Colchester Borough Council

Level 2 Strategic Flood Risk Assessment - Addendum

AECOM

Introduction

The Level 1 Strategic Flood Risk Assessment (SFRA) for Colchester Borough Council was updated and published in August 2016[1]. The purpose of the Level 1 SFRA was to collate and analyse the most up to date readily available flood risk information for all sources of flooding, provide an overview of flood risk issues across the study area and provide national and local guidance and policies for flood risk management in the borough.

The Level 2 Strategic Flood Risk Assessment (SFRA) for Colchester Borough Council was published in February 2017 to support the development of the Colchester BC Local Plan. The Level 2 SFRA provides a detailed assessment of the flood risk for specific development sites which have been identified as requiring the application of the Exception Test.

Following consultation on the Draft Local Plan and supporting evidence base, Colchester BC has identified three additional sites for assessment as part of the Level 2 SFRA. Table 1 provides details of the sites. The sites have been assessed using the same site assessment approach as detailed in Section 2 of the Colchester BC Level 2 SFRA.

Table 1 Colchester Borough Council Level SFRA Addendum site for assessment

Site ID	Site Address	Size
COL111	Bridge House, Hythe Quay, Colchester	0.42 ha
COL107	Land west of Hawkins Road, Colchester	1.15 ha
COL107	Land east of Hawkins Road, Colchester	4.62 ha

[1] **www.colchester.gov.uk/CHttpHandler.ashx?id=23376&p=0**

Site Assessment Summary –Bridge House, Hythe Quay, Colchester

Location:	SHLAA Ref /Ref:	Area (ha):	Proposed use:	Vulnerability Classification:
Colchester	COL111	0.42	Residential (36 dwellings)	More Vulnerable

Sequential Test Status:

The Sequential Test has been undertaken by Colchester BC for this site as part of the preparation of the Local Plan Site Allocations.

Tidal and Fluvial Flood Risk

Flood Zone 1:	Flood Zone 2:	Flood Zone 3a:	Flood Zone 3b:
30%	29%	41%	0%

Flood Zones and Flood Defences

Tidal

The River Colne flows from north to south along the eastern edge of the site in open channel. At this location the River Colne is tidally influenced and the dominant source of flooding. The majority of the site is identified as Flood Zone 2 and just under half of the site is identified as Flood Zone 3, high probability of flooding associated with the River Colne. It is important to note that Figure A shows the extent of flooding without the presence of flood defences including the absence of the River Colne Barrier.

The eastern area of the site is shown to benefit from the presence of defences. Immediately east of the site a private coastal wall acts as a flood defence. The Colne Barrier is located approximately 4.5km downstream at Wivenhoe and provides protection when water levels are forecast to rise greater than 3.2mAOD.

Fluvial

The Environment Agency Detailed River Network identifies two ordinary watercourses at the vicinity of the site. Porters Brook, a culverted watercourse, joins the River Colne approximately 0.3km north of the site. An un-named ordinary watercourse which becomes culverted towards the River Colne is located approximately 0.3km south-east of the site.

Functional Floodplain

The site is not located within the functional floodplain associated with the River Colne.

Climate Change

Environment Agency modelling for the Colne and Blackwater Estuary (constructed in 2010 and re-run in 2015 as part of this Level 2 SFRA) identifies that water remains in bank during the 0.5% AEP tidal event including an allowance for climate change.

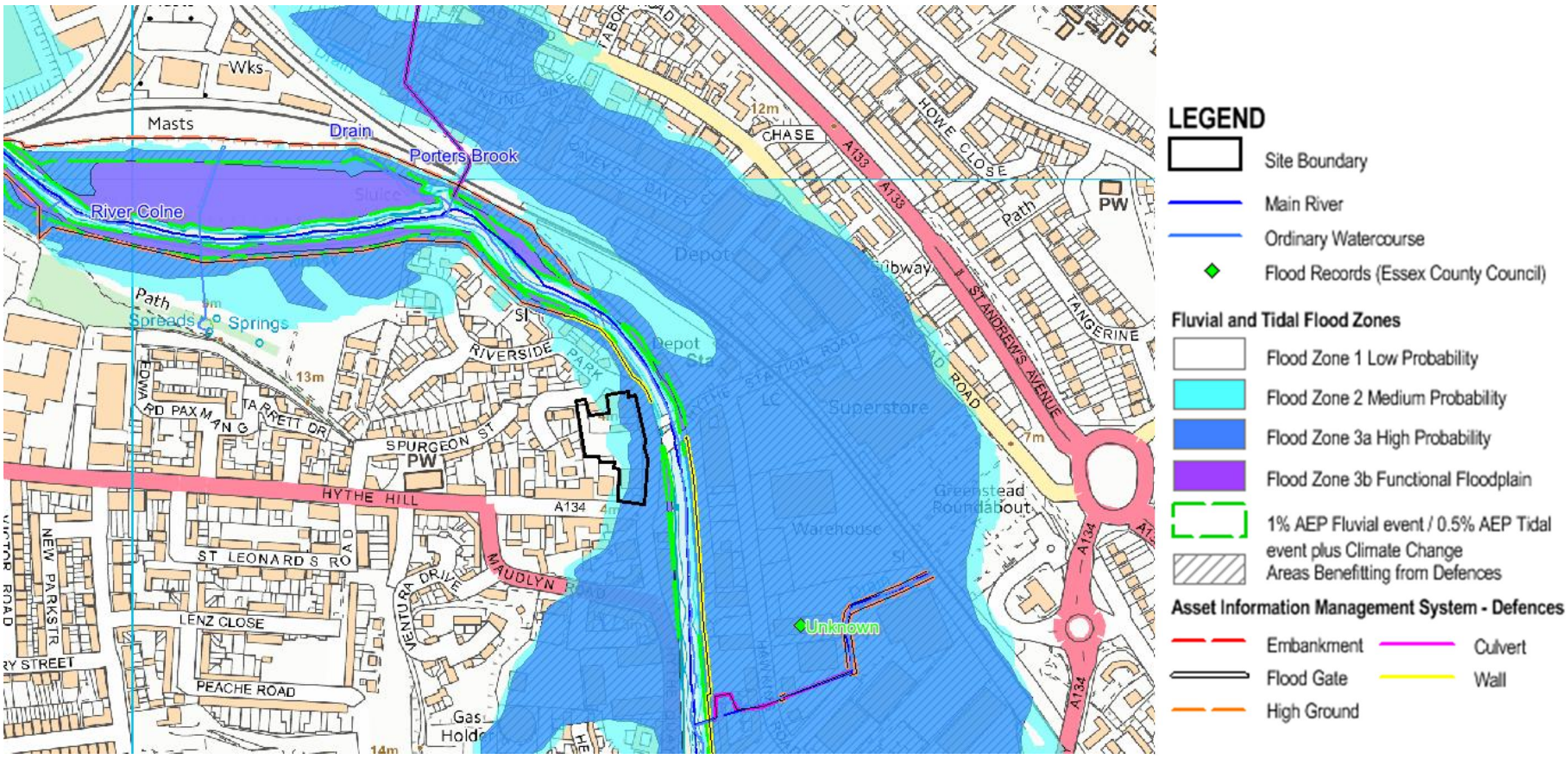

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Figure A Modelled Flood Extents

Residual Risk – Failure of the Colne Barrier at Wivenhoe

The site is protected by the presence of the Colne Barrier at Wivenhoe which closes during extreme tidal events. A model simulation has been completed to determine the residual risk to the site in the event there is a failure of the Barrier to close. Results for the 0.5% AEP event including an allowance for climate change (2115) show that flood depths on the site would be 0.1-1.5m, corresponding to a hazard rating of Significant Hazard (danger for most). Potential access / egress routes for the site would experience depths of flooding up to 1.0m.

Site Assessment Summary –Bridge House, Hythe Quay, Colchester

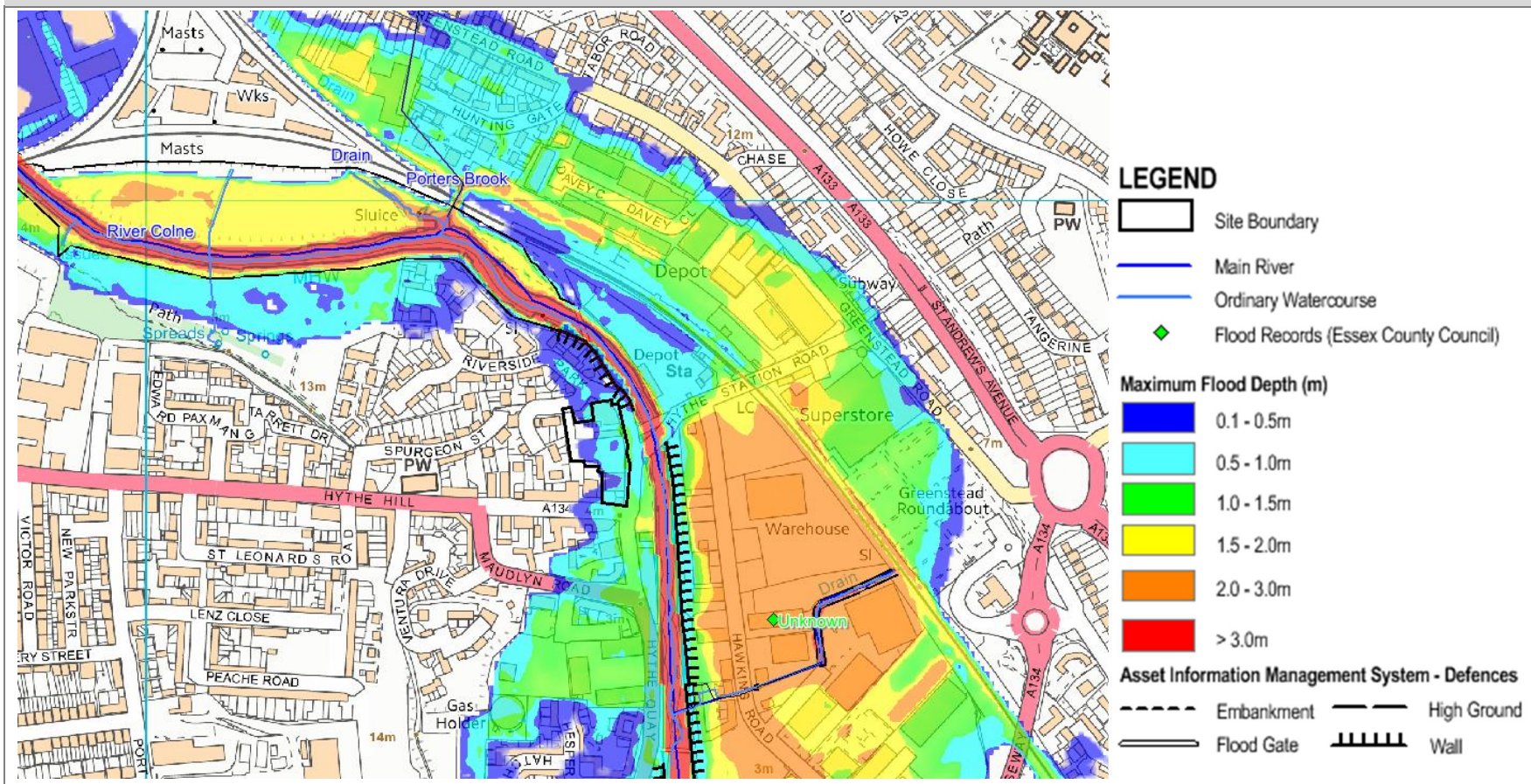

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Figure B Colne Barrier Breach Assessment; 0.5% AEP including Climate Change: Maximum Flood Depth

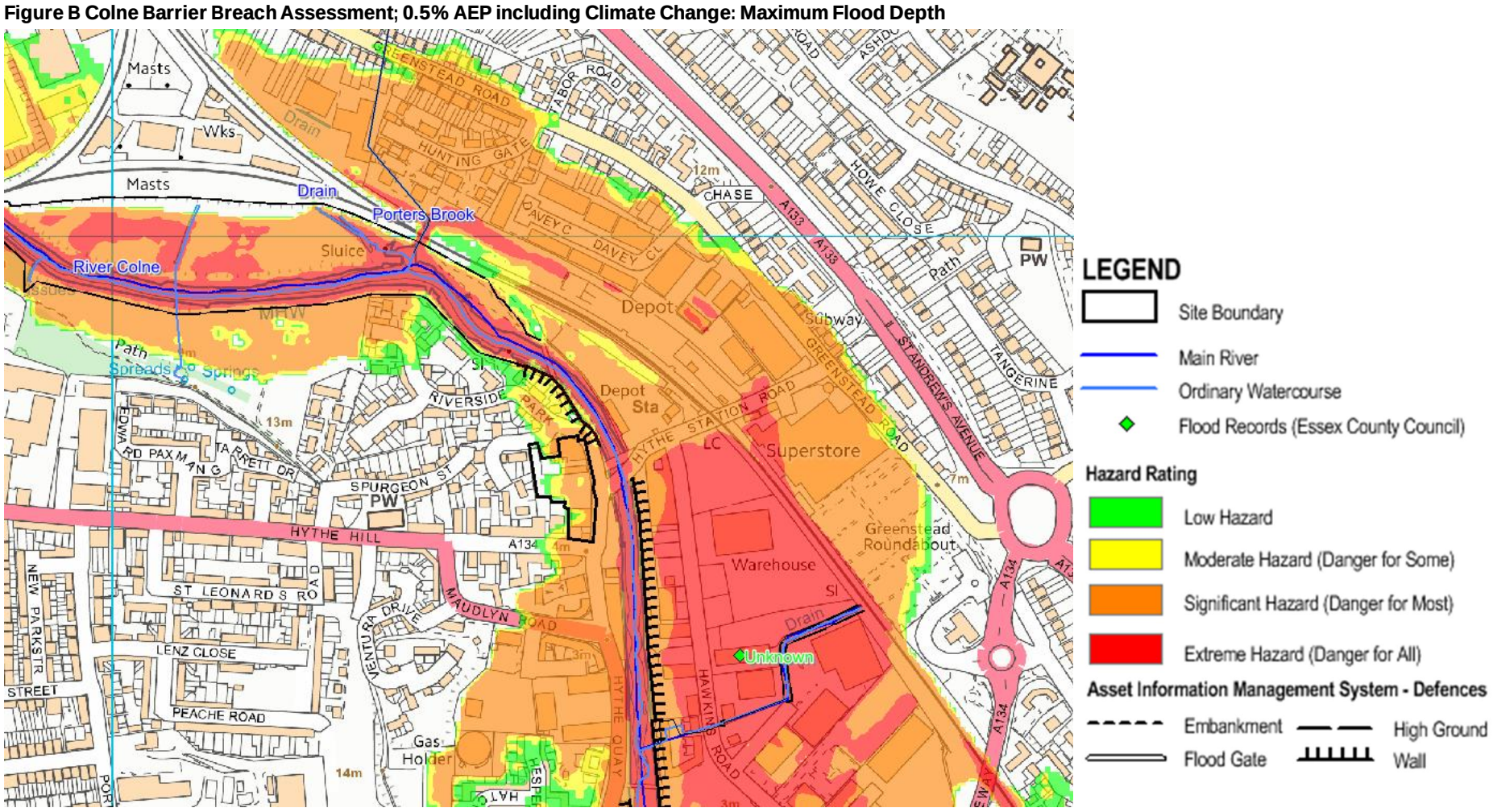

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Figure C Colne Barrier Breach Assessment; 0.5% AEP including Climate Change: Hazard Ratings

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW) and SWMP Modelling

The ROFSW and SWMP modelling indicates that the area in which the site is located is at very low risk of surface water flooding (<0.1% AEP) with the exception of an isolated area of ponding south-west of the site shown to be at high risk of surface water flooding (>3.3% AEP). The SWMP modelling indicates that surface water ponding within the site is between 0.1 – 0.25m.

In accordance to the National Planning Policy Framework, proposed development should not have unacceptable adverse impacts on the flow and quantity of surface water. Therefore the site layout should be carefully planned to ensure that residential dwellings are not at risk from surface water flooding and the position of new development does not divert flow paths to a neighbouring area.

Geology

The bedrock geology in this area is Thames Group, comprising clay and silt. Superficial deposits of alluvial clays and silts are present overlying the bedrock. The underlying clay soils are typically not very permeable and provide the potential for ponding of surface water on the ground surface during heavy rainfall.

Historic Records

The site is shown to lie within a Critical Drainage Area (CDA) named Colchester Town Area which was identified during the preparation of the town of Colchester SWMP. There are historic records of flooding to the south of the site; however the source of flooding for these records are unknown.

Site Assessment Summary –Bridge House, Hythe Quay, Colchester

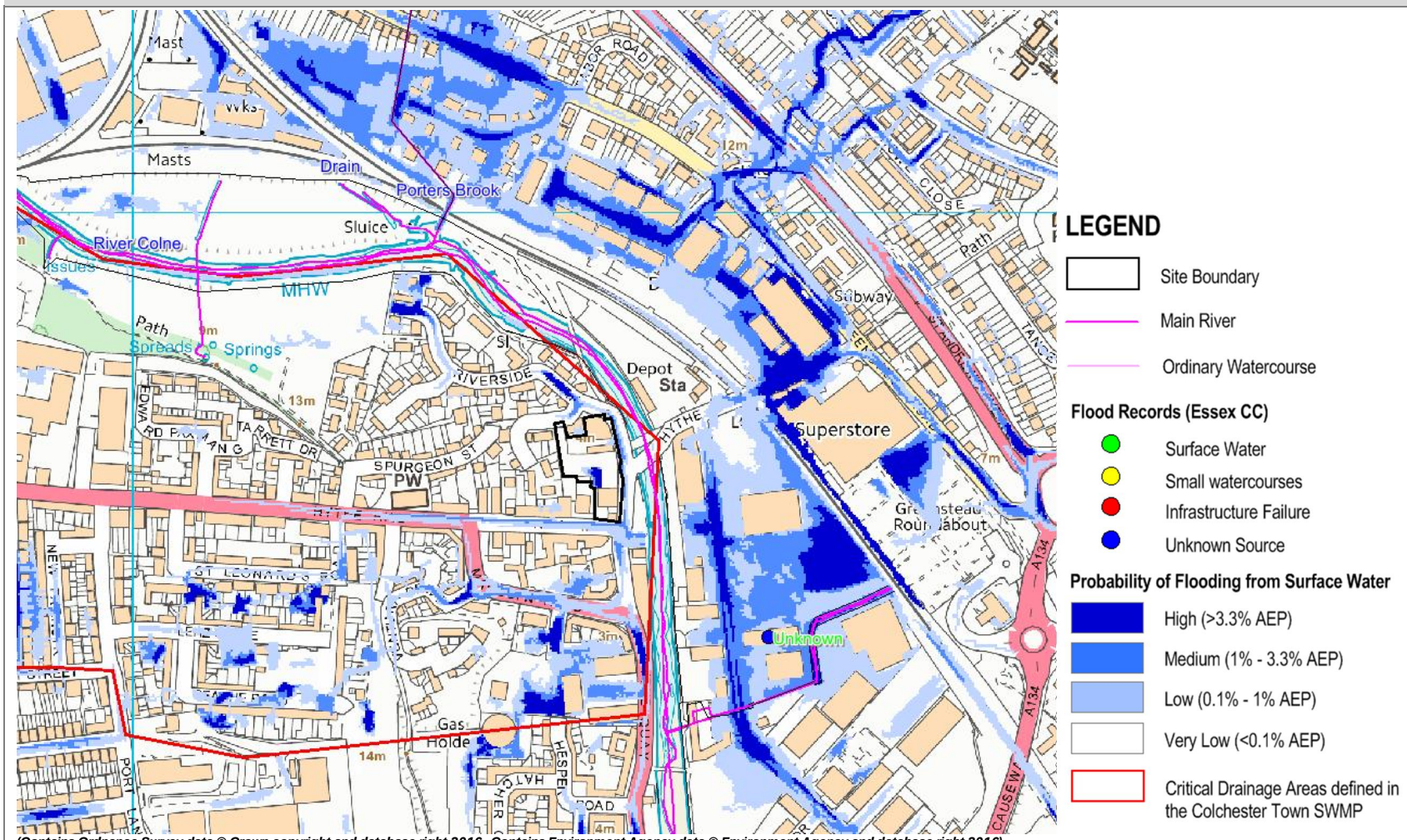

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Figure D Risk of Flooding from Surface Water (RoFSW)

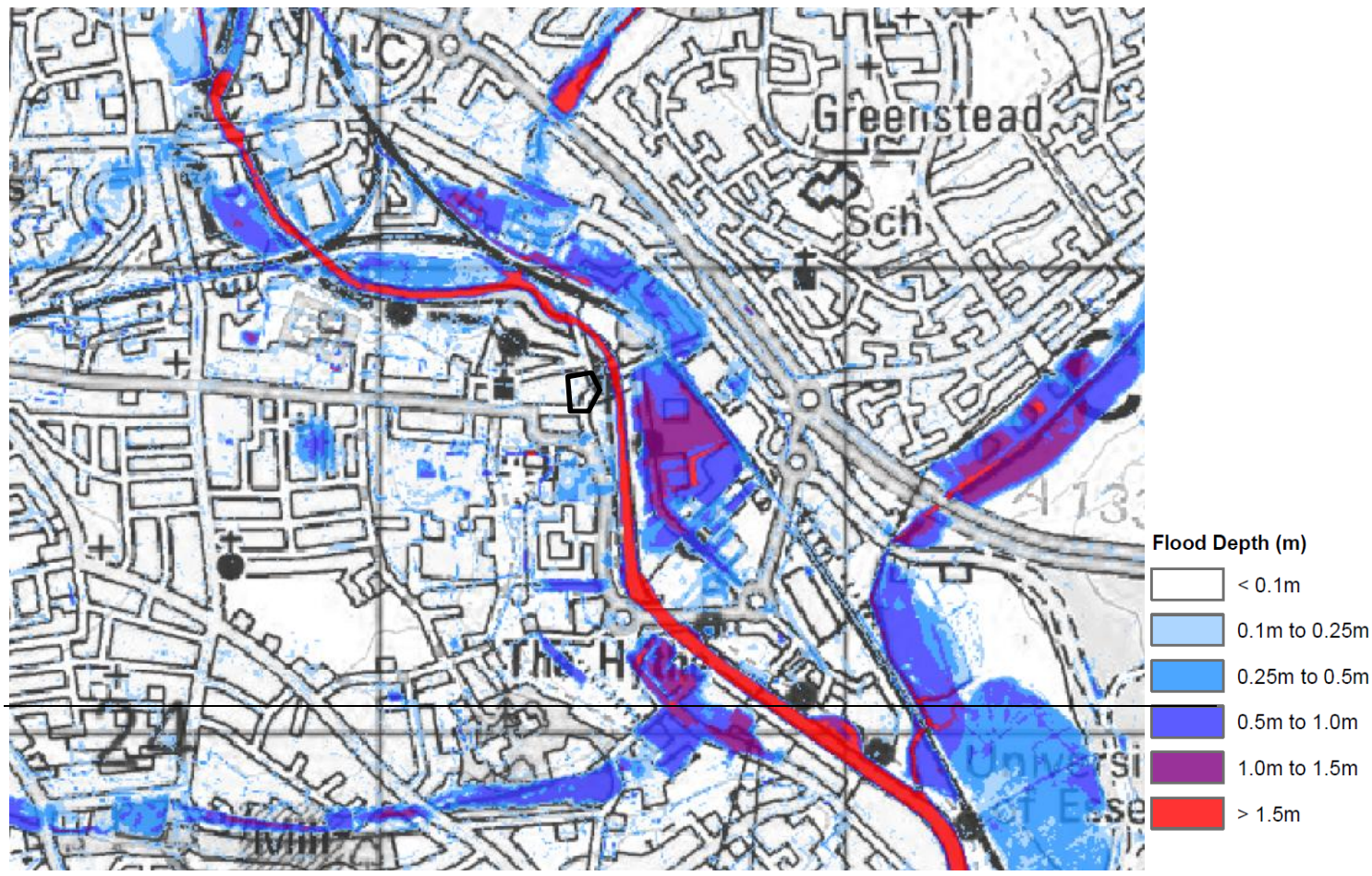

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Figure E Town of Colchester SWMP (Capita Symonds, 2013) Surface Water Modelling, 1% AEP Maximum Flood Depth

Estimated Greenfield Runoff Rates (IH124 Results).	**QBAR:**	**1.0 l/s**	
	1 in 1 year:	**0.8 l/s**	
	1 in 30 year:	**2.2 l/s**	
	1 in 100 year:	**3.1 l/s**	
Drainage Hierarchy	**Infiltration to ground**		**Uncertain due to geology; subject to on site infiltration testing.**
	Discharge to watercourse		**Discharge possible to the River Colne, subject to consultation with the Environment Agency.**
	Discharge to surface water sewer		**Possible, subject to consultation with Anglian Water.**

Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Appendix A Figure 5) shows that the site is located within a 1km square of which 25-50% is susceptible to groundwater emergence. The potential for groundwater flooding in this area is therefore generally considered to be low. This will need to be confirmed during site investigation survey.

Other Sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the floodplain of the River Colne including the site is at risk of inundation in the event of a failure of the following reservoirs: Ardleigh (NGR (603487, 228024); Abberton Central and Western Arm (NGR 598901, 219790); and Abberton (NGR 598780, 219734). As noted in the Level 1 SFRA report, given the regular inspection of these reservoirs in accordance with the Reservoirs Act 1975, flooding from reservoirs is considered to be a managed risk.

Site Specific Recommendations

Site Assessment Summary –Bridge House, Hythe Quay, Colchester

Set-back Distance

All development should be set back 16m from the edge of the River Colne. The Environment Agency will need to be consulted and an Environmental Permit obtained for any work within 16m of the watercourse.

Site Layout and Design

Residential development should be steered towards areas defined as Flood Zone 1 and 2 away from the edge of the River Colne. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS as stated within the Interim Code of Practice for SuDS July 2004[2] (i.e. considering infiltration measures first wherever possible). The site is within a Critical Drainage Area, Colchester Town Area; opportunities should be sought for the development to contribute to the proposed scheme for surface water management in this area and Essex CC should be consulted to confirm the current status of this work. A summary of the initial preferred option for the CDA, as set out in the SWMP, is provided in Section 4 of the Colchester Level 2 SFRA Report.

Finished Floor Levels

The Environment Agency will seek Finished Floor Levels for new development set 300mm above the 0.5% AEP flood level including an allowance for climate change. The modelled flood level in the event of a failure of the Colne Barrier during the 0.5% AEP flood event including climate change to 2115 in this location is 4.5mAOD. Based on LiDAR topographic survey, the ground levels across the site vary between approximately 3.6-4.8mAOD.

Access / Egress

Safe dry access to and from the site should be provided where possible, and this is likely to be provided to the south-west of the site via Hythe Hill. When considering the residual risk to the site, flood depths of up to 1.3m are modelled to occur along this route, corresponding to a hazard rating of Significant (danger to most). It will therefore be necessary to include provision of a place of safe refuge for residents of the residential development above the 0.1% AEP flood level including an allowance for climate change and is internally accessible.

Emergency Planning

The site is shown to be within an Environment Agency Flood Warning Area for the Tidal Colne upstream of the Colne Barrier; residents should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the Colne Barrier, Flood Response Plans should be prepared by residents of the site including details of egress routes and place to safe refuge.

Summary

Based on the strategic assessment of flood risk and the recommendations for mitigation measures set out above, it is considered that proposed development on this site could be suitably designed to satisfy part 2) of the Exception Test.

[2] **http://www.susdrain.org/files/resources/other-guidance/nswg_icop_for_suds_0704.pdf**

Site Assessment Summary – Land west of Hawkins Road, Colchester

Location:	SHLAA Ref /Ref:	Area (ha):	Proposed use:	Vulnerability Classification:
Colchester	COL107	1.15	Residential (100 dwellings)	More Vulnerable

Sequential Test Status:

The Sequential Test has been undertaken by Colchester BC for these sites as part of the preparation of the Local Plan Site Allocations.

Tidal and Fluvial Flood Risk

Flood Zone 1:	Flood Zone 2:	Flood Zone 3a:	Flood Zone 3b:
0%	0%	100%	0%

Flood Zones and Flood Defences

Tidal

The River Colne flows from north to south in open channel along the western edge of the site. At this location the River Colne is tidally influenced and the dominant source of flooding. The entirety of the site is identified as Flood Zone 3a; high probability of flooding associated with the River Colne. It is important to note that Figure A shows the extent of flooding without the presence of flood defences including the absence of the River Colne Barrier.

The area of Flood Zone 3a is shown to benefit from the presence of defences. The AIMS dataset identifies a private river wall adjacent to the west of the site.

Fluvial

The Environment Agency Detailed River Network identifies an ordinary watercourse immediately south of the site which joins the River Colne from the east. The ordinary watercourse passes through Hawkins Road open ditch, west of the railway which is bounded by high ground before becoming culverted in the west. The Colne Barrier is located approximately 4.2km downstream at Wivenhoe and provides protection when water levels are forecast to rise greater than 3.2mAOD.

Functional Floodplain

The site is not within the functional floodplain associated with the River Colne.

Climate Change

Modelling of the Colne and Blackwater Estuary shows that water remains in bank during the 0.5% AEP tidal event including an allowance for climate change.

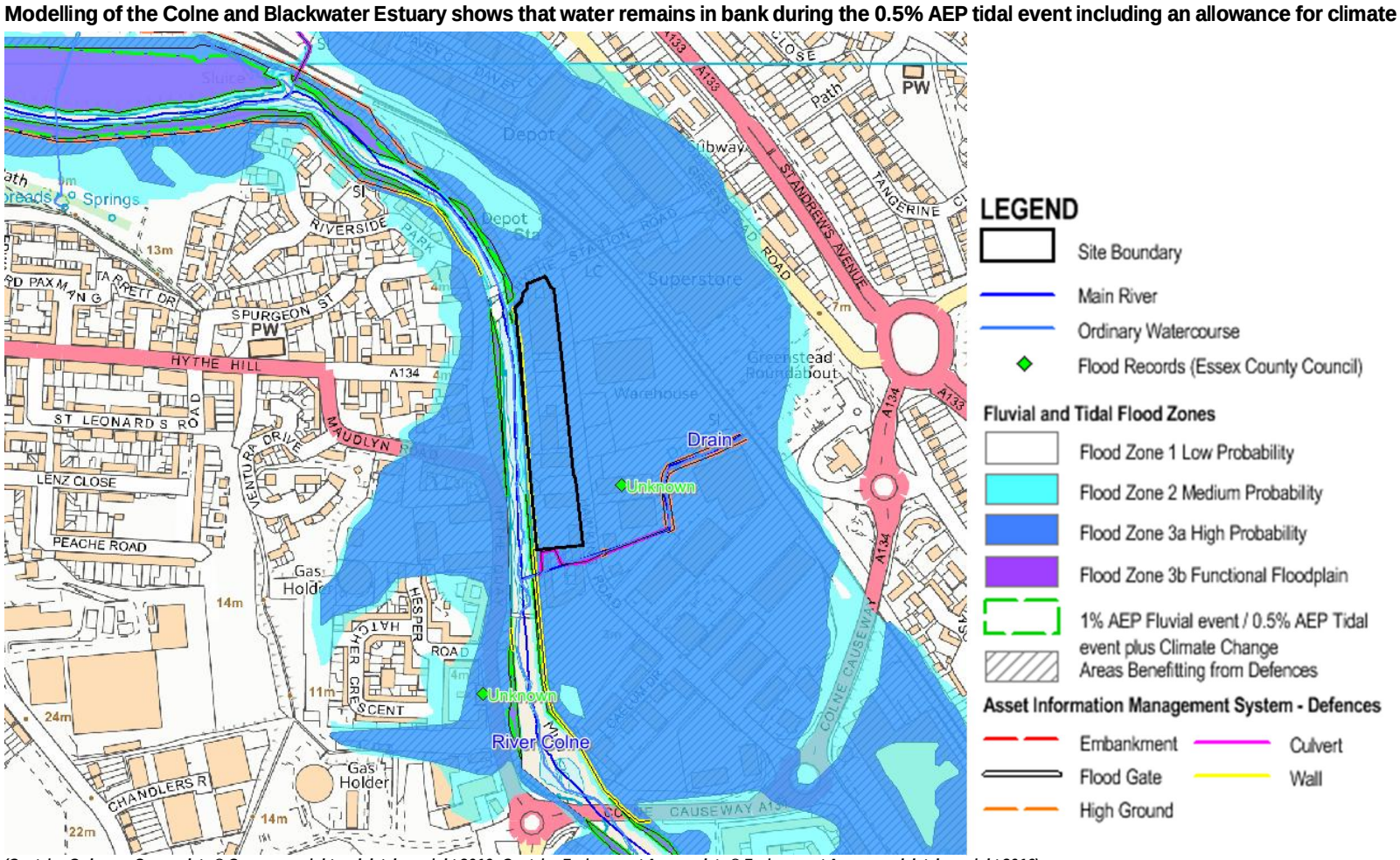

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Figure A Modelled Flood Extents

Residual Risk – Failure of the Colne Barrier at Wivenhoe

The site is protected by the presence of the Colne Barrier at Wivenhoe, which closes during extreme tidal events. A model simulation has been completed to determine the residual risk to the site in the event there is a failure of the Barrier to close. Results for the 0.5% AEP event including an allowance for climate change show that flood depths on the site could reach up to 3m, corresponding to a hazard rating of Significant (danger to most) and Extreme (danger for all) across the site. Potential access / egress routes for the site would experience depths of flooding up to 2.8m, corresponding to a hazard rating of Extreme (danger for all).

Site Assessment Summary – Land west of Hawkins Road, Colchester

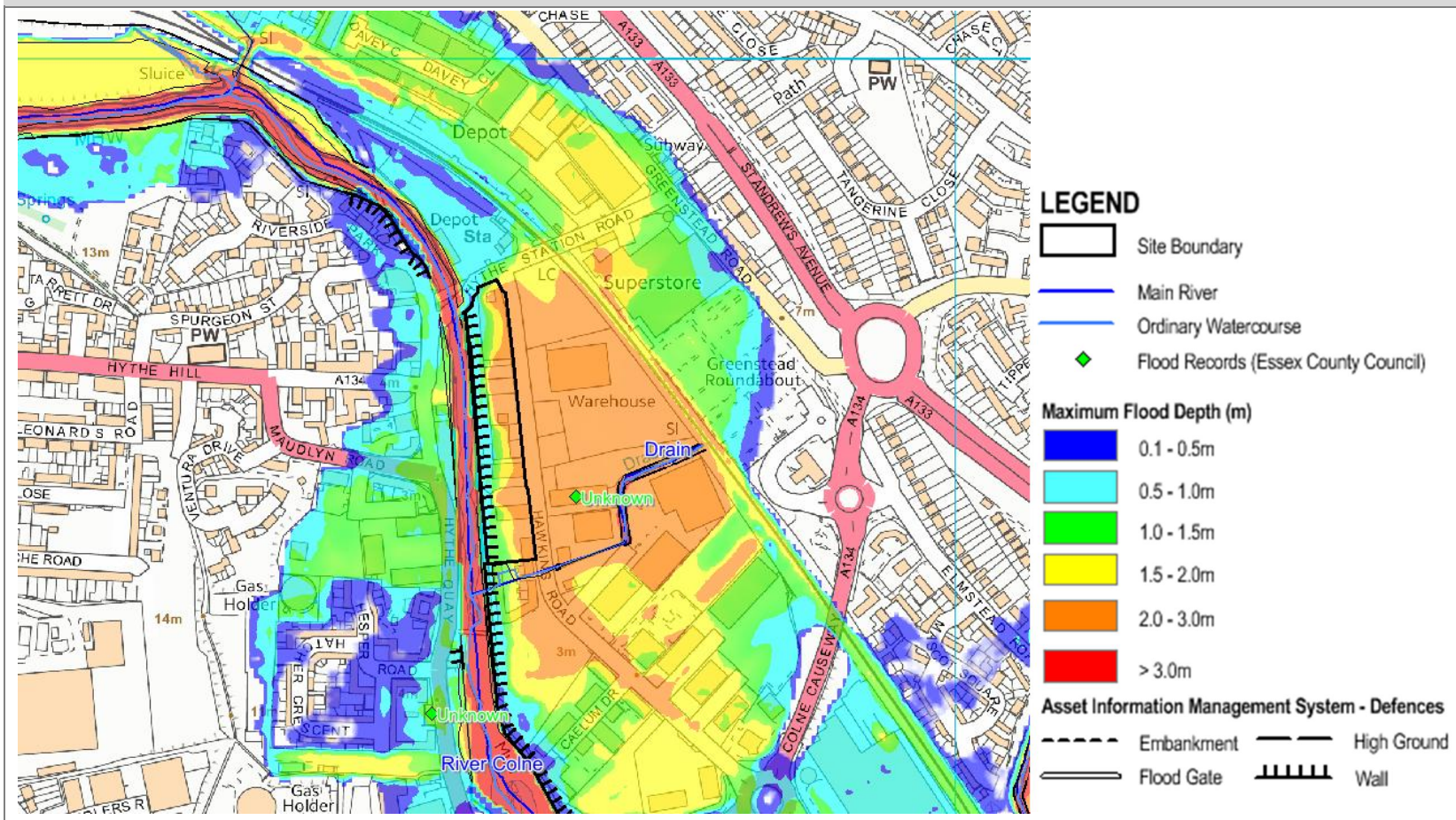

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Figure B Colne Barrier Breach Assessment; 0.5% AEP including Climate Change: Maximum Flood Depth

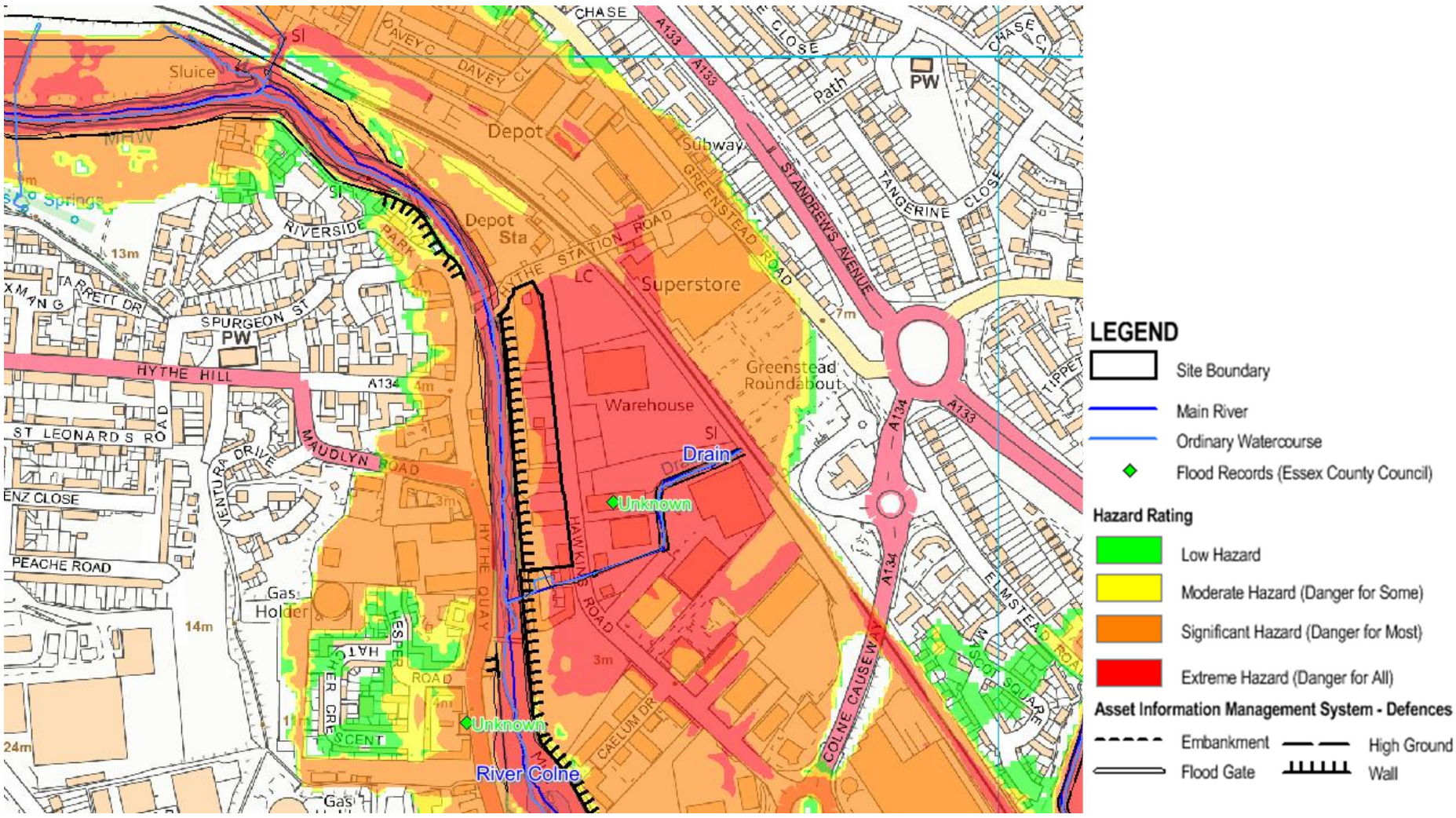

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Figure C Colne Barrier Breach Assessment; 0.5% AEP including Climate Change: Hazard Ratings

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW) and SWMP Modelling

The RoFSW mapping and SWMP modelling indicates that west of the site is located at a very low risk of surface water flooding (<0.1% AEP). However, east of the site is identified as having a high risk of surface water flooding (>3.3% AEP). The SWMP modelling indicates that flood depths could reach up to 1.5m. In accordance to the National Planning Policy Framework, proposed development should not have unacceptable adverse impacts on the flow and quantity of surface water. Therefore the site layout should be carefully planned to ensure that residential dwellings are not at risk from surface water flooding and the position of new development does not divert flow paths to a neighbouring area.

Geology

The bedrock geology in this area is Thanet Sand Formation and Lambeth Group, comprising clay, silt and sand. Superficial deposits of alluvial clays and silts are present overlying the bedrock. The underlying clay conditions are typically not very permeable and provide the potential for ponding of surface water on the ground surface during heavy rainfall.

Historic Records

The site is not shown to lie within a Critical Drainage Area (CDA) identified during the preparation of the town of Colchester SWMP. There are historic records of flooding to the east and south of the site; however the source of flooding for these records is unknown.

Site Assessment Summary – Land west of Hawkins Road, Colchester

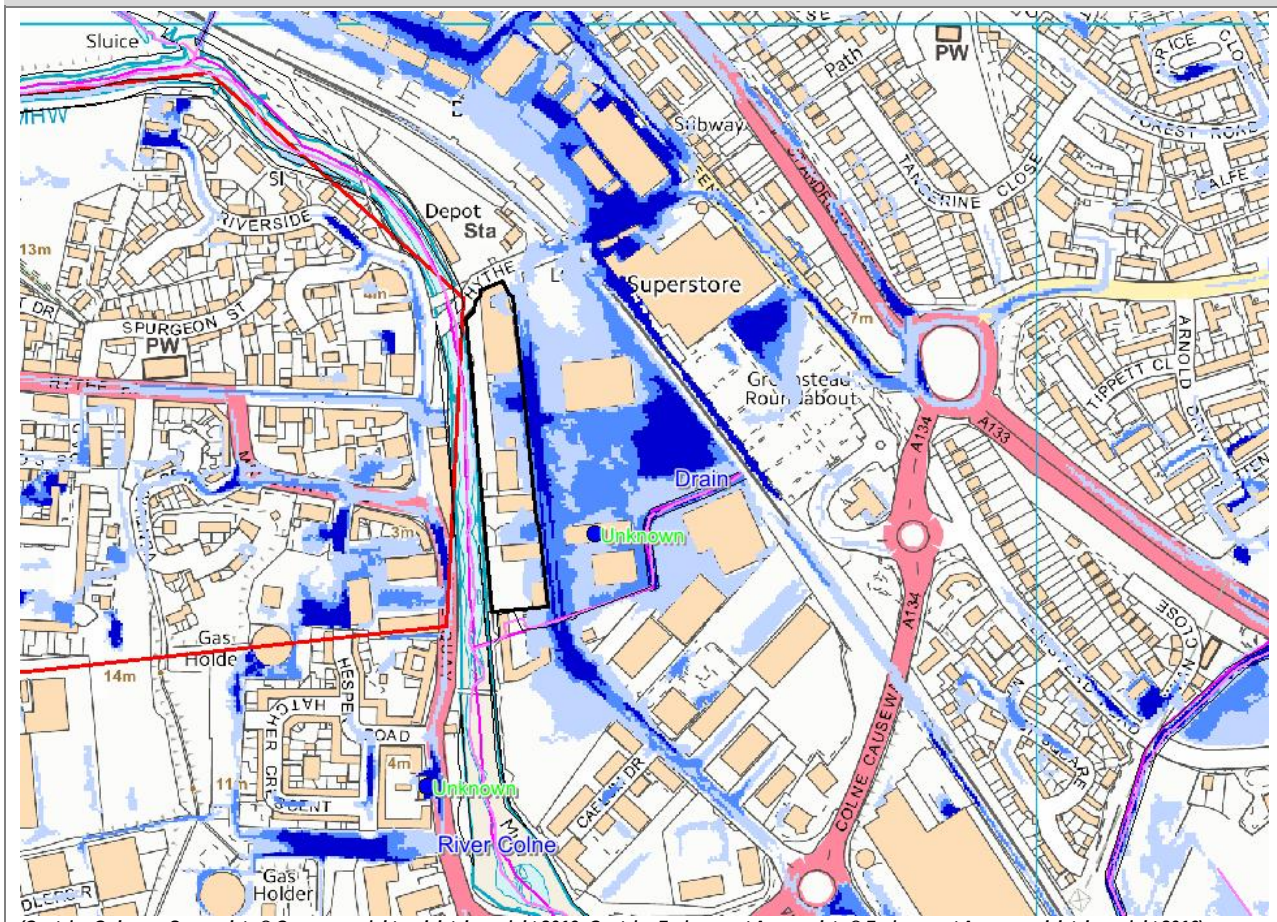

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Figure D Risk of Flooding from Surface Water (RoFSW)

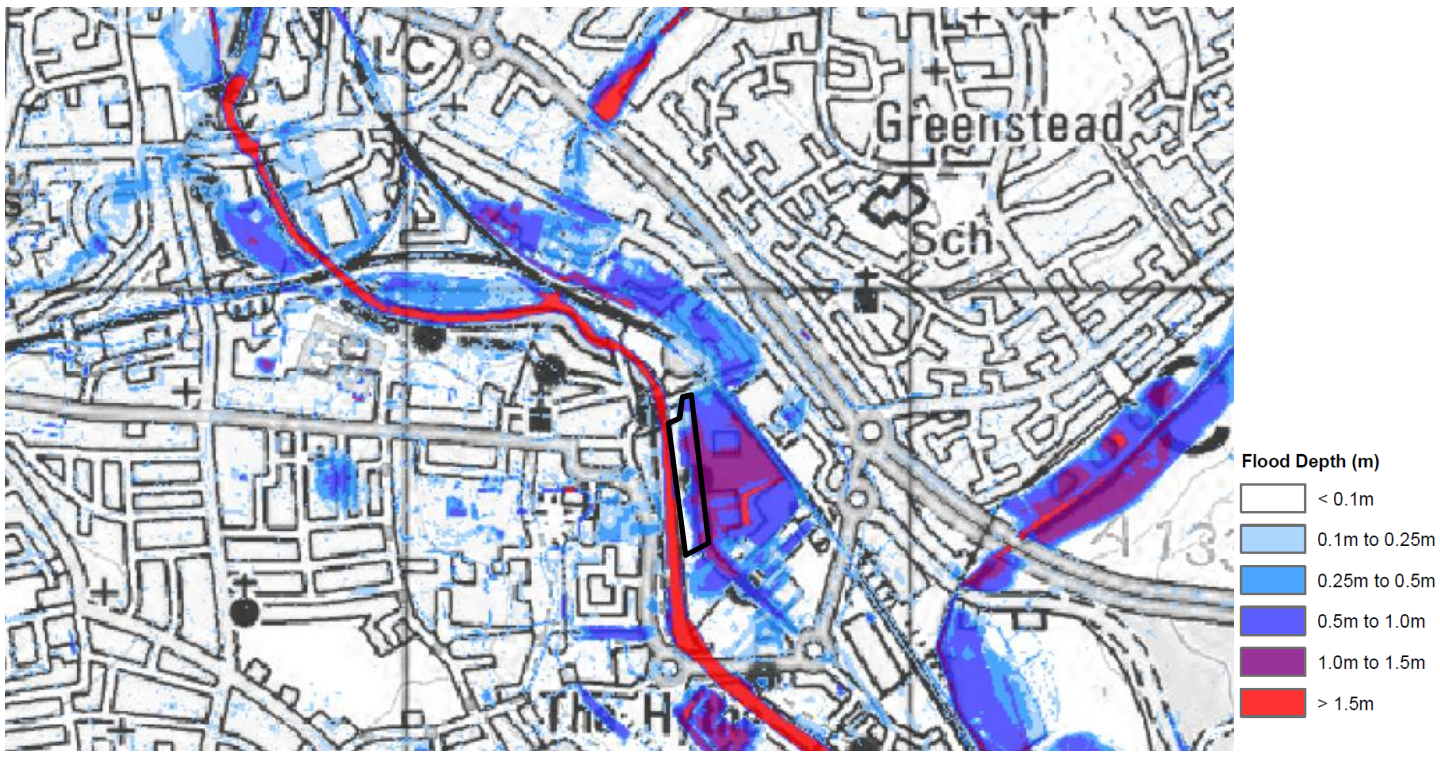

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Figure E Town of Colchester SWMP (Capita Symonds, 2013) Surface Water Modelling, 1% AEP Maximum Flood Depth

Estimated Greenfield Runoff Rates (IH124 Results).	**QBAR:**	**2.4 l/s**		
	1 in 1 year:	**2.0 l/s**		
	1 in 30 year:	**5.4 l/s**		
	1 in 100 year:	**7.6 l/s**		
Drainage Hierarchy	**Infiltration to ground**			**Uncertain due to geology; subject to on site infiltration testing.**
	Discharge to watercourse			**Discharge possible to the River Colne, subject to consultation with the Environment Agency. Discharge possible to the ordinary watercourse which flows through the site, subject to consultation with Essex CC and subject to confirmation that this will not exacerbate the surface water flooding with the ordinary watercourse.**
	Discharge to surface water sewer			**Possible, subject to consultation with Anglian Water and subject to confirmation that this will not exacerbate the surface water flooding along Hawkins Road.**

Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Appendix A Figure 5) shows that the site is located within a 1km square of which 25-50% is susceptible to groundwater emergence. The potential for groundwater flooding in this area is therefore generally considered to be low. This will need to be confirmed during site investigation survey.

Other Sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the floodplain of the River Colne including the site is at risk of inundation in the event of a failure of the following reservoirs: Ardleigh (NGR (603487, 228024); Abberton Central and Western Arm (NGR 598901, 219790); and Abberton (NGR 598780, 219734). As noted in the Level 1 SFRA report, given the regular inspection of these reservoirs in accordance with the Reservoirs Act 1975, flooding from reservoirs is considered to be a managed risk.

Site Specific Recommendations

Set-back Distance

All development should be set back 16m from the edge of the River Colne. The Environment Agency will need to be consulted and an Environmental Permit obtained for any work within 16m of the watercourse. A 3m wide set-back distance should be retained on at least one side of the ordinary watercourse to provide access for maintenance. Essex CC, as the LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Site Layout and Design

Site Assessment Summary – Land west of Hawkins Road, Colchester

Residential development should be steered away from the edge of the River Colne. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. They should be considered in accordance with the hierarchy of SuDS as stated within the Interim Code of Practice for SuDS July 2004[3] (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek Finished Floor Levels for new development set 300mm above the 0.5% AEP flood level including an allowance for climate change for tidal flooding associated with the River Colne. The modelled flood level in the event of a failure of the Colne Barrier during the 0.5% AEP flood event including climate change to 2115 in this location is 4.6mAOD. Based on LiDAR topographic survey, the ground levels across the site vary between approximately 1.9m-3.7mAOD.

Access / Egress

Safe dry access to and from the site should be provided where possible, and this is likely to be provided to the north of the site via Hythe Station Road in relation to surface water flooding. When considering the residual tidal risk to the site, flood depths of up to 1.8m are modelled to occur along this route, corresponding to a hazard rating of Extreme (danger to all) in areas. Therefore a safe dry access route would not be achievable during residual tidal flooding. It will therefore be necessary to include provision of a place of safe refuge for residents of the residential development above the 0.1% AEP flood level including an allowance for climate change and is internally accessible.

Emergency Planning

The site is shown to be within an Environment Agency Flood Warning Area for the Tidal Colne upstream of the Colne Barrier; residents should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the Colne Barrier, Flood Response Plans should be prepared by residents of the site including details of egress routes and place to safe refuge.

Summary

The proposed development is a More Vulnerable residential development located in Flood Zone 3a which is subject to the Exception Test in accordance with the NPPF. One of the key issues for the proposed site is the residual tidal flood risk posed to the site and the existing access/egress route along Hythe Station Road and the high risk of surface water flooding east of the site. Note the residual tidal risk is based on the failure of the Colne Barrier to close and is considered an unlikely event. The suitability of allocating this site in the Colchester BC Site Allocations rests on the ability of the risk management authorities to work together to deliver a solution for the potential flood risk. Based upon the strategic review of the flood risk posed to the site, and the recommendations set out above, it is likely that the proposed development itself could be suitably designed to protect the site and occupants from the risk of flooding.

[3] **http://www.susdrain.org/files/resources/other-guidance/nswg_icop_for_suds_0704.pdf**

Site Assessment Summary – Land east of Hawkins Road, Colchester

Location:	SHLAA Ref /Ref:	Area (ha):	Proposed use:	Vulnerability Classification:
Colchester	COL107	4.62	Residential (200 dwellings)	More Vulnerable

Sequential Test Status:

The Sequential Test has been undertaken by Colchester BC for these sites as part of the preparation of the Local Plan Site Allocations.

Tidal and Fluvial Flood Risk

Flood Zone 1:	Flood Zone 2:	Flood Zone 3a:	Flood Zone 3b:
0%	0%	100%	0%

Flood Zones and Flood Defences

Tidal

The River Colne flows from north to south in open channel west of the site. At this location the River Colne is tidally influenced and the dominant source of flooding. The entirety of the site is identified as Flood Zone 3a; high probability of flooding associated with the River Colne. It is important to note that Figure A shows the extent of flooding without the presence of flood defences including the absence of the River Colne Barrier. The area of Flood Zone 3a is shown to benefit from the presence of defences. The AIMS dataset identifies a private river wall along the eastern edge of the River Colne. The Colne Barrier is located approximately 4.16km downstream at Wivenhoe and provides protection when water levels are forecast to rise greater than 3.2mAOD.

Fluvial

Salary Brook flows from north to south before joining the River Colne approximately 0.8km downstream of the site which is bounded by high ground. The Environment Agency Detailed River Network identifies an ordinary watercourse which passes through the centre of the site and joins the River Colne. The ordinary watercourse passes through Hawkins Road open ditch, west of the railway which is bounded by high ground before becoming culverted in the west.

Functional Floodplain

The site is not within the functional floodplain associated with the River Colne.

Climate Change

Modelling of the Colne and Blackwater Estuary shows that tidal flood water remains in bank during the 0.5% AEP tidal event including an allowance for climate change.

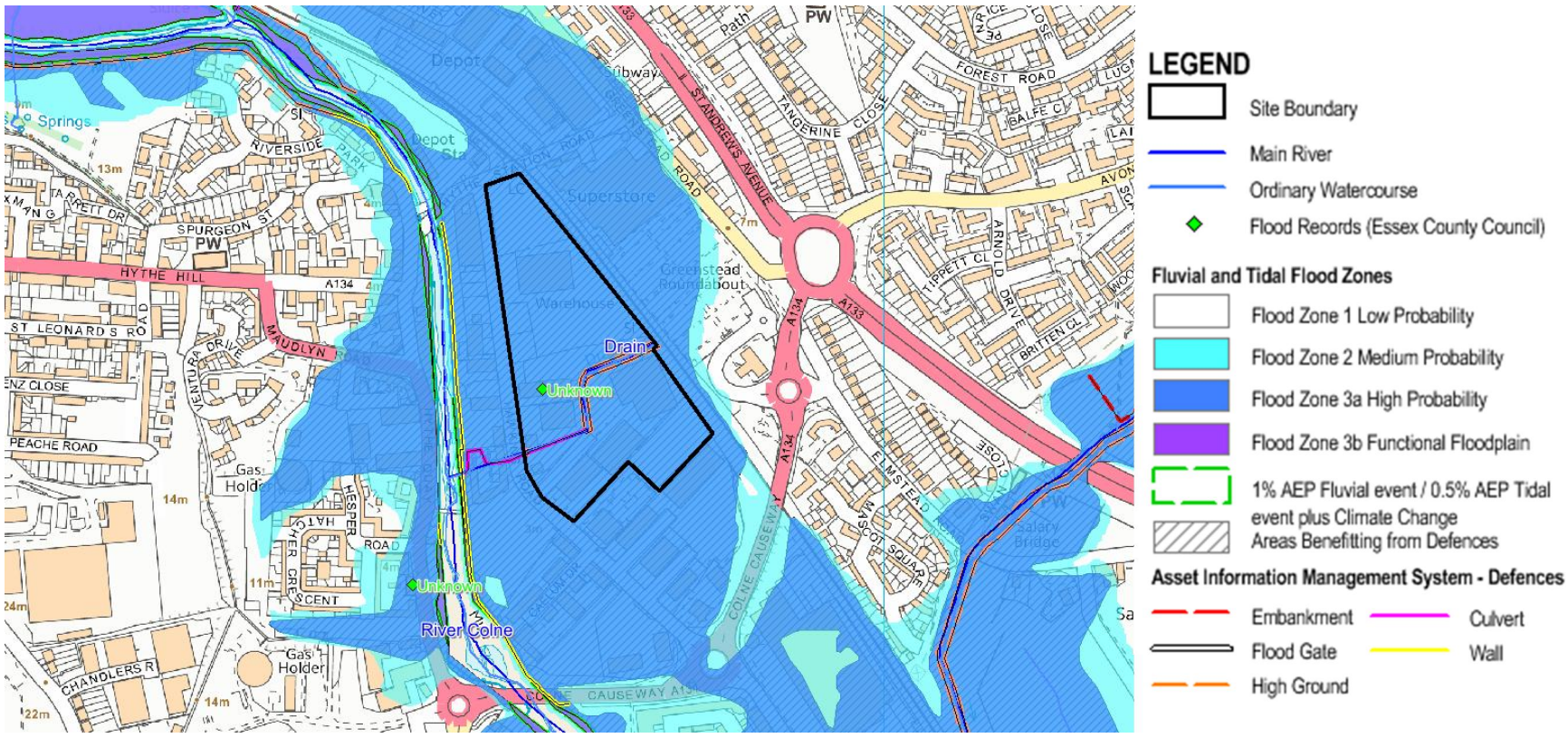

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Figure A Modelled Flood Extents

Residual Risk – Failure of the Colne Barrier at Wivenhoe

The site is protected by the presence of the Colne Barrier at Wivenhoe, which closes during extreme tidal events. A model simulation has been completed to determine the residual risk to the site in the event there is a failure of the Barrier to close. Results for the 0.5% AEP event including an allowance for climate change show that flood depths on the site could reach up to 2.8m on site increasing to 3.6m within the open channel of the ordinary watercourse. This corresponds to a hazard rating of Extreme (danger for all). Potential access / egress routes for the site would experience depths of flooding up to 2.6m, corresponding to a hazard rating of Extreme (danger for all).

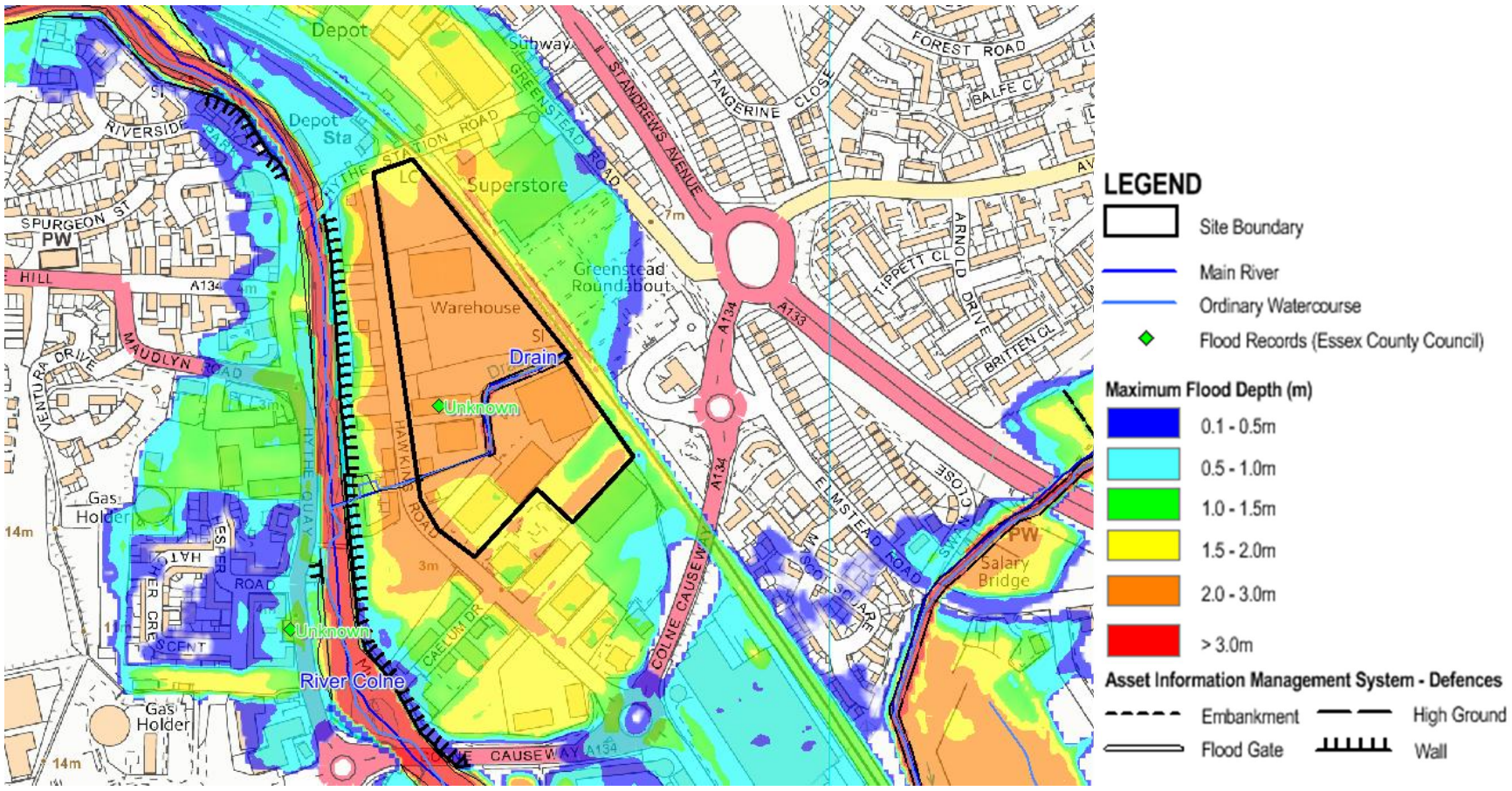

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Figure B Colne Barrier Breach Assessment; 0.5% AEP including Climate Change: Maximum Flood Depth

Site Assessment Summary – Land east of Hawkins Road, Colchester

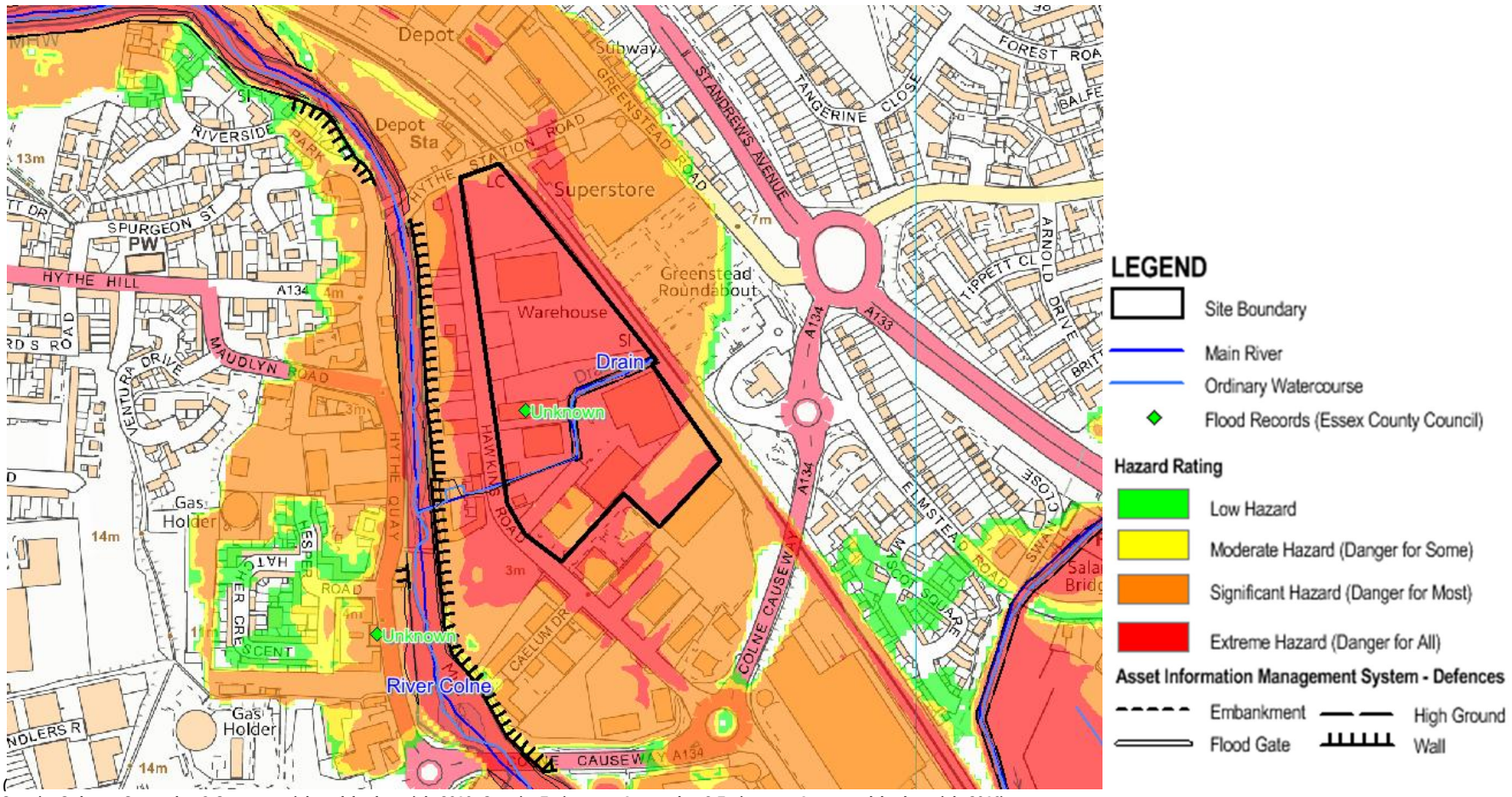

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Figure C Colne Barrier Breach Assessment; 0.5% AEP including Climate Change: Hazard Ratings

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW) and SWMP Modelling

The RoFSW mapping indicates that most of the site is at a medium (1% - 3.3% AEP) to a high risk of surface water flooding (>3.3% AEP). This is evident north of the ordinary watercourse; The SWMP modelling indicates that flood depths could reach up to 1.5m on site and increasing above 1.5m within the ordinary watercourse. In accordance to the National Planning Policy Framework, proposed development should have unacceptable adverse impacts on the flow and quantity of surface water. Therefore the site layout should be carefully planned to ensure that residential dwellings are not at risk from surface water flooding and the position of new development does not divert flows paths to a neighbouring area.

Geology

The bedrock geology in this area is Thanet Sand Formation and Lambeth Group, comprising clay, silt and sand which are overlain by alluvial clays and silts associated with the River Colne. Underlying clay conditions are typically not very permeable and provide the potential for ponding of surface water on the ground surface during heavy rainfall.

Historic Records

The site is not shown to lie within a Critical Drainage Area (CDA) identified during the preparation of the town of Colchester SWMP. There are historic records of flooding within the site boundary and to the south-west of the site; however the source of flooding for these records is unknown.

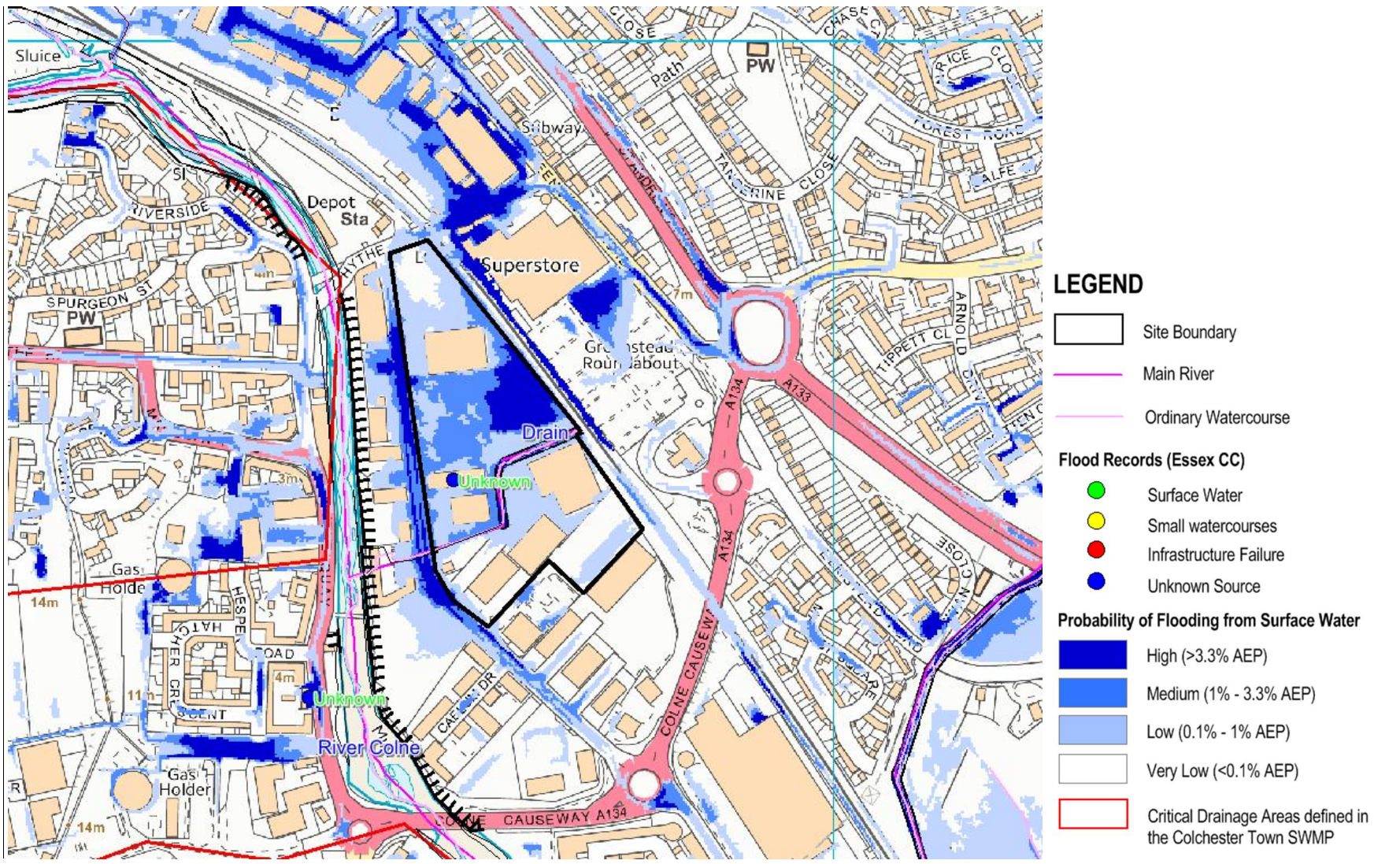

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Figure D Risk of Flooding from Surface Water (RoFSW)

Site Assessment Summary – Land east of Hawkins Road, Colchester

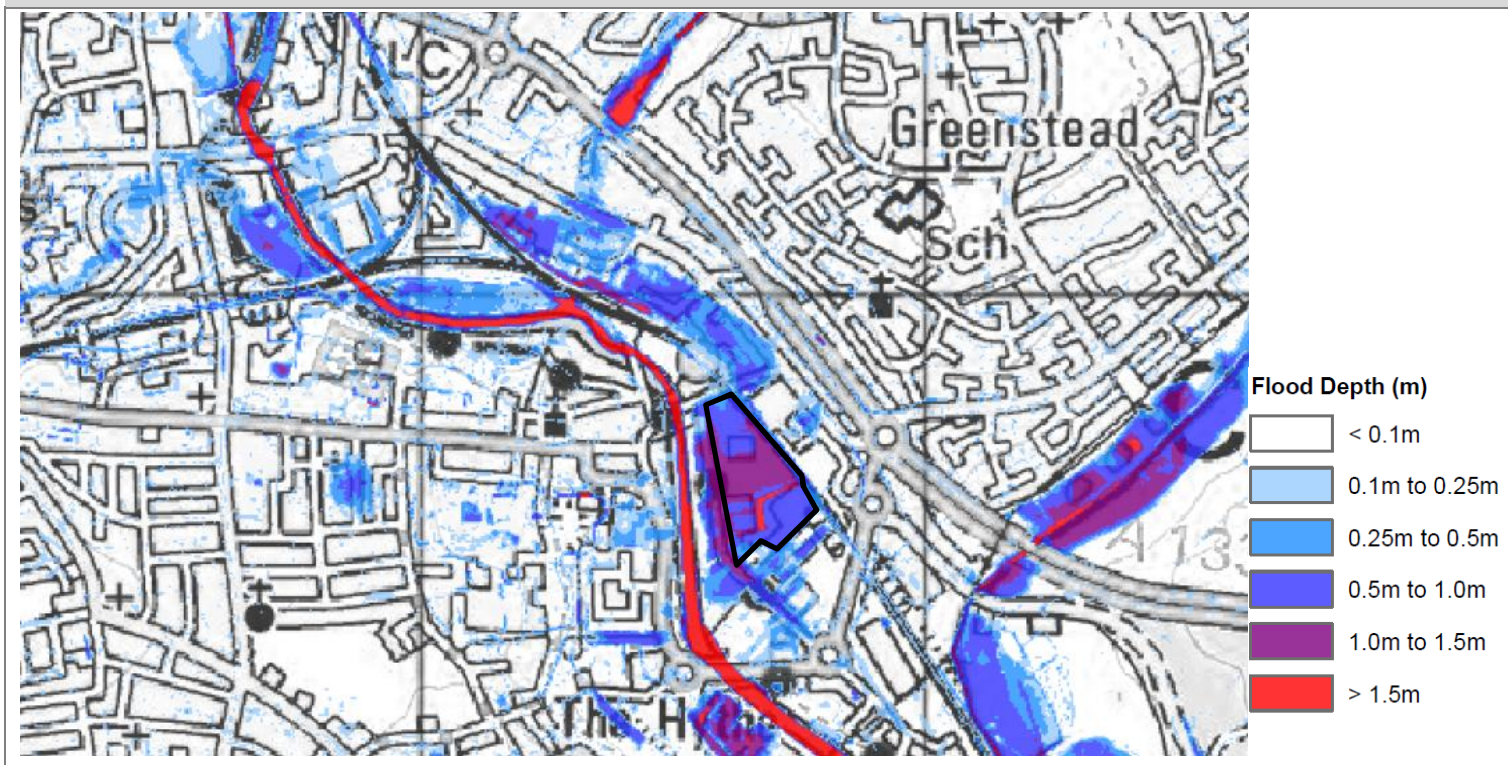

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Figure E Town of Colchester SWMP (Capita Symonds, 2013) Surface Water Modelling, 1% AEP Maximum Flood Depth

Estimated Greenfield Runoff Rates (IH124 Results).	**QBAR:**	**8.3 l/s**	
	1 in 1 year:	**7.0 l/s**	
	1 in 30 year:	**18.7 l/s**	
	1 in 100 year:	**26.3 l/s**	
Drainage Hierarchy	**Infiltration to ground**		**Uncertain due to geology; subject to on site infiltration testing.**
	Discharge to watercourse		**Discharge possible to the River Colne, subject to consultation with the Environment Agency. Discharge possible to the ordinary watercourse which flows through the site, subject to consultation with Essex CC and subject to confirmation that this will not exacerbate the surface water flooding with the ordinary watercourse.**
	Discharge to surface water sewer		**Possible, subject to consultation with Anglian Water and subject to confirmation that this will not exacerbate potential surface water flooding on Hawkins Road.**

Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Appendix A Figure 5) shows that the site is located within a 1km square of which 25-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area is therefore generally considered to be low. This will need to be confirmed during site investigation survey.

Other Sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the floodplain of the River Colne including the site is at risk of inundation in the event of a failure of the following reservoirs: Ardleigh (NGR (603487, 228024); Abberton Central and Western Arm (NGR 598901, 219790); and Abberton (NGR 598780, 219734). As noted in the Level 1 SFRA report, given the regular inspection of these reservoirs in accordance with the Reservoirs Act 1975, flooding from reservoirs is considered to be a managed risk.

Site Specific Recommendations

Set-back Distance

All development should be set back 16m from the edge of the River Colne. The Environment Agency will need to be consulted and an Environmental Permit obtained for any work within 16m of the watercourse. A 3m wide set-back distance should be retained on at least one side of the ordinary watercourse to provide access for maintenance. Essex CC, as the LLFA will need to be consulted and consent obtained for any proposed works that may impact flow within the channel of the watercourse.

Site Layout and Design

Residential development should be steered away from the edge of the River Colne. The drainage strategy for the site must be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. They should be considered in accordance with the hierarchy of SuDS as stated within the Interim Code of Practice for SuDS July 2004[4] (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek Finished Floor Levels for new development to be set 300mm above the 0.5% AEP flood level including an allowance for climate change for tidal flooding associated with the River Colne. The modelled flood level in the event of a failure of the Colne Barrier during the 0.5% AEP flood event including climate change to 2115 in this location is 4.6mAOD. Based on LiDAR topographic survey, the ground levels across the site vary between approximately 1.8m- 3.1mAOD.

Access / Egress

Safe dry access to and from the site should be provided where possible. The current access for the site is along Hawkins Road and Hythe Station Road. The safest access is likely to be provided to the north of the site via Hythe Station Road where flood depths of up to 1.8m are modelled to occur along this route corresponding to a hazard rating of Extreme (danger to all) in some areas and Significant (danger to most). Flood depths of up to 2.8m are modelled to occur along Hawkings Road, corresponding to a hazard rating of Extreme (danger to all). It will therefore be necessary to include provision of a place of safe refuge for residents of the residential development above the extreme flood level with an allowance for climate change and is internally accessible.

Emergency Planning

The site is shown to be within an Environment Agency Flood Warning Area for the Tidal Colne upstream of the Colne Barrier; residents should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the Colne Barrier, Flood Response Plans should be prepared by residents of the site including details of egress routes and place to safe refuge.

Summary

The proposed development entails More Vulnerable residential development located in Flood Zone 3a, which is subject to the Exception Test in accordance with the NPPF. The site is also identified as having a high risk of surface water flooding east of the site and therefore appropriate surface water flooding mitigation measures need to be considered in the design. One of the key issues for the proposed site is the residual tidal flood risk posed to the existing access/egress route along Hythe Station Road and Hawkings Road. Note the residual tidal risk is based on the failure of the Colne Barrier to close and is considered an unlikely event. The suitability of allocating this site in the Colchester BC Site Allocations rests on the ability of the risk management authorities to work together to deliver a solution for the potential flood risk. Based upon the strategic review of the flood risk posed to the site, and the recommendations set out above, it is likely that the proposed development itself could be suitably designed to protect the site and occupants from the risk of flooding.

[4] **http://www.susdrain.org/files/resources/other-guidance/nswg_icop_for_suds_0704.pdf**