water.

When London is coloured yellow, amber or red on a FGS, the Met Office Public Weather Service Advisor will usually provide an amplification of the likely impacts focussing on London. These amplifications are issued to Category 1 and 2 responders by email.

7.1.2 Media

In the build up to a flooding incident, the media are routinely sent all warning messages issued by the Environment Agency, Met Office and Flood Forecasting Centre. As an incident unfolds, the scale of flooding and disruption will dictate the level of media interest. Organisations tend to be contacted individually by the media for updates and statements and organisations provide interviews to comment on their own responsibilities. If a major incident (for Havering) is declared and a coordination centre is convened, key messages should be produced and circulated regularly to all responders to ensure consistency.

If a major incident for London is declared and the Strategic Coordination Centre (SCC) is convened (due to widespread flooding in several boroughs), a media cell will be set up to handle all media issues. Individual organisations may still be approached by the media but the SCC must issue a top lines brief to ensure any interviews conducted away from the SCC contain consistent messages

7.2 Thresholds and Triggers for Plan Activation

There are several thresholds and triggers that can be used to assess the need to escalate a situation and activate this plan. Activating the plan will instigate a coordinated multi agency response.

There are two stages of activation:

1-Preparation
2-Response

Stage 1 (preparation) should be activated when any of the following occur:

- London is coloured amber or red (medium or high risk) on the Flood Guidance Statement
- The Met Office Public Weather Service Advisor issues a specific update for London confirming the likelihood of disruption
- The Environment Agency issues a Flood Alert for a river in Havering
- Problems have been identified with a reservoir upstream or within Havering but has not yet failed or started to fail
- Reports in the media are talking about potential flooding in London

Stage 2 (response) should be activated when any of the following occur:

- The Environment Agency issues a Flood Warning or Severe Flood Warning for a river in Havering
- Any organisation becomes aware of disruption to transport in Havering due to flooding
- Any organisation receives reports of properties flooding internally
- Instruction to escalate our response from the London Resilience Forum (usually in

response to a pan London incident) – top down activation

- A reservoir upstream or within Havering is failing

7.3 Plan Activation

What will 'activating the plan' look like? The following information provides suggested actions for organisations to carry out, when either stage is reached.

Stage 1 – Preparation

- Consider arrangements for preparing staff to deal with a potential incident. This may involve placing key staff on standby or assessing staffing levels and availability for the next 3 days
- Check your Business Continuity Management plan to ensure your organisation's critical business activities can still be met, if flooding were to occur
- Prepare for potential media interest. Allocate a media spokesperson and confirm your organisation's key messages. Consider issuing proactive press releases to highlight that we're ready to response and give advice to the public on how to prepare for flooding
- Check your organisation's local coordination centre / incident room is fully prepared to be opened if necessary
- Check stocks of equipment and supplies both for your own needs and that which is provided to the public
- Enquire about the status of your partners who you would normally rely on for mutual aid so you know in advance whether you can rely on them or not

There may be a period of inactivity from when any/all of the above items have been actioned to when flooding occurs and activation of stage 2 is necessary. This could range from hours to days, depending on the detail and confidence of the weather/flood forecasts. There will be occasions when stage 1 is activated and preparations for an escalating situation are made, but activation of stage 2 is not required. By activating stage 1 though at the given triggers, escalation to stage 2 can be made much quicker and smoother, enabling responders to stay ahead of the incident, instead of trying to catch up.

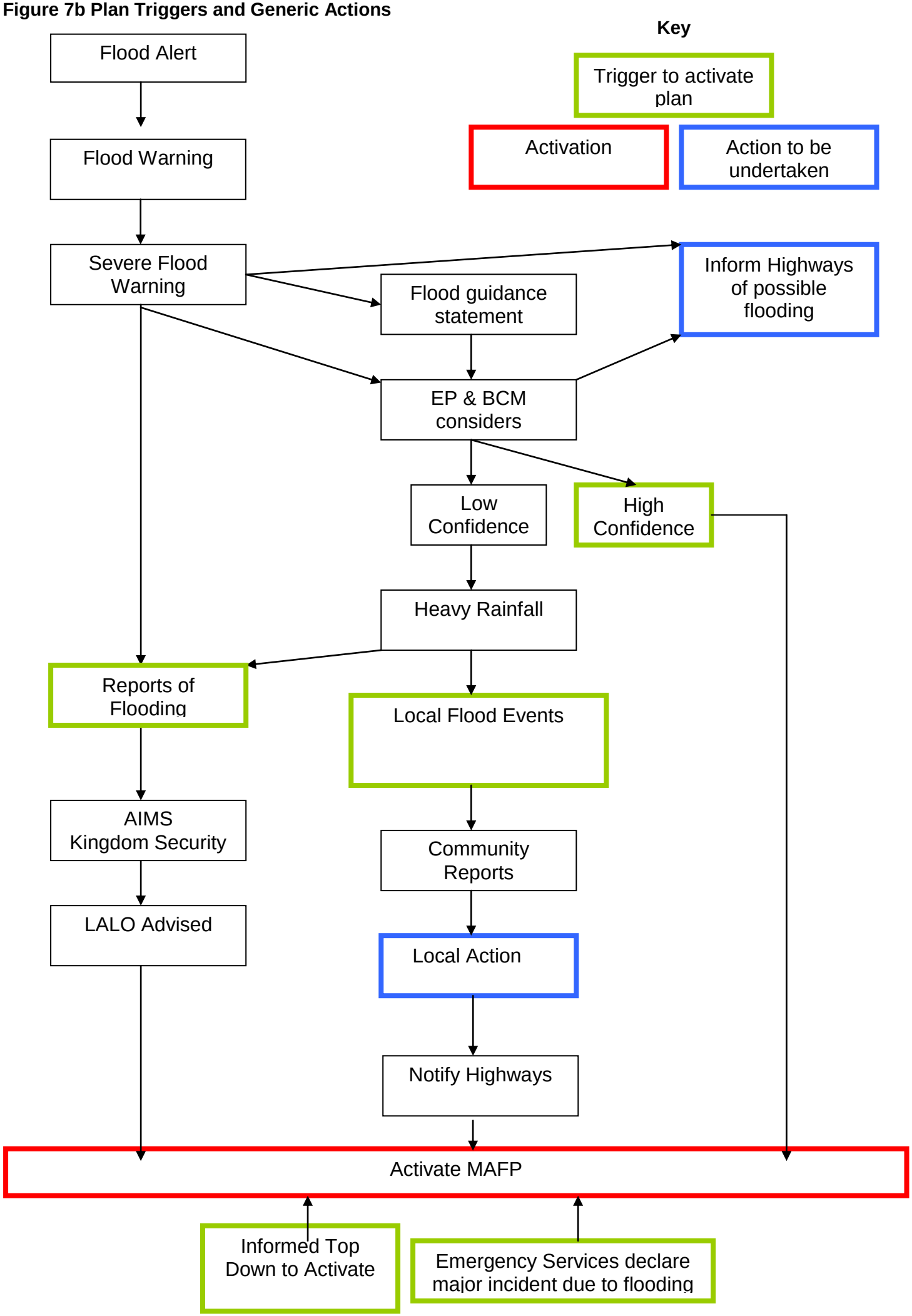
Stage 2 – Response

- Organisations should activate their own generic emergency response plans and/or BCM plans to prepare for or deal with transport and staff disruption and an increase in calls from the general public. Additional staff will be required to work on the incident response if other core activities are to be maintained
- LB Havering Emergency Planning and Business Continuity (EP and BC) Service should convene a Silver tactical level multi agency meeting or teleconference so the situation and status of each responder can be assessed, to give an overall picture for the borough. Attendees, contact details and a draft agenda for this meeting are listed in this plan and the EP and BC Contacts list.
- Organisations should open their control centres / incident rooms where appropriate to provide coordination for your organisation and a central point of contact
- Single points of contact for each organisation should be circulated to ensure effective communication

- By opening the Havering Borough Emergency Control Centre (BECC), notification of the incident will be sent to the London Resilience Group.
- The BECC may be required to open or submit situation reports to the London Local Authority Coordination Centre at the request of the Local Authority Gold, if flooding incidents are already occurring in other boroughs, even if the situation in Havering is currently under control
- Consider the need for a Borough Gold Strategic Coordination Group to be established at the outset. Bear in mind that regional/national responders may need several hours notice to attend a meeting in person. Travel times are likely to be longer than normal due to transport disruption caused by flooding
- Organisations should check the situation of all their key sites and infrastructure that is known to be in flood risk areas. Any site that is near locations currently experiencing flooding should be brought to the attention of the Silver group. Critical sites that are known to be in flood risk areas should also be highlighted so plans can be made to protect them if necessary
- Gold (Strategic)/Silver(Tactical) meetings should be planned for the next 2 days and details circulated to partners
- Media messages need to be agreed and circulated on a regular basis. A flooding situation can change rapidly.
- The Environment Agency will try, when possible, to consult with the multi- agency borough Strategic Gold group before issuing a Severe Flood Warning. This will allow all responders to prepare for increased media and public interest.
- All organisations should keep a log of all details of any reports of flooding and pass them to the Environment Agency on a regular basis. These can be observations from staff who are travelling around or from calls from the public. The Environment Agency will collate these details and circulate summaries at regular intervals.

Overall responsibility for activating the Multi Agency Flood Plan will lie with either the Police or the Local Authority's Borough Emergency Planning & Business Contingency Manager, (or team in their absence). Alternatively activation could occur from the Emergency Response Team, if the BECC is open.

Figure 7b Plan Triggers and Generic Actions



8. Actions, Roles and Responsibilities

8.1 Activation and Response

Upon activation of the plan all relevant organisations should be notified and meet at a pre-arranged safe rendezvous point (RVP) to establish the multi-agency Silver Tactical Coordinating Group. Borough Strategic Gold will be established as required. The RVP is at: Borough Emergency Control Centre, 3rd Floor, Mercury House Romford.

The Police will chair any Silver (Tactical) and Gold (Strategic) meetings in response to a flooding incident with input from all responding agencies. If search and rescue activities are being undertaken the chair may pass to the LFB.

8.2 Roles and Responsibilities

The different agencies responding to a flood event will carry out their duties as stated in the LESLP Procedure Manual (with focus on Appendix E). These responsibilities are also in Appendix E of this plan for quick reference. Figure 8a identifies the responsibilities and actions to be undertaken upon activation of this plan.

8.3 Silver Tactical Coordinating Group

When the decision to activate this flood plan is taken representatives from the following organisations should be contacted and attend Silver Tactical meetings:

- Metropolitan Police
- London Fire Brigade
- London Ambulance Service
- Havering Council
- Other specialist advisors e.g.:
  i. NHS E (L)
  ii. EA
  iii. Thames Water etc.

A template situation report and silver tactical coordinating group agenda can be found in Appendix F and G.

8.4 Escalation of Response

A major incident will be declared if the incident requires implementation of special arrangements by one or more of the emergency services and will generally include the involvement, either directly or indirectly, of large numbers of people. For example

- Rescue and transportation of a large number of casualties
- Large-scale combined resources of Police, LFB and LAS
- Mobilisation and organisation of the emergency services and support services

Response to a flooding incident will require a multi-agency approach, and liaison with all blue light responders, the Environment Agency and other stakeholders as required is essential. Liaison will in the first instance take place at a silver tactical meeting which should be at the BECC if it is a rising tide event, or initially it could be at the scene. It should be recognised that flooding may cover several areas, so therefore a remote location like the BECC will provide a more tactical overview across the borough.

A larger incident may involve the activation of London's Strategic Coordination Group (SCG) which would have Police lead as Gold during the response phase and would include activation of the London Strategic Flood Framework.

In these circumstances our primary objective would be to inform the London Local Authority Co-ordination Centre (LLACC) that we have activated our Borough Emergency Control

Centre. In addition to this, where possible, we would inform the London Resilience Group of this activation in terms of a flooding incident.

8.5 Environmental Impacts and Responsibilities

In a flood event a number of environmental issues may occur. The list below gives a brief description as to who is responsible for these issues. Further information can be found in the Recovery Plan:

Animal Carcasses:	The council would be responsible for the disposal of animal carcasses found on council property. Domestic animals would be the responsibility of the owner.
Personal Property:	The council should facilitate recycling and waste collection for flood damaged goods as part of its emergency response and recovery.
Silt:	The council will take responsibility for clearing Silt on public land but not on private property.
Contaminated Sandbags:	The council will dispose of its own contaminated sandbags, but due to the council's policy not to supply sandbags to the public, the council will not be held responsible for personal sandbags.
Domestic Oil	The council has a list of designated contractors who are responsible for removing this.
Industrial Oil / Petrol	The Environment Agency are responsible for cleaning up Industrial Oil and Petrol and for this they have a list of designated contractors.

.

8.6 Health and Safety Considerations

Health and safety considerations and information for responders are held by each of the responding agencies. These considerations are not in this plan; responders needing more information should speak to their own agency.

Due to the possibility of sewerage being present in floodwater, NHS E (L) and Public Health England will provide advice concerning the risk to public health (See annex 2).

Health and safety information for the public can be found in the Environment Agency leaflets, which can be found in Appendix A.

Figure 8a: Responsibilities and Actions

Who	Responsibilities & Actions
Metropolitan Police Service	▪ As stated in LESLP guidance (can be found in Appendix E in this document) ▪ This includes: Preservation of life — Secure, protect, preserve the scene Collection and distribution of casualty information — Assistance with warning and Informing ▪ Any further responsibilities and roles will come from their central control ▪ Attend multi agency meetings ▪ Liaise with other agencies to prioritise response
London Fire Brigade	▪ As stated in LESLP guidance (can be found in Appendix E in this document) ▪ This includes: Search and Rescue — Give assistance with pumping operations Fire fighting and fire prevention — Salvage and damage control ▪ Any further responsibilities and roles will come from their central control ▪ Attend multi agency meetings ▪ Liaise with other agencies to prioritise response
London Ambulance Service	▪ As stated in LESLP guidance (can be found in Appendix E in this document) ▪ This includes: Saving of life — Provide transport, medical staff, equipment and resources Evacuation of vulnerable persons — Establish effective triage system ▪ Any further responsibilities and roles will come from their central control ▪ Attend multi agency meetings ▪ Liaise with other agencies to prioritise response
London Borough of Havering	▪ As stated in LESLP guidance (can be found in Appendix E in this document) ▪ This includes: Technical, engineering advice; Building control; Highways services Public health/environmental issues; Reception centres; Transport Social services; Help lines; Re-housing & accommodation needs Psychosocial support; Welfare; Financial needs ▪ Activate BECC ▪ Follow internal escalation procedures ▪ Activate Highways teams to clear blockages ▪ Identify rest centres

	▪ Identify vulnerable people, sites and locations and consider evacuation strategy ▪ Assess flood defences in the risk area ▪ Once flooding has receded take lead role in Recovery process
Environment Agency	▪ Issue alerts ▪ Lead public body for protecting and improving the environment ▪ Maintain flood defences where responsibility is identified as belonging to that agency. ▪ Collect flood data for historical records and to enhance future mapping ▪ Once flooding has receded repair any damaged defences
NHS E (L)	▪ Liaise with Public Health England ▪ Link with Local Authority with regard to identifying vulnerable people ▪ Link with LAS with regard to potential primary care evacuation ▪ Brief incident controls and general public on health risks associated with the flooding incident ▪ Liaise with other agencies ▪ Once flooding has receded obtain statistics of human cost to inform borough wide plans
Port of London Authority	▪ Navigational safety along the Tidal Thames ▪ Inspect and maintain more than 230 PLA moorings ▪ Ensure the Thames continues to be a safe and enjoyable environment ▪ Alter the navigation in/out/around the Thames and impose restrictions as needed ▪ Provide vessels for movement of people (‘rescue’ rather than ‘mass evacuation’) ▪ Put out any necessary information via VHF marine channels ▪ Liaise with other agencies
National Grid	▪ Maintain supplies to customers ▪ Cooperate with blue lights to isolate supplies and make safe as necessary Reconfiguration of supplies where possible ▪ Invoke mutual aid and resource plans ▪ Liaise with other agencies ▪ Once flooding has receded re-establish supplies and return to service as usual
British Telecom	▪ Maintain supplies to customers ▪ All actions are to be managed through Incident Management Response ▪ Cooperate with blue lights ▪ Liaise with other agencies ▪ Customer service prioritisation is an important part of the process to ensure ongoing communications
Voluntary Sector	▪ Provision of staff to assist in the delivery of humanitarian services

British Transport Police	▪ Deliver a safe railway that is free from disruption and the fear of crime. ▪ Police force for the railways (providing a policing service to rail operators) ▪ Assist with evacuation of premises if necessary paying particular attention to vulnerable people ▪ Assist to secure premises to prevent damage and or theft ▪ Liaise with other agencies ▪ Consider a representative at any recovery management cell
Transport for London	▪ Liaise with MPS to determine a joint response under the Benbow scheme. ▪ This includes buses trains and underground ▪ Coordinate response with blue lights to coordinate responses ▪ Liaise with other agencies ▪ Provide senior officers in respect of any command and control requirement

9. Vulnerable People

The guidance Emergency Preparedness states that it is not easy to define in advance and for planning purposes who are the vulnerable people to whom special consideration should be given in plans. Those who are vulnerable will vary depending on the nature of the emergency. It then states that for planning purposes there are broadly three categories that should be considered:

a. Those who, for whatever reason, have mobility difficulties, including people with physical disabilities or a medical condition and even pregnant women;
b. Those with mental health difficulties;
c. And others who are dependent, such as children.

Havering Emergency Planning and Business Continuity Service would broaden and clarify this further as:

d. Those who have mobility limitations or are supporting someone with mobility limitations (Disabled, the ill & parents nursing infants)
e. Those that have limited ability to comprehend a risk / hazard or cannot understand a situation because of language issues.
f. Those passively at risk
g. Those displaced in unfamiliar surrounds without friends and family or support nearby

Below is a list of those identified who hold information on potentially vulnerable people:

Health:

- GP's/CCG's
- Pharmacists
- NHS E (L)
- Mental Health Trusts
- Acute Hospitals
- Independent Health
- Private Care Homes

Local Authority:

- Adult Services
- Children's Services
- Housing & Partner Organisations
- Community Safety Teams
- Transport
- LALO

Others

Voluntary Sector
Utilities

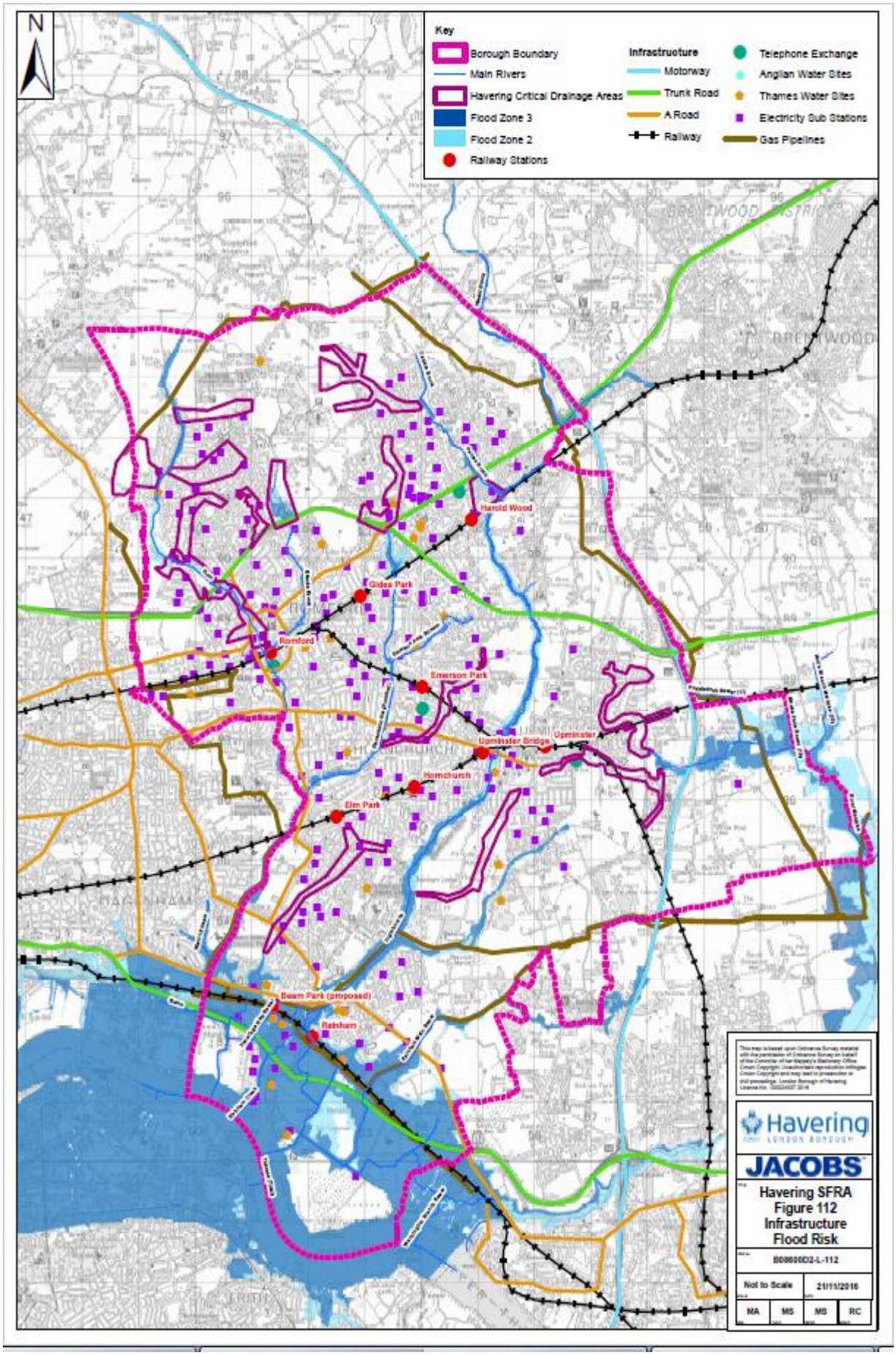
The most up-to-date local authority vulnerable people lists can be obtained 24 hours a day from trained Council staff. The Borough Emergency Planning and Business Continuity Service and Social Care have access to this information.

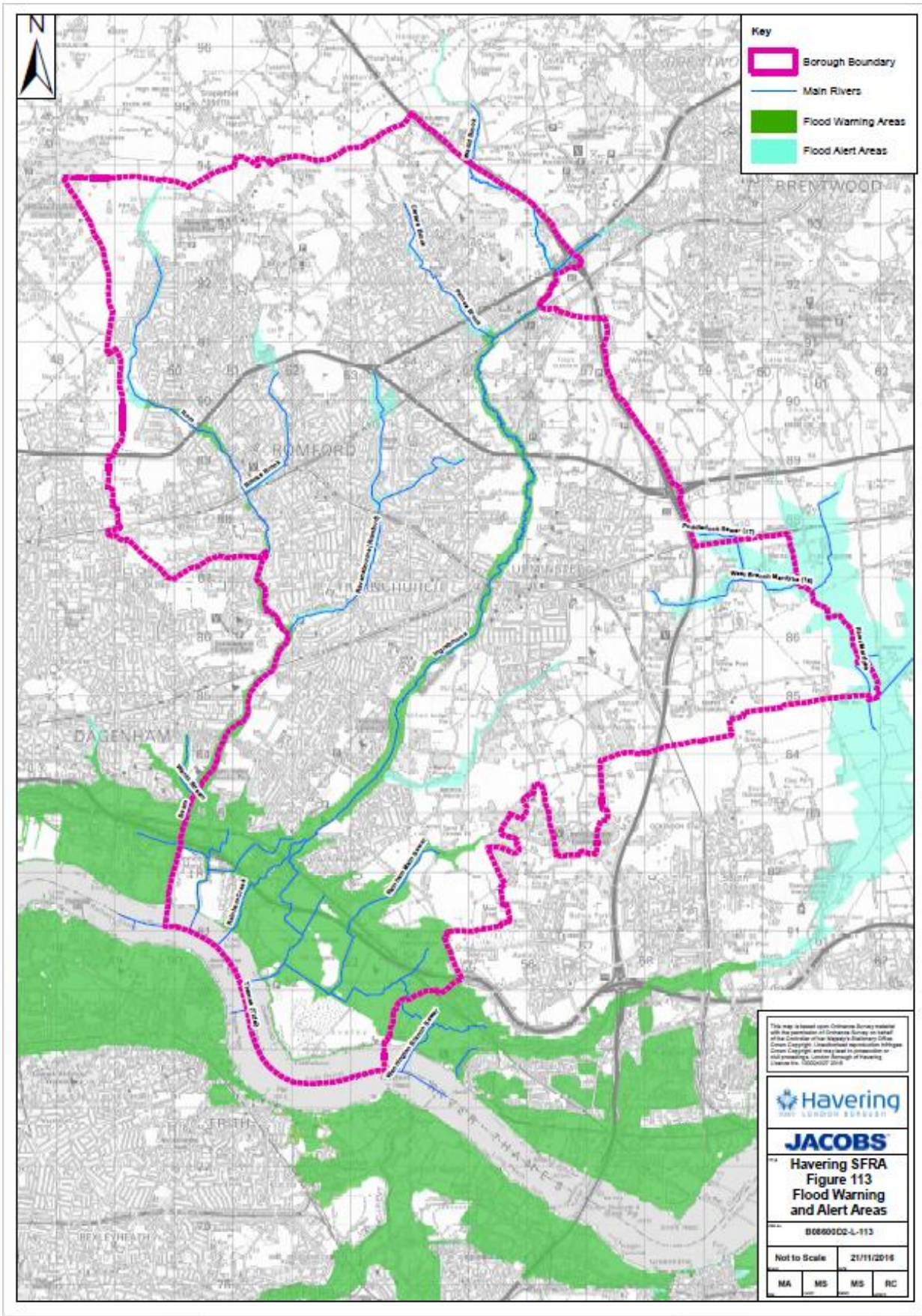
If it is necessary to share information with other responders, in relation to the welfare of any individuals on the vulnerable persons list, then this will be authorised.

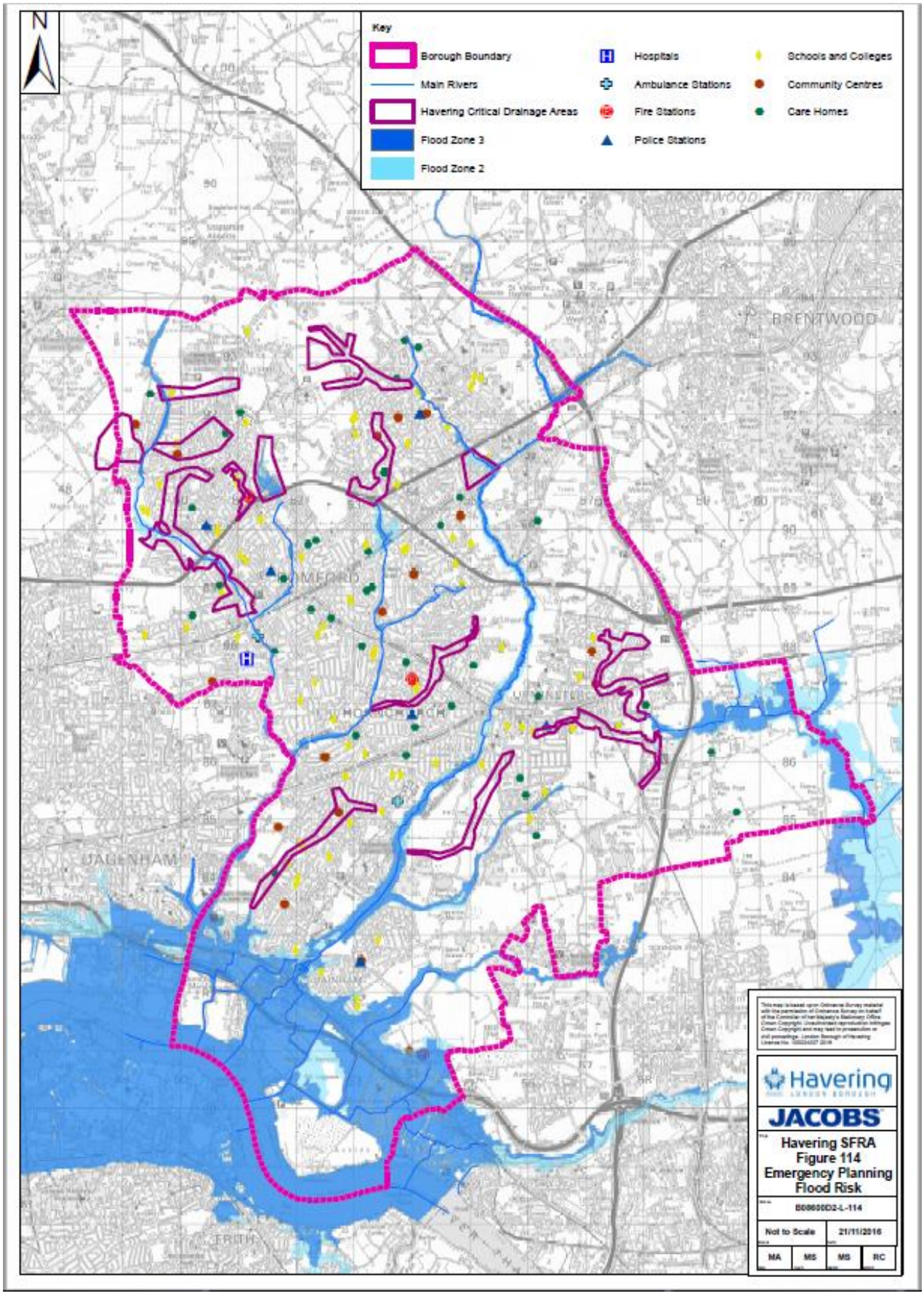
10. Key Infrastructure

Figure 112 (Infrastructure Flood Risk, Figure 113 (Flood Warning and Alert Areas) and Figure 114 (Emergency Planning: Flood Risk) identify the key sites and infrastructure in the London Borough of Havering that are at risk from flooding. Those that are most critical are identified on this list. The individual flood risk sheets also contain key vulnerable infrastructure relevant to that area.

Infrastructure Maps below


N
Key
Borough Boundary
Main Rivers
Havering Critical Drainage Areas
Flood Zone 3
Flood Zone 2
Railway Stations
Infrastructure
Motorway
Trunk Road
A Road
Railway
Telephone Exchange
Anglian Water Sites
Thames Water Sites
Electricity Sub Stations
Gas Pipelines
Harold Wood
Gidea Park
Romford
Emerson Park
Upminster Bridge
Upminster
Hornchurch
Elm Park
Beam Park (proposed)
Rainham
Havering
LONDON BOROUGH
JACOBS
Havering SFRA
Figure 112
Infrastructure
Flood Risk
B08600D2-L-112
Not to Scale
21/11/2016
MA
MS
MS
RC


N
Key
Borough Boundary
Main Rivers
Flood Warning Areas
Flood Alert Areas
BRENTWOOD
ROMFORD
DAGENHAM
ERITH
Havering
JACOBS
Havering SFRA
Figure 113
Flood Warning
and Alert Areas
B08600D2-L-113
Not to Scale
21/11/2016
MA
MS
MS
RC


N
Key
Borough Boundary
Main Rivers
Havering Critical Drainage Areas
Flood Zone 3
Flood Zone 2
Hospitals
Ambulance Stations
Fire Stations
Police Stations
Schools and Colleges
Community Centres
Care Homes
BRENTWOOD
Havering
JACOBS
Havering SFRA
Figure 114
Emergency Planning
Flood Risk
B08600D2-L-114
Not to Scale
21/11/2016
MA
MS
MS
RC

11. Evacuation and Sheltering of People

Evacuation is by no means an easy option and may not be the safest option for the majority of those potentially at risk. It may be safer to advise people to seek refuge in the upper storeys of a building rather than run the risk of being overcome by the flood waters.

The decision to evacuate an area affected by the flooding will be the responsibility of the police. However evacuation will prompt Council action around providing a Rest Centre if not already set up and the transportation of evacuees. It will be for the LBH Silver Tactical Officer to make decisions regarding support to be given to those persons who refuse to be evacuated.

Further information on the evacuation process and transportation of evacuees can be found in the Major Emergency Plan, Rest Centre Plan and the London Mass Evacuation Framework.

Further information on the sheltering of evacuees and procedures can be found in the Rest Centre Activation and Operating Procedures. These plans include contacts of internal and external transport contractors to assist in an emergency. Rest Centres are not identified in this plan.

Boroughs may call upon the voluntary sector for assistance in an emergency, and in particular the Salvation Army in Havering.

Evacuation routes and traffic management arrangements are not specified in this plan as these arrangements will depend on the flood situation itself. However, evacuation routes and traffic management will be discussed in the initial phases of the response.

A resources list can be found in Appendix G of this document.

For further information please see the London Borough of Havering Recovery Management Protocol.

12. Recovery

The purpose of providing recovery support is to assist the affected community towards management of its own recovery. It is recognised that where a community experiences a significant emergency, there is a need to supplement the personal, family and community structures which have been disrupted.

The recovery phase of a flooding incident must begin as soon as practicably possible and run along side flood response operations. Following the end of the emergency response phase to a flooding incident, the BECC will decide when it is appropriate to stand down. At this point control will officially be handed back to directorates and services to run as 'business as normal' or to the designated recovery team as required.

Recovery is more than simply the replacement of what has been destroyed and the rehabilitation of those affected. It is a complex social and developmental process rather than just a remedial process. The manner in which recovery processes are undertaken is critical to their success. Recovery is best achieved when the affected community is able to exercise a high degree of self-determination.

Common issues following flooding include:

- Clean up and waste disposal
- Repairs to public infrastructure – schools, buildings, roads, bridges
- Restoration of power, communications and water
- Domestic and business insurance needs
- Displaced businesses
- Humanitarian assistance needs including
    - Homeless/ displaced residents
    - Psychological impacts
- Environmental impacts.

Please refer to the Havering Recovery Management Protocol held by the Borough Emergency Planning and Business Continuity Service for further details on recovery.

13. Training and Exercising

It is essential to train responding officers in their roles and responsibilities before they need to use the plan during an exercise or an actual event. Training should take place at appropriate intervals to maintain awareness and to inform responding officers of any amendments.

Exercising the plan and responding officers will identify areas for improvement and ensure that staff are able to deal with a flooding incident, should one occur. Exercises aim to validate the plans, train staff and test procedures.

Such exercises may be internal, or tied into other multi-agency exercises. They should confirm the roles and responsibilities or responding departments / agencies, as well as the adequacy of communications, resources and equipment.

It is recommended that exercising this plan at operational and strategic levels is undertaken whenever there is a major revision, or at least every three years.

Organiser	LFB Emergency Planning	**Exercise Title**	Safer City 2010
Date	25/03/2010	**Type**	Table Top
Relevant lessons / link	This was an exercise predominantly designed to test the warning and informing arrangements within flood plans. Exercise report is : W:\data01\EP & BCU\EMERGENCY PLANNING\EXERCISES\Exercise Safer City 2010\Inject 1 Havering 1_1.doc		

Organiser	LFB Emergency Planning	**Exercise Title**	Safer City 2015
Date	13/10/2015	**Type**	Command Post/BECC
Relevant lessons / link	:\\Romford\shareddata\data01\EP & BCU\EMERGENCY PLANNING\EXERCISES\Safer City 2015 PXR - final draft.pdf		

Organiser	LBH EP and BC Service	**Exercise Title**	Exercise Atlantis
Date	30/5/17	**Type**	Table Top
Relevant lessons / link	This was a multi -agency exercise to test the Borough's response and recovery to a major flooding incident using this Multi-agency Flood Plan. The scenario was based on a development of the extensive flooding that occurred in Havering in June 2016. Exercise report is: \\Romford\shareddata\data01\EP & BCU\EMERGENCY PLANNING\EXERCISES\Exercise Atlantis\Exercise Atlantis Post Exercise Report.rev 1.docx		

14 Community Flood Risk Sheets

14.1: The River Thames from Mar Dyke to Barking Creek	**Ref: 063FWT23Barking**

The River Thames from Mar Dyke to Barking Creek including Rainham Marshes, South Hornchurch, Ford Motor Works, Creekmouth, the New England Estate and South Barking.

Key Vulnerable Infrastructure

Chafford Secondary School (Lambs Lane), Brady Primary School (Wennington Road) and Rainham Village Primary School, Brights Day Care Centre (Upminster Road North), Royals Youth Centre (Viking Way), Wennington Fire Station (Wennington Road), Post Office and Sorting Office (Wennington Road), Flogas (COMAH site/Marsh Way), Tesco's (Bridge Road), Cleanaways (Havering's waste disposal site/Coldharbour Lane), CEME (Marsh way), Library (Broadway), Rainham Station (Ferry Lane) and CTRL and C2C Railway lines and various industrial estates.

No. of people / properties at risk in Flood Warning Area	**No. of properties registered to Flood Warning Service (FWD & EDW*)**	**Return Period**
9766	7732	100
Frequency of Flooding	**Probability of Flooding**	**Lead Time**
1:1000	1%	2 hours. No lead time for breaches.

Flooding History (if known)

Tidal flooding has been recorded twice in this flood warning area.

In October 1707, there was a breach in the defences at Dagenham which affected part of this flood warning area. The defences took some time to repair, so subsequent tides caused significant damage over a long period of time.

The January 1953 flood also affected parts of this flood warning area.

Flood Defences / Alleviation Measures (if any)

Tidal flood defences line the entire stretch of this section of the tidal Thames, ranging in height from 5.5 metres above ordinance datum (AOD) along the banks of Barking Creek to 7.1m AOD. Barking Creek is protected by the Barking Barrier. The Barking barrier is also positioned at the exit of the River Roding tributary that flows along the border of the London boroughs of Newham and the London Borough of Barking & Dagenham. This can be lowered in an effort to stop tidal flood water flowing up the River Roding channel and meeting fluvial flow. However, the Barking Barrier may not be closed if fluvial flows in the river are sufficiently high. If the Barking Barrier were to close with high fluvial flows, this could cause a dam effect.

As well as the River Roding, the rivers Beam and Ingrebourne enter the Thames in

this Flood Warning Area. Both rivers have tidal sluices where they meet the River Thames. The prime function of the sluices is to prevent the tidal flows from the Thames entering the River Beam and Ingrebourne and thus causing flooding. The River Beam sluice site is situated in Ford's complex at Dagenham.

Elsewhere, the river embankments are a mixture of stone pitched and concrete faced embankments, vertical steel sheet piling, masonry and concrete walls. Downstream of the Barrier, there are large steal gates that must be closed during a Thames Barrier closure. Flood defences downstream are higher than upstream, as the Barrier itself can be used to block the river if embankments are likely to be overtopped upstream. Upstream defences in this section of the tidal Thames is made up of property and commercial frontages with removable gates. These flood defences include small defences, gates and floodboards. These are the responsibility of riparian owners.

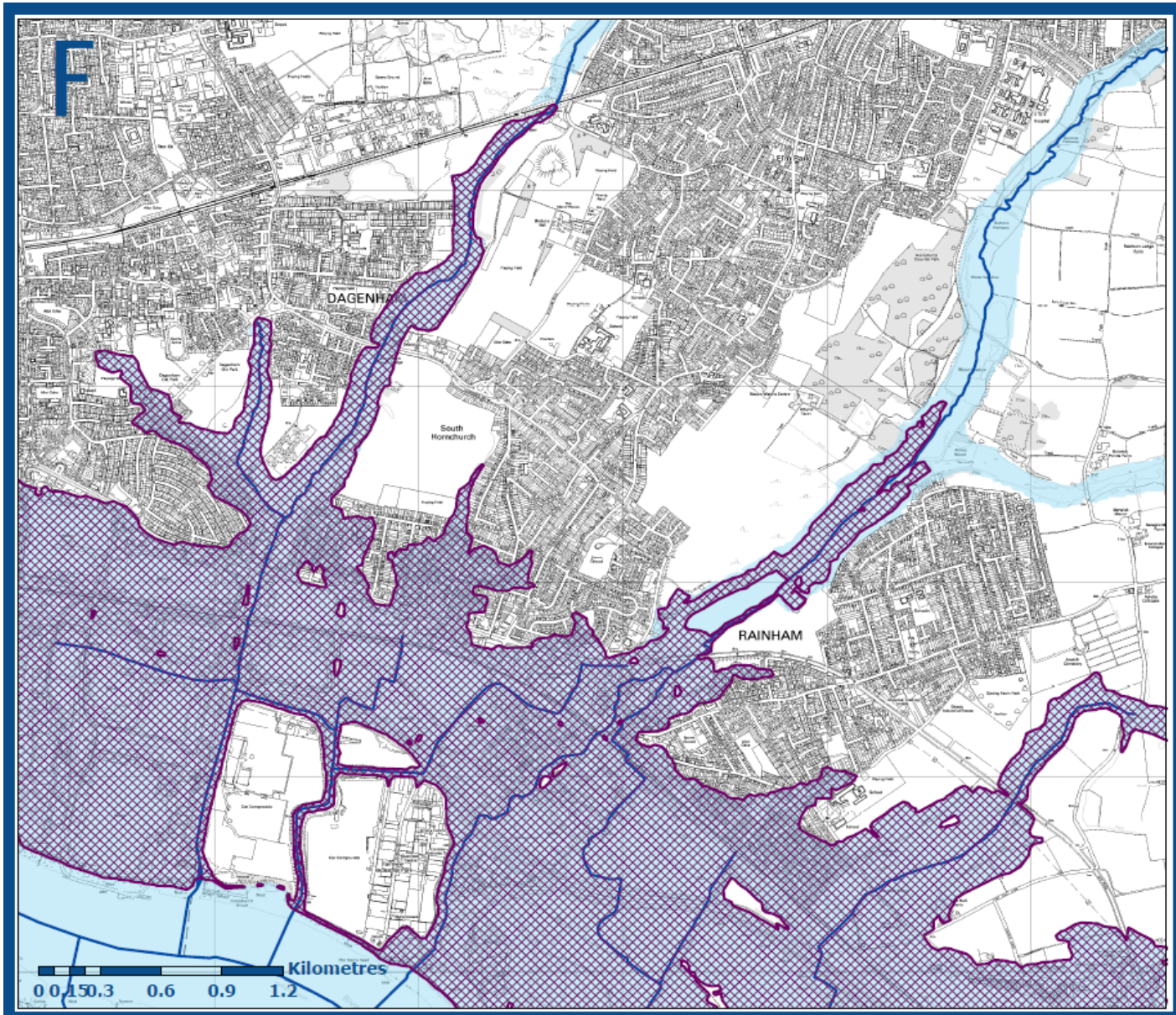
The area behind the defences in this Flood Warning Areas are populated with a mixture of residential, commercial and recreational properties as well as large areas of marsh land. Works were designed to provide a level of protection to a 1:1000 year flood standard for the main channel of the Thames. Defence levels were set by statute in 1930.

Tidal defences are inspected at least twice per annum from both the river side and the land side of the defence, as a major breach would have serious consequences due to high-density urbanisation and extensive transport infrastructure which includes the London Underground. Tide, tidal surge and Thames flow data and forecast surge are monitored at the Thames Tidal Defences Control Room, Thames Barrier, and the Thames Barrier (and subsidiary gates) will be closed should the need arise.

Flood Warning Status Area(s) at risk	**Locations Affected**	**Message Issued**
The River Thames from Mar Dyke to Barking Creek	Areas include Rainham, Wennington and Aveley Marshes, Wennington Village, South Rainham and the Rainham sewage works, South Hornchurch, Ford Motor Works, Creekmouth, the Dagenham Breach, the New England Estate and South Barking. Major roads likely to affected are: A13, A1306 and A123. Dagenham Dock and Rainham National Rail stations are also in this Flood Warning Area	Flood Warning Flood Warning Update Severe Flood Warning

Risk Assessment: (Based on HL 17)		
Likelihood	3	**Final Risk Rating**

Impact -Health -Social -Economic -Environmental	Overall Impact 3 2 4 3 3	**Rick Category: High**
* FWD – Flood Warnings Direct, EDW Extended Direct Warnings		



Environment Agency

KEYPLAN

LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

The data provided is based on that currently available to the Agency. It should not be taken as definitive as full surveys may not have been carried out. Localised flooding from drains and small watercourses is not included. The Agency accepts no liability for any loss or damage arising from the interpretation or use of the information.

The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

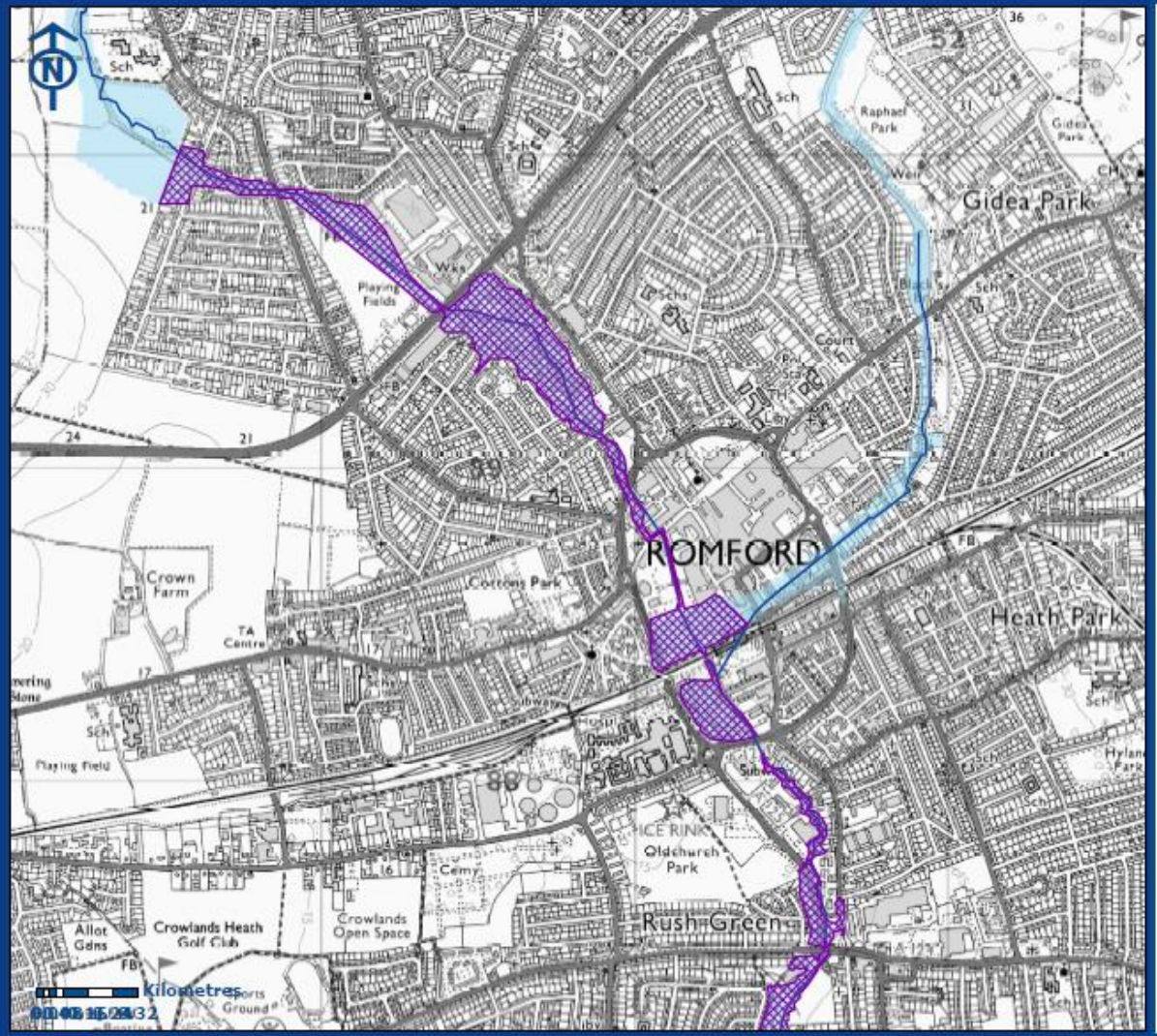
DRAWING NUMBER: 063FWT23Barking (2 of 3)
MAP 4

The River Thames from Mar Dyke to Barking Creek

Flood Warning Area: 063FWT23Barking

14.2: The River Rom at Romford		**Ref: 062FWF55Romford**
The River Rom including Rush Green.		
Key Vulnerable Infrastructure		
Romford Ambulance Station (Bridge Close), Mawney Primary School (Como St), Crownfield Primary School (Cross Rd), Heatherbrook Nursing Home (80 Como St), Lombard Court (Poplar St) and Cottons/Fambridge Court (Marks Road) both sheltered housing schemes, Beech Court Care Centre (298-304 South St), Churchill House Res Care Home (48-50 Mawney Road), Romford Town Centre (particularly subways) and access routes into Queens Hospital(Rom Valley Way).		
No. of people / properties at risk in Flood Warning Area)	**No. of properties registered to Flood Warning Service (FWD & EDW*)**	**Return Period**
452	265	100
Frequency of Flooding	**Probability of Flooding**	**Lead Time**
1:100	1%	2 hours
Flooding History (if known)		
2016 – June - Property flooding occurred in Collier Row, YMCA Rush Green and Health Surgery in Upper Rainham Road as the Rom came out of its banks 2000 – December – Property gardens and industrial works in Romford were affected by flood water 1987 – August – Property flooding in Collier Row and Romford as the Rom came out of its banks 1974 – November – No property flooding recorded, flood waters kept within flood plain.		
Flood Defences / Alleviation Measures (if any)		
Defences include a natural earth defence reinforced with sections of concrete wall upstream of the A12 Road Bridge, two access ramps, one adjacent to South Road and one at Old Church Road and an area of earth depression at Cross Road Flood Storage Area embankment that allows peak flows to enter the Flood Storage Area. We also operate a River Flow Gauging Station at the downstream end of Cedar Close Road culvert. As part of the River Rom Flood Alleviation Scheme a concrete lined defence was constructed around a 2-stage channel upstream of Rush Green Road bridge.		
Flood Warning Status Area(s) at risk	**Locations Affected**	**Message Issued**
The River Rom at Romford	Mawney Road, North Street, St Edwards Way,	Flood Warning

	High Street, Bridge Close, Gorseway, The Chase, Collier Row Road, Cross Road, Asten Way,	Flood Warning Update Severe Flood Warning
Risk Assessment: (Based on HL 19)		
Likelihood	4	**Final Risk Rating** **Very High**
Impact -Health -Social -Economic -Environmental	Overall impact 4 3 5 4 3	
* FWD – Flood Warnings Direct, EDW Extended Direct Warnings		



Environment Agency

KEYPLAN

LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

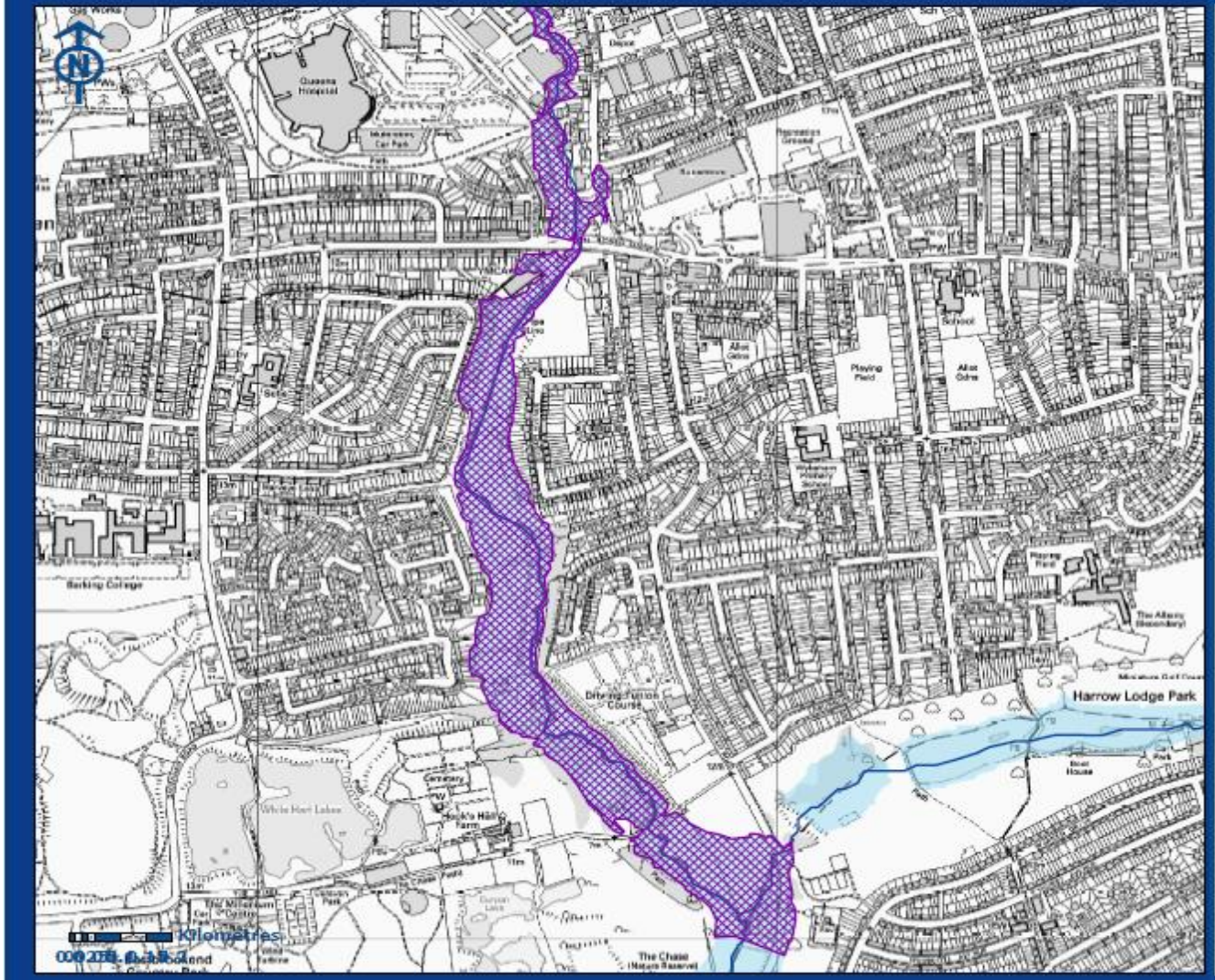
The data provided is based on that currently available to the Agency. It should not be taken as definitive as full surveys may not have been carried out. Localised flooding from drains and small watercourses is not included. The Agency accepts no liability for any loss or damage arising from the interpretation or use of the information.

The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

DRAWING NUMBER: 062FWF55Romford (1 of 2)
MAP 4

The River Rom at Romford including Rush Green

Flood Warning Area: 062FWF55Romford



Environment Agency

KEYPLAN

LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

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The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

DRAWING NUMBER: 062FWF55Romford (2 of 2)
MAP 4

The River Rom at Romford including Rush Green

Flood Warning Area: 062FWF55Romford

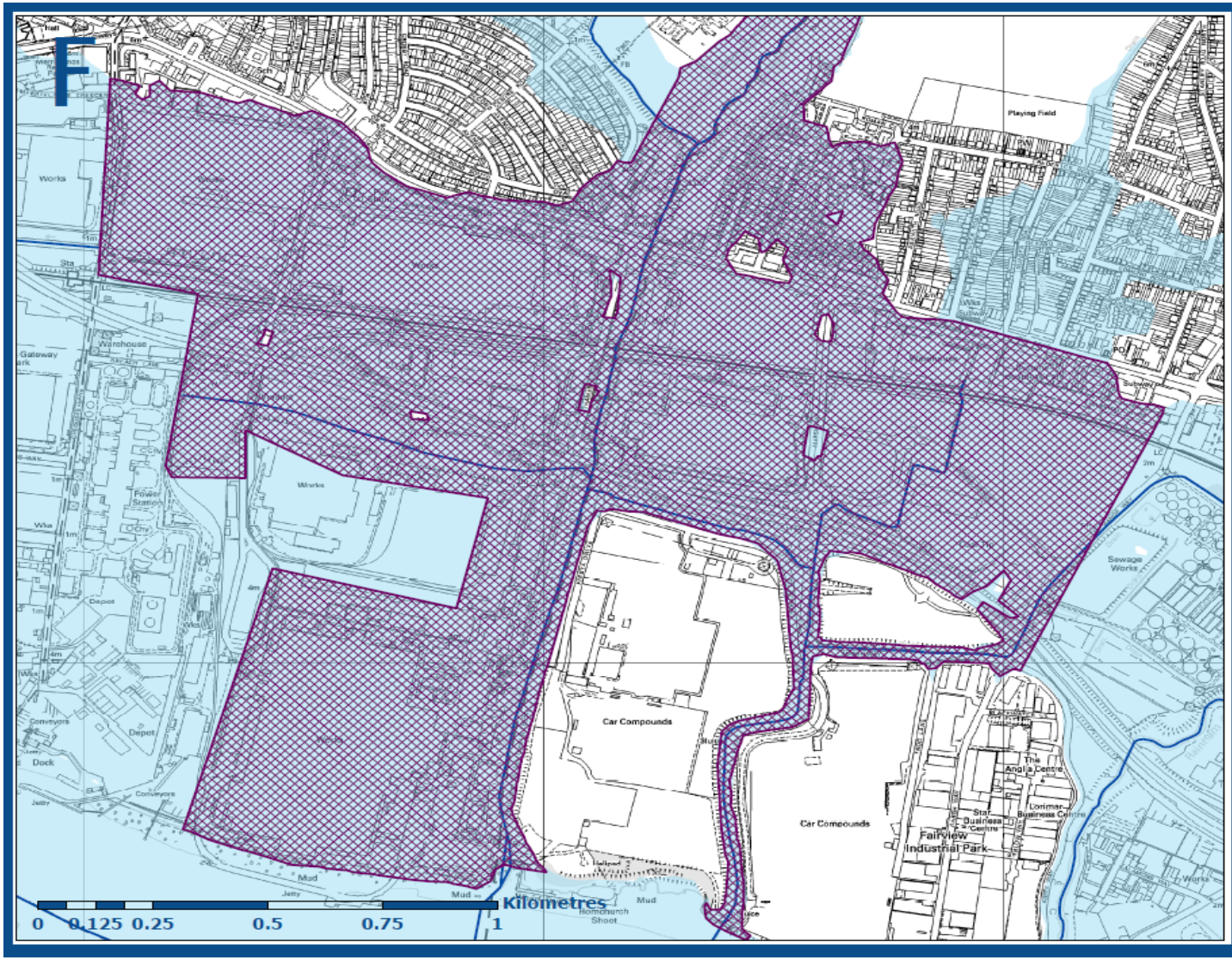
14.3: The River Beam at Dagenham		**Ref: 062FWB55Dagenham**
The River Beam at Dagenham including Rainham.		
Key Vulnerable Infrastructure		
Orchard Place Housing Estate (formerly the Mardyke Estate), Newtons Primary School (Lowen Road), and various industrial areas including Ford works.		
No. of people / properties at risk in Flood Warning Area)	**No. of properties registered to Flood Warning Service (FWD & EDW*)**	**Return Period**
608	397	100
Frequency of Flooding	**Probability of Flooding**	**Lead Time**
1:100	1%	2-4 hours
Flooding History (if known)		
2000 – December - Property Gardens in Dagenham were affected by flood water 1974 – November - No property flooding recorded, flood waters kept within flood plain 1953 – January - Widespread flooding of the industrial area to the north of the River Thames affecting properties at Beam reach and Sutton Business Parks		
Flood Defences / Alleviation Measures (if any)		
Beam Washlands Works – Washlands is a flood storage area on the River Beam. The storage area is owned and operated by the Environment Agency. Its earth embankments were constructed in 2006 and in 2007 endured major refurbishment of the control structure. In addition, the storage capacity will be increased therefore improving the flood risk management standard downstream. The Environment Agency have constructed pumping stations at Beam Tidal Sluice and Horseshoe Corner Tidal sluice on the Gores Brook. Beam Tidal Sluice – This structure is a tidal sluice at the outfall of the River Beam to River Thames. Its main function is to prevent the tidal flows from the River Thames entering the River Beam and thus causing flooding. The site is situated in Ford's industrial complex at Dagenham. Local improvement works for this Flood Warning Area include the construction of the Bretons Park Storage Area, an offline flood storage lake completed in 1983 and the Washlands Flood Storage Reservoir upstream of the A13 completed in 1962, with capacity increased in 1984. Channel and bank improvements were also carried out in 1984 such as the concrete lining of the channel, construction of embankments at Rush Green Road and earth channel improvements at Gorseway. Construction of the Beam outfall and tidal sluice was also completed in 1969. These works were designed to provide a level of		

protection to a 1 in 70 year standard.

Flood Warning Status Area(s) at risk	Locations Affected	Message Issued
The River Beam at Dagenham	Low lying land and property surrounding the River Beam from it's confluence with the Rivers Rom and Ravensbourne downstream to, and including, the industrial area on the north bank of the River Thames. The area includes Lower Mardyke Avenue, South Street, New Road, Marshway, Thames Avenue, Kent Avenue, Consul Avenue, Ford Industrial Park, Beam Park, Suttons Business Park and Courier Road	Flood Warning Flood Warning Update Severe Flood Warning

Risk Assessment: (Based on HL19)		
Likelihood	4	**Final Risk Rating**
Impact -Health -Social -Economic -Environmental	Overall impact 4 3 5 4 3	**Very High**

* FWD – Flood Warnings Direct, EDW Extended Direct Warnings



Environment Agency

KEYPLAN

LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

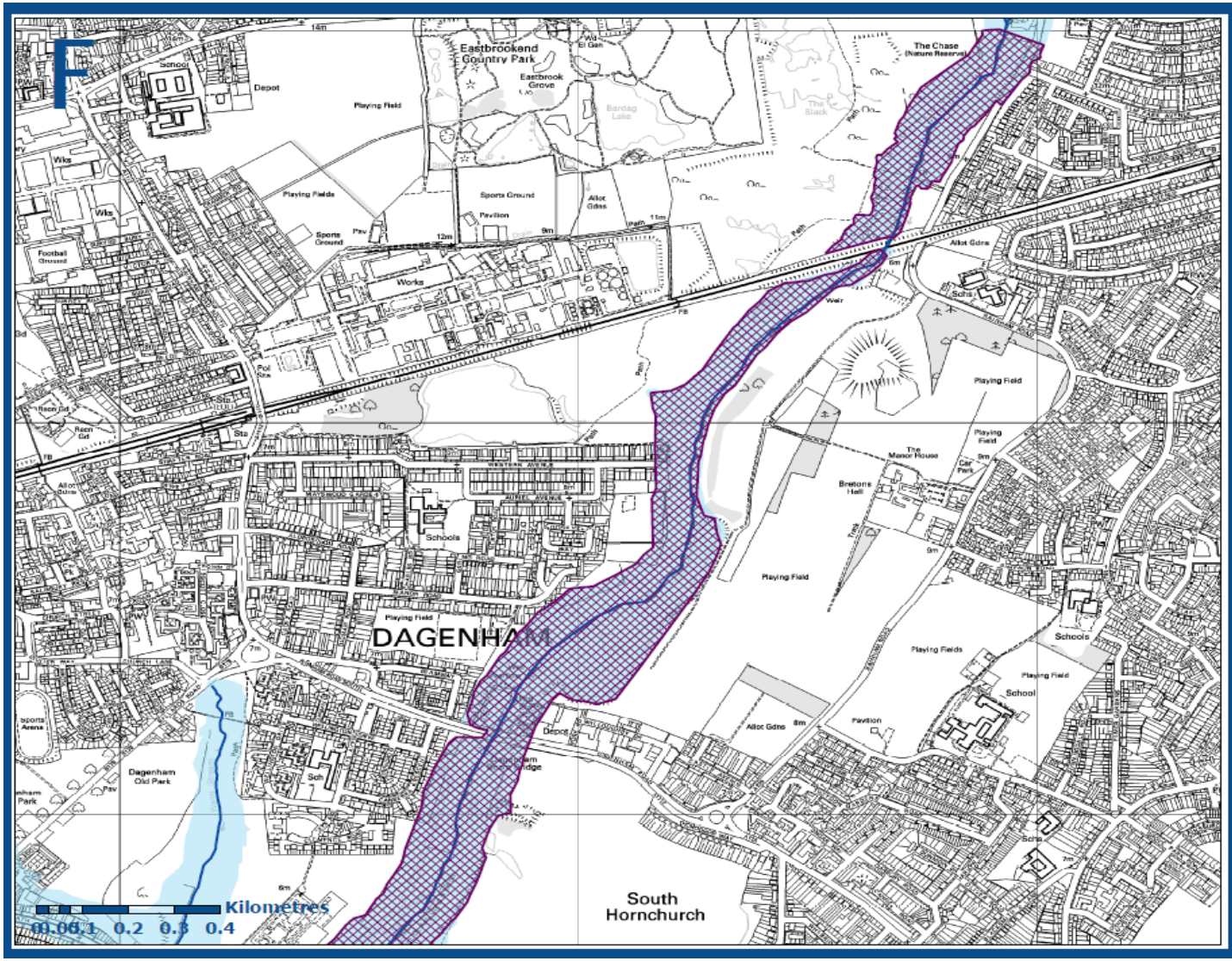
The data provided is based on that currently available to the Agency. It should not be taken as definitive as full surveys may not have been carried out. Localised flooding from drains and small watercourses is not included. The Agency accepts no liability for any loss or damage arising from the interpretation or use of the information.

The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

DRAWING NUMBER: 062FWB55Dagenham (1 of 2)

The River Beam at Dagenham including Rainham

Flood Warning Area: 062FWB55Dagenham



Environment Agency

KEYPLAN

LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

The data provided is based on that currently available to the Agency. It should not be taken as definitive as full surveys may not have been carried out. Localised flooding from drains and small watercourses is not included. The Agency accepts no liability for any loss or damage arising from the interpretation or use of the information.

The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

DRAWING NUMBER: 062FWB55Dagenham (2 of 2)

The River Beam at Dagenham including Rainham

Flood Warning Area: 062FWB55Dagenham

14.4: The River Ingrebourne at Harold Park	**Ref: 062FWF55Haroldpk**
The River Ingrebourne at Harold Park including Harold Wood.	
Key Vulnerable Infrastructure	
Cockabourne Court (Archibald Rd) and Ethelburga Court (Ethelburga Rd) both sheltered housing schemes, Harold Court Primary School (Church Rd) and Bates Industrial Estate.	

No. of people / properties at risk in Flood Warning Area)	**No. of properties registered to Flood Warning Service (FWD & EDW*)**	**Return Period**
44	39	100
Frequency of Flooding	**Probability of Flooding**	**Lead Time**
1:100	1%	2 hours

Flooding History (if known)

2012 – July - Roads in Harold Wood were affected by flooding

1974 – November - Widespread flooding throughout Flood Warning Area.

1968- September- Widespread flooding throughout Flood Warning Area, property flooding in Harold Park, Upminster and low lying properties in Rainham

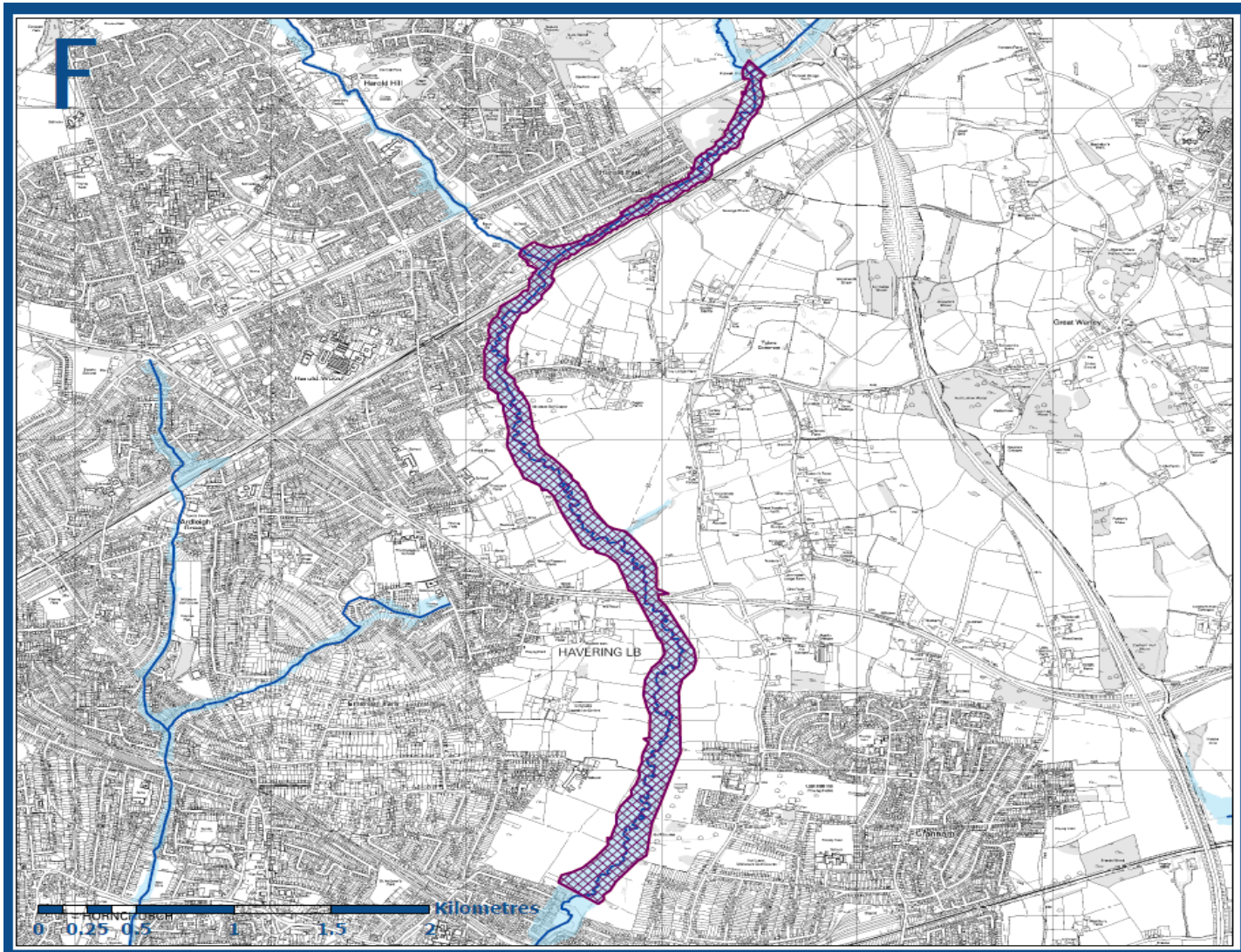
Flood Defences / Alleviation Measures (if any)

Local works for this Flood Warning Area have been carried out on Paine's Brook which includes channel improvements and bank raising. In addition to this, the culvert under Church Road was rebuilt. Steel sheet piled walls were also installed downstream of Church Road to the Ingrebourne confluence in order to increase capacity of the channel.

On the main channel of the Ingrebourne, works were carried out to the railway bridge at Bates Road Industrial Estate. The current flood defence works on the River Ingrebourne are designed to provide flood protection standards of a 1 in 50 year flood event.

Flood Warning Status Area(s) at risk	**Locations Affected**	**Message Issued**
The River Ingrebourne at Harold Park	Low lying riverside properties surrounding the River Ingrebourne from it's confluence with the Weald Brook south west to it's confluence with the	Flood Warning Flood Warning Update Severe Flood Warning

	Paines Brook and then South to Upminster Golf Club. The area includes Ingre Way, Archibald Road, the A127, and Ingrebourne Farm	
Risk Assessment: (based on HL 19)		
Likelihood	4	**Final Risk Rating**
Impact -Health -Social -Economic -Environmental	Overall impact 4 3 5 4 3	**Very High**
* FWD – Flood Warnings Direct, EDW Extended Direct Warnings		



Environment Agency

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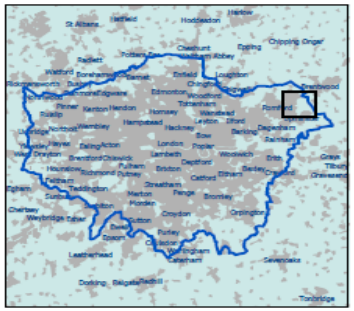


LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

The data provided is based on that currently available to the Agency. It should not be taken as definitive as full surveys may not have been carried out. Localised flooding from drains and small watercourses is not included. The Agency accepts no liability for any loss or damage arising from the interpretation or use of the information.

The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

DRAWING NUMBER: 062FWF55HaroldPk (1 of 1)

The River Ingrebourne at Harold Park

Flood Warning Area: 062FWF55HaroldPk

14.5: The River Ingrebourne at Hornchurch		**Ref: 062FWF55Hornchurch**
The River Ingrebourne at Hornchurch including Upminster and Rainham.		
Key Vulnerable Infrastructure		
La Salette Catholic Primary School and the telephone exchange (Rainham Rd), A1306, Rainham Station and the C2C/CTRL railway lines, Tesco's (Bridge Rd), and the Royals Youth Centre, Library and local shops (Rainham village).		
No. of people / properties at risk in Flood Warning Area)	**No. of properties registered to Flood Warning Service (FWD & EDW*)**	**Return Period**
547	466	100
Frequency of Flooding	**Probability of Flooding**	**Lead Time**
1:100	1%	2 hours
Flooding History (if known)		
2016 – June - I pub flooded and garden outbuildings in Frimley Avenue River bank collapsed in Rainham by Dovers Corner 2012 – July - 1 property flooded and roadways where flood plain exceeded in Harold Wood and Upminster . 2003 – January – Flooding within Rainham 2000 – October - Historically, roads and properties in Romford, Hornchurch, Rainham and Upminster were affected by flooding during these events 1992 – October - Small scale patchy flooding on outskirts of Upminster, some property flooding on Frimley Avenue 1974 – November - Widespread flooding throughout Flood Warning Area, however mostly rural flooding 1968 – September - Widespread flooding throughout Flood Warning Area, property flooding in Harold Park, Upminster and low lying properties in Rainham		
Flood Defences / Alleviation Measures (if any)		
Local works for this Flood Warning Area have been carried out on Paine's Brook which includes channel improvements and bank raising. In addition to this, the culvert under Church Road was rebuilt. Steel sheet piled walls were also installed downstream of Church Road to the Ingrebourne confluence in order to increase capacity of the channel.		

On the main channel of the Ingrebourne, works were carried out to the railway bridge

at Bates Road Industrial Estate. The current flood defence works on the River Ingrebourne are designed to provide flood protection standards of a 1 in 50 year flood event.

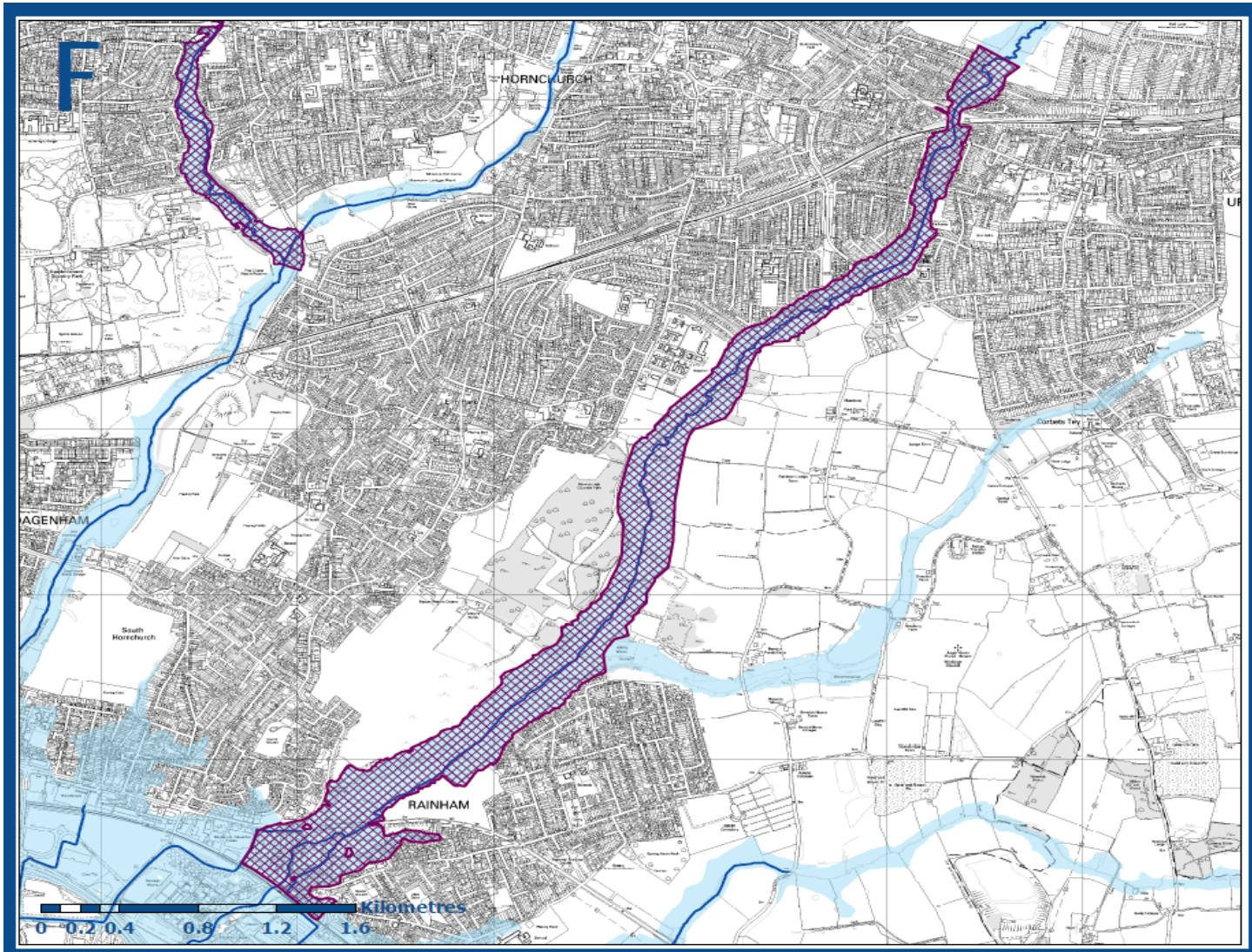
In 1997, river works downstream of the old A13 at Dover's Corner included bridge works, channel improvements and the removal of Red Bridge sluice gates.

Local protection works such as the construction of retaining walls, toe piling, improvement works to bridges and embankments were carried out at Upminster Bridge, St Mary's Lane and were completed in 1987.

Flood Warning Status Area(s) at risk	**Locations Affected**	**Message Issued**
The River Ingrebourne at Hornchurch including Upminster and Rainham.	Low lying riverside properties surrounding the River Ingrebourne from Frimley Avenue to Rainham Library including Hornchurch Football Club, Derby Avenue, Ingrebourne Valley Greenway, Suttons Parkway, The Watermeadow, Rainham Road, Sterling Close, Viking way, Creekside and Broadway.	Flood Warning Flood Warning Update Severe Flood Warning

Risk Assessment: (based on HL19)		
Likelihood	4	**Final Risk Rating**
Impact -Health -Social -Economic -Environmental	Overall impact 4 3 5 4 3	**Very High**

* FWD – Flood Warnings Direct, EDW Extended Direct Warnings



Environment Agency

KEYPLAN

LEGEND

Extreme Flood Outline

Flood Warning Area

River

The area outlined in purple indicates the flood warning area.

The data provided is based on that currently available to the Agency. It should not be taken as definitive as full surveys may not have been carried out. Localised flooding from drains and small watercourses is not included. The Agency accepts no liability for any loss or damage arising from the interpretation or use of the information.

The extreme flood outline represents a 0.1% chance of flooding in any one year to this extent. (1 in 1000 year flood event)

DRAWING NUMBER: 062FWF55Hornchur (1 of 1)

The River Ingrebourne at Hornchurch

Flood Warning Area: 062FWF55Hornchur

14.6. Havering Critical Drainage Areas (HCDA's)

These are areas which are likely to be most at risk of flooding from local sources (surface water, groundwater and ordinary watercourses). These areas have been termed Havering Critical Drainage Areas or HCDAs to differentiate them from Critical Drainage Areas that can be designated by the Environment Agency. The Environment Agency has not designated any Critical Drainage Areas in the London Borough of Havering. Based on the EA's updated flood mapping for surface water (uFMfSW) 2017, a number of residential and commercial properties in Havering could be at risk of flooding from local sources (principally surface runoff generated by intense rainfall, groundwater and ordinary watercourses). In areas susceptible to local flooding, the volume of runoff and sufficiency of the drainage, ordinary watercourse and sewer systems are critical to determining the degree of flood risk. For this reason, the Strategic Flood Risk Assessment has delineated HCDA's across the Borough. A summary of the larger HCDA's lying outside fluvial Flood Zones is provided below:

Romford

The extent of FZ3 within the Romford area is mainly within the river channel. However the uFMfSW identifies three areas beyond the area of fluvial flood risk in FZ3 that are at risk of flooding from surface water:

- Upstream of the A12;
- Immediately upstream of the town centre;
- Between the town centre and the A124.

In each case there are extensive areas at risk from surface water flooding under the 3% AEP event.

Rise Park

The uFMfSW identifies an area at risk of flooding upstream (north) of the A12 at Rise Park. There is an extensive area at risk from the 3.3% (1 in 30) and 1% (1 in 100) annual chance events in the vicinity of Pettits Lane North, Heather Gardens and Linton Court. The flowpath upstream is contained on the highway but its passage appears to be blocked by the A12. The predicted flooding closely matches that predicted by the Drain London SWMP.

Harold Hill

The uFMfSW identifies a flow path to the north of Harold Hill running eastwards towards Carters Brook. There is an extensive area of flooding predicted under the 3.33% (1 in 30) annual chance event. The properties at risk are centred upon Taunton Road and North Hill Drive. Upstream a number of flowpaths converge from the rural areas at Noak Hill Road. The Drain London SWMP predicts a similar flowpath but with a narrower extent in the urban area.

Gallows Corner

The uFMfSW identifies a flow path running southwards towards Gallows Corner on the A12, north-east of Romford. This closely matches the flood mapping produced by the Drain London SWMP. The flow path affects properties to the south of Myrtle Road and then appears to be impeded by the Gallows Corner roundabout as there is extensive predicted flooding immediately to the north.

Upminster

The uFMfSW identifies two main branches of surface water flood risk upstream of the Main River extent of the western branch of the River Mardyke in Upminster. The northern flood path rises south of the A127 in Pot Kiln Wood and then flows southwards potentially placing properties at risk in Front Lane, Waycross Road, and Brunswick Avenue. There is a second smaller branch which places properties at risk on Roseberry Gardens and Cranham Gardens. These flow paths combine to flow southwards along Front Lane and then eastwards along Moor Lane to the Mardyke. The southern flow path is to the south of St. Marys Lane (B187). This is currently a rural area and consequently few properties are at risk of flooding.

Hacton

There is an Ordinary Watercourse which flows south-westwards from Upminster towards the Ingrebourne through Hacton. This is identified on the uFMfSW but is not designated as FZ3. The watercourse is predominantly rural, however, at its head; the uFMfSW does identify roads in Upminster: Maple Avenue, Oak Avenue and South View Drive as at risk of flooding.

Elm Park and South Hornchurch

Elm Park lies between the Beam and the Ingrebourne and the uFMfSW identifies a flow path running south-westwards towards South Hornchurch where it joins a drain to the Beam. The flow path places properties at risk of flooding on a number of roads and flows through the grounds of Brittons Academy. There is a second area of flood risk from surface water to the east potentially affecting properties on a number of roads in South Hornchurch. The route initially follows South End Road and then Nelson Road.

15. Bibliography

Civil Contingencies Act (2004)

HM Publication Emergency Preparedness (2005)

HM Publication Emergency Response and Recovery (2005)

HM Publication National Recovery Guidance

Evacuation and Shelter Guidance HM Publication

DEFRA Guidance on Planning for Major Water and Wastewater Incidents (2006)

LESLP Major Incident Procedure Manual

EA Local Flood Warning Plan for the Greater London Metropolitan Police Area

EA Local Flood Warning Plan for the Essex Area

EA Website: http://www.environment-agency.gov.uk

LB Havering website: http://www.havering.gov.uk

Appendix A – General Public Advice

Preparing for a flood

Over the last few years the risk of flooding has increased significantly. The Rivers Rom, Beam and Ingrebourne are monitored continually, last causing a problem in June 2016 where widespread flooding occurred.

No-one can stop flooding altogether, but we can be prepared by taking a few precautions:

- Make sure you know how to turn off your electricity, gas and water
- Keep your emergency pack available
- Think about how you would cook, or prepare meals, without gas or electricity supplies
- When choosing furniture, floor coverings etc, keep in mind how they may be affected by water and the need to be able to move them easily
- Consider the most appropriate insurance cover for your home and contents – it's too late after a flood

In the event of flooding

If flooding affects you or your property, there are a few simple practical tips you can follow to reduce the risk and damage floodwater can cause.

Do……

- Stay calm
- Check that neighbours know about any flood warnings that may have been issued. If you know that you live in a flood risk area, you may be able to subscribe to the free Environment Agency automated flood-warning system
- Switch off gas, water and electricity
- Try to reduce, floodwater coming into your home without taking unnecessary risks. If possible, try to cover doors, windows and airbricks
- Move people and animals to a place of safety. Remember to provide a litter tray for pets and have pet carriers available if possible
- Unplug electrical items and store them upstairs if possible. For larger appliances such as fridges and freezers, it may be necessary to raise them on bricks.
- If you can, move furniture, rugs, valuables and sentimental items upstairs
- Have a supply of drinking water in clean bottles or similar containers
- Fill the bath and buckets with water for washing etc.
- Listen to the local media for up-to-date news on the flood
- Have your emergency grab bag to hand
- If you need to be evacuated because of severe flooding or damage, contact the emergency services on 999

- If flooding traps you, stay by a window and try to attract attention
- REMEMBER TO LOCK UP if you leave your property
- Avoid moving water

Don't…..

- Throw rubbish into watercourses or leave debris on the banks – it can add to the flooding problem
- Try to walk or drive through floodwater – there may be hazards you can't see, such as raised manhole covers
- Drink domestic water supply until you are advised it is safe
- Use the floodwater for drinking, food preparation, washing or bathing, the water will be contaminated with sewage and other pollution
- Use any foodstuffs that have been in contact with floodwater

After a flooding incident

When flood water recedes, it may leave a muddy deposit. As well as the distress of clearing up there may be structural damage to your property. So:

- Remember that while sandbags help to keep water out, they will also keep it in as the level goes down
- Refer to the Yellow Pages, under "flood protection" which gives details of qualified assistance such as plumbers and electricians as well as suppliers of cleaning materials and equipment
- It may be necessary to contact utility suppliers to reconnect supplies
- Don't use electrical circuits or equipment exposed to floodwater until they are checked by a qualified electrician
- Contact your insurance company immediately. Don't dispose of damaged goods until your insurers have had a chance to inspect them and remember to keep records of flood damage (photos etc)

Cleaning up after a flood

Do not re-enter your house until all floodwater has been removed. The local fire service may be able to help you with pumping floodwater out, but others may also need this help so you may have to wait your turn. Remember – there is no point pumping out rising water as it will come straight back in!

If traffic is causing waves and further flooding to your property, contact the police. Alternatively, if flooding is being caused by a public sewer, contact Thames or Anglia water.

It is also recommended the following measures are taken:

- Ventilate your building after flooding – less damp is less damage; it takes a house brick about one month per inch to dry out
- Put on protective clothing such as rubber gloves and wellington boots before starting any clean-up – the water will have been contaminated with sewage and other pollution
- Remove all soft furnishings and fittings that are damaged beyond repair (Unless insurance states otherwise)

- Remove dirty water and silt from the property, including the space under the ground if you have wooden floors. This space may need pumping out
- Wash down all hard surfaces with hot soapy water

- Use a domestic disinfectant (following manufacturers' directions as to concentrations) to wash all hard surfaces after cleaning
- Launder clothing, bedding and other soft or fabric articles, including children's toys, etc, at the highest temperature as indicated on manufacturers' instructions
- Arrange professional cleaning for other soft furnishings that have been contaminated and cannot be put in a washing machine or, if this is not possible, dispose of them
- Seek advice from the council on cleaning up if you have any doubts
- Seek professional advice if your property is damaged

If floodwater has damaged your property

If you are the property owner and insured, your insurers will most probably appoint a structural engineer or loss adjuster to carry out an assessment of your property and arrange repairs. If you are uninsured you may have to arrange this yourself. If you are a tenant, you may be responsible for the repairs, depending on your property owner. If in doubt contact your local Citizens Advice Bureau for further advice.

If your home is uninhabitable, and you are insured, your insurers may help you arrange emergency accommodation. If you are uninsured or a tenant and are made homeless, you should contact the Councils' Public Advice and Service Centre.

In addition there are leaflets available from the Environment Agency website at www.environment-agency.gov.uk

Annex A2 –Public Health England Advice

Flooding: health guidance and advice
https://www.gov.uk/government/collections/flooding-health-guidance- and-advice

Flooding presents a number of risks to health. This guidance helps professionals and the public address those risks and clean up safely.
People living through a flood:

- Flooding: planning, managing and recovering from a flood
- Flooding health advice: mental health following floods
- Floods: how to clean up your home safely
- Flooding: questions and answers about health

Frontline responders:

- Recovering from flooding: information for frontline responders
- Flooding and mental health: essential information for frontline responders

Appendix B – Media Announcements

The general public will receive information about potential flooding from various different medial sources

Residents in the London Borough of Havering can obtain information from radio and TV sources, as well as

Environment Agency website: www.environment-agency.gov.uk

Met Office website: www.metoffice.gov.uk

London Borough of Havering: www.havering.gov.uk

Produce message templates from the Communications Strategy in conjunction with the emergency services for a joint release and information. The LBH Communications Strategy is outlined and dealt with by the Assistant Director of Communications.

Appendix C – Sandbag Policy

In the floods of the summer of 2007, a substantial number of sandbags were used nationally to shore up defences and to protect properties and utilities throughout the affected areas. Sandbags were obtained from varying sources including the Environment Agency, commercial suppliers, the army, and local authorities.

Sandbag supplies were stretched to breaking point, as the responding agencies fought to hold back the rising floodwaters over a large geographical area. At the same time, there were thousands of calls from the public demanding sandbags with which to protect their properties. This placed further strain on both local authorities and the Environment Agency as they attempted to balance the priority dispersal of their already stretched sandbag supplies, while meeting the needs of an anxious population.

The London Borough of Havering will only sandbag any identified 'High risk' properties and installations in accordance with the Environment Agency Flood warnings and Met Office severe weather warnings, subject to availability of resources in both materials and labour. Contingency plans are in place to implement a temporary works program to prevent widespread flooding of those installations.

As the extent of flood prevention works cannot be predicted in advance of an event it is essential that the Council prioritise the distribution of sandbags according to the level of threat to the infrastructure and key installations within the authority area. It is therefore essential that Havering Council has a clear policy governing the supply of sandbags to the public during a major flood event.

Policy
In keeping with the strategic aim of preventing large scale flooding to the borough, key installations and public infrastructure priority will initially be given to:

- Repairs to existing flood defences
- Key installations: Utility stations, hospitals, schools, communication centres, council buildings (i.e. residential homes) and operational emergency services premises.
- Critical transportation routes and other essential roads.

Situations covered by this Policy
This policy is intended to counter the threat from overtopping of main rivers (River Thames, Rom, Beam & Ingrebourne), breaches of permanent or temporary defences, or areas of surface water flooding. In respect of non main-river flooding the council will not consider providing sandbags to affected property owners on a case by case basis for which a charge may be made.

Public Supplies
- Supplies of sandbags to the public generally will not be made unless residents are within the area designated as being part of a priority infrastructure area;

Note: If the facility was offered to the public then it will be kept under constant review during the incident and may be withdrawn at any time if stocks reduce to a level where the authority would be unable to meet its strategic aim.

Other Information
Householders and Commercial property owners in flood risk areas are encouraged to make their own provision for flood defence and not rely upon the council stock to defend their property

Sandbags will not totally prevent floodwater encroaching into property and householders should remove articles to a safe location above the anticipated flood level. People building flood defences with sandbags should also be aware of the building methods to employ in order to make an effective seal and the health & safety implication of manual handling sandbags as they are exceptionally heavy.

Further information on flood protection can be found on the Environment Agency web site: http://www.environment-agency.gov.uk/subjects/flood/

There are a number of web sites offering flood defence products to protect homes and offices. People who are serious about protecting their property should explore the practicality of the alternatives to sandbags.

LB Havering does not provide endorsement to flood protection products. It is for the purchaser to decide if a specific product is suitable to their needs. The British Standards Institute however now awards the BSI Kite mark to products they have tested and approved. This is a quality assurance check by an independent body and is only issued to products that meet the manufacturer's claims as proved by rigorous testing.

Appendix D – Building a Sandbag Wall

It is essential to fill the sandbags correctly. They must not be over-filled as the sand within the bag would not be able to form a solid wall. This would allow water to flow between sandbags.

Sandbag walls should never be constructed with a vertical face, but should be laid in a pyramid shape with never less than two rows at the top of the pyramid.

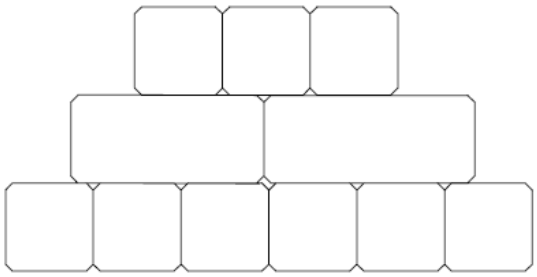


Figure x – Sandbag wall cross-section showing pyramid formation

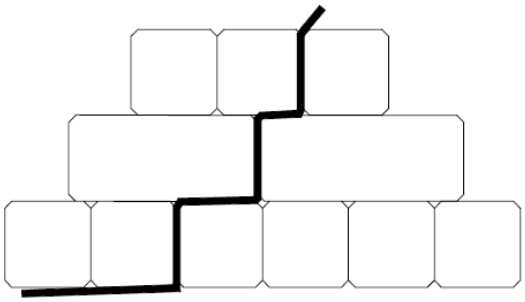


Figure x – Location of plastic waterproofing sheeting

Sandbag walls are not waterproof, but waterproofing can be achieved using plastic sheeting which is threaded through the layers. Avoid placing any of the outside walls in the direction of the water.

Appendix E - Responding Agency Responsibilities
(from LESLP Guidance)

	LESLP Guidance	LESLP Annex E (Flooding)
Police	▪ Saving of life ▪ Coordination of the emergency services, local authorities and other organisations ▪ Secure, protect and preserve the scene and control sightseers and traffic through the use of cordons ▪ Investigation of the incident and obtaining and securing of evidence ▪ Collection and distribution of casualty information ▪ Identification of the dead on behalf of HM Coroner ▪ Prevention of crime ▪ Family liaison ▪ Short term measures to restore normality	In the event of the agreed procedures for warning and informing communities at risk not being effective, then, where practicable, assistance will be given.
Fire	▪ Life saving through search and rescue ▪ Fire fighting and fire prevention ▪ Rendering humanitarian services ▪ Detection, identification, monitoring and management of hazardous materials and protecting the environment ▪ Provision of qualified scientific advice in relation to HAZMAT incidents via their scientific advisors ▪ Salvage and damage control ▪ Safety management within the inner cordon ▪ To maintain emergency service cover throughout the LFB area and return to a state of normality at the earliest time	Give assistance with pumping operations, depending on the situation prevailing at the time, priority being given to calls where flooding involves a risk to life, of fire or explosion and to calls from hospitals, residential homes for the elderly, public utilities and food storage depots. To assist other relevant agencies, particularly the local authority, to minimise the effects of major flooding on the community.
Ambulance	▪ Save life together ▪ Provide treatment, stabilisation and care of those injured at the scene ▪ Provide appropriate transport, medical staff, equipment and resources ▪ Establish an effective triage sieve, triage sort system and to establish a safe location for casualty clearing ▪ Provide a focal point at the incident for all NHS and other medical resources ▪ Provide communication facilities for NHS resources at the scene, with direct radio links to hospitals, control facilities and any other agency as required ▪ Nominate and alert the receiving hospitals ▪ Provide transport to the incident scene for the Medical Incident Officer (MIO), mobile medical/surgery teams and their equipment ▪ Arrange the most appropriate means of transporting those injured to the receiving and specialist hospitals ▪ Maintain emergency cover throughout the LAS area and return to a state of normality at the earliest time ▪ Act as a portal into the wider health services including Public Health England Regional Health Emergency Planning Advisors, and in the event of a CBRN incident advise on the convening of the Health Advisory Team (HAT) which will be able to advise and lead as far as health advice is concerned.	The LAS may become involved in the evacuation of vulnerable persons and supporting the local authority. It should be noted that the LAS does not possess any waterborne response capability.

Local Authority	▪ Provide support for the emergency services
	▪ Provide support and care for the local and wider community
	▪ Support may include:
	  o Technical, engineering advice
	  o Building control
	  o Highways services
	  o Public health/environmental issues
	  o Reception centres
	  o Re-housing and accommodation needs
	  o Transport
	  o Social services
	  o Psychosocial support
	  o Help lines
	  o Welfare and financial needs
	▪ Use resources to mitigate the effects on an emergency
	▪ Lead the recovery stage
		Provision of general advice and information in support of the EA to the public on flood prevention measures and environmental health issues, including encouraging those at potential risk of flooding to sign up to the EA's flood alert scheme. London Boroughs may also provide further assistance to the public if resources permit i.e. drying out facilities, provision, filling or placing sandbags where danger is foreseen. Joint agency coordination of non-life threatening floods and of the recovery phase following a flooding incident.

Appendix F – Template Situation Reports

Situation Reports should be distributed at JESCC/FCP, Silver Tactical Group and include impact maps where they have been compiled.

- Major Incident declared?

- Type of flooding
  Fluvial, tidal, surface water etc.

- Community area at risk…….
  List by ward area, rough guess at percentage of area affected

- Localised hazards
  For example fast flowing water, exposed man hole covers,
  Rough guess of flood water depths

- Access issues to include rail, road, bridge and traffic status updates
  Closures, diversions, indication of length of time of disruption
  Special attention given to areas of stranded commuters, travellers

- Health and safety issues for responders

- Fire update of flood incident related responses to date

- Police update of flood incident related responses to date

- Ambulance update of flood incident related responses to date
  Number of casualties treated, areas of high numbers, receiving hospitals

- RNLI update of flood incident related responses to date
  Number of rescues, key focus areas

- Local Authority update of flood incident related responses to date
  Location of rest/reception centres, areas protected by sandbags/defences
  Damage reports on buildings, road & bridges
  Traffic flow

- NHS E (L) update of flood incident related responses to date

Appendix G – Template Silver Tactical Coordinating Group Agenda

This template can be used as an actual agenda, virtual agenda or a checklist for agencies.

- Introductions

- Situation report on current flood risk
  - River flooding Environment Agency
  - Surface water flooding Local Authority

- Potential impact assessment to include
  - Extent of potential flooding and approximate depth, speed and cause
  - Request impact maps to be compiled
  - Vulnerable people and vulnerable site lists
  - Total number of residents, businesses, transient population in affected area
  - Critical infrastructure sites within flood zones to be identified
  - Liaise with utilities on areas of possible/likely disruption

- Traffic management plan
  - Potential evacuation routes (pedestrian/road)

- Location of emergency shelters as required clear of risk area

- River safety issue

- Environmental impact assessment

- Environmental Health Teams

- Utilities

- Environment Agency

- Public Health England

- Port of London Authority

- Water contaminants

- Location of industrial sites in flooded area

- Flood mitigation methods (sandbags / barriers)
  - Areas currently protected
  - Areas requiring protection
- Escalation policies/procedures

- Forecasting of weather conditions

- Public information required
  - Information to be provided by each agency
  - Methods/channels to be used
  - Media management

Appendix H – Resources

Agency	Resources
Metropolitan Police Service	**Personnel** Approx within borough throughout a day (minimum): 1 x Inspector 3 x Sergeants 10 x Constables **Facilities** 1 Patrol Base and 1 main Police Station in Borough 5 Safer Neighbourhood Contact Points Possible use of the Police Marine Support Unit on the River Thames, as well as the PLA and RNLI.
London Borough of Havering	**Personnel** 7 x LALO's 1 x Rest Centre Manager 10 x Rest Centre Staff Approximately 8,000 council staff **Equipment** o Gulley Suckers o Rest Centre Boxes o Welfare supplies o Snow Plough o Derigible boat on trailer with lifejackets **Facilities** Rest Centres throughout the Borough: Emergency Accommodation Providers
London Fire Brigade	**Equipment** All LFB pumping appliances (Pump Ladders/Pumps) carry personal flotation devices, water rescue lines and hose inflation kits for water rescue. Romford: Pump Ladder Wennington: Pump Ladder, IRU(Mass decontamination) + disrobe and re-robe units Harold Hill: Pump Ladder Hornchurch: Pump Ladder. Fire Rescue Units containing inflatable boat with motor and specialist trained Swift Water Rescue personnel, including the provision of wet and dry suits. can be called into Havering. As well as the standard pumping appliances, High Volume Pumps are located at various East London Fire Stations. These are part of a fleet of national response appliances to major flooding, and can be used in Havering or anywhere as required. LFB Bulk Media Advisors (BMA), who are specialist officers trained to assist with pumping of flood water. .

Although resources may be stated above this does not guarantee their attendance at an incident.

Appendix I – Key Infrastructure

Key Infrastructure	Address	Useful Contact number(s)	Details	Map Reference

(This data has been excluded as it holds contact information)

Appendix J - Glossary of Terms

ABBREVIATION	TERM
BECC	Borough Emergency Control Centre
BTP	British Transport Police
BRONZE	Bronze Commander (Operational)
CMT	Crisis Management Team
CNI	Critical National Infrastructure
CBR(N)	Chemical Biological Radiological (Nuclear)
DH	Department of Health
DEFRA	Department of Environment, Food and Rural Affairs
EA	Environment Agency
GOLD	Gold Commander (Strategic)
GO	Regional Government Office
HSE	Health and Safety Executive
HA	Humanitarian Assistance
JESSC/FCP	Joint Emergency Services Control Centre/Forward Control Point
LALO	Local Authority Liaison Officer
LAS	London Ambulance Service
LFB	London Fire Brigade
LRF	Local Resilience Forum
MAFP	Multi Agency Flood Plan
MCA	Maritime and Coastguard Agency
MEF	Media Emergency Forum
MPS	Metropolitan Police Service
NHS E (L)	National Health Service England (London)
PPE	Personal Protective Equipment
RCG	Recovery Co-ordinating Group
SCG	Strategic Co-ordinating Group
SILVER	Silver Commander (Tactical)
SOP	Standard Operating Procedure
SSSI	Site of Specific Scientific Interest’s
TfL	Transport for London