



Huntingdonshire Level 2 Strategic Flood Risk Assessment Site Summary

Site CfS:221

Final Draft Report

Prepared for
Huntingdonshire District
Council

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This report describes work commissioned by Huntingdonshire District Council by an instruction via email dated 21 July 2025. The Client's representative for the contract was Frances Schulz of Huntingdonshire District Council. Amy Ewens of JBA Consulting carried out this work.

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The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken between 21 July 2025 and 6 November 2025 and is based on the conditions encountered and the information available during the said period. The scope of this Report and the services are accordingly factually limited by these circumstances.

The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate.

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1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for Local Plan Site CfS:221. The content of this report assumes the reader has already consulted the 'HDC Level 1 SFRA' (2024) and read the 'HDC Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

1.1 Site CfS:221

- Location: Land North of A141, between Huntingdon Racecourse and A1307
- Existing site use: Agricultural with habitable farmhouse present on site
- Existing site use vulnerability: More vulnerable
- Proposed site use: Commercial
- Proposed site use vulnerability: Less vulnerable
- Site area (ha): 102.98
- Watercourse: Alconbury Brook, several unnamed unmodelled ordinary watercourses
- Environment Agency (EA) model: Lower Ouse 2015 (Alconbury Brook)
- Summary of requirements from Level 2 SFRA scoping stage:
 - Flood Zone 3b present onsite
 - Assessment of fluvial flood depths, velocities and hazards
 - Assessment of surface water flood extent, depths and hazards
 - Assessment of all other sources of flood risk

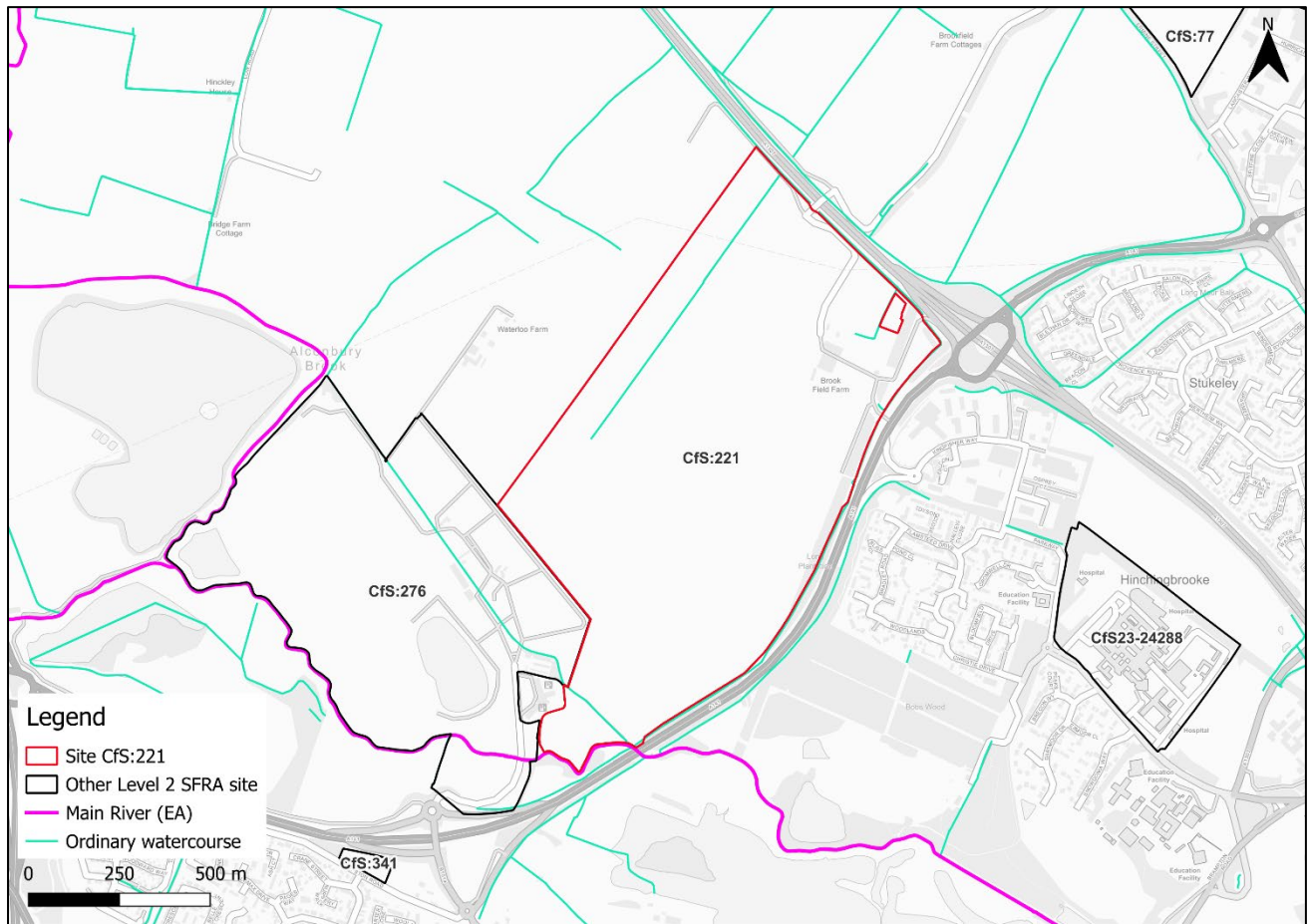


Figure 1-1: Existing site location boundary



Figure 1-2: Aerial photography

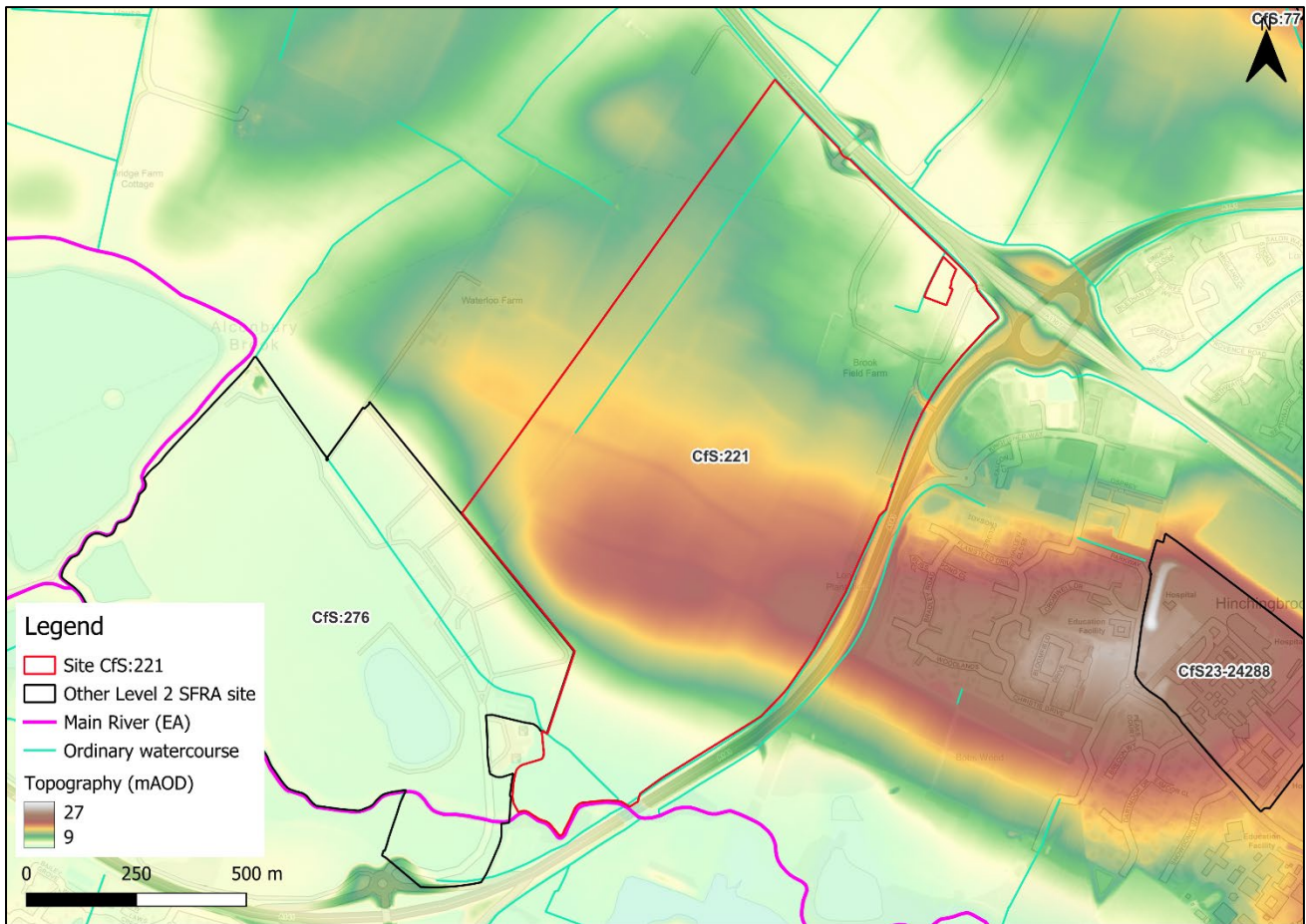


Figure 1-3: Topography

2 Flood risk from rivers and sea

2.1 Existing risk

2.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning (accessed July 2025) and Flood Zone 3b (functional floodplain), as updated in this Level 2 SFRA, the percentage areas of the site within each flood zone are stated in Table 2-1 and can be viewed on Figure 2-1. This version of the Flood Map for Planning does not consider flood defence infrastructure (Section 2.2) or the impacts of climate change (Section 2.3).

Fluvial flood risk from Alconbury Brook is confined to the southern site extent. 5% of the site is located within the Functional Floodplain. Flood Zone 3b in this location is based on the Flood Map for Planning 3.3% AEP defended fluvial event. The majority of the site is within Flood Zone 1, indicating that this area is at low risk of flooding from rivers and the sea. Flood Zones 3a and 2 appear to be based on the outputs from the fluvial Lower Ouse 2015 (Alconbury Brook) model.

Table 2-1: Existing flood risk based on percentage area of site at risk

Flood Zone 1 (% area)	Flood Zone 2 (% area)	Flood Zone 3a (% area)	Flood Zone 3b (% area)
93	1	<1	5

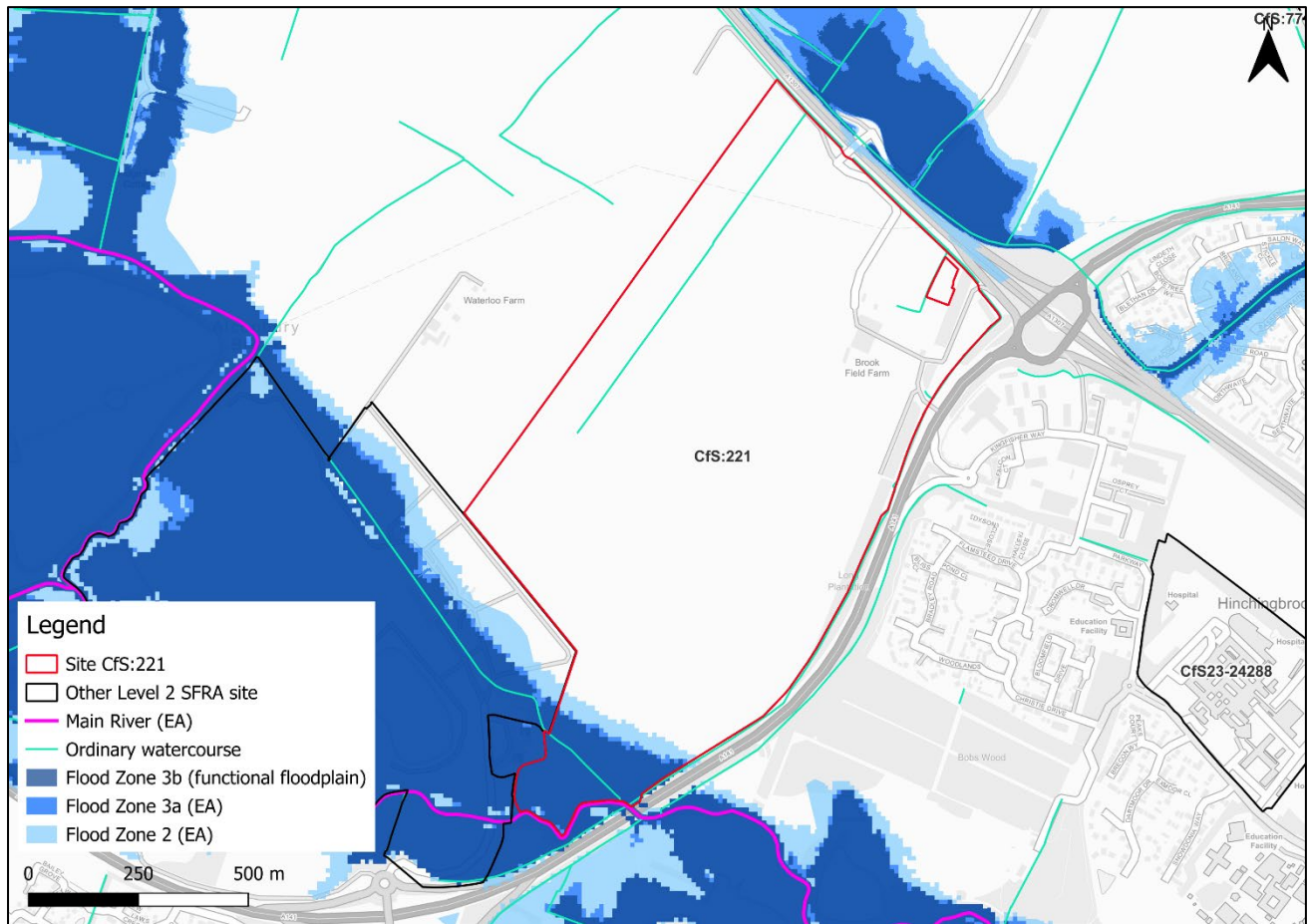


Figure 2-1: Existing risk

2.1.2 Fluvial undefended model outputs (Lower)

The Lower Ouse - Alconbury Brook (2015) detailed model shows that flood depths in the south of the site are predicted to predominantly remain below 0.90m in depth. However, some nominal areas may exceed 1.2m (Figure 2-2).

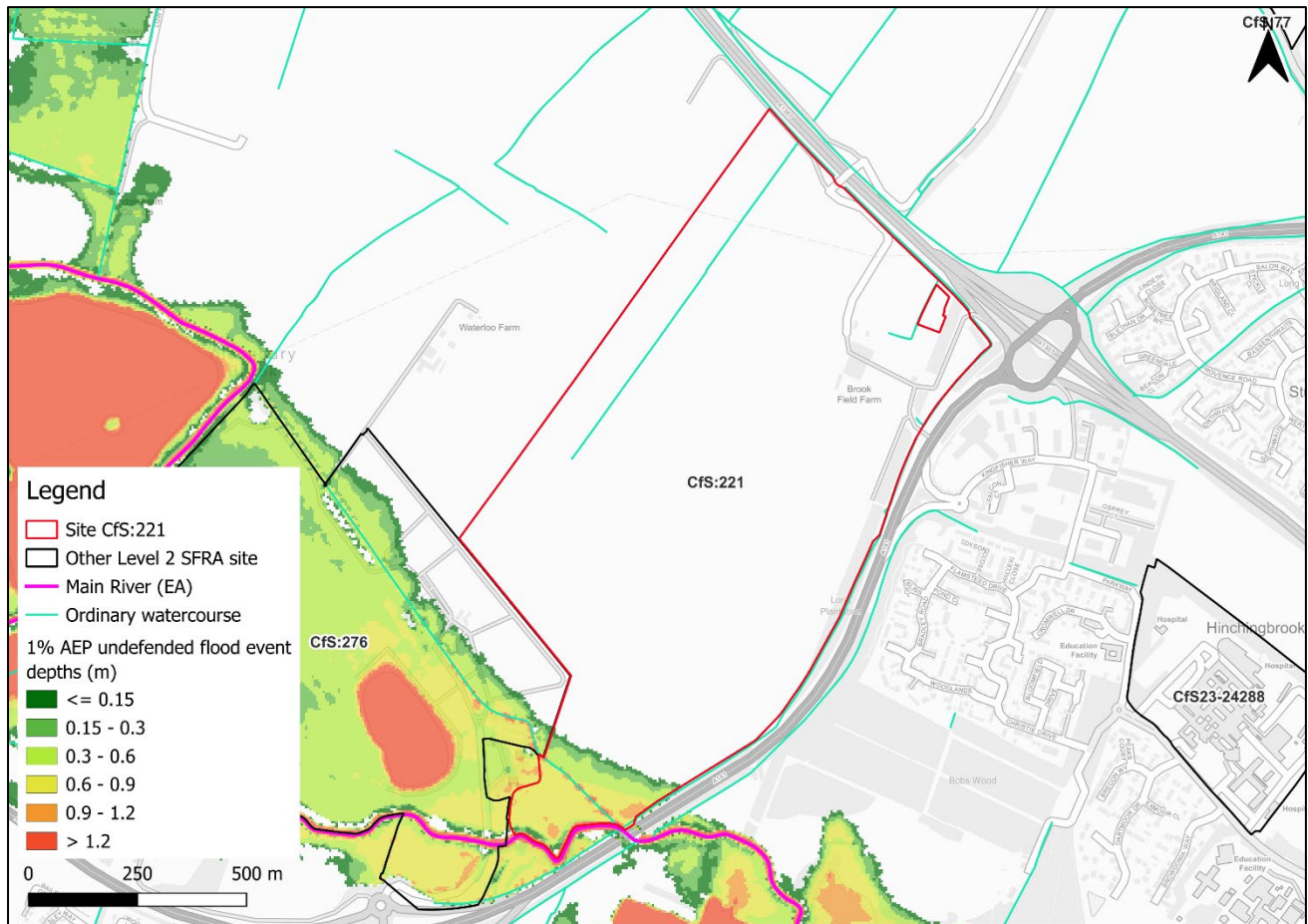


Figure 2-2: Flood depths for 1% AEP undefended flood event

The Lower Ouse - Alconbury Brook (2015) detailed model shows that flood velocities should predominantly remain below 0.50m/s. However, some small areas may reach up to 1m/s (Figure 2-3).

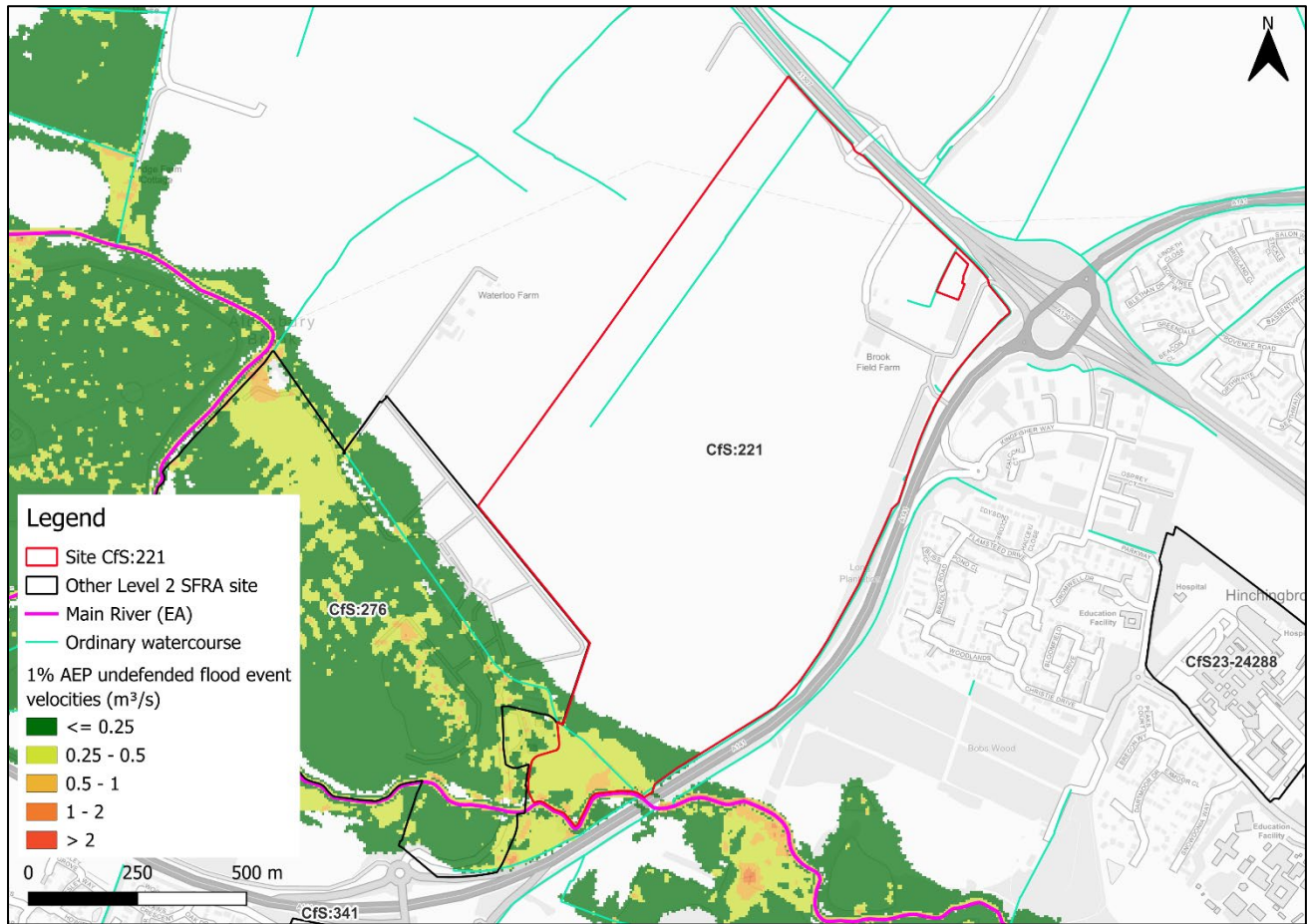


Figure 2-3: Flood velocities for 1% AEP undefended flood event

The Lower Ouse - Alconbury Brook (2015) detailed model shows that the flooding in the south of the site is predicted to predominantly be a danger for some but some nominal areas may be a danger for most (Figure 2-4).

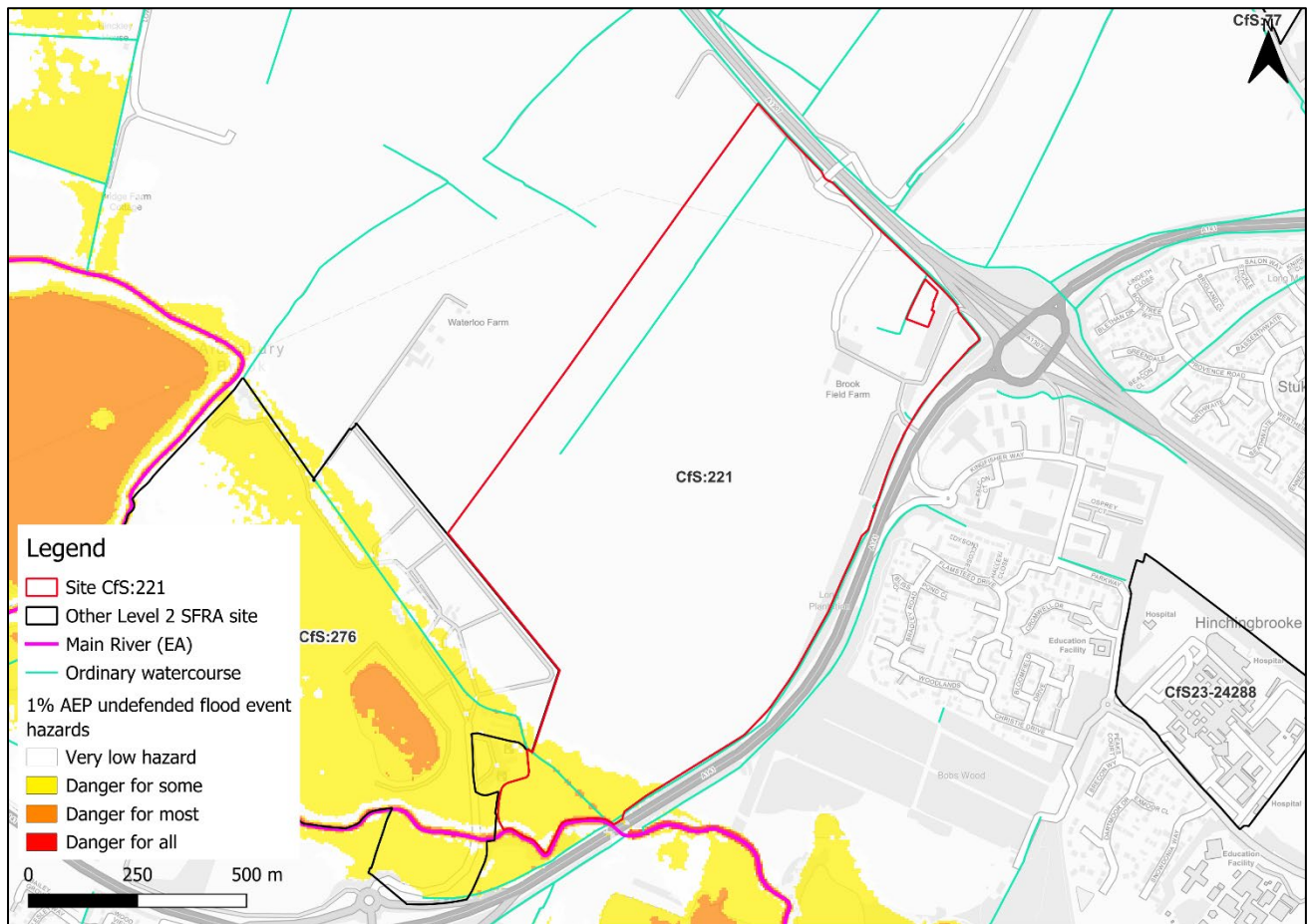


Figure 2-4: Flood hazard¹ for 1% AEP undefended flood event

2.2 Flood risk management

2.2.1 Flood defences

The EA's spatial flood defences dataset and modelling outputs show that the site does not appear to benefit from any formal defences.

2.2.2 Working with Natural Processes

The EA's Working with Natural Processes (WwNP) dataset has been interrogated to identify opportunities for Natural Flood Management (NFM) to reduce flood risk to the site and surrounding areas. These areas are shown in Figure 2-5. Note, the WwNP mapping is

¹ Fluvial hazard ratings based on Table 4 of the SUPPLEMENTARY NOTE ON FLOOD HAZARD RATINGS AND THRESHOLDS FOR DEVELOPMENT PLANNING AND CONTROL PURPOSE – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1. May 2008.

broadscale and indicative, therefore further investigation will be required for any land shown to have potential for WwNP. There is significant potential within and upstream of the site for tree planting to reduce flood risk.

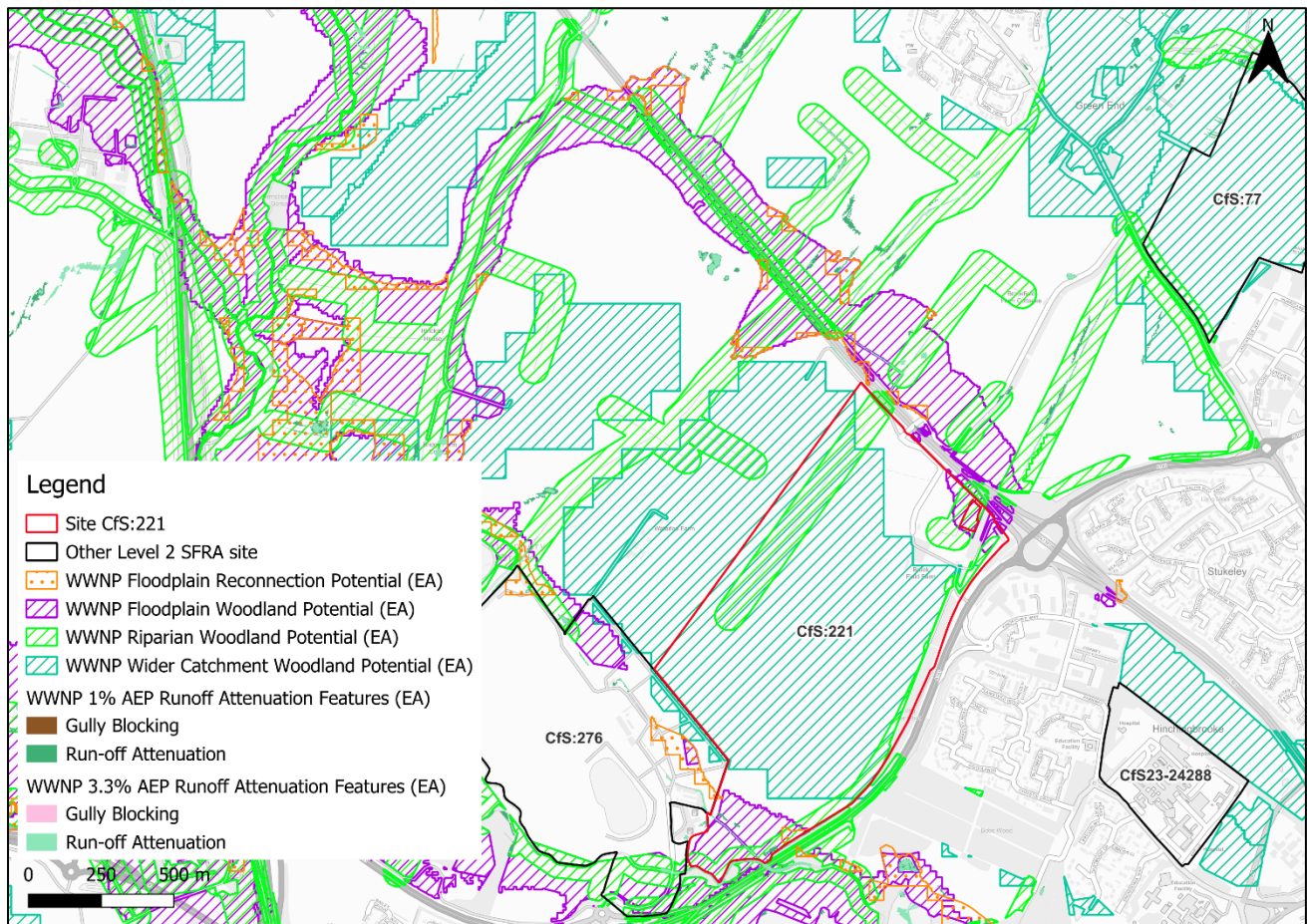


Figure 2-5: Natural Flood Management (NFM) potential mapping

2.3 Impacts from climate change

2.3.1 Fluvial

The EA's SFRA guidance states that SFRAs should assess the central allowance for less, more, highly vulnerable, and water compatible development. The higher central allowance should be assessed for essential infrastructure.

The impacts of climate change on flood risk from the Alconbury Brook have been modelled with and without flood defence infrastructure in place, where applicable, as shown in Figures 2-6, 2-7, and 2-8.

With consideration of the EA's SFRA guidance, the latest central and higher central climate change allowances have been modelled as shown in Table 2-2.

Table 2-2: Modelled climate change allowances for peak river flows for the Upper and Bedford Ouse management catchment

Return period (AEP event)	Central allowance 2080s (% increase)	Higher central allowance 2080s (% increase)
2% as a proxy for 3.3% which is not available	19	30
1%	19	30
0.1%	Model would not run for this scenario	

The Lower Ouse - Alconbury Brook (2015) detailed model with climate change shows that flood depths are predicted to increase so that they are predominantly between 0.9m and 1.2m (Figure 2-6).

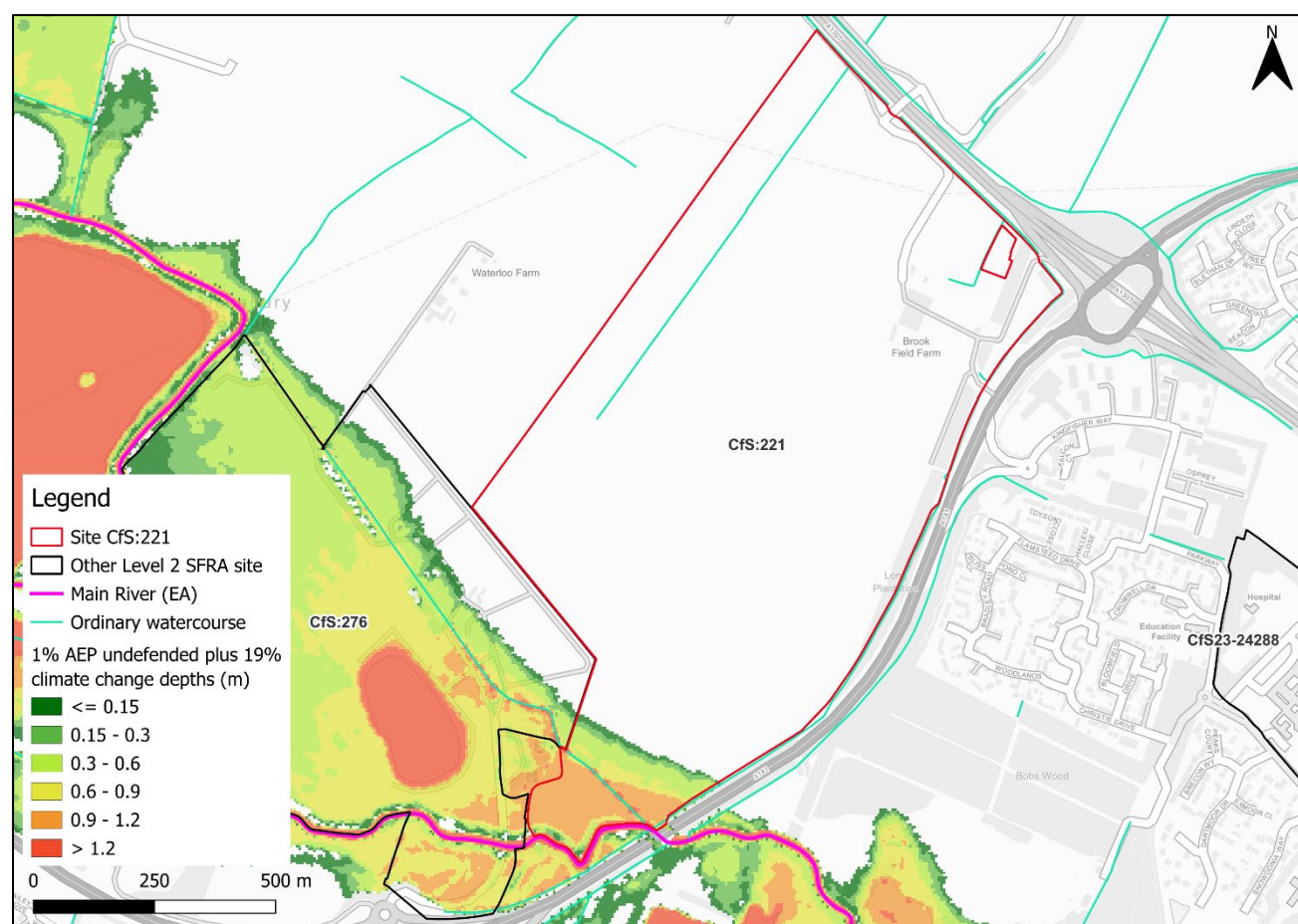


Figure 2-6: Flood depths for 1% AEP undefended flood event +19% (central climate change allowance)

The Lower Ouse - Alconbury Brook (2015) detailed model with climate change shows that the flooding is still predominantly predicted to remain below 0.5m/s. However, a larger area is now predicted to reach up to 1m/s (Figure 2-7).

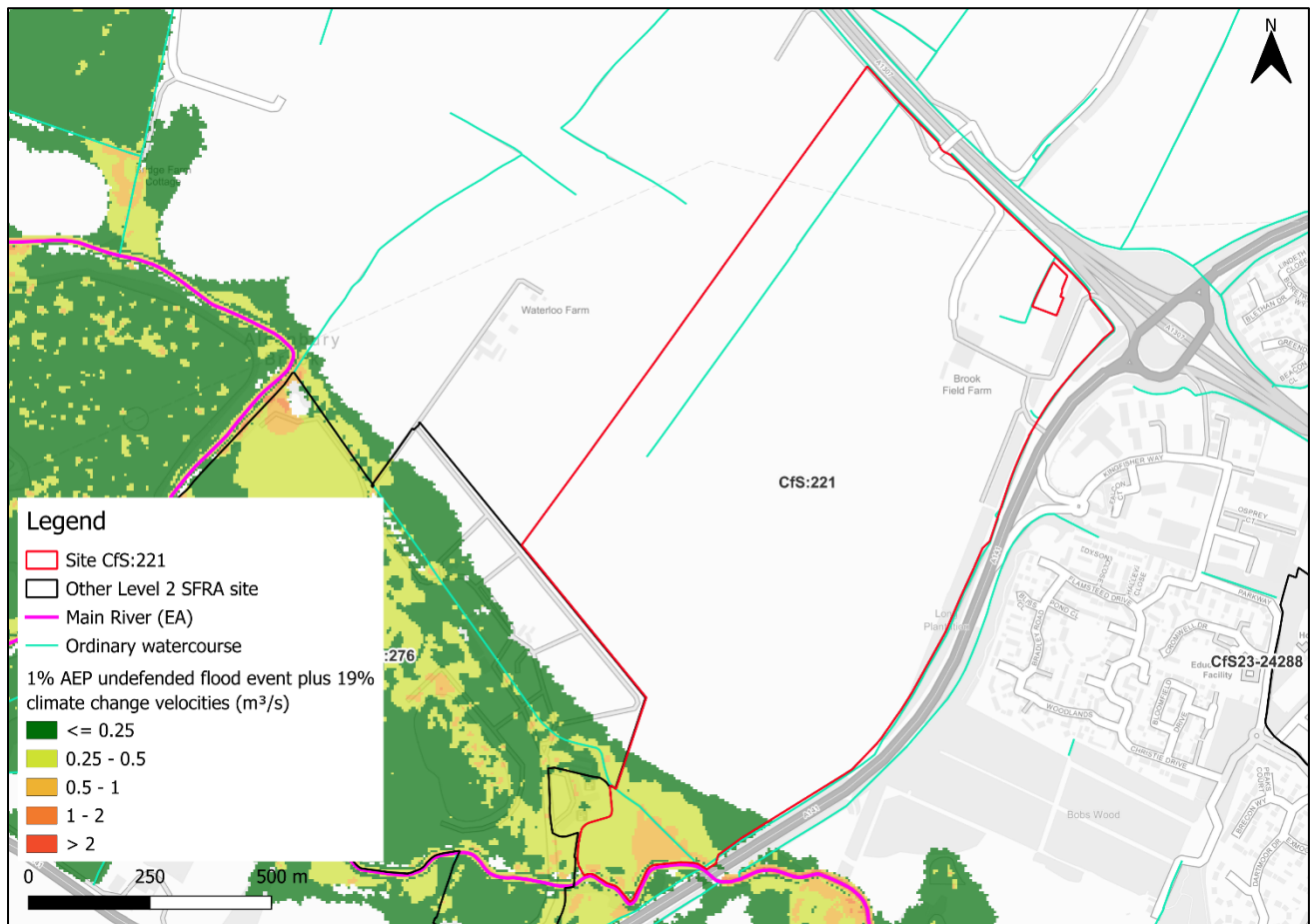


Figure 2-7: Flood velocities for 1% AEP undefended flood event +19% (central climate change allowance)

The Lower Ouse - Alconbury Brook (2015) detailed model with climate change shows a larger area now predicted to be a danger for most (Figure 2-8).

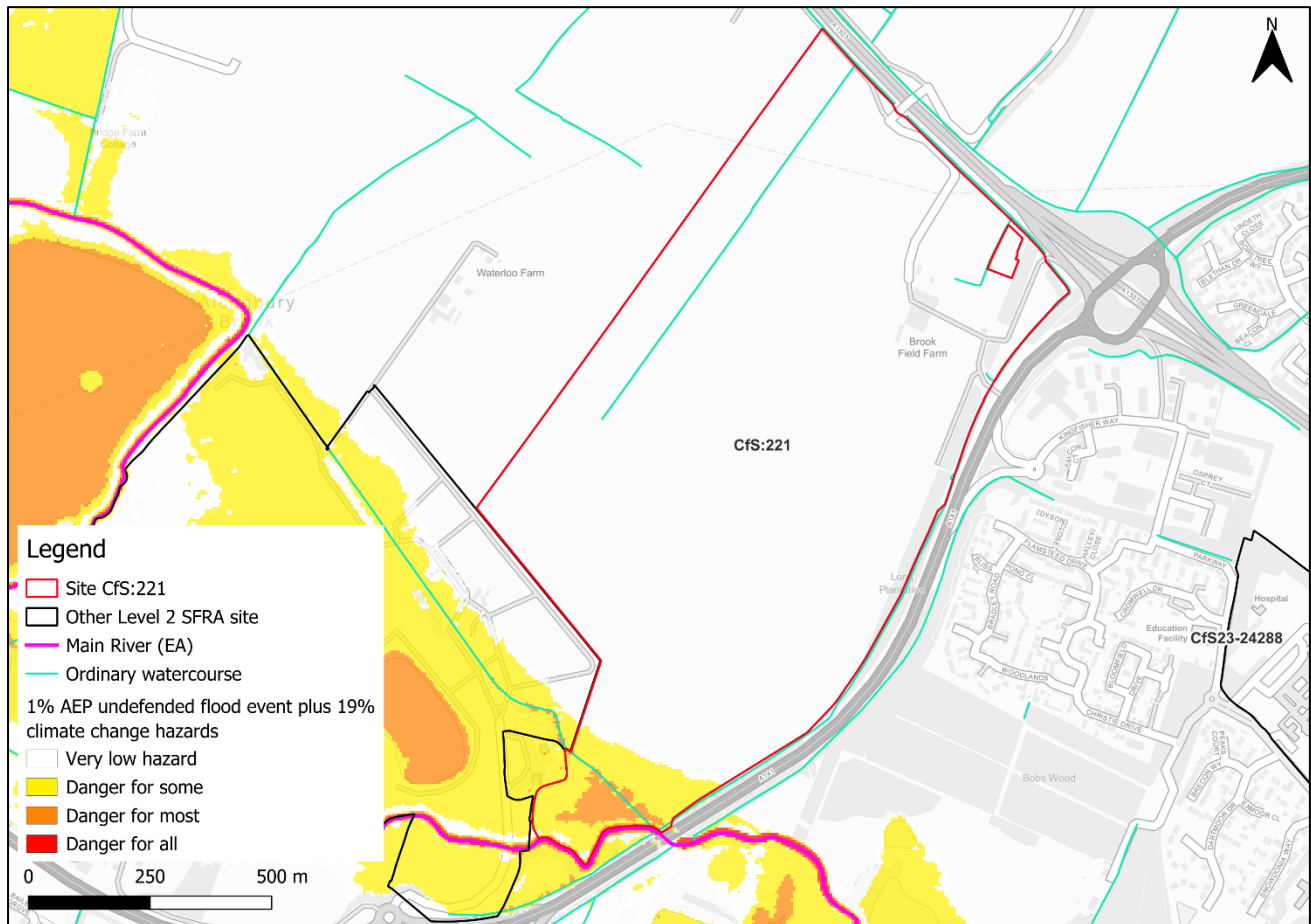


Figure 2-8: Flood hazard¹ for 1% AEP undefended flood event +19% (central climate change allowance)

The impacts of climate change on flood risk from the ordinary watercourses to the northeast of the site have been modelled by the EA through the New National Model which models the central allowance (+19% on peak river flows for the Upper and Bedford Ouse EA management catchment) for the 3.3% AEP defended, 1% AEP defended and undefended, and 0.1% AEP defended and undefended fluvial events.

The New National Model with climate change shows the northeast of the site to be at fluvial flood risk, as shown in Figure 2-9.

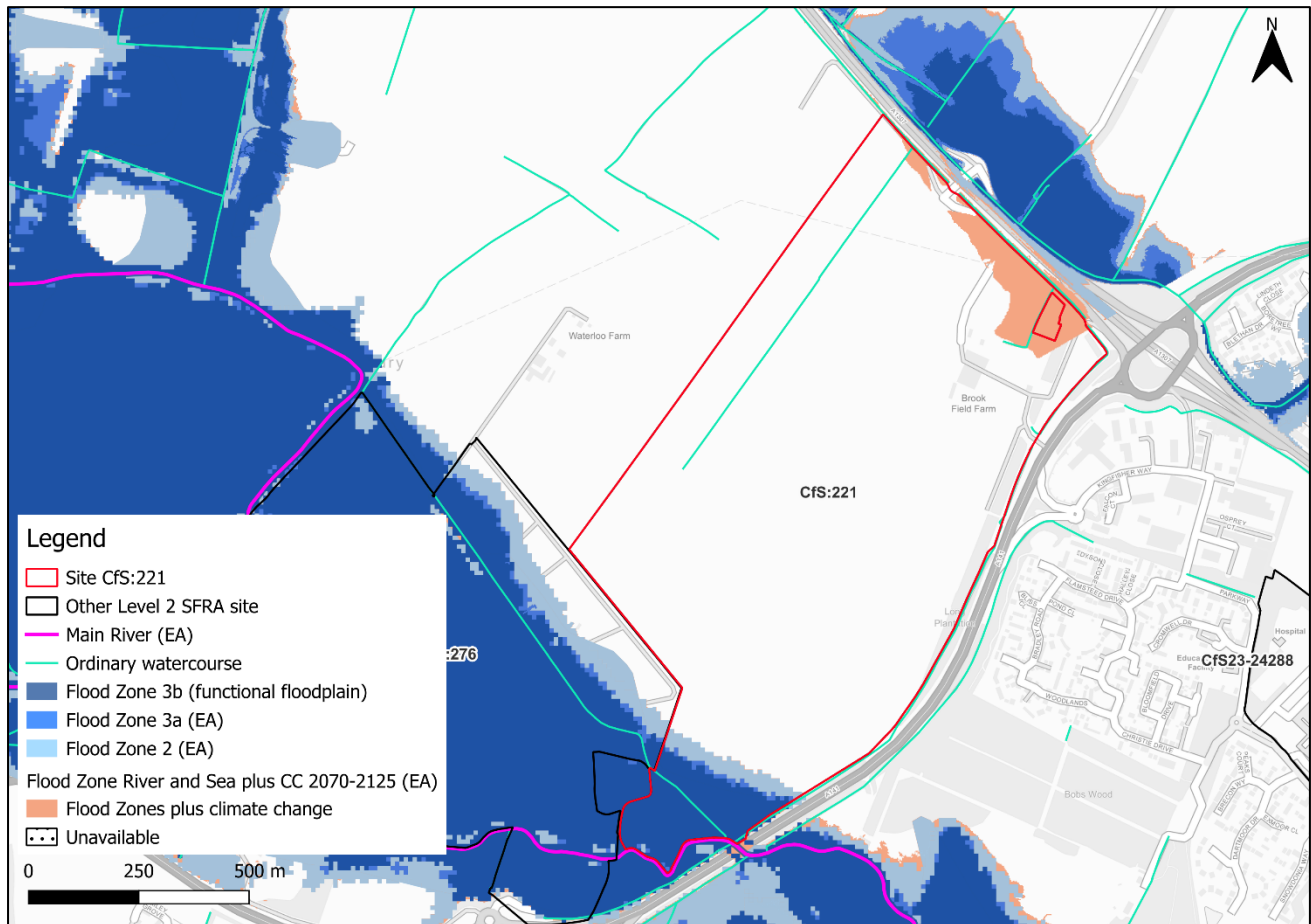


Figure 2-9 Flood Map for Planning 1% and 0.1% AEP undefended flood events +19% (central climate change allowance)

2.3.2 Tidal

The EA's Flood Map for Planning shows the site is not at risk from tidal climate change.

2.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered and mapped in Figure 2-9 which shows two historic flood events which impacted the southern extent of the site, March 1947 and April 1998. The flood source for both events is unknown.

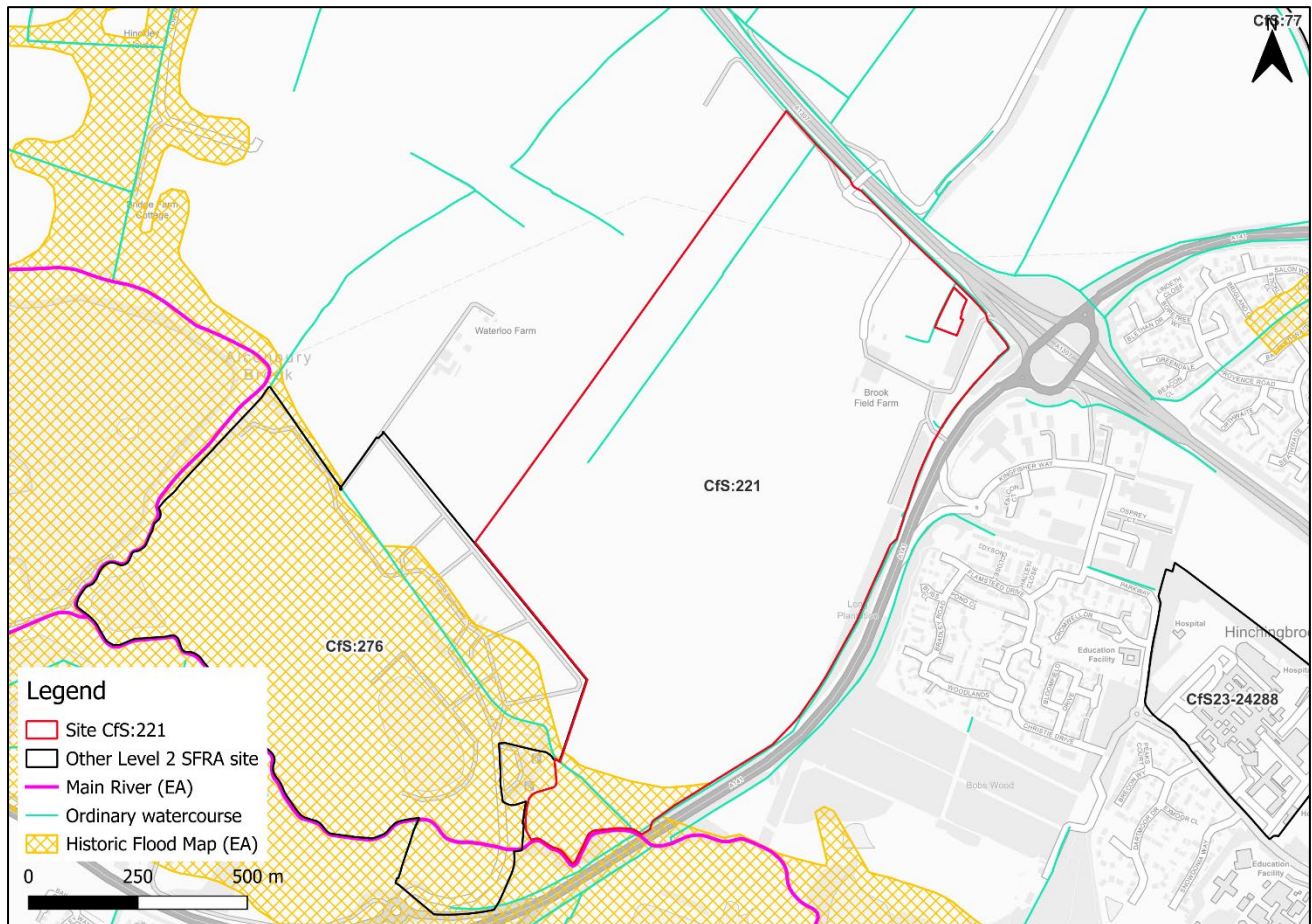


Figure 2-10: Recorded historic flood events onsite and around the site

2.5 Emergency planning

2.5.1 Flood warning

The EA operates a Flood Warning Service for properties located within a Flood Warning Area (FWA) for when a flood event is expected to occur. As shown in Figure 2-11, this site is located within a FWA, namely Alconbury Brook at Hamerton, Alconbury Weston, Alconbury, Little Stukeley and Brampton.

Flood alerts may be issued before a flood warning for properties located within a Flood Alert Area (FAA) to provide advance notice of the possibility of flooding. A flood alert may be issued when there is less confidence that flooding will occur in a FWA. As shown in Figure 2-10, this site is located within a FAA, namely Alconbury Brook in Cambridgeshire.

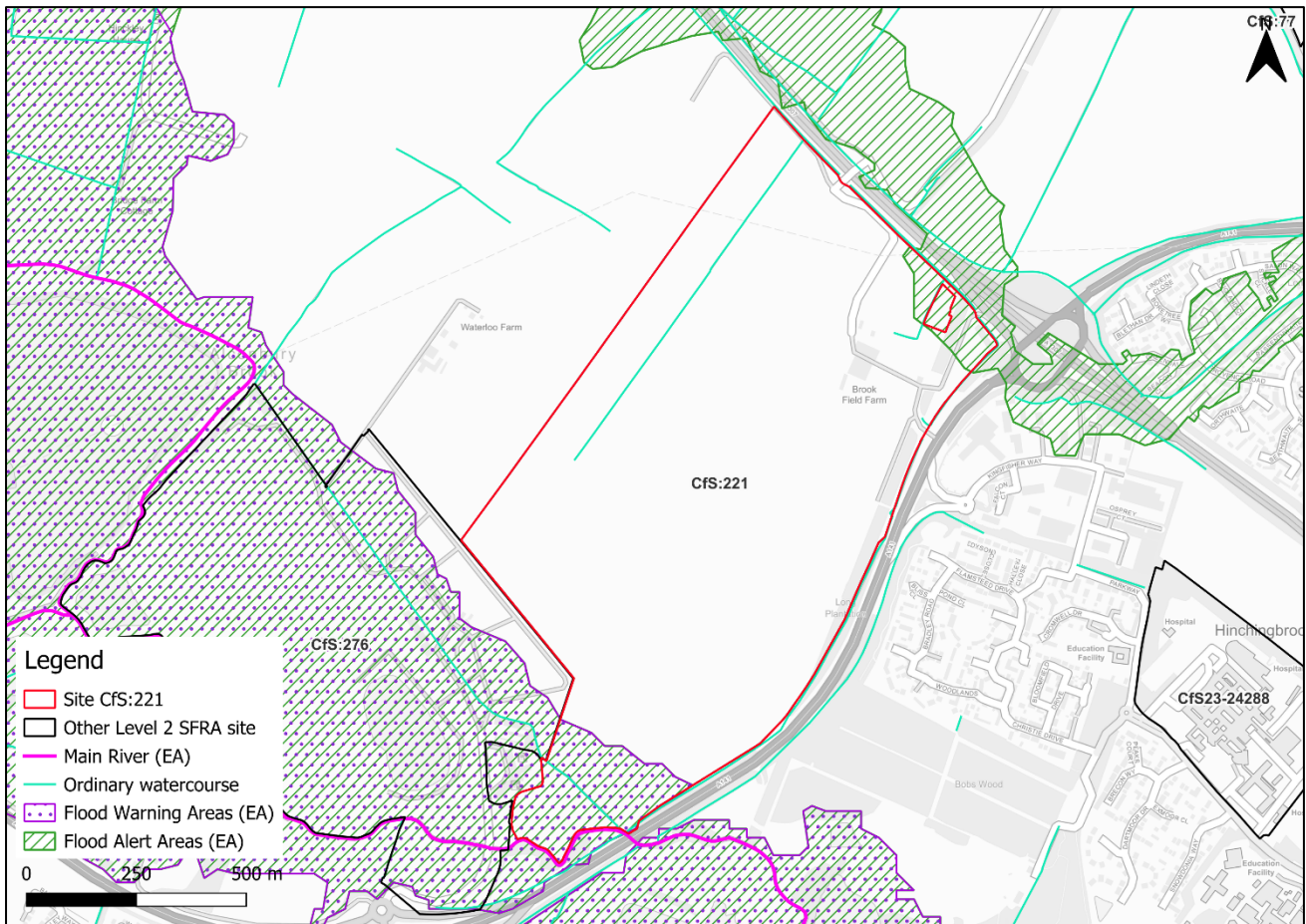


Figure 2-11: EA Flood Warning Areas and Flood Alert Areas

2.5.2 Access and escape routes

Based on available information, safe access and escape routes could likely be achieved during a flood event via Ermine Street and the A141 to the east, as shown in....

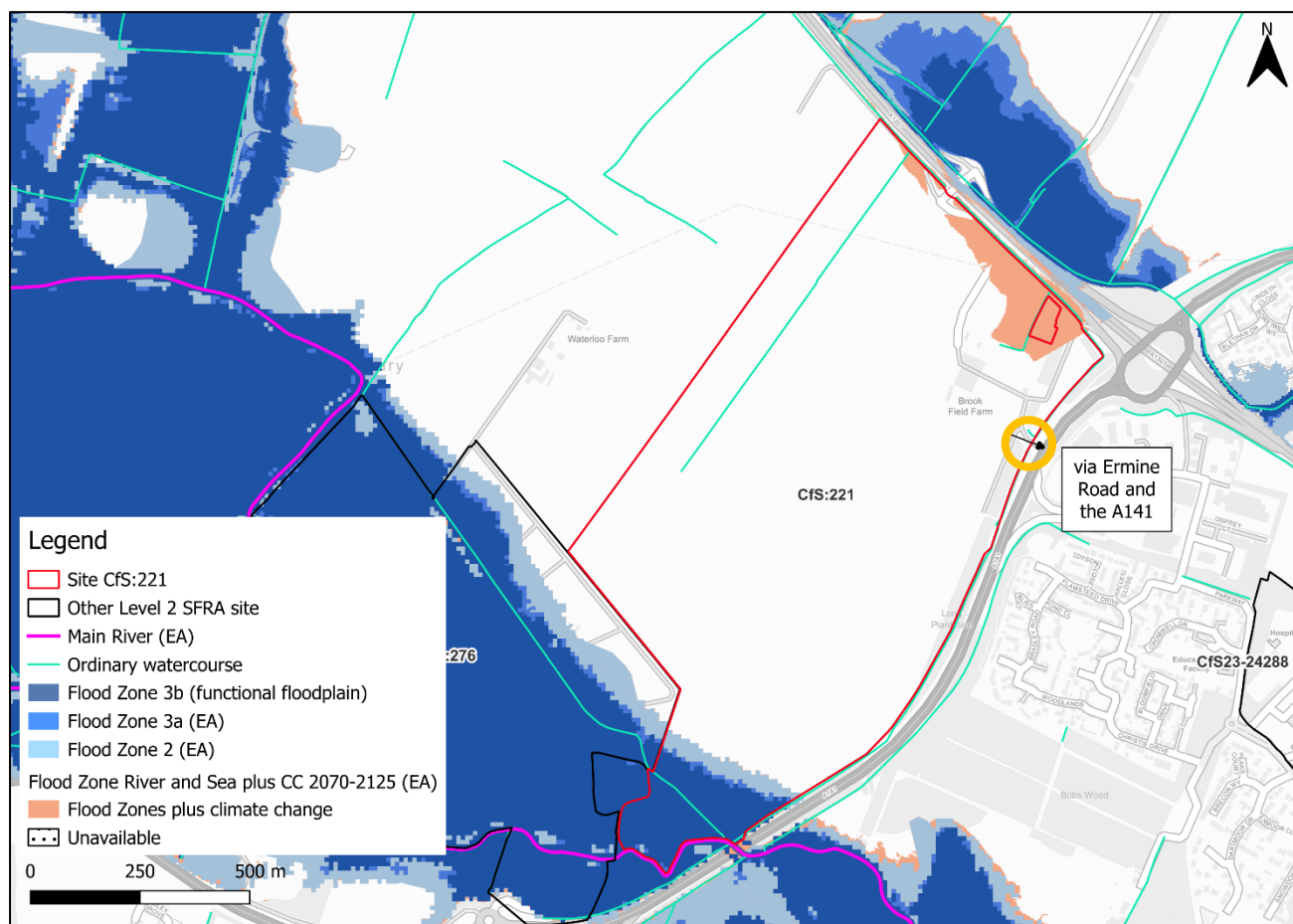


Figure 2-12: Potential access and escape routes

2.6 Observations, mitigation options, site suitability, sequential approach to development management - fluvial and tidal

- **Observations:**
 - The proposed development of the site would see a change in the risk classification from more vulnerable to less vulnerable, according to the NPPF.
 - Local detailed modelling of the Alconbury Brook shows significant flood depths and hazards within the 1% AEP event extent. This risk increases with climate change. It is therefore recommended that all development avoids the whole risk area in the south.
 - The area of functional floodplain onsite should remain undeveloped and left as open greenspace that is allowed to flood.
 - The climate change risk area on the northern boundary should also be left as open greenspace.
 - The extent of fluvial risk from several ordinary watercourses is currently unknown. Using the 0.1% AEP surface water event as a proxy, risk is modelled to be low from each watercourse.
- **Defences:**
 - The site does not benefit from any formal engineered defences.

- Mitigation:
 - All risk areas should be left as open greenspace. This should be achievable given the large size of the site.
 - The site-specific FRA should investigate risk from the unmodelled ordinary watercourses to fully understand the onsite fluvial risk .
 - The ordinary watercourses should be included within the site design and layout. Infilling of drainage ditches should be avoided.
 - Were development of this site to proceed, given the proximity of this site to neighbouring site CfS:276, it would be prudent to formulate a strategy to develop these sites in tandem and for consultation between each developer to take place to ensure a joined-up approach for sustainable development is in place.
 - If works are proposed on or near a river, a separate permission may be required. The type of permission needed and whether it must be sought from the Environment Agency, Lead Local Flood Authority or Internal Drainage Board will depend on the activity and location proposed.
- Access and escape:
 - Safe access and escape routes must be available at times of flood and appear to be available via Ermine Street and the A141 to the east. A FWA and FAA are in place however which should provide advanced warning for site users to evacuate ahead of a flood event in the short term.
 - EA flood warnings and alerts should continue to be in place to ensure early evacuation of site users before an extreme flood event occurs.

3 Flood risk from surface water

3.1 Existing risk

The NaFRA2 Risk of Flooding from Surface Water (RoFSW) mapping received a significant update and was published January 2025, including for surface water flood extents and depths. However, at the time of writing, the EA has confirmed that the depth information available is not structured in a way that is suitable for planning purposes. Therefore, this Level 2 SFRA considers the third generation RoFSW depth and hazard mapping in addition to the NaFRA2 extents, as agreed with the EA. Surface water depth and hazard should be modelled at the site-specific FRA stage.

3.1.1 Risk of Flooding from Surface Water - NaFRA2 extents

Based on the EA's national scale RoFSW map, as updated in January 2025, surface water risk to the site is predominantly very low. Approximately 5% of the site is at high surface water risk. A further 1% is at medium surface water risk and 1% at low surface water risk.

Surface water risk is predominantly confined to the northeast and south of the site within modelled fluvial risk areas which are recommended to remain as open greenspace, with an additional flow path present in the west.

Table 3-1: Existing surface water flood risk based on percentage area at risk using the NaFRA2 RoFSW map

Very low risk (% area)	Low risk (% area)	Medium risk (% area)	High risk (% area)
93	1	1	5

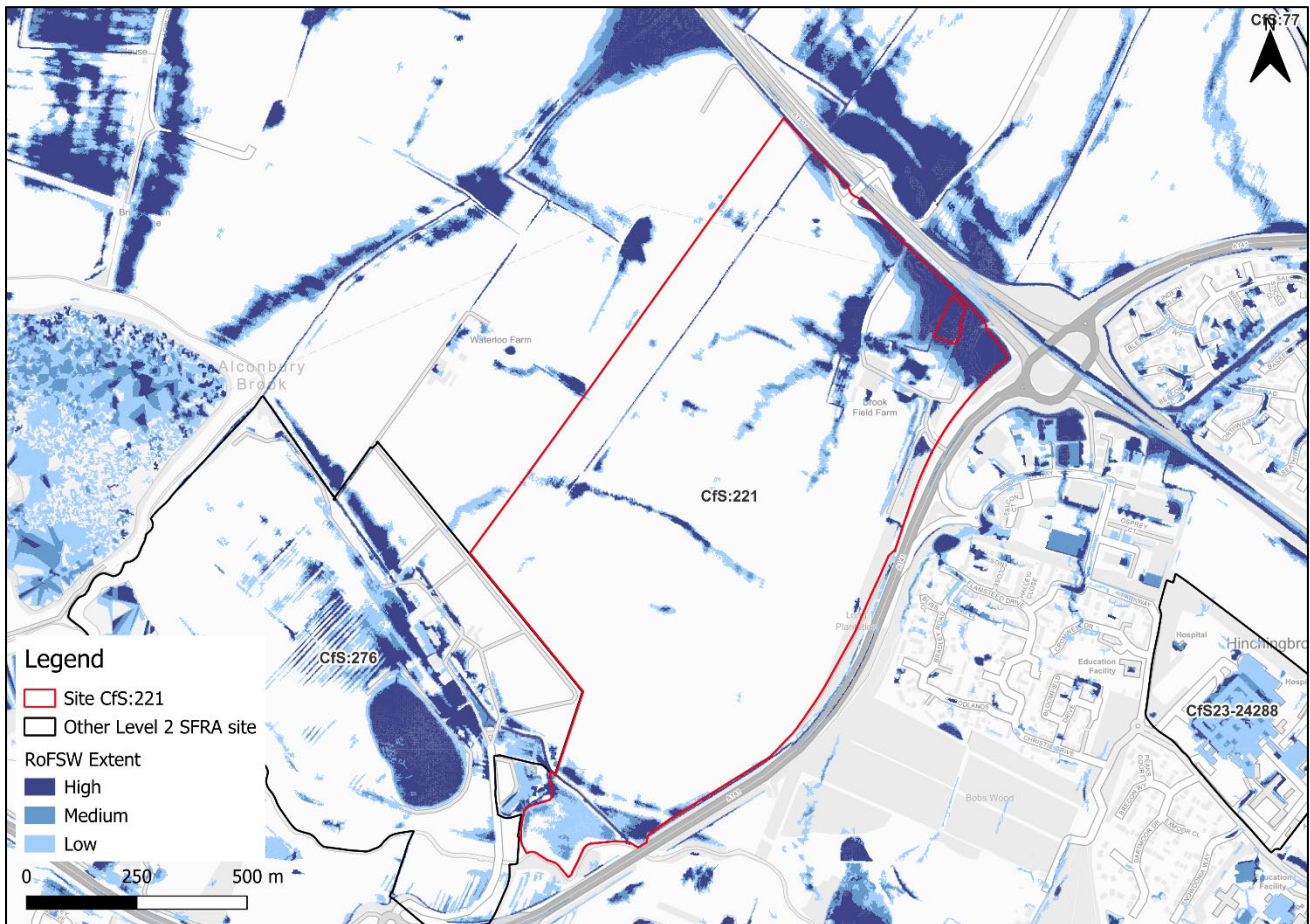


Figure 3-1: Surface water flood extents (NaFRA2 - Risk of Flooding from Surface Water map)

3.1.2 Risk of Flooding from Surface Water - third generation depths and hazard

Based on the EA's national scale third generation RoFSW map, flooding in the northeast of the site is predicted to remain below 0.6m in depth (Figure 3-2). However, some areas in the northeast corner may reach up to 1.2m in depth. Flooding is predicted to be a significant hazard (Figure 3-3).

The EA's national scale third generation RoFSW map shows nominal to no flood risk in the south of the site. There are therefore clear differences between the NaFRA2 RoFSW map and the third-generation depths and hazard mapping. This reinforces the requirement for detailed assessment of surface water at the FRA stage to establish surface water flood risk conditions.

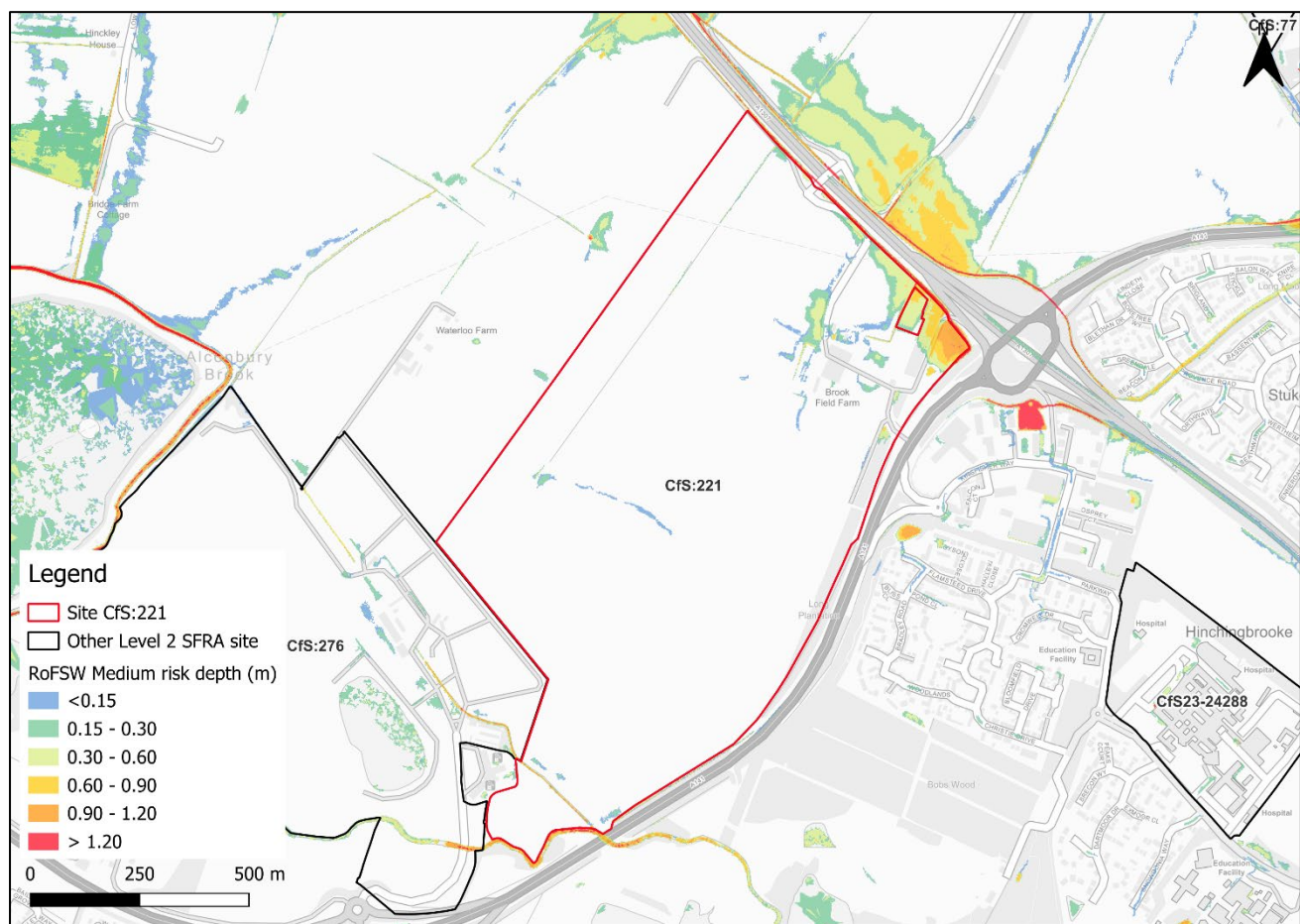


Figure 3-2: Medium risk event surface water flood depths (Third generation - Risk of Flooding from Surface Water map)

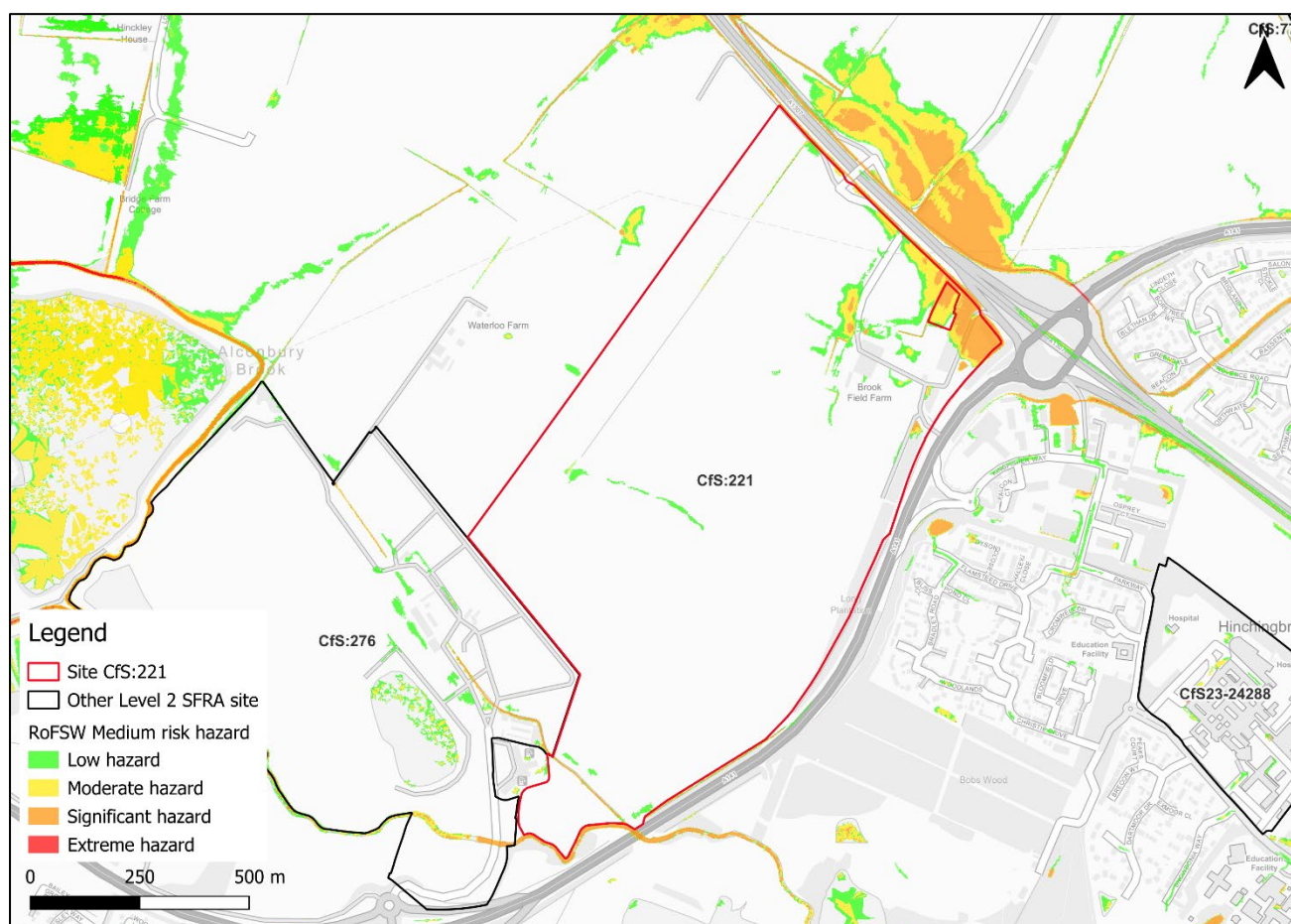


Figure 3-3: Medium risk event surface water flood hazard² (Third generation - Risk of Flooding from Surface Water map)

3.2 Impacts from climate change

The NaFRA2 RoFSW mapping now includes one modelled climate change scenario, the 2050s central allowance for the high, medium and low risk events. However, the upper end allowance on peak rainfall for the 2070s should be assessed in SFRAs. Therefore, at the time of writing, the available national surface water climate change mapping is unsuitable for consideration in development planning. This Level 2 SFRA considers the low risk surface water event as a conservative proxy for the medium risk event plus climate change, as agreed with the EA. The impact of climate change on surface water flood risk should be fully accounted for at the site-specific FRA stage.

Based on current information, flood risk is predicted to be similar to a medium risk event but with a greater extent of risk in the northeast, west and particularly the south (Figure 3-4). Flooding is now predicted to exceed 1.2m in the northeast but should remain below 0.3m in the west and south (Figure 3-5). A much larger area of flooding in the northeast is predicted

² Based on Section 7.5 Hazard rating. What is the Risk of Flooding from Surface Water map? Report version 2.0. April 2019. Environment Agency

to be a significant hazard (Figure 3-6). Flooding in the west and south is predicted to be a low hazard.

The EA's national scale third generation RoFSW map shows a much smaller area of flood risk in the south of the site. There are therefore clear differences between the NaFRA2 RoFSW map and the third-generation depths and hazard mapping. This reinforces the requirement for detailed assessment of surface water at the FRA stage to establish surface water flood risk conditions.

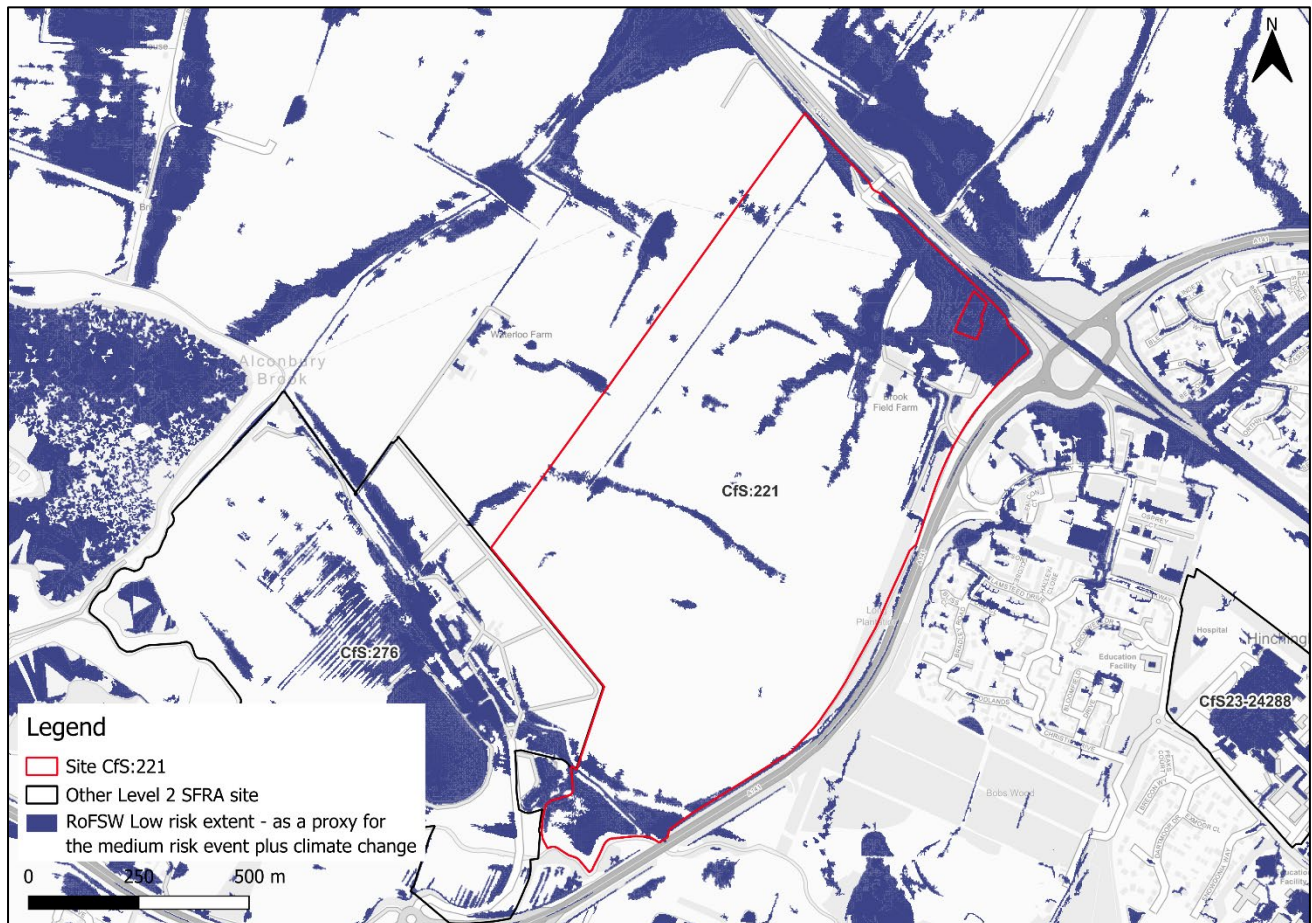


Figure 3-4: Low risk event surface water flood extent, as a proxy for the medium risk event plus climate change (NaFRA2 - Risk of Flooding from Surface Water map)

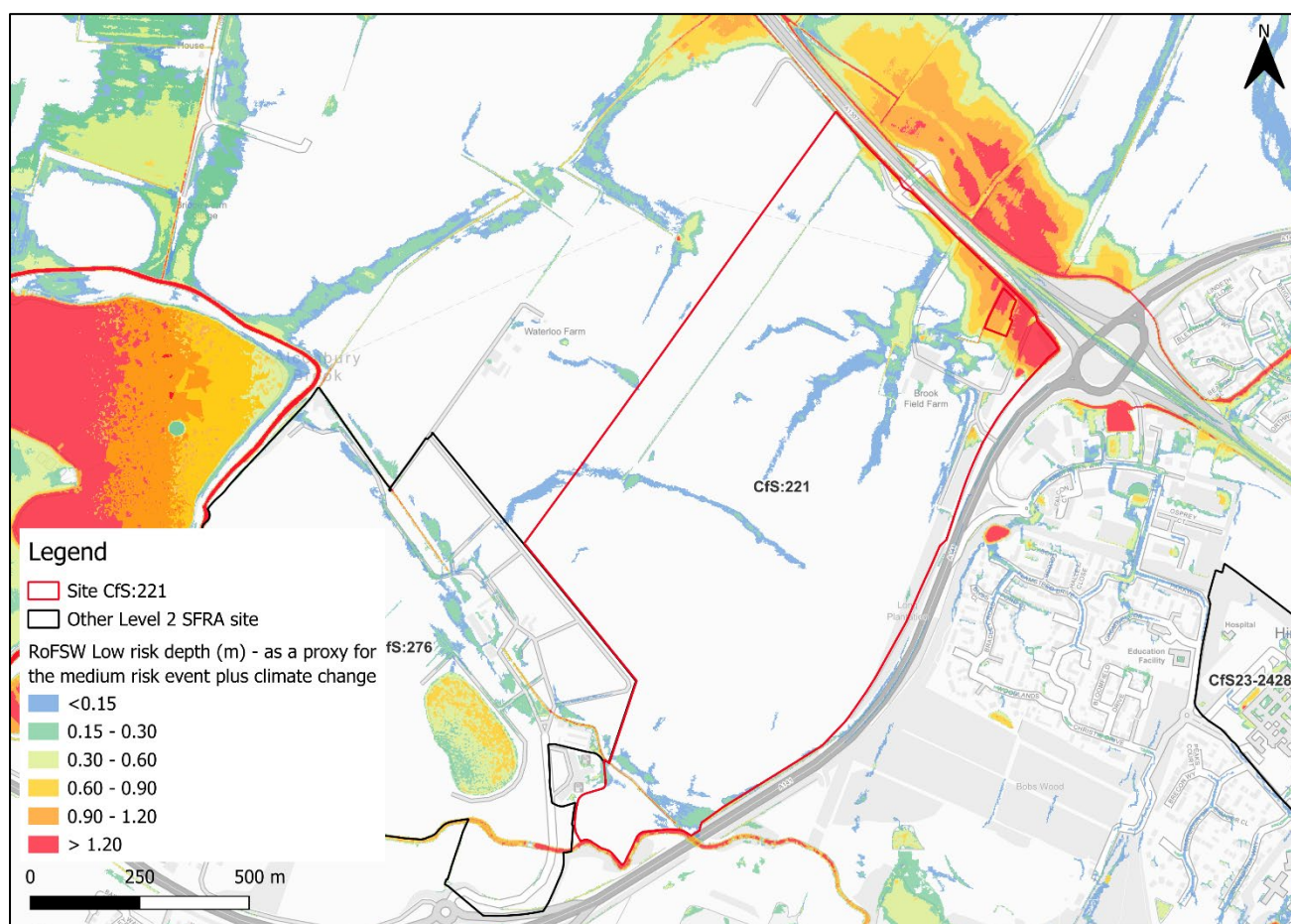


Figure 3-5: Low risk event surface water flood depths, as a proxy for the medium risk event plus climate change (Third generation - Risk of Flooding from Surface Water map)

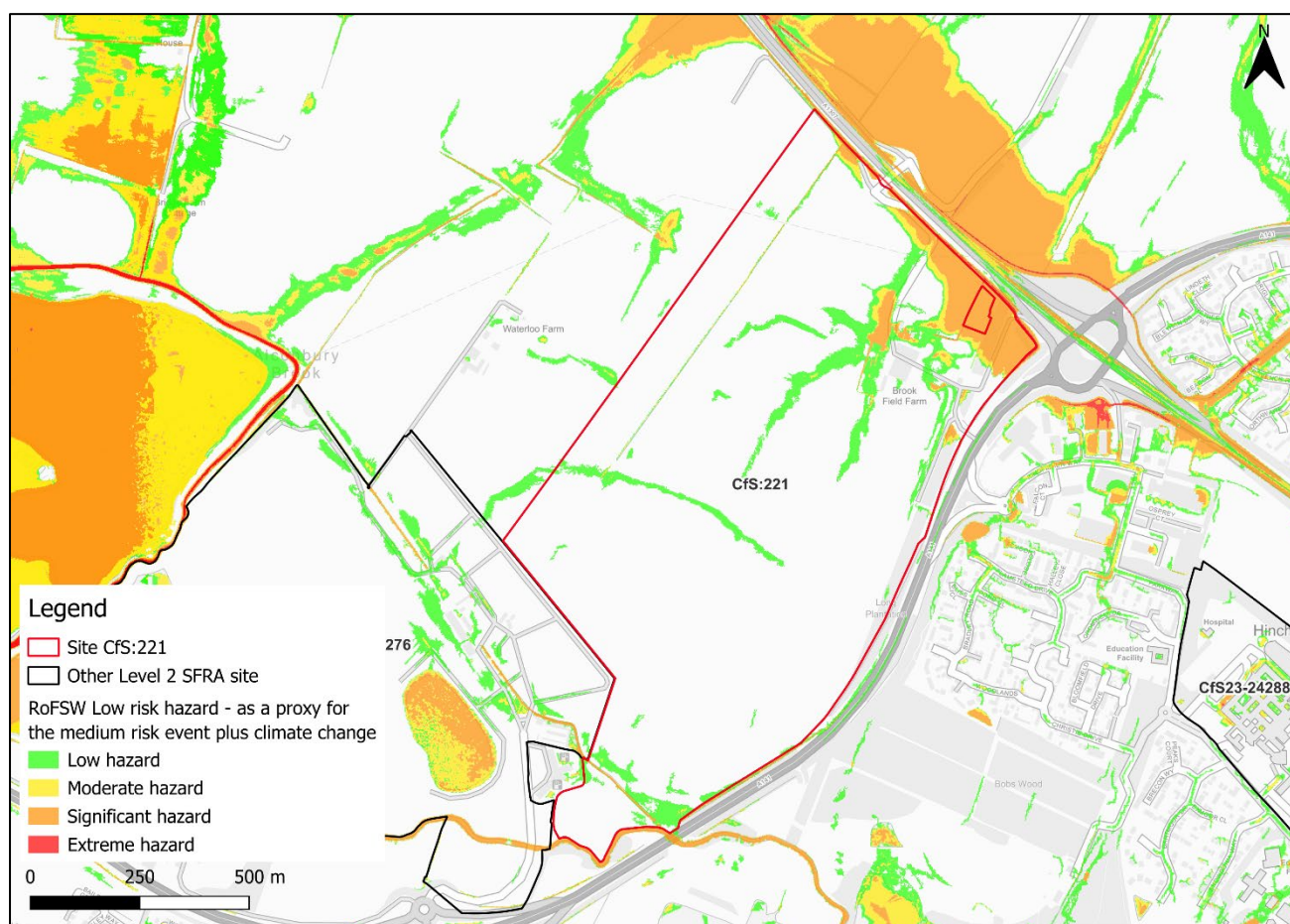


Figure 3-6: Low risk event surface water flood hazard, as a proxy for the medium risk event plus climate change (Third generation - Risk of Flooding from Surface Water map)

3.3 Observations, mitigation options, site suitability, sequential approach to development management - surface water

- Current risk to the site is predominantly very low, with 93% of the site being at very low surface water flood risk. Surface water risk in the high and medium risk events is mostly confined to the northeast and south of the site.
- The effects of climate change on surface water have not been modelled for this SFRA, however the low risk surface water event has been used as a proxy for the medium risk event plus climate change. Risk is largely similar to the medium risk event, with a greater extent of flooding predicted in the northeast, west and particularly the south.
- Surface water flood depths, hazards, including for the impact of climate change should be considered further through the site-specific FRA and drainage strategy. Any surface water modelling at the FRA stage should consider flood depths and hazards.
- There are clear differences between the NaFRA2 RoFSW map and the third-generation depths and hazard mapping. This reinforces the requirement for detailed assessment of surface water at the FRA stage to establish surface water flood risk conditions.

- The drainage strategy must ensure there is no increase in surface water flood risk elsewhere as a result of new development. Greenfield rates will apply, and the developer should follow the National SuDS guidance and any local guidance available from the LLFA.
- The main areas of risk along the ordinary watercourse at the northeast site boundary And in the south of the site should be left free of development and left as open greenspace.
- Topographic low spots and flow paths should be incorporated into site design and layout. Infilling of ditches or depressions should be avoided.
- The RoFSW map is not suitable for identifying whether an individual property will flood and is therefore indicative. The RoFSW map is not appropriate to act as the sole evidence for any specific planning or regulatory decision or assessment of risk in relation to flooding at any scale without further supporting studies, modelling, or evidence.

4 Cumulative impacts assessment and high risk catchments

4.1 Level 1 cumulative impacts assessment

A cumulative impact assessment was completed through the Huntingdonshire Level 1 SFRA (2024), which aimed to identify catchments sensitive to the cumulative impact of new development. This site is located within one catchment, namely, the Alconbury and Brampton Brooks catchment. This catchment is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development can be found in Appendix G of the Level 1 SFRA. Cumulative impacts of development should also be considered as part of a site-specific FRA.

5 Groundwater, geology, soils, SuDS suitability

Risk of groundwater emergence is assessed in this SFRA using JBA's 5m Groundwater Emergence Map. This dataset is recommended for use by the EA in the SFRA Good Practice Guide³. Figure 5-1 shows the map covering this site and the surrounding areas. Table 5-1 explains the risk classifications.

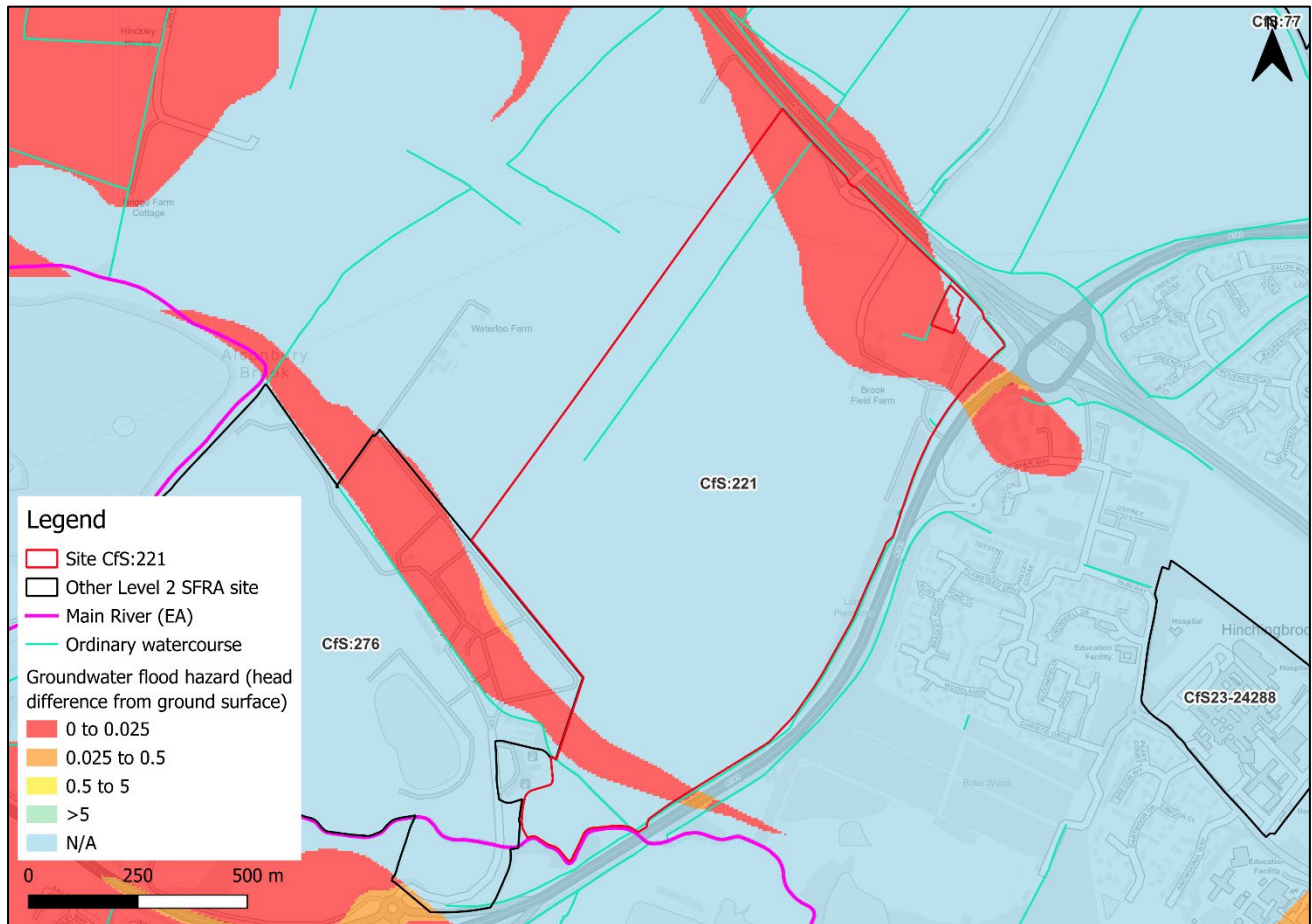


Figure 5-1: JBA 5m Groundwater Emergence Map

The majority of the site is classified as no risk. Any infiltration SuDS should therefore be suitable for the majority of this site. However, within the main fluvial and surface water risk areas, groundwater levels are either at very near (within 0.025m of) the ground surface in the 100-year return period flood event. There is a risk of groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots. Infiltration SuDS in these areas are therefore unlikely to be appropriate.

³ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 5-1: Groundwater Hazard Classification

Groundwater head difference (m)*	Class label
0 to 0.025	Groundwater levels are either at very near (within 0.025m of) the ground surface in the 100-year return period flood event. Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots.
0.025 to 0.5	Groundwater levels are between 0.025m and 0.5m below the ground surface in the 100-year return period flood event. Within this zone there is a risk of groundwater flooding to surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally.
0.5 to 5	Groundwater levels are between 0.5m and 5m below the ground surface in the 100-year return period flood event There is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely.
>5	Groundwater levels are at least 5m below the ground surface in the 100-year return period flood event. Flooding from groundwater is not likely.
N/A	No risk. This zone is deemed as having a negligible risk from groundwater flooding due to the nature of the local geological deposits.
*Difference is defined as ground surface in mAOD minus modelled groundwater table in mAOD.	

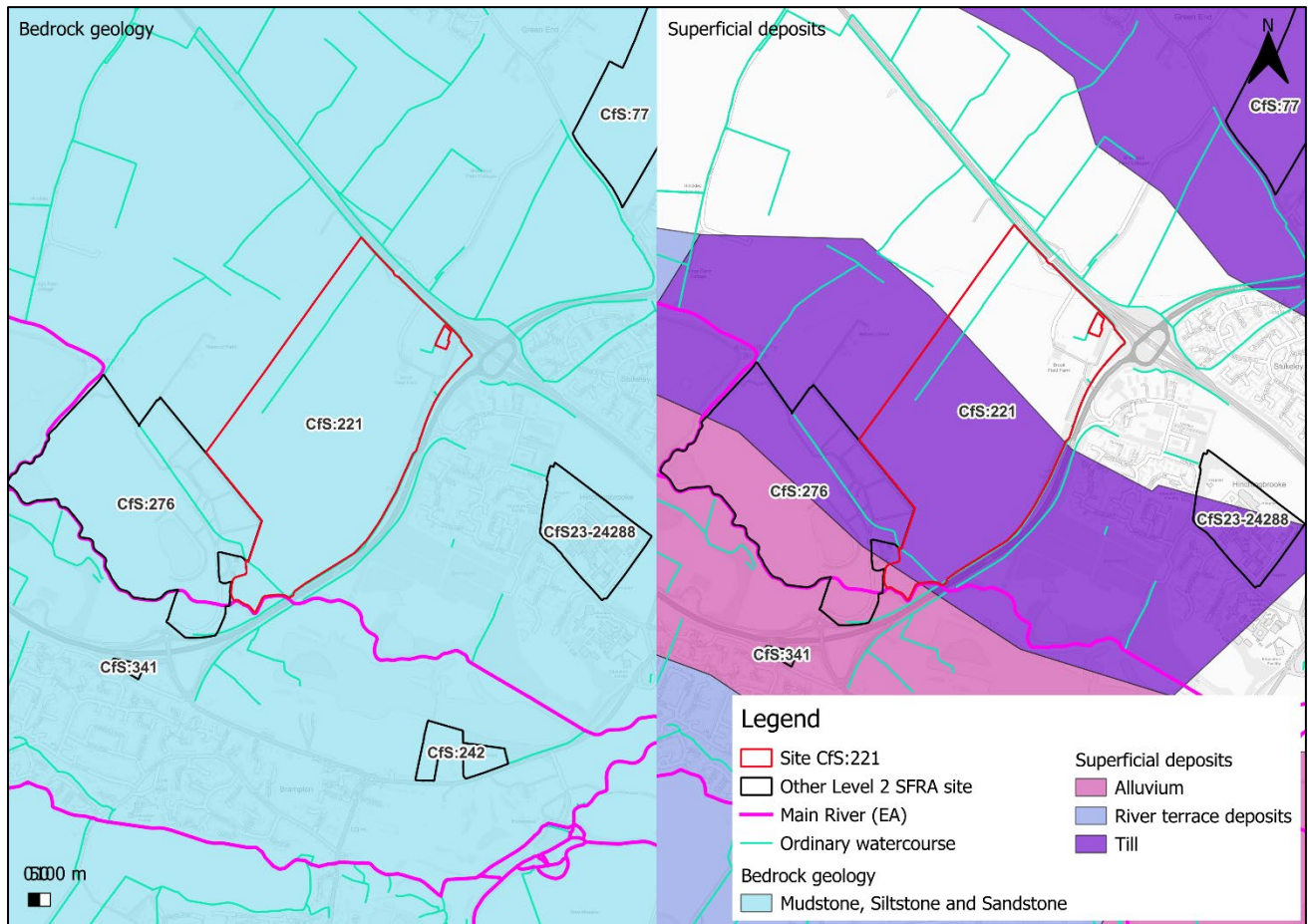


Figure 5-2: Soils and geology

6 Residual risk

Although a site may be afforded some protection from defences and / or drainage infrastructure, there is always a residual risk of flooding from asset failure i.e. breaching / overtopping of flood defences, blockages of culverts or drainage assets.

Residual risk at this site comes from the potential blockage of the two structures beneath roads in the northeast of the site and flooding from Caldecotte Lake reservoir in the unlikely event of a reservoir or dam failure.

6.1 Potential blockage

A blockage of the two culverts in the northeast of the site may cause flooding to the site, depending on the severity of the blockage and the magnitude of the flood event. Such a scenario should be investigated at the FRA stage. Culvert course and condition surveys may be required, including for consultation with the culvert owner. There may also be other culverted sections of watercourse on or near the site that will require investigation.

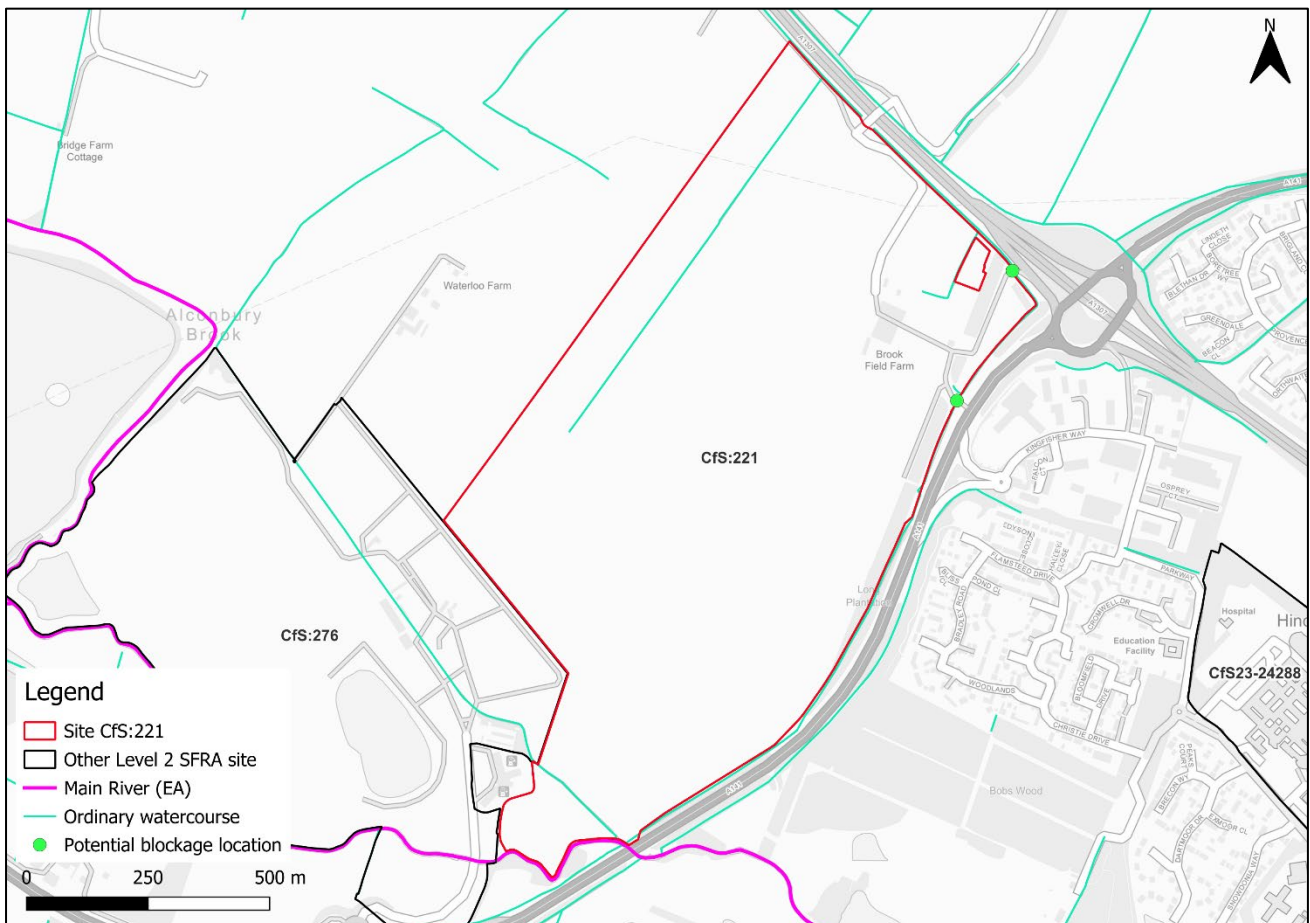


Figure 6-1: Potential blockage

6.2 Flood risk from reservoirs

The EA's Reservoir Flood Maps (RFM) (2021) show where water may go in the unlikely event of a reservoir or dam failure. Figure 6-2 shows the RFM in a 'dry day' and 'wet day' scenario. A 'dry day' scenario assumes that the water level in the reservoir is the same as the spillway level or the underside of the roof for a service reservoir and the watercourses upstream and downstream of the reservoir are at a normal level. A 'wet day' scenario assumes a worst-case scenario where a reservoir releases water held on a 'wet day' when local rivers have already overflowed their banks.

The site is potentially at risk from flooding from Caldecotte Lake reservoir, located within the Milton Keynes LLFA. The undertaker of Caldecotte Lake is Anglian Water Services Ltd.

The EA's SFRA guidance states that where a proposed development site is shown to be at potential risk from reservoir failure, then an assessment into whether the reservoir design or maintenance schedule needs improving should be carried out. Expert advice may be required from an all-reservoirs panel engineer. The Council should consult Anglian Water Services Ltd to ascertain whether the proposed development could affect the reservoir's risk designation, its design category or how it is operated. The Council, as category 1 responders, can access more detailed information about reservoir risk and reservoir owners using the [Resilience Direct](#) system.

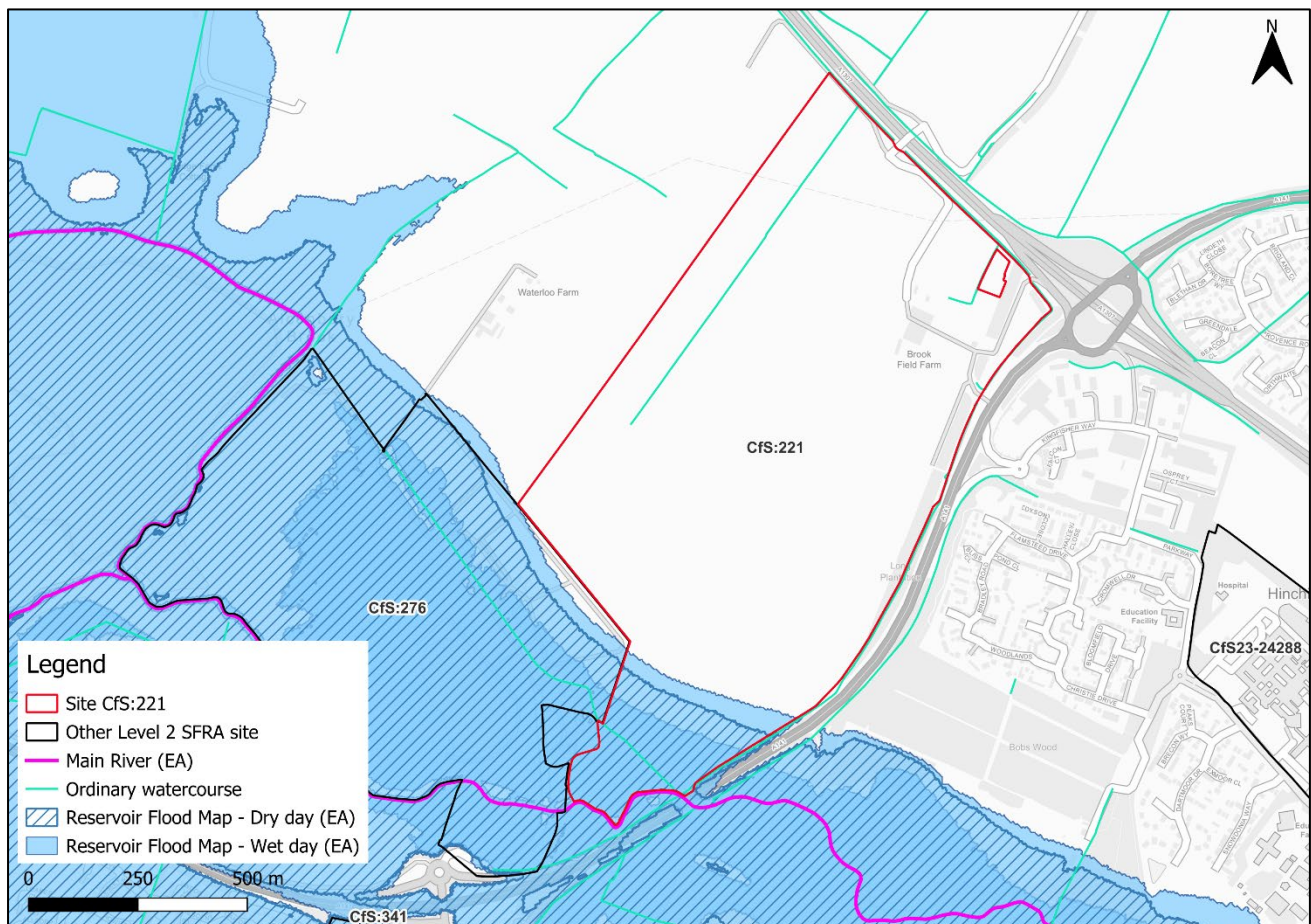


Figure 6-2: EA Reservoir Flood Map

7 Overall site assessment

7.1 Can part b) of the exception test be passed?

This site is not required to pass part b) of the exception test as it is proposed for less vulnerable development. However, it must still be proven that the development can be safe for its lifetime, which is 75 years for non-residential development

7.2 Recommendations summary

Based on the evidence presented in the Level 1 SFRA (2024) and this Level 2 SFRA:

- It should be appropriate to develop this site for less vulnerable purposes, assuming the risk areas can be left as open greenspace which should be possible given the large size of the site.
- Risk from the ordinary watercourses should be investigated at the FRA stage. Modelling may be required.
- A detailed drainage strategy will be required for any new development, given the large area of the site and the fact it is currently greenfield.
- The drainage strategy must ensure there is no increase in surface water flood risk elsewhere as a result of new development. Greenfield rates will apply, and the developer should follow the National SuDS guidance and any local guidance available from the LLFA. Groundwater conditions should be assessed.
- Surface water flood risk is inconclusive between datasets. A drainage strategy should therefore investigate risk further.
- The ordinary watercourses should be included within the site design and layout. Infilling of drainage ditches should be avoided.
- There is potential residual risk to the site from a blockage of the culverts in the northeast of the site. The reservoir owner should be consulted on any new development.
- Opportunities for NFM features to reduce flood risk to the site and surrounding areas should be explored at the site-specific FRA stage.
- Safe access and escape routes should be considered further to ensure safe evacuation of site users during the low risk surface water flood event.
- Were development of this site to proceed, given the proximity of this site to neighbouring site CfS:276, it would be prudent to formulate a strategy to develop these sites in tandem and for consultation between each developer to take place to ensure a joined-up approach for sustainable development is in place.

7.3 Site-specific FRA requirements and further work

At the planning application stage, the following should be considered:

- Further consideration of surface water flood risk, including a drainage strategy. Discharge rates should remain at greenfield rates at a minimum in consultation with the LLFA.
- Condition and capacity assessments of the culverts in the northeast of the site and investigate the impact of a potential blockage of the structures.
- FRA should be carried out in line with the latest versions of the NPPF; FRCC-PPG; EA online guidance; the HDC Local Plan, and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with, where applicable, the local planning authority; the lead local flood authority; emergency planning officers; the Environment Agency; Anglian Water; the highways authorities; and the emergency services.

8 Licencing

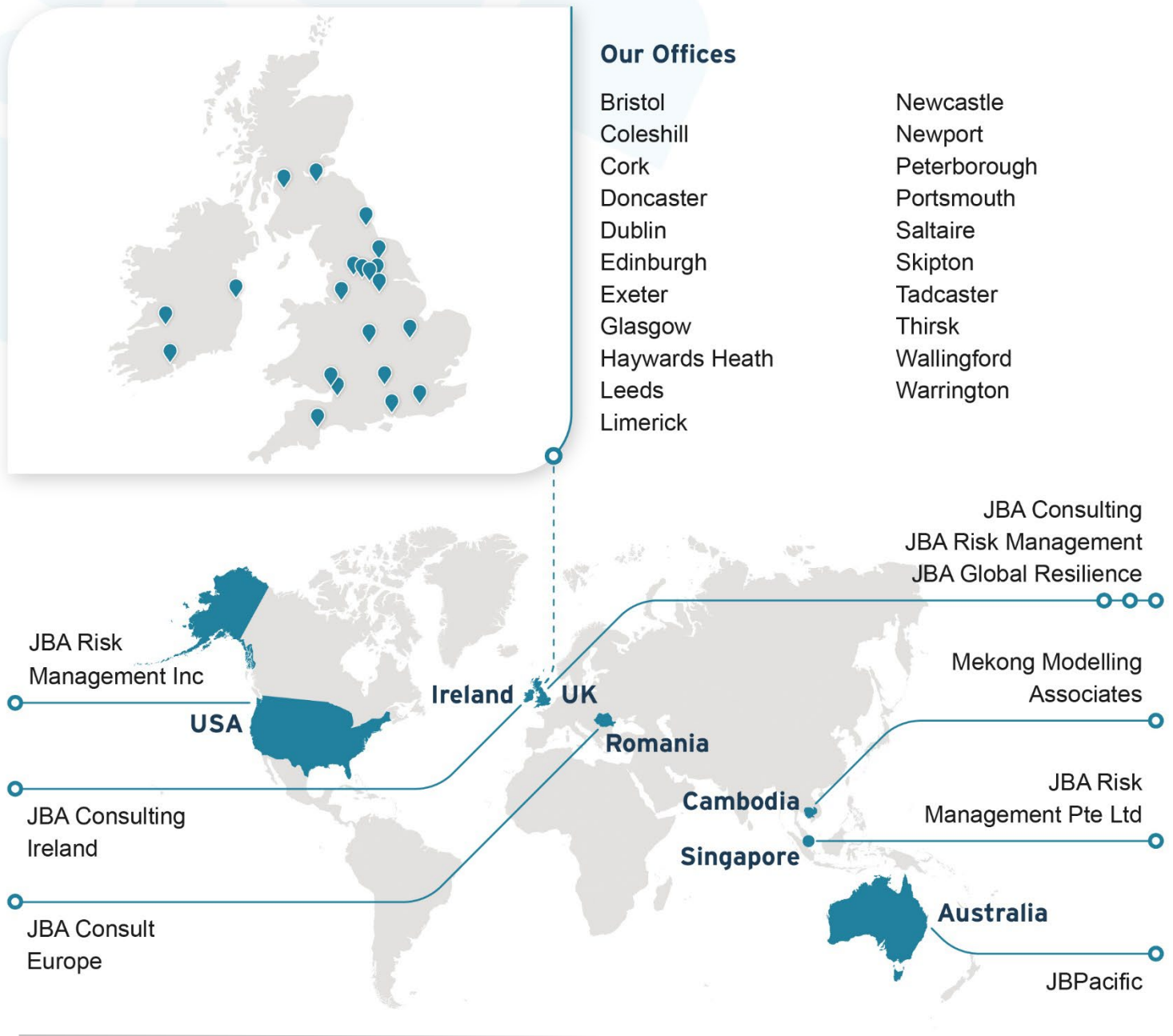
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