

Bradford Level 2 Strategic Flood Risk Assessment - Appendix C

**South Pennine Towns Nominal Risk
Site Assessments
Draft**

January 2025

Prepared for:



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1 Introduction

A Level 2 Strategic Flood Risk Assessment (SFRA) is required by the City of Bradford Metropolitan District Council (CBMDC) as all identified potential development sites cannot be allocated outside of areas of flood risk, as identified through the Bradford Level 1 SFRA, finalised November 2023.

The Level 1 SFRA entailed the high-level flood risk screening of 1,396 potential development sites. 260 of these sites were shown to be at some level of fluvial and/or surface water flood risk yet considered important to CBMDC's Local Plan ambitions. 98 of the 260 sites were shown to be at nominal risk of flooding yet still required brief assessment and commentary to support allocation.

This report summarises the fluvial, surface water, groundwater, reservoir, sewer and canal risk to the sites at nominal risk of flooding within the South Pennine Towns Local Plan sub-area. This sub-area is located within the west of Bradford district, covering the villages of Oakworth, Haworth, Oxenhope, Cullingworth, Harden and Denholme.

2 Nominal Risk Sites

2.1 H339

Site summary (Figure 2-1)	
Location	Lees Lane, Crossroads
Existing site use	Greenfield
Existing site vulnerability	Water compatible
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	0.9 hectares

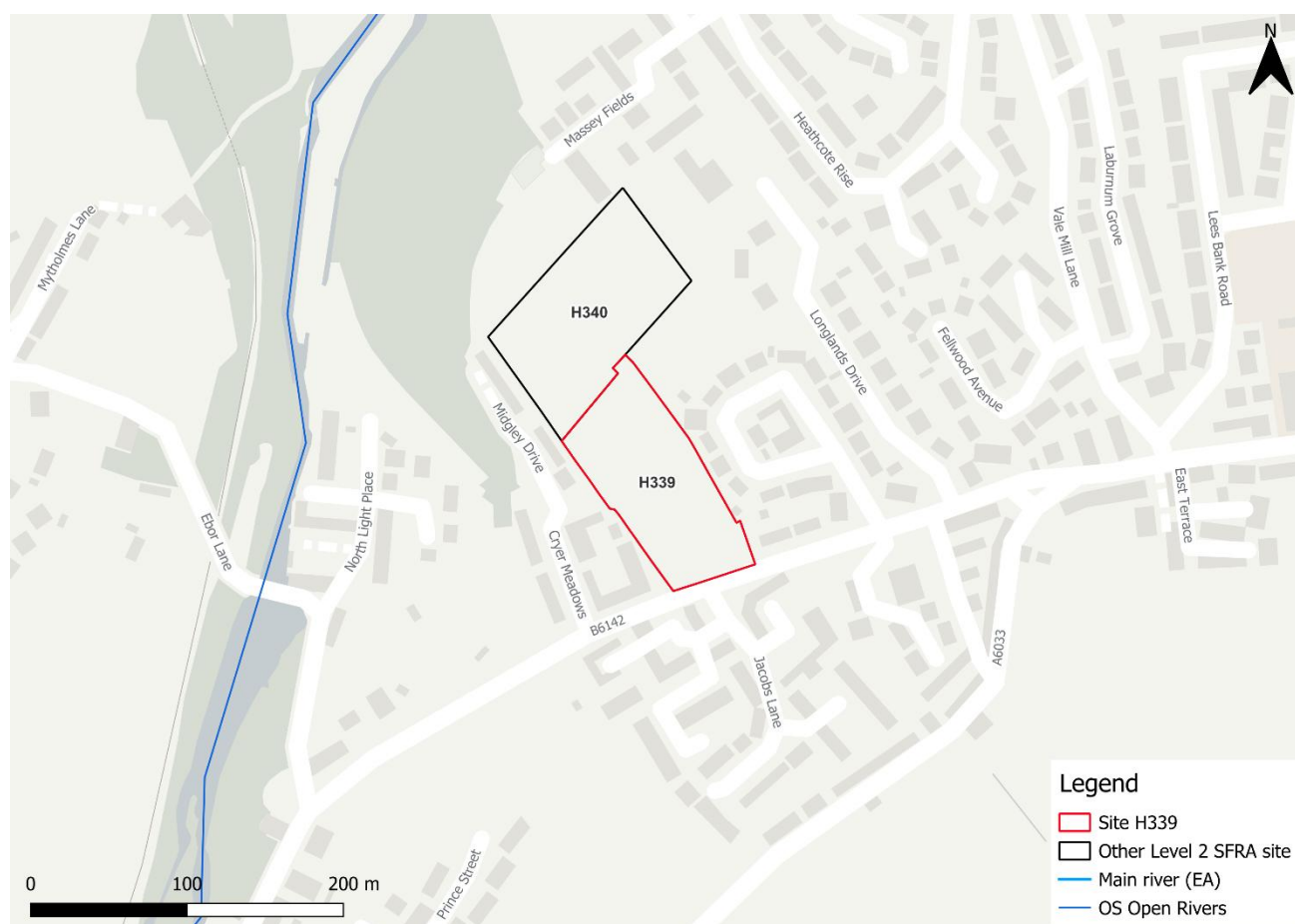


Figure 2-1: H339 site location boundary

2.1.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled

to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

Bridgehouse Beck is located to the west of the site, which is modelled in the River Worth 2022 model.

2.1.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-1). There is a small area of ponding within the north west of the site in the medium risk surface water event. Maximum depths within the site are between 0.15 and 0.3 m (Figure 2-2). The area of ponding is modelled to increase in extent in the medium risk event +40% climate change, with a short flow path emerging towards the south, although depths are modelled to remain low.

Based on available information, safe access and escape routes should be possible via the B6142. This route becomes inundated in the surface water plus climate change event, however depths are low and therefore safe access and escape should remain possible.

Table 2-1: Existing surface water flood risk within H339 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
98	1	1	0



Figure 2-2: Medium risk event surface water flood depths within H339 (Risk of Flooding from Surface Water)

2.1.3 Groundwater

The majority of the site is in an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.

2.1.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from water compatible to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.

- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which should investigate ground conditions for infiltration SuDS suitability.

2.2 H340

Site summary (Figure 2-3)	
Location	Lees Lane, Crossroads
Existing site use	Greenfield
Existing site vulnerability	Water compatible
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	1.0 hectares

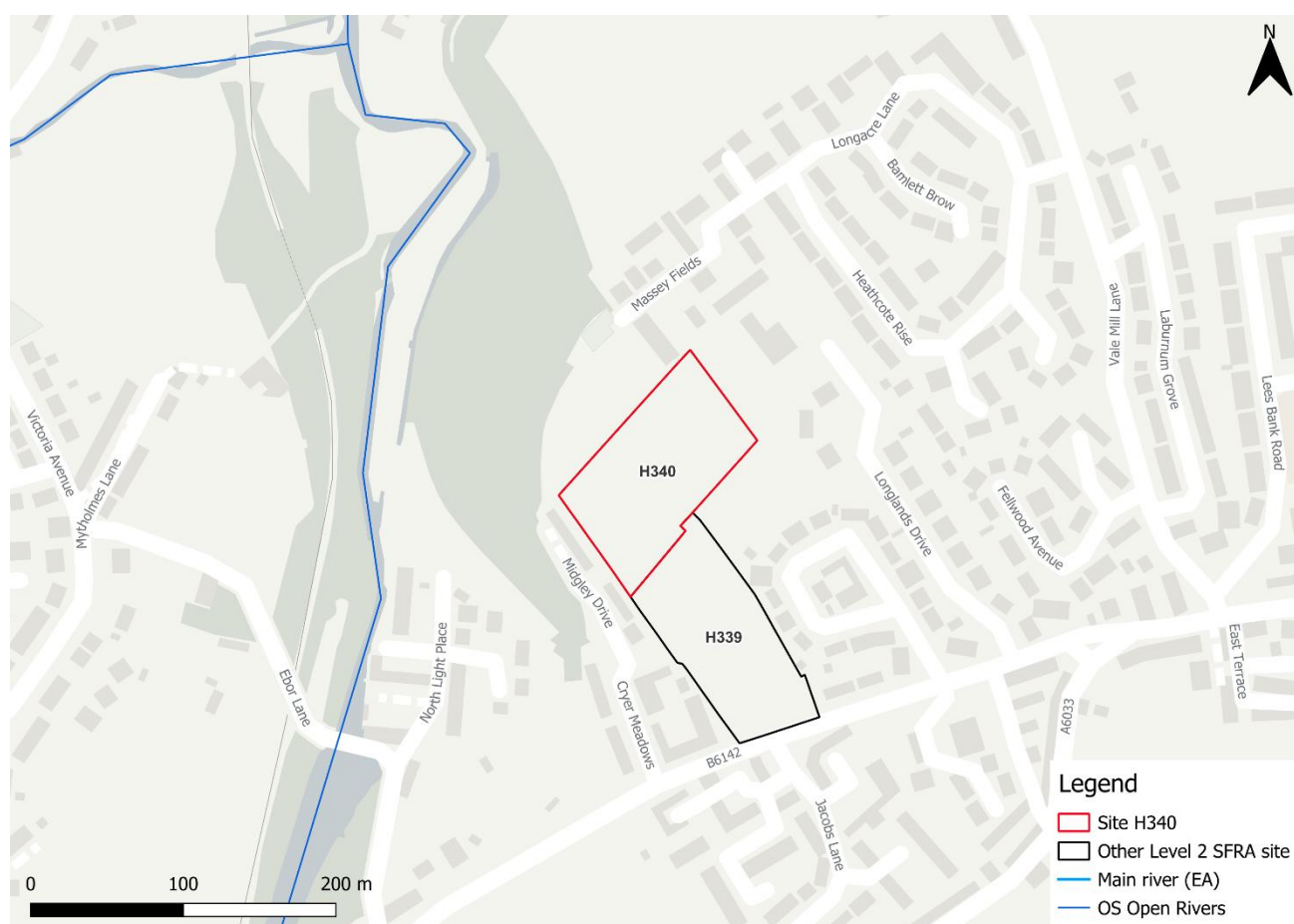


Figure 2-3: H340 site location boundary

2.2.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

Bridgehouse Beck is located to the west of the site, which is modelled in the River Worth 2022 model.

2.2.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-2). There is a small area of ponding within the north west of the site in the medium risk surface water event. Maximum depths within the site are between 0.15 and 0.3 m (Figure 2-4). The area of ponding is modelled to increase in extent in the medium risk event +40% climate change, with a short flow path emerging towards the south, although depths are modelled to remain low.

Based on available information, safe access and escape routes should be possible via the B6142. This route becomes inundated in the surface water plus climate change event, however depths are low and therefore safe access and escape should remain possible.

Table 2-2: Existing surface water flood risk within H340 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
96	3	1	0

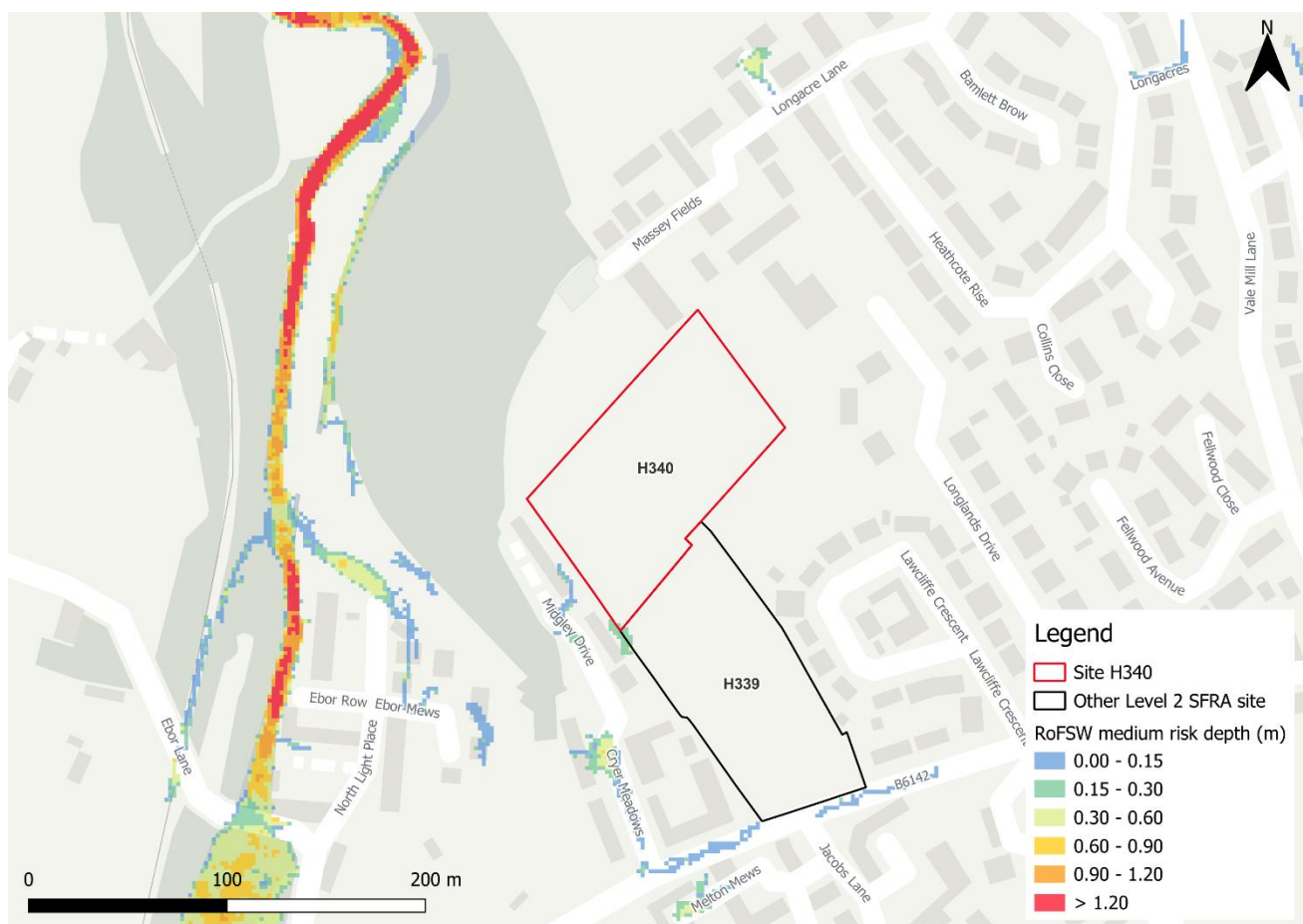


Figure 2-4: Medium risk event surface water flood depths within H340 (Risk of Flooding from Surface Water)

2.2.3 Groundwater

The majority of the site is in an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.

2.2.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from water compatible to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which should investigate ground conditions for infiltration SuDS suitability.

2.3 H818

Site summary (Figure 2-5)	
Location	Pasture Avenue
Existing site use	Greenfield
Existing site vulnerability	Water compatible
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	1.1 hectares



Figure 2-5: H818 site location boundary

2.3.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

An unnamed watercourse is present to the west of the site, which is modelled in the River Worth 2022 model.

2.3.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-3). There is a very small area within the western corner of the site at medium risk of surface water flooding. Maximum depths within the site are < 0.15 m (Figure 2-6). A shallow flow path is modelled to develop through the south of the site in the medium risk event +40% climate change.

Based on available information, safe access and escape routes should be possible via Pasture Avenue in the medium risk present day event. This route becomes inundated in the surface water plus climate change event to between 0.3 and 0.6 m in depth, therefore safe access and escape in the long term should be considered further.

Table 2-3: Existing surface water flood risk within H818 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
94	5	1	0

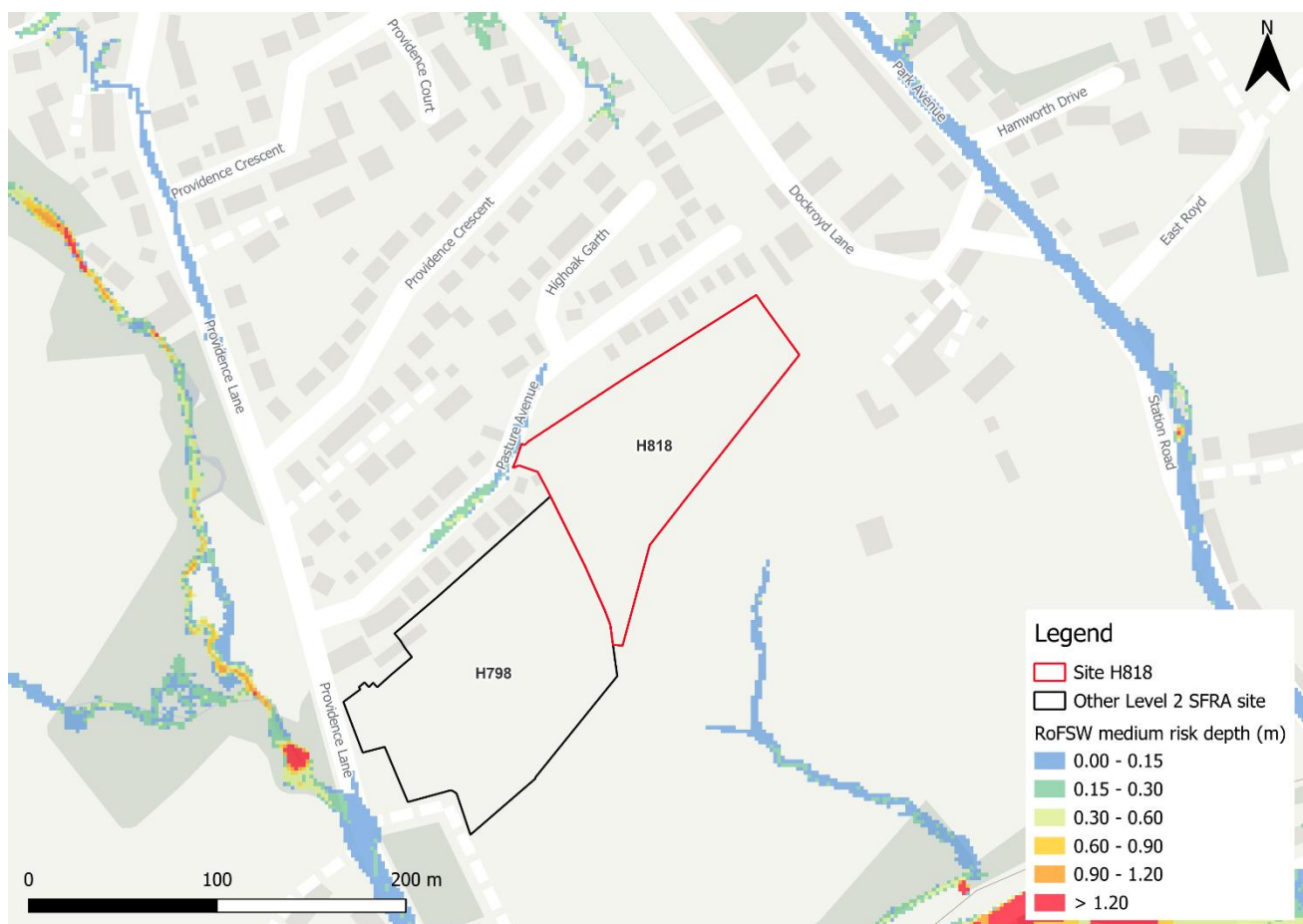


Figure 2-6: Medium risk event surface water flood depths within H818 (Risk of Flooding from Surface Water)

2.3.3 Groundwater

The entirety of the site is in an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.

2.3.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from water compatible to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change, however safe access and escape routes in the long term should be considered further.
- Any FRA should include for a drainage strategy which should investigate ground conditions for infiltration SuDS suitability.

2.4 H866

Site summary (Figure 2-7)	
Location	Queensbury Golf Course
Existing site use	Golf course
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	13.3 hectares

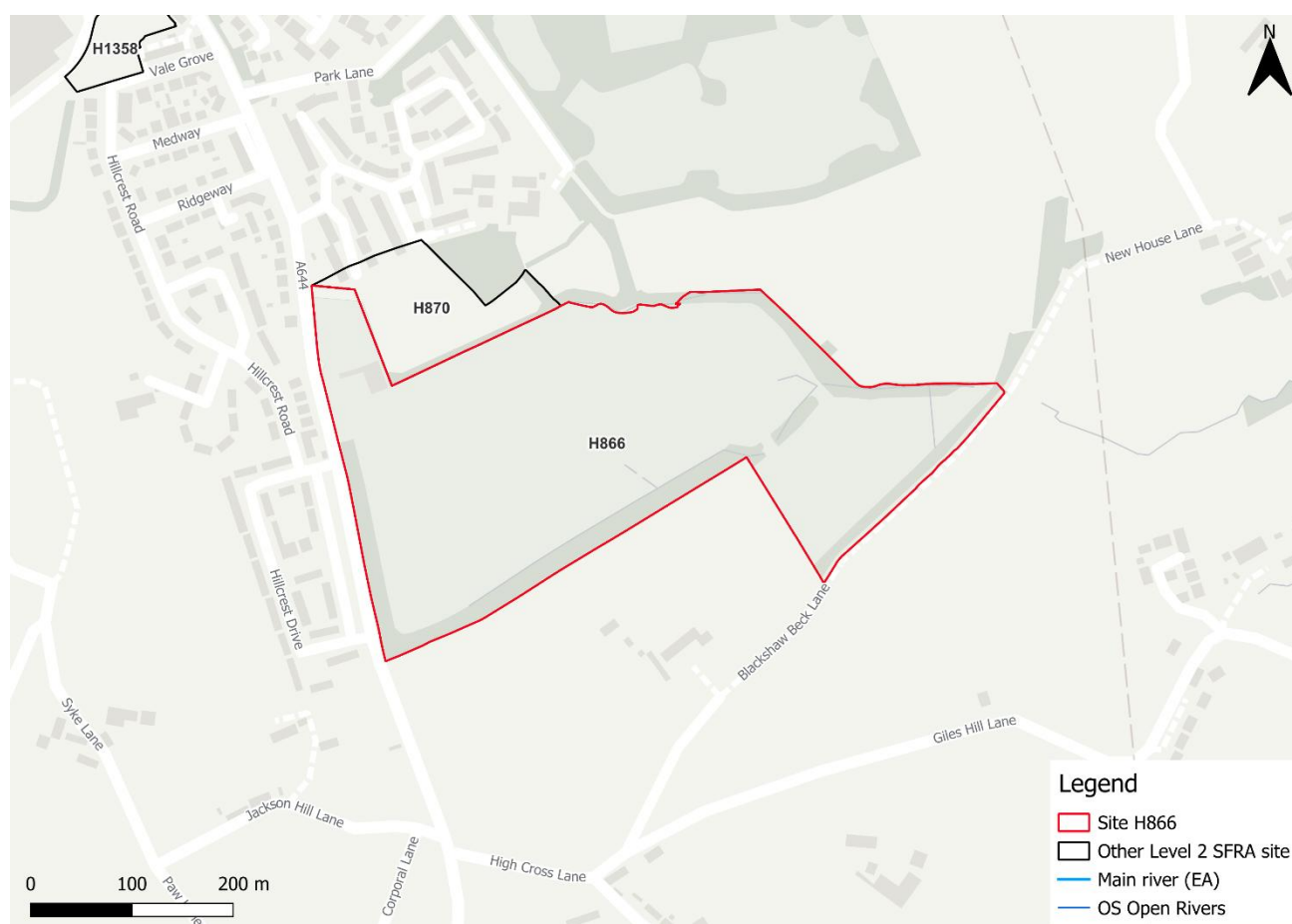


Figure 2-7: H866 site location boundary

2.4.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. Blackshaw Beck is an unmodelled watercourse located along the northern boundary of the site that is not a designated main river or located within OS Open Rivers dataset. There is potential for this

watercourse to contribute to fluvial flooding within the site. Blackshaw Beck should be modelled as part of a site-specific FRA.

2.4.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-4). There is a surface water flow path located along the northern boundary of the site in the medium risk event, coincident with the existing Blackshaw Beck watercourse. Any existing flow paths should be maintained in site design.

Maximum depths within the site are between 0.9 and 1.2 m (Figure 2-8), however these are located within the existing channel. The flow path along the northern site boundary is modelled to increase in extent in the medium risk event +40% climate change, however remains contained within channel. There is also an additional short, shallow flow path emerging within the north of the site.

Based on available information, safe access and escape routes should be possible via the A644 and Blackshaw Beck Lane both in the present day and longer term.

Table 2-4: Existing surface water flood risk within H866 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
97	1	1	1

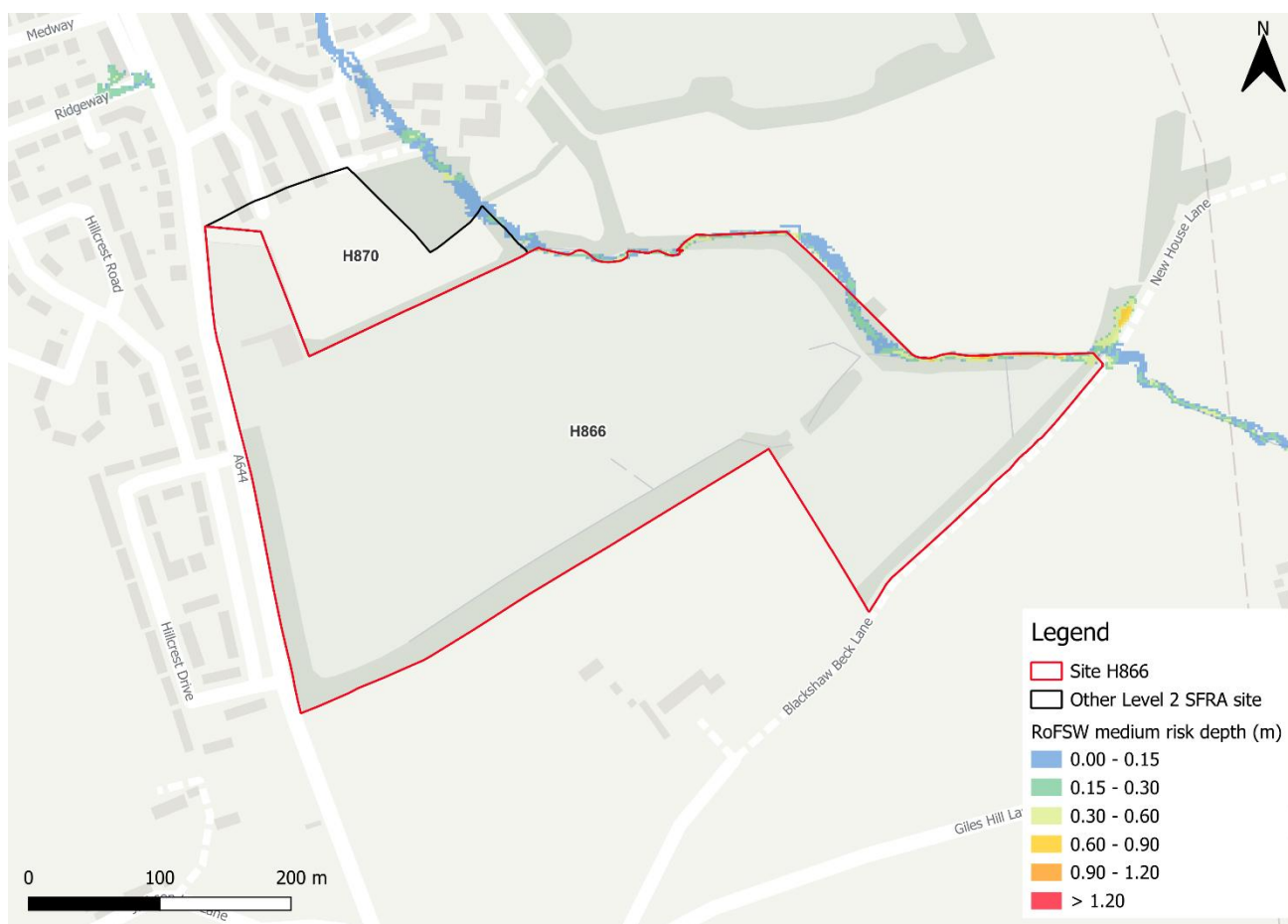


Figure 2-8: Medium risk event surface water flood depths within H866 (Risk of Flooding from Surface Water)

2.4.3 Groundwater

Within the west of the site, there is a risk of groundwater emergence to both surface and subsurface assets. Across the remaining area of the site there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS within some areas.

2.4.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.

- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site. However, potential fluvial risk from Blackshaw Beck must be confirmed.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change. However, potential fluvial risk from Blackshaw Beck must be confirmed.
- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.5 H870

Site summary (Figure 2-9)	
Location	Brighouse Road
Existing site use	Greenfield
Existing site vulnerability	Water compatible
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	1.5 hectares



Figure 2-9: H870 site location boundary

2.5.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

2.5.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-5). There is a surface water flow path located along the eastern boundary of the site in the medium risk event. Any existing flow paths should be maintained in site design. Maximum depths within the site are between 0.9 and 1.2 m (Figure 2-10). The flow path along the eastern site boundary is modelled to increase in extent in the medium risk event +40% climate change, however remains confined to the boundary.

Based on available information, safe access and escape routes should be possible via Black Dyke View both in the present day and longer term.

Table 2-5: Existing surface water flood risk within H870 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
96	2	2	0

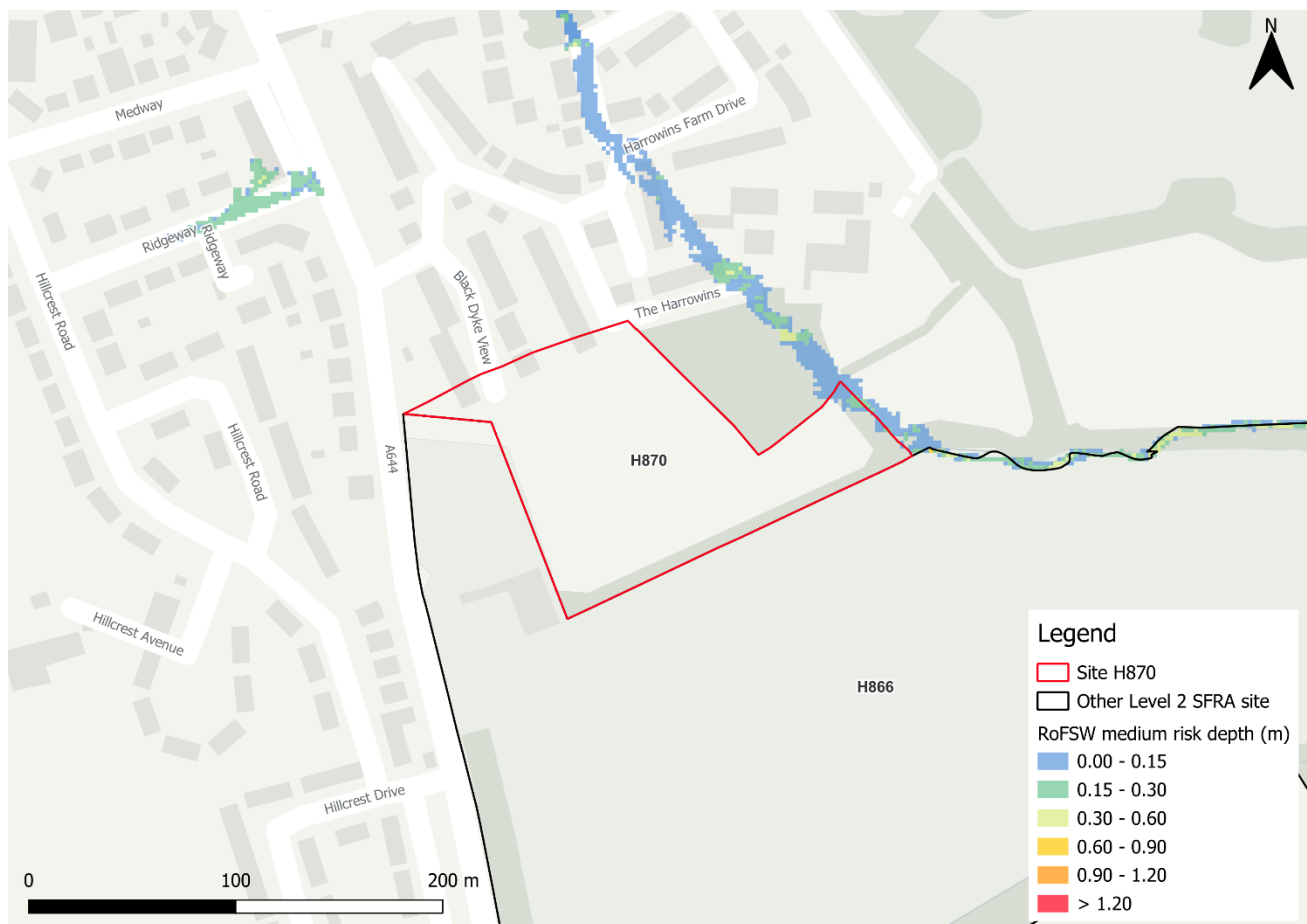


Figure 2-10: Medium risk event surface water flood depths within H870 (Risk of Flooding from Surface Water)

2.5.3 Groundwater

Through the centre of the site, there is a risk of groundwater emergence to both surface and subsurface assets. Across the remaining area of the site there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS within some areas.

2.5.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from water compatible to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which should investigate ground conditions for infiltration SuDS suitability.

2.6 H873

Site summary (Figure 2-11)	
Location	Old Guy Road / Fleet Lane (1)
Existing site use	Agriculture
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	11.1 hectares



Figure 2-11: H873 site location boundary

2.6.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

2.6.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-6). There are two small areas of ponding within topographic low spots within the north and west of the site in the medium risk event. Maximum depths within the site are between 0.3 and 0.6 m (Figure 2-12). These areas of ponding are modelled to increase in extent in the medium risk event +40% climate change, with a short flow path emerging towards the south, although depths are modelled to remain low. Any existing flow paths and topographic depressions should be maintained within site design.

Based on available information, safe access and escape routes should be possible via Old Guy Road both in the present day and longer term.

Table 2-6: Existing surface water flood risk within H873 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
97	1	1	1

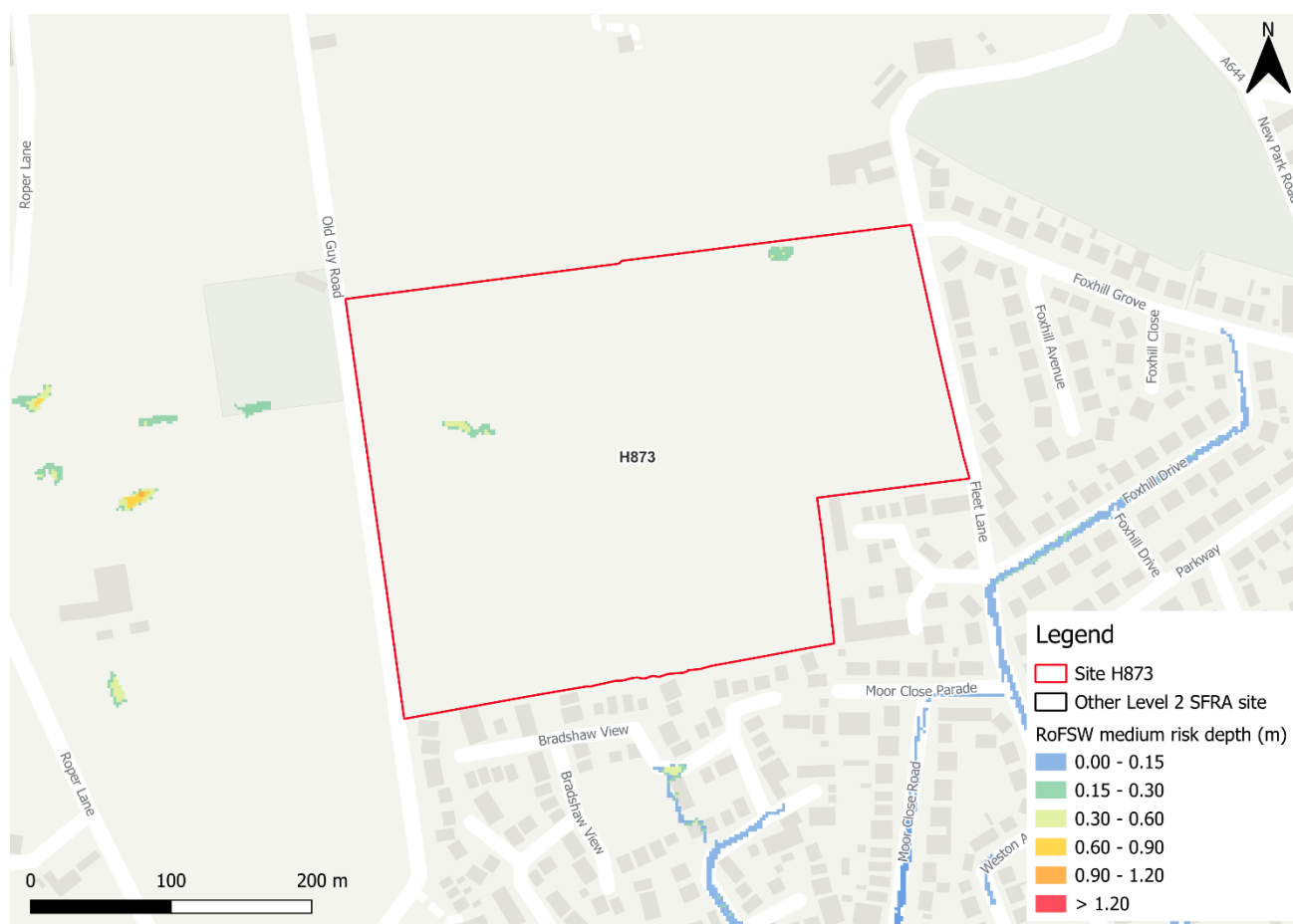


Figure 2-12: Medium risk event surface water flood depths within H873 (Risk of Flooding from Surface Water)

2.6.3 Groundwater

The entirety of the site is in an area where there is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely.

2.6.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which includes the ponded areas and flow path in site design.

2.7 H874

Site summary (Figure 2-13)	
Location	Long lane (2)
Existing site use	Agriculture
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	0.7 hectares



Figure 2-13: H874 site location boundary

2.7.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future. There is an unnamed, unmodelled watercourse to the southeast of the site.

2.7.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-7). In the high and medium risk events, surface water risk is confined to a very small area along the northern boundary of the site. In the low risk event, there is a distinct flow path through the centre of the site. Maximum depths within the site are between 0.15 and 0.3 m (Figure 2-14). In the medium risk event +40% climate change, there is a significant, shallow flow path through the centre of the site. Any existing flow paths should be maintained within site design.

Based on available information, safe access and escape routes should be possible via Long Lane both in the present day and longer term.

Table 2-7: Existing surface water flood risk within H874 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
78	12	0	1

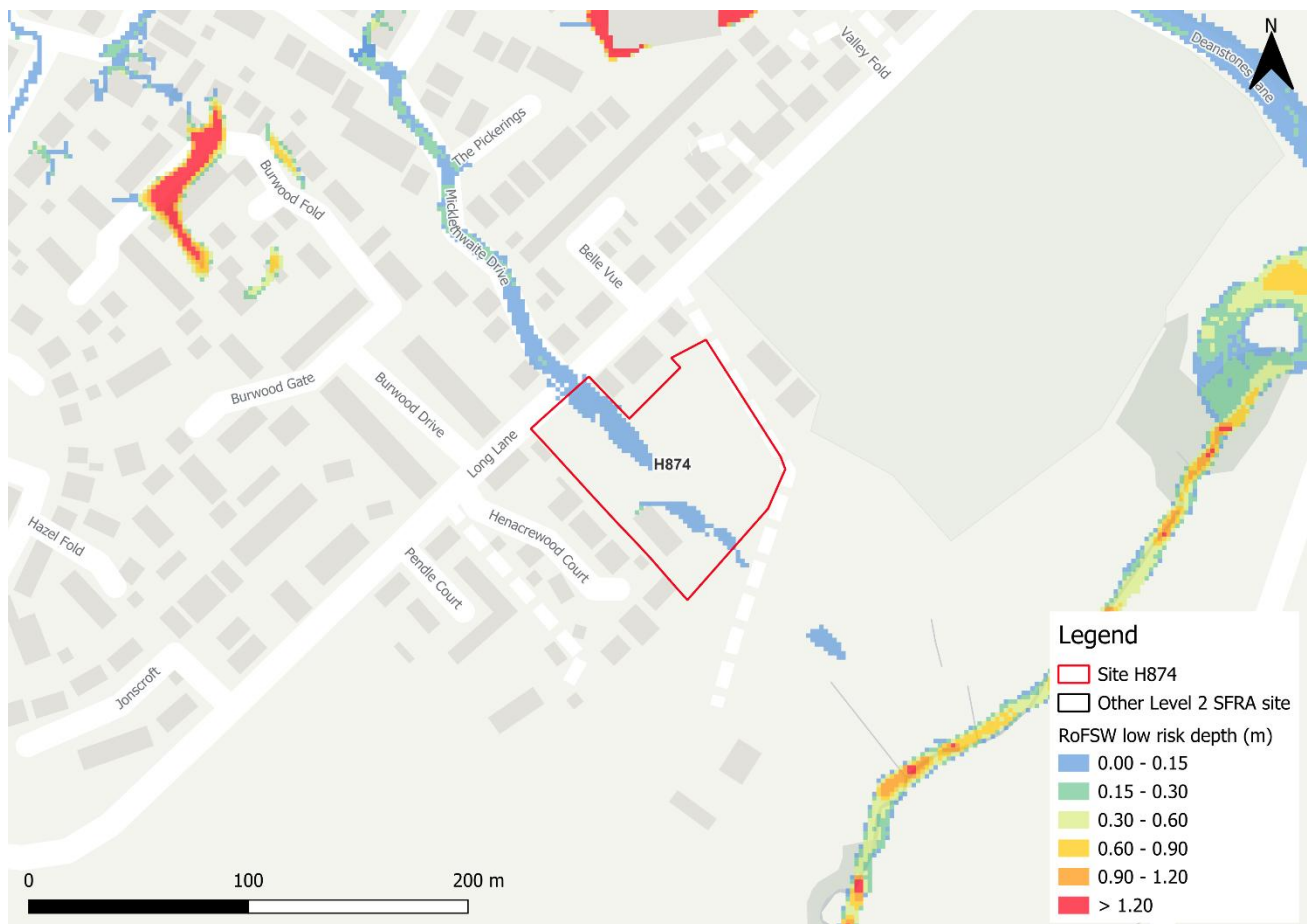


Figure 2-14: Low risk event surface water flood depths within H874 (Risk of Flooding from Surface Water)

2.7.3 Groundwater

Within the east of the site, there is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely. Across the rest of the site, groundwater emergence is not likely. Groundwater conditions may therefore be suited to infiltration SuDS within the west.

2.7.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change, however the flow path through the centre of the site in the long term should be maintained within site design.
- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.8 H1311

Site summary (Figure 2-15)	
Location	Thornton Road
Existing site use	Greenfield
Existing site vulnerability	Water compatible
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	2.4 hectares



Figure 2-15: H1311 site location boundary

2.8.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

2.8.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-8). There is a surface water flow path along the northwestern boundary of the site in the medium risk event. Maximum depths within the site are between 0.3 and 0.6 m (Figure 2-16). The flow path within the northwest of the site is modelled to increase in extent in the medium risk event +40% climate change, with an additional flow path along the entire northern boundary, although depths are modelled to remain low. Any existing flow paths should be maintained within site design.

Based on available information, safe access and escape routes may be challenging to achieve in both the present day and longer term.

Table 2-8: Existing surface water flood risk within H1311 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
92	5	1	2



Figure 2-16: Medium risk event surface water flood depths within H1311 (Risk of Flooding from Surface Water)

2.8.3 Groundwater

Within the north west of the site, there is a risk of groundwater emergence to both surface and subsurface assets. Across the rest of the site there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS within the majority of the site.

2.8.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from water compatible to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Safe access and escape routes should be investigated further as part of a site-specific FRA. Routes may need to be raised above the existing surface water flow path along the northern boundary to allow surface water to flow naturally.
- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.9 H1323

Site summary (Figure 2-17)	
Location	Dole and Prospect Mills
Existing site use	Brownfield
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	1.2 hectares



Figure 2-17: H1323 site location boundary

2.9.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

Pinch Beck is an unmodelled watercourse located to the south of the site.

2.9.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-9). There is a small area of surface water ponding in a topographic low spot within the centre of the site in the medium risk event. Maximum depths within the site are between 0.3 and 0.6 m (Figure 2-18). The area of ponding is modelled to increase in depth extent in the medium risk event +40% climate change, with a number of short, shallow flow paths emerging towards the south and east. Any existing flow paths and topographic depressions should be maintained within site design.

Based on available information, safe access and escape routes should be possible via the B6145. This route becomes inundated in the surface water plus climate change event, however depths are low and therefore safe access and escape should remain possible.

Table 2-9: Existing surface water flood risk within H1323 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
95	4	1	0

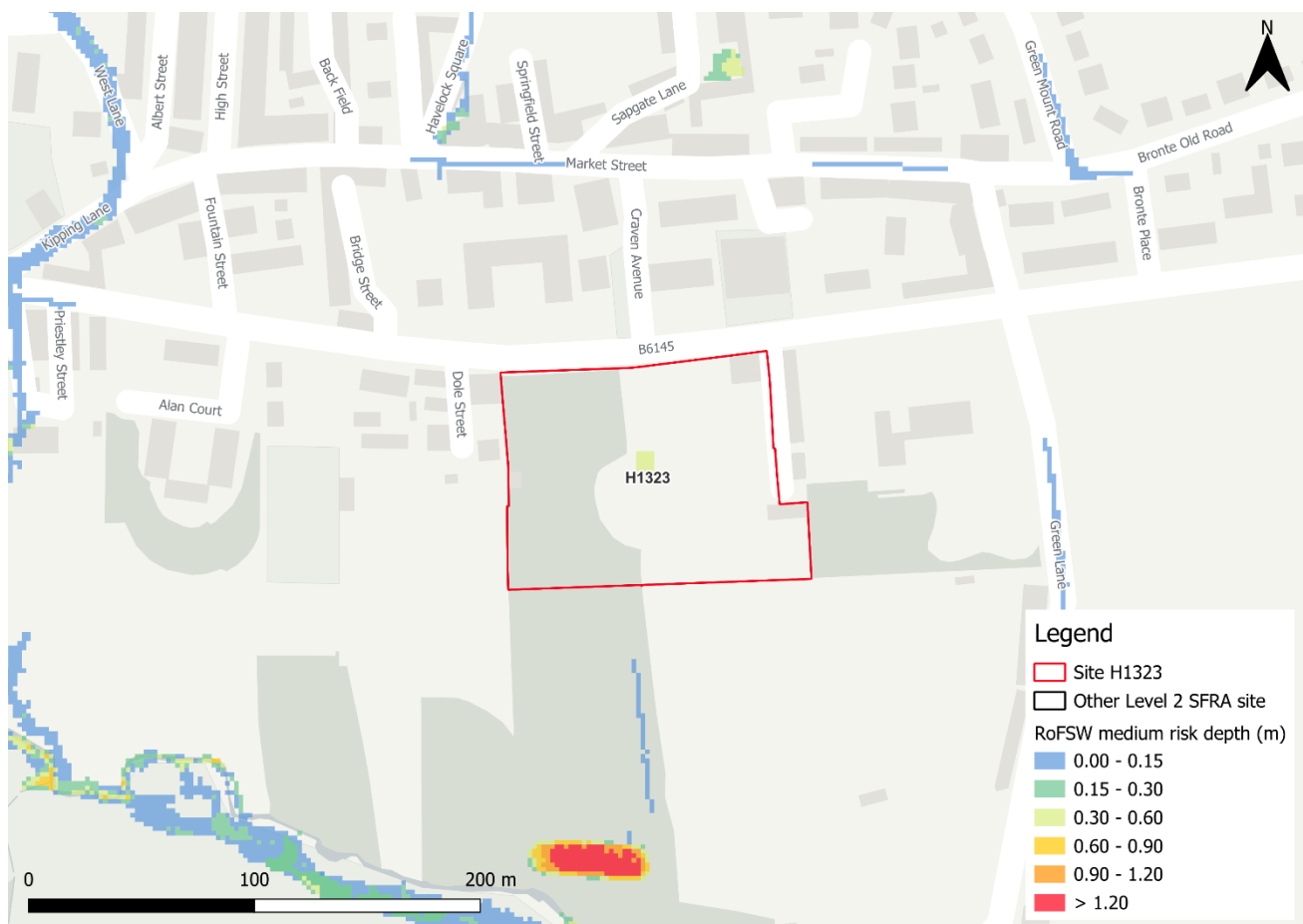


Figure 2-18: Medium risk event surface water flood depths within H1323 (Risk of Flooding

from Surface Water)

2.9.3 Groundwater

Within the north of the site, there is a risk of groundwater emergence to both surface and subsurface assets (Figure 2-19). The south of the site is in an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS in the south of the site.

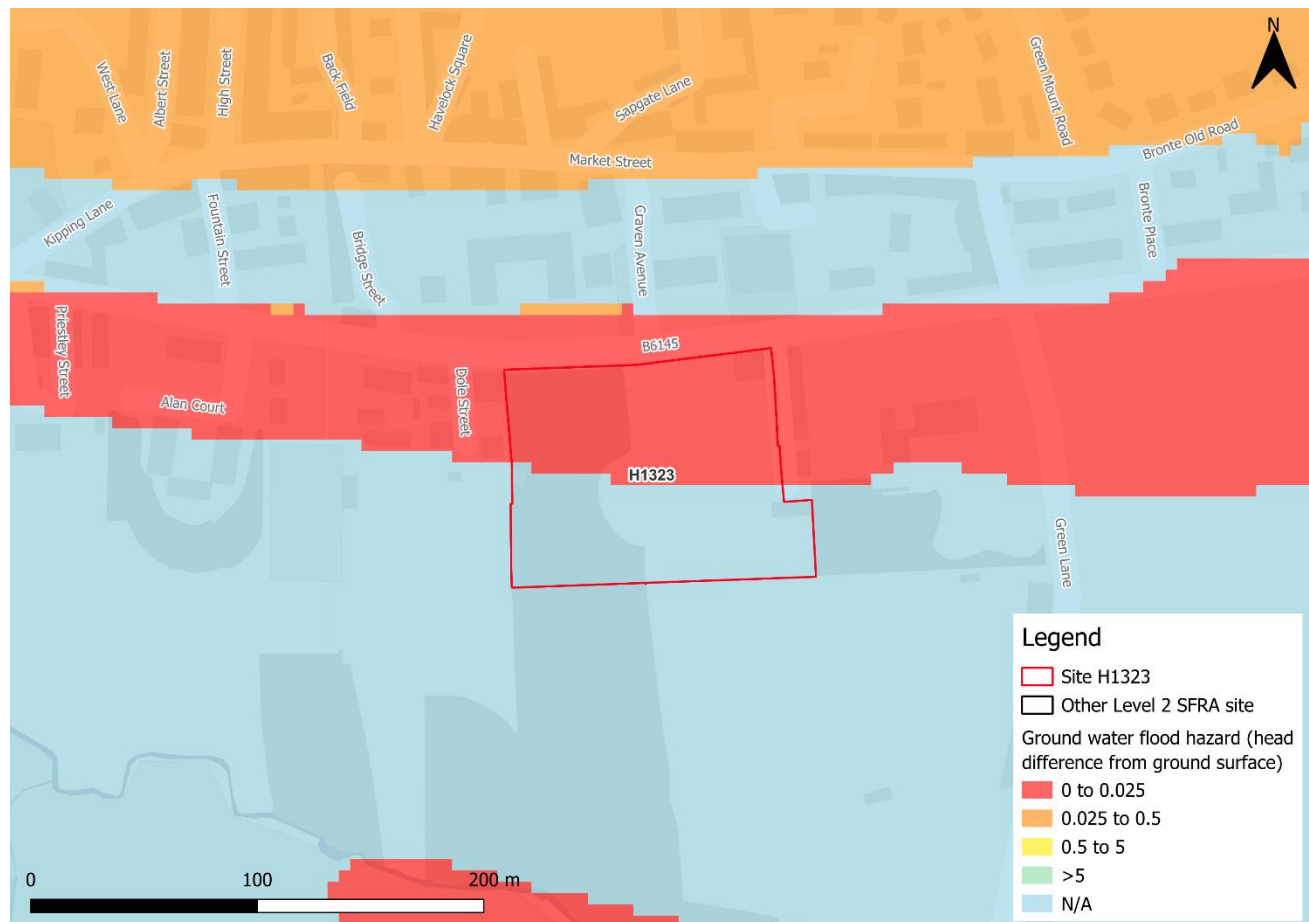


Figure 2-19: JBA 5m Groundwater Emergence Map (H1323)

2.9.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.

- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which includes the ponded area and flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.10 H1325

Site summary (Figure 2-20)	
Location	Bents Lane
Existing site use	Agriculture
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	4.1 hectares



Figure 2-20: H1325 site location boundary

2.10.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

Harden Beck is located to the north of the site which is within Flood Zone 3a. There is an additional watercourse located to the east of the site that is not a designated main river or located within OS Open Rivers dataset. This watercourse is also within Flood Zone 3a.

2.10.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-10). There is a surface water flow path along the eastern boundary of the site in the medium risk event. Maximum depths within the site are between 0.15 and 0.3 m (Figure 2-21). The flow path in the east is modelled to increase in both extent and depth in the medium risk event +40% climate change. Any existing flow paths should be maintained within site design.

Based on available information, safe access and escape routes should be possible via the Bents Lane. This route becomes inundated in the surface water plus climate change event, however depths are low and therefore safe access and escape should remain possible.

Table 2-10: Existing surface water flood risk within H1325 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
92	4	2	2

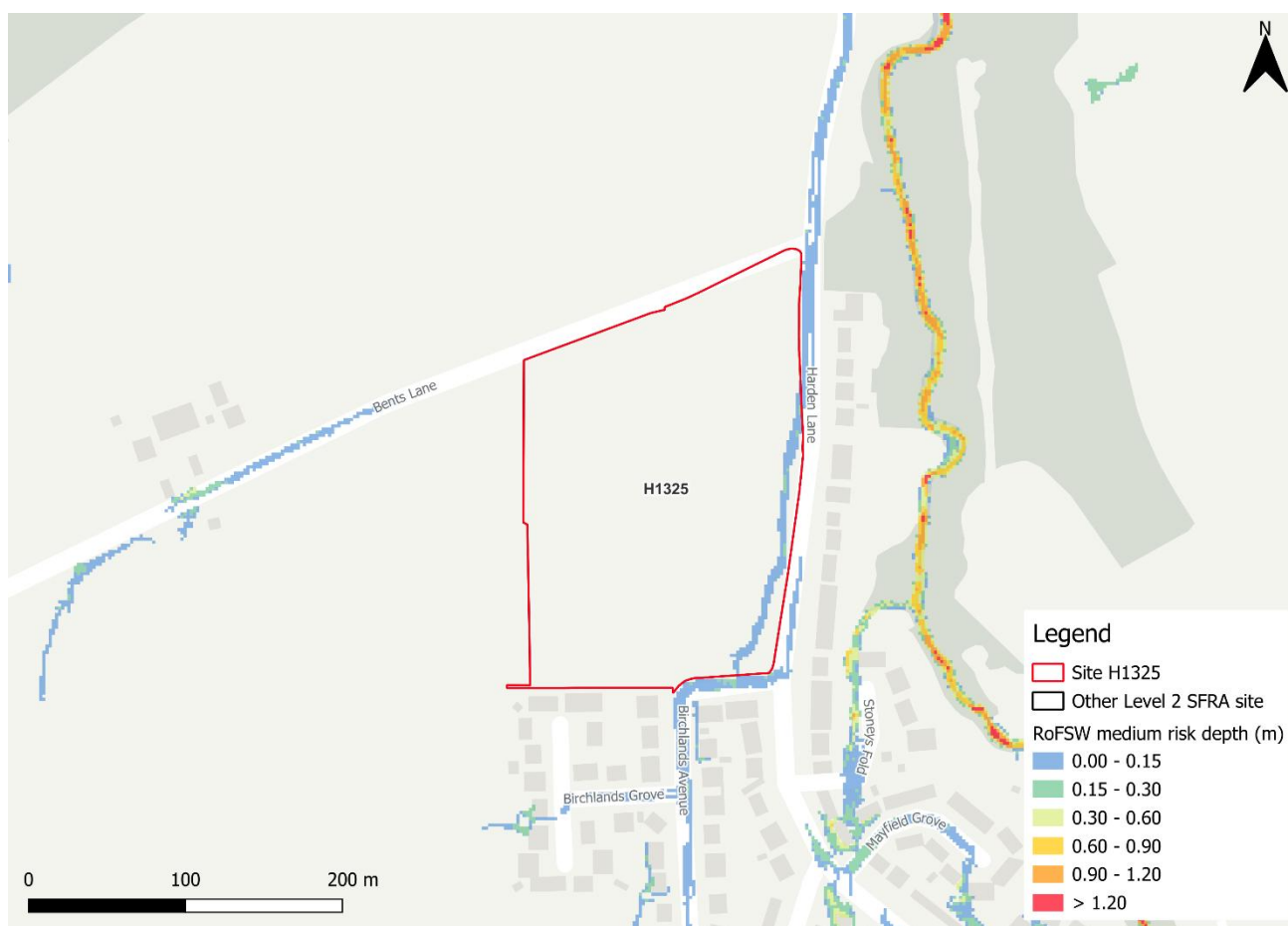


Figure 2-21: Medium risk event surface water flood depths within H1325 (Risk of Flooding from Surface Water)

2.10.3 Groundwater

Across the majority of the site, the risk of groundwater emergence is unlikely. Within the east of the site, there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.

2.10.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.

- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.11 H1326

Site summary (Figure 2-22)	
Location	Crack Lane north
Existing site use	Agriculture
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	0.7 hectares



Figure 2-22: H1326 site location boundary

2.11.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

There is a watercourse located to the north west of the site that is not a designated main river or located within OS Open Rivers dataset. This watercourse is within Flood Zone 3a.

2.11.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-11). Within all events, surface water risk is confined to the southwest corner of the site. Maximum depths within the site in the low risk event are between 0.15 and 0.3 m (Figure 2-23). Surface water risk in the medium risk event +40% climate change is similar in both extent and depth to the present day low risk event.

Based on available information, safe access and escape routes may be challenging to achieve in both the present day and longer term.

Table 2-11: Existing surface water flood risk within H1326 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
97	1	1	1

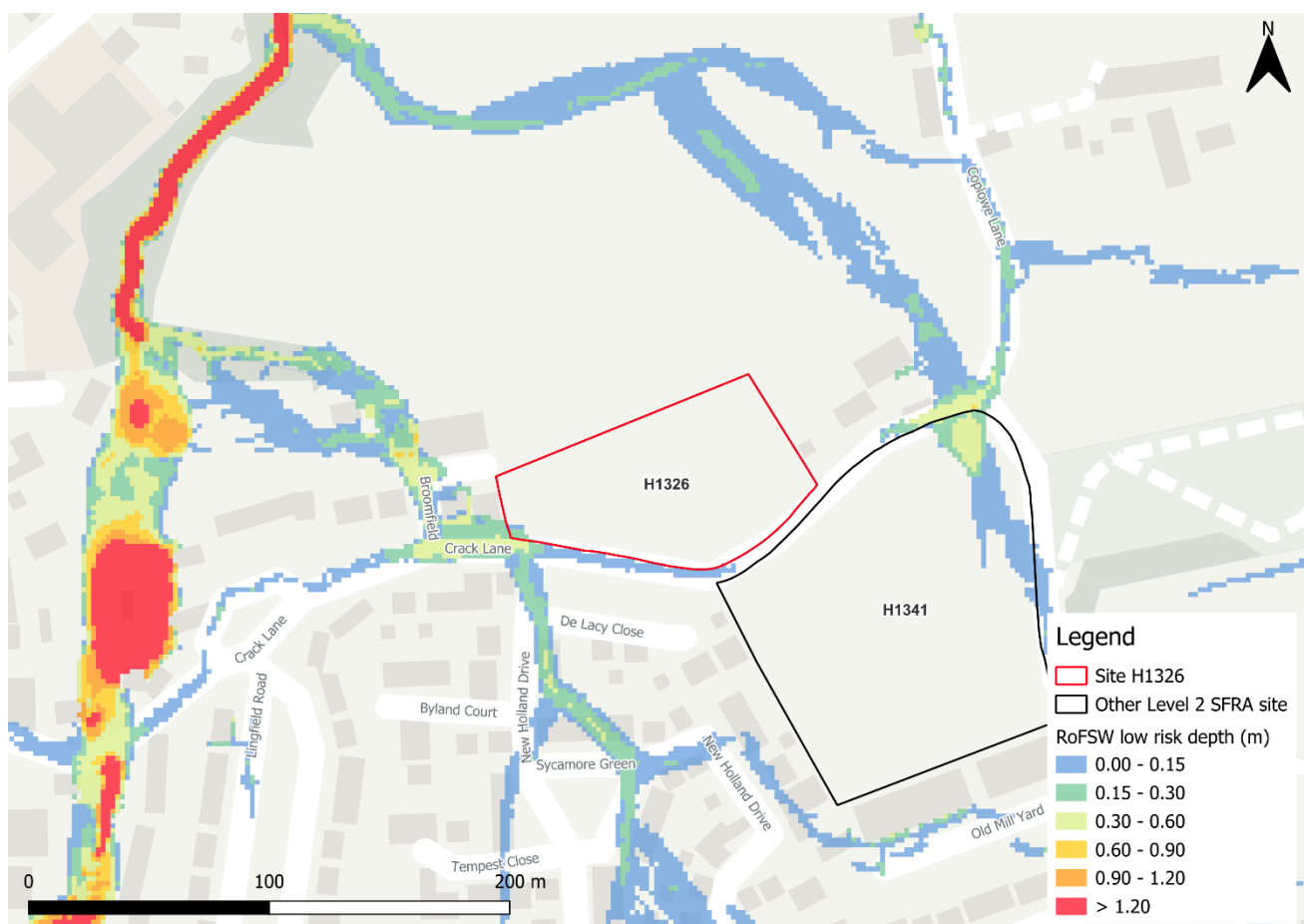


Figure 2-23: Low risk event surface water flood depths within H1326 (Risk of Flooding from Surface Water)

2.11.3 Groundwater

The majority of the site is in an area where there is no risk of groundwater emergence. There is an area within the west of the site where groundwater emergence is unlikely. Groundwater conditions may therefore be suited to infiltration SuDS.

2.11.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Safe access and escape routes should be investigated further as part of a site-specific FRA. Routes may need to be raised above the existing surface water flow path along the northern boundary to allow surface water to flow naturally.
- Any FRA should include for a drainage strategy which should investigate ground conditions for infiltration SuDS suitability.

2.12 H1341

Site summary (Figure 2-24)	
Location	Crack Lane
Existing site use	Agriculture
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	1.5 hectares



Figure 2-24: H1341 site location boundary

2.12.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

There is a watercourse located to the north west of the site that is not a designated main river or located within OS Open Rivers dataset. This watercourse is within Flood Zone 3a.

2.12.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-12). There is a surface water flow path along the eastern boundary of the site in the medium risk event. Maximum depths within the site are between 0.3 and 0.6 m (Figure 2-25). The flow path is modelled to increase in extent in the medium risk event +40% climate change. Any existing flow paths should be maintained within site design.

Based on available information, safe access and escape routes should be possible via the Shay Lane. This route is inundated in both the medium risk present day and climate change events, however depths are low and therefore safe access and escape should remain possible.

Table 2-12: Existing surface water flood risk within H339 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
91	5	1	3

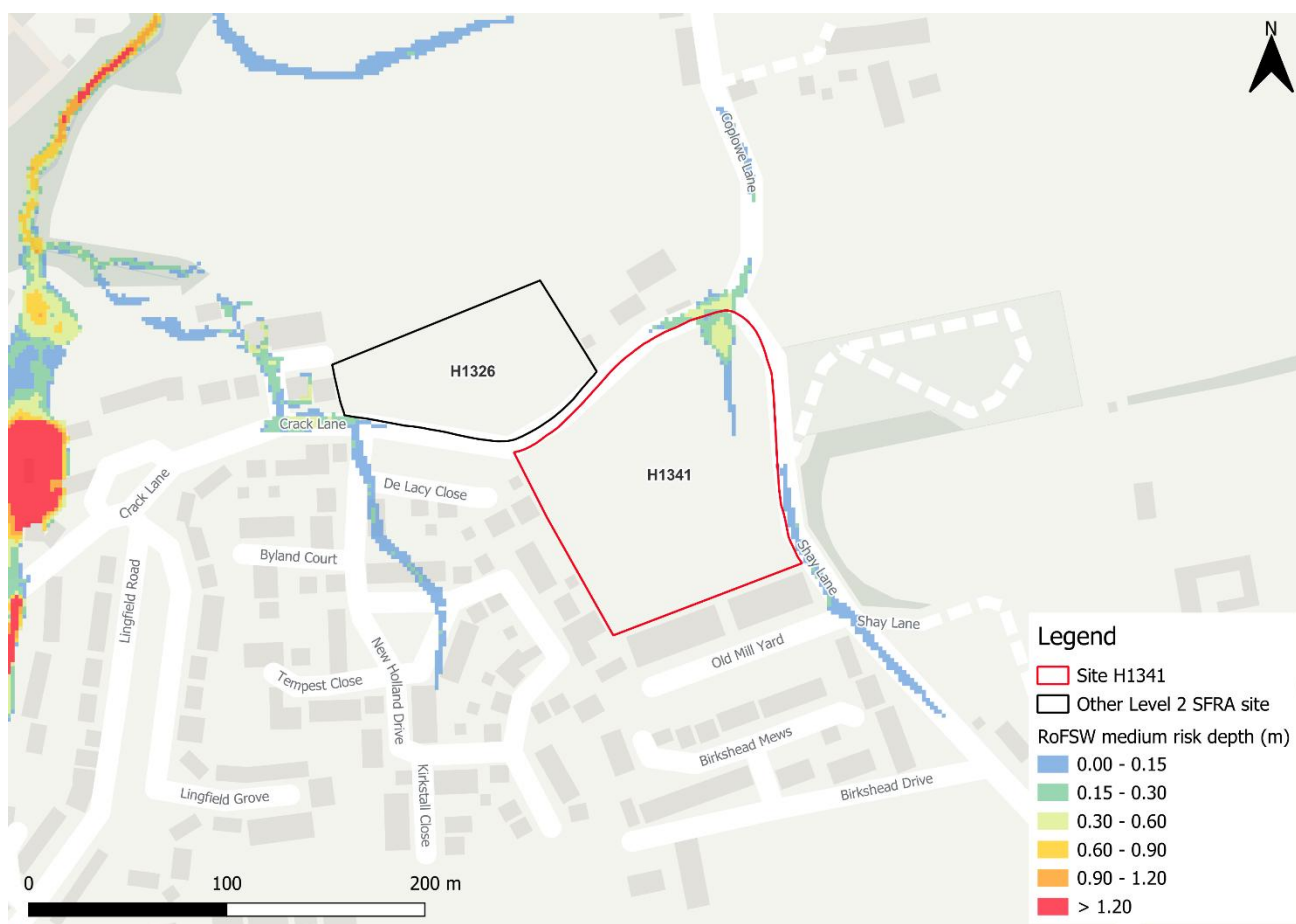


Figure 2-25: Medium risk event surface water flood depths within H1341 (Risk of Flooding from Surface Water)

2.12.3 Groundwater

The entirety of the site is in an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.

2.12.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.

- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.13 H1342

Site summary (Figure 2-26)	
Location	Moorside Farm
Existing site use	Agriculture
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	3.1 hectares



Figure 2-26: H1342 site location boundary

2.13.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

2.13.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-13). There is a small area of surface water ponding in a topographic low spot within the south of the site in the medium risk event. Maximum depths within the site are between 0.15 and 0.3 m (Figure 2-27). The area of ponding is modelled to increase in both extent and depth in the medium risk event +40% climate change. Any existing topographic depressions should be maintained within site design.

Based on available information, safe access and escape routes should be possible via Moorside View both in the present day and longer term.

Table 2-13: Existing surface water flood risk within H1342 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
98	1	1	0



Figure 2-27: Medium risk event surface water flood depths within H1342 (Risk of Flooding from Surface Water)

2.13.3 Groundwater

The entirety of the site is in an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.

2.13.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.
- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

2.14 H1358

Site summary (Figure 2-28)	
Location	Old Mill Dam Lane
Existing site use	Brownfield
Existing site vulnerability	Less vulnerable
Proposed site use	Housing
Proposed site vulnerability	More vulnerable
Site area	0.7 hectares



Figure 2-28: H1358 site location boundary

2.14.1 Fluvial

The site is wholly located within Flood Zone 1 of the Environment Agency's (EA) Flood Map for Planning which indicates it as at low risk of flooding from rivers. The site is not modelled to be at additional risk from fluvial climate change and is therefore at low risk of flooding from rivers in the future.

2.14.2 Surface water

The site is predominantly at very low risk of surface water flooding, based on the EA's Risk of Flooding from Surface Water (RoFSW) map (Table 2-14). There is a surface water flow path through the north of the site in the medium risk event. Maximum depths within the site are between 0.6 and 0.9 m (Figure 2-29). The surface water flow path is modelled to increase in both extent and depth in the medium risk event +40% climate change. Any existing flow paths should be maintained within site design.

Based on available information, safe access and escape routes should be possible via the A644 both in the present day and longer term.

Table 2-14: Existing surface water flood risk within H1358 based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
94	2	1	3



Figure 2-29: Medium risk event surface water flood depths within H1358 (Risk of Flooding from Surface Water)

2.14.3 Groundwater

The majority of the site is in an area where there is no risk of groundwater emergence (Figure 2-30). Within the south of the site, there is a risk of groundwater emergence to

subsurface assets, but surface manifestation of groundwater is unlikely. There are some areas in the south where there is a risk of groundwater emergence to surface and subsurface assets. Groundwater conditions may therefore be suited to infiltration SuDS across the majority of the site.

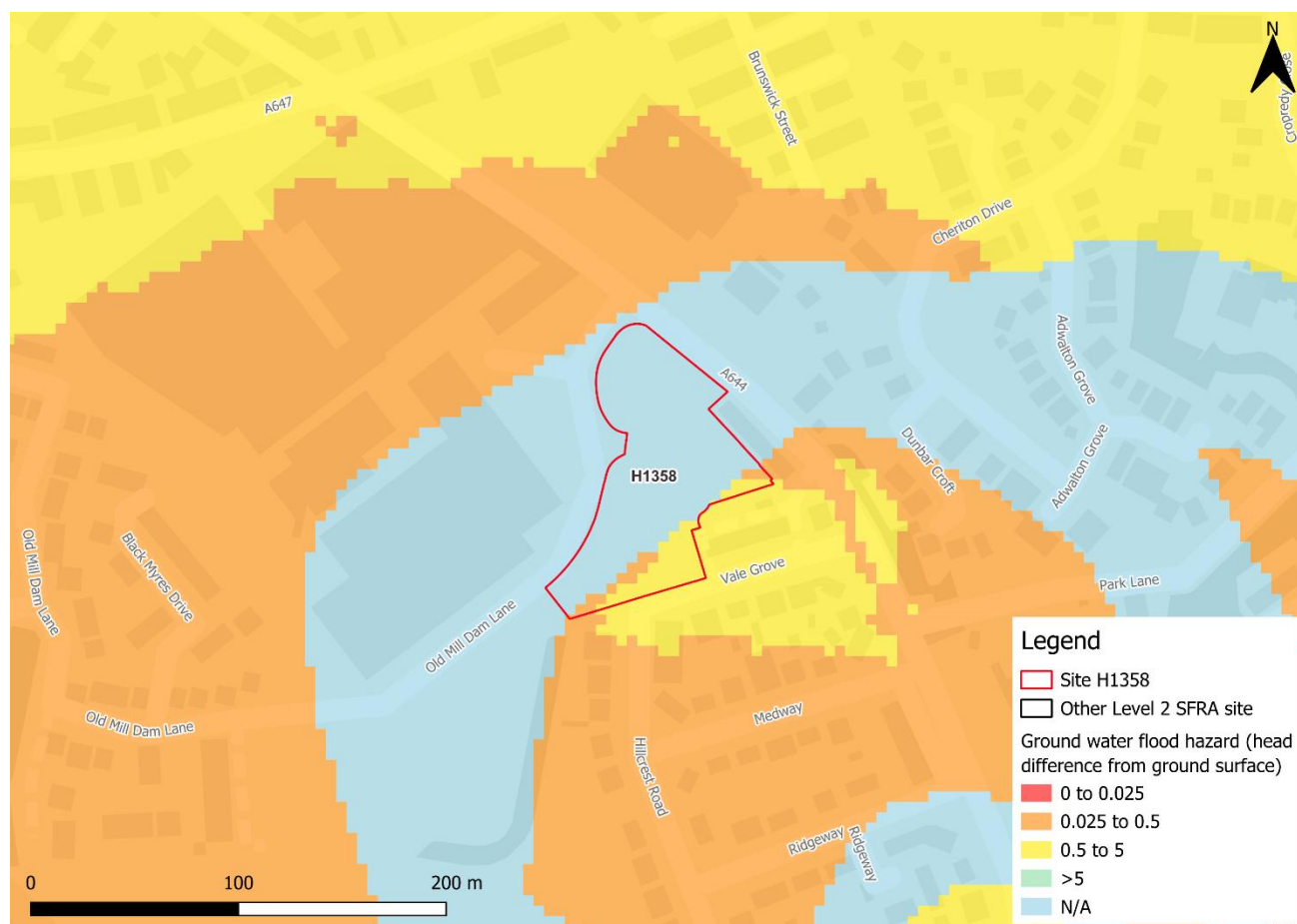


Figure 2-30: JBA 5m Groundwater Emergence Map (H1358)

2.14.4 Summary and recommendations

- The site is not required to pass the exception test as it is not located within Flood Zone 3a.
- The proposed development would see a change in the risk classification from less vulnerable to more vulnerable, according to the NPPF.
- Given the change in use and therefore vulnerability of the site, the FRA must show that the development can be designed to be safe and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- Based on available information, there is no additional risk to the site from reservoir, canal or sewer flooding.
- Development should be possible at this site given the low fluvial and very low surface water flood risk to the site.
- The site is not modelled to be at significant additional fluvial or surface water risk as a result of climate change.

- Any FRA should include for a drainage strategy which includes the flow path in site design and investigate ground conditions for infiltration SuDS suitability.

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