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Huntingdonshire Level 2 Strategic Flood Risk Assessment Site Summary

Site CfS:46

Final Draft Report

Prepared for

Huntingdonshire District Council

Date

November 2025

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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. Mike Williamson 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.

Acknowledgements

We would like to thank the Environment Agency, Cambridgeshire County Council for their assistance with this work.

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1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for Local Plan Site CfS:46. 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:46

- Location: Galley Hill, Fenstanton
- Existing site use: agriculture
- Existing site use vulnerability: less vulnerable
- Proposed site use: commercial
- Proposed site use vulnerability: less vulnerable
- Site area (ha): 61.99
- Watercourse: Hall Green Brook, River Great Ouse, several ordinary watercourses
- Environment Agency (EA) model: Lower Ouse 2015 (Downstream Lower Ouse)
- Summary of requirements from Level 2 SFRA scoping stage:
    - 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

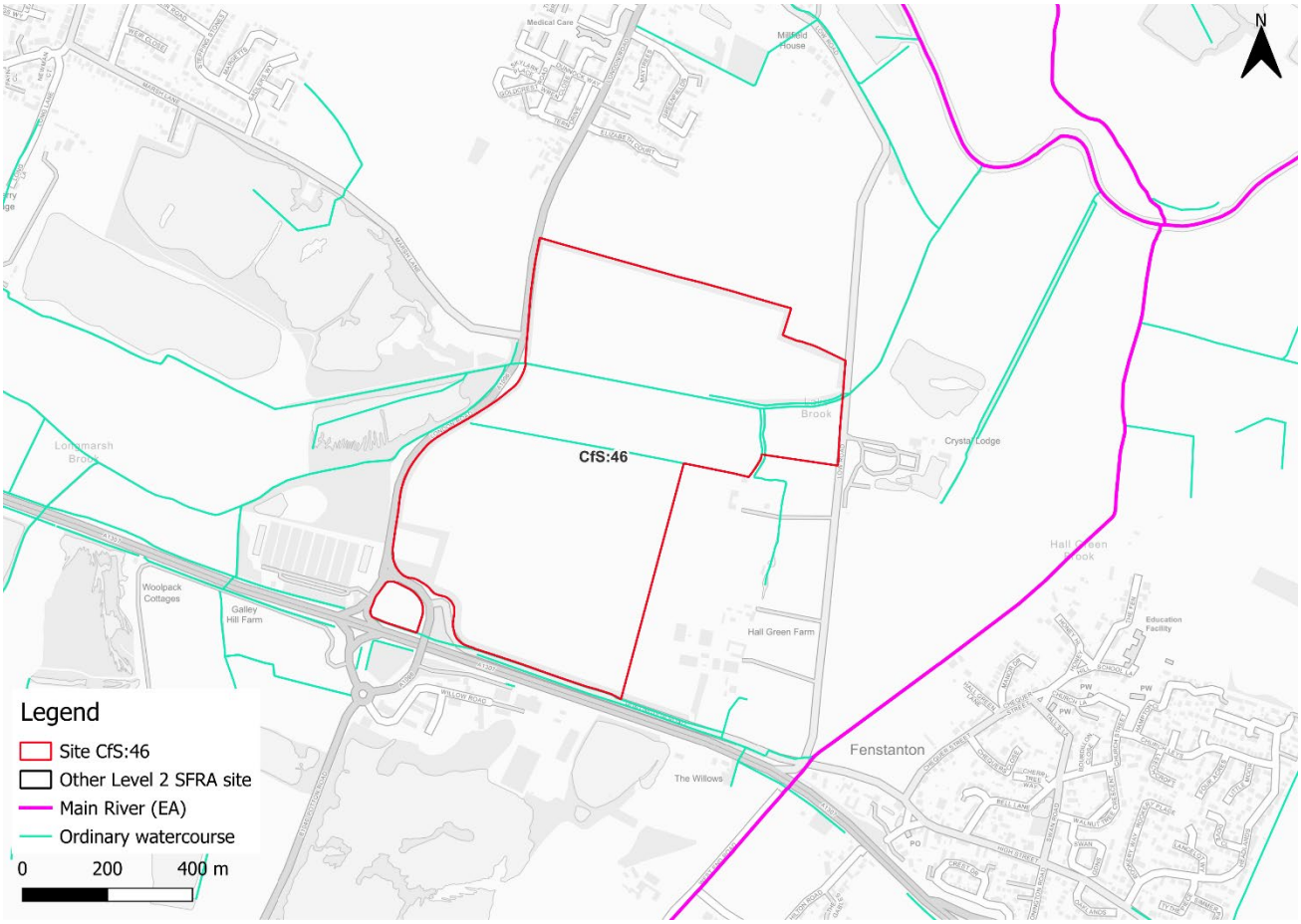

Figure 1-1: Existing site location boundary

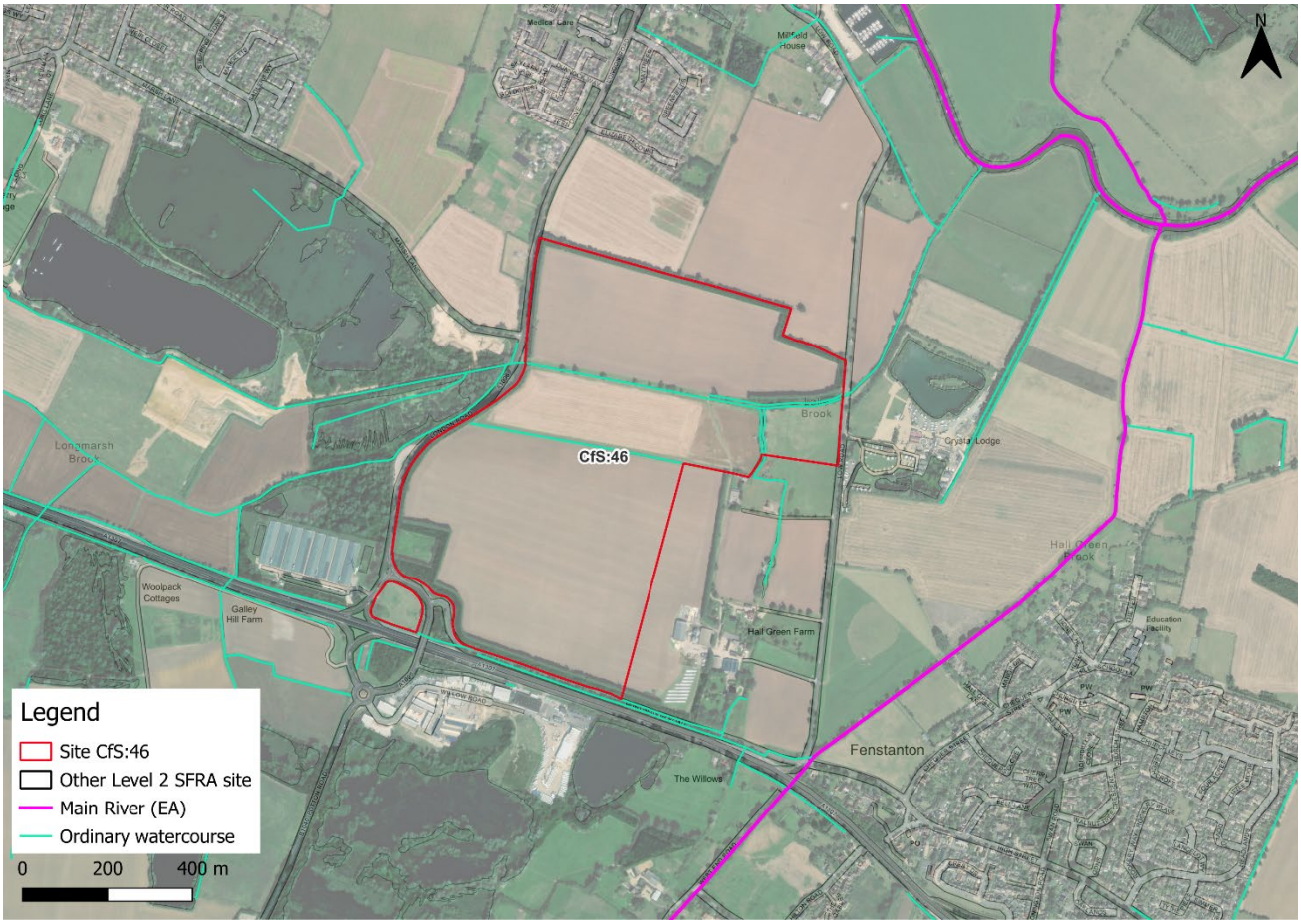

Figure 1-2: Aerial photography

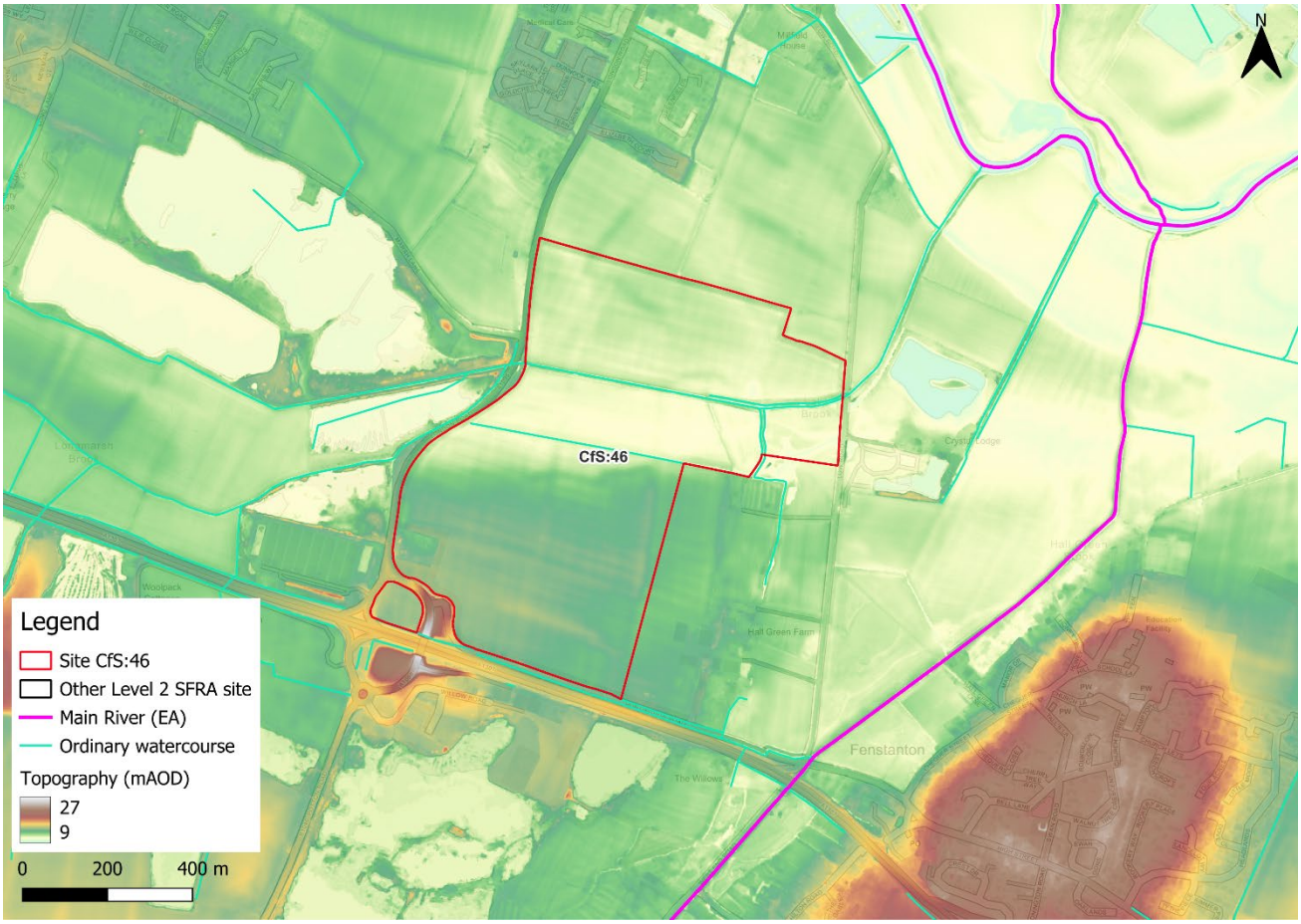

Figure 1-3: Topography

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).

The risk to the site mainly comes from the River Great Ouse to the north, and also from its tributary, Hall Green Brook to the east. Over half of the site is modelled to be within Flood Zone 3b (functional floodplain). Less vulnerable development is not permitted in Flood Zone 3b. Flood Zone 3b in this location is based on the Flood Map for Planning 3.3% AEP defended river and sea event. 40% of the site is within Flood Zone 1. However, the site is surrounded by functional floodplain and Flood Zone 3.

Note: the flood source for the area of Flood Zone 3 onsite is stated as 'river and sea'.

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)
40	2	1	57

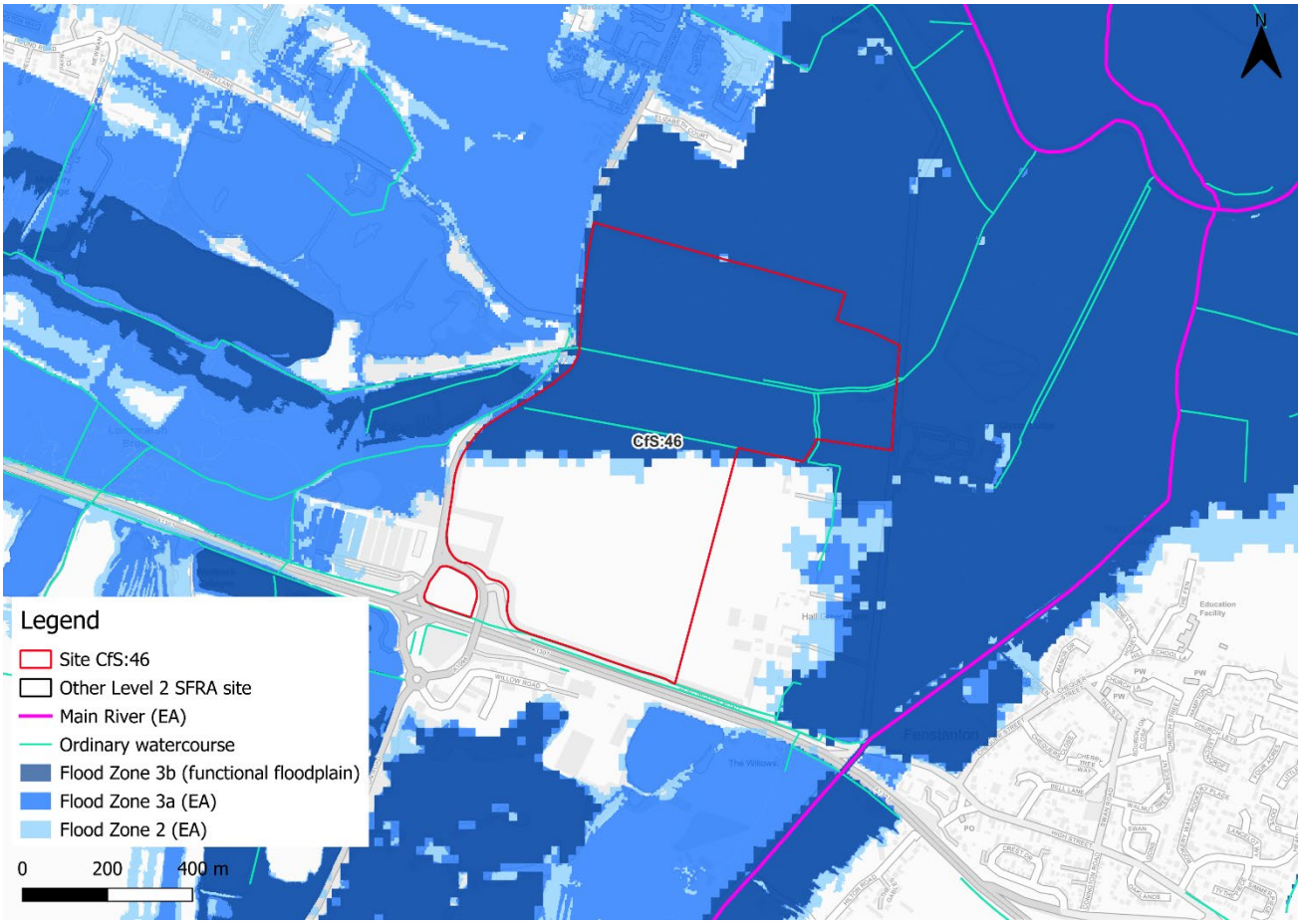

Figure 2-1: Existing risk

2.1.2 Fluvial undefended model outputs (Lower Ouse 2025 (Downstream Lower Ouse))

Figures 2-2, 2-3, and 2-4 show the modelled flood depths, velocities, and hazards for the 1% AEP undefended event respectively. Risk is modelled to be significant across the approximate northern half of the site with hazard ratings on 'danger for most'.

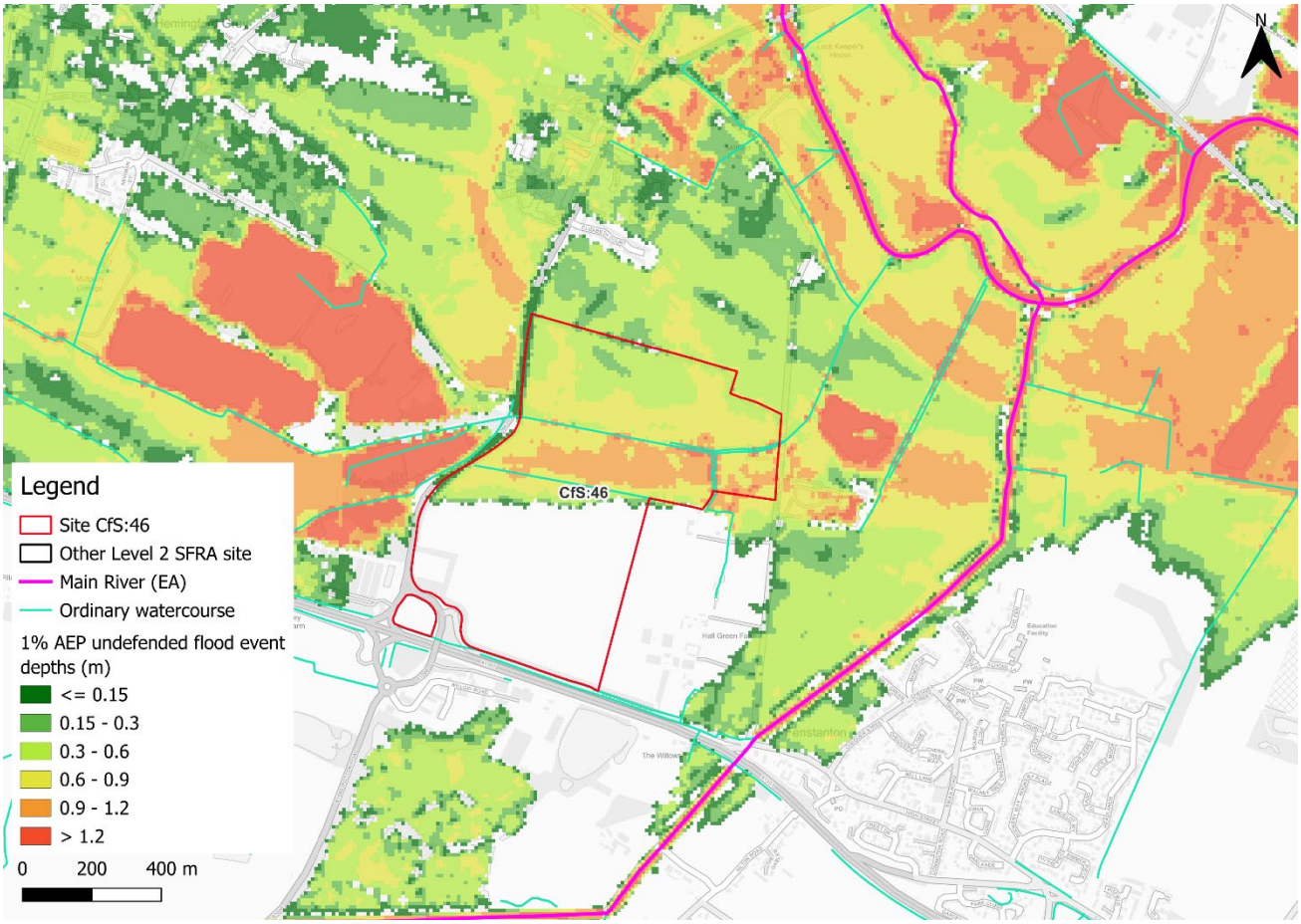

Figure 2-2: Flood depths for 1% AEP undefended flood event

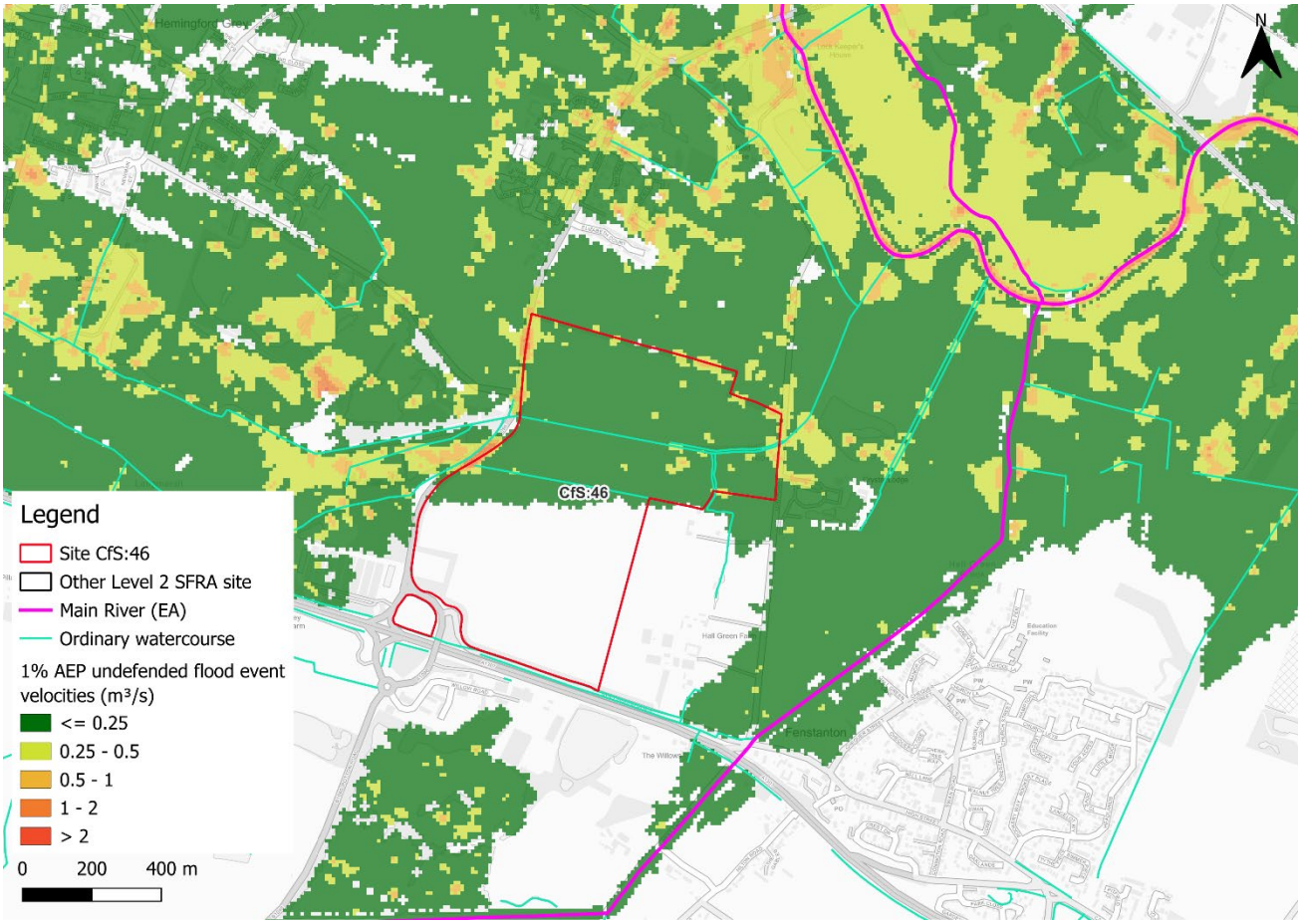

Figure 2-3: Flood velocities for 1% AEP undefended flood event

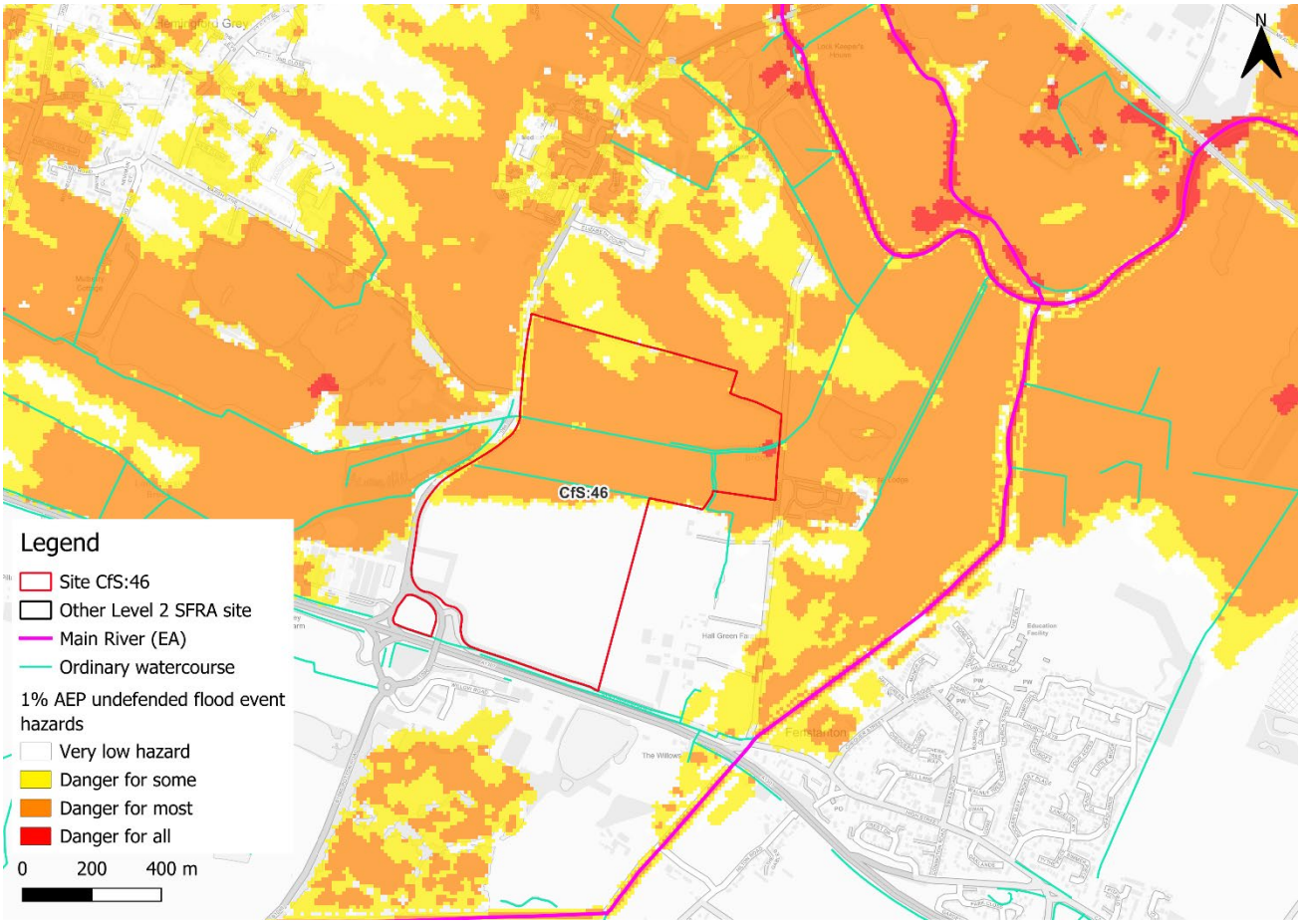

Figure 2-4: Flood hazard[1] for 1% AEP undefended flood event

2.2 Flood risk management

2.2.1 Flood defences

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset. However, the west of the site does appear to benefit from several flood embankments located along the right bank of the River Great Ouse to the north of the site, as shown in Figure 2-5. Each embankment has a design standard of protection of 100 years.

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.

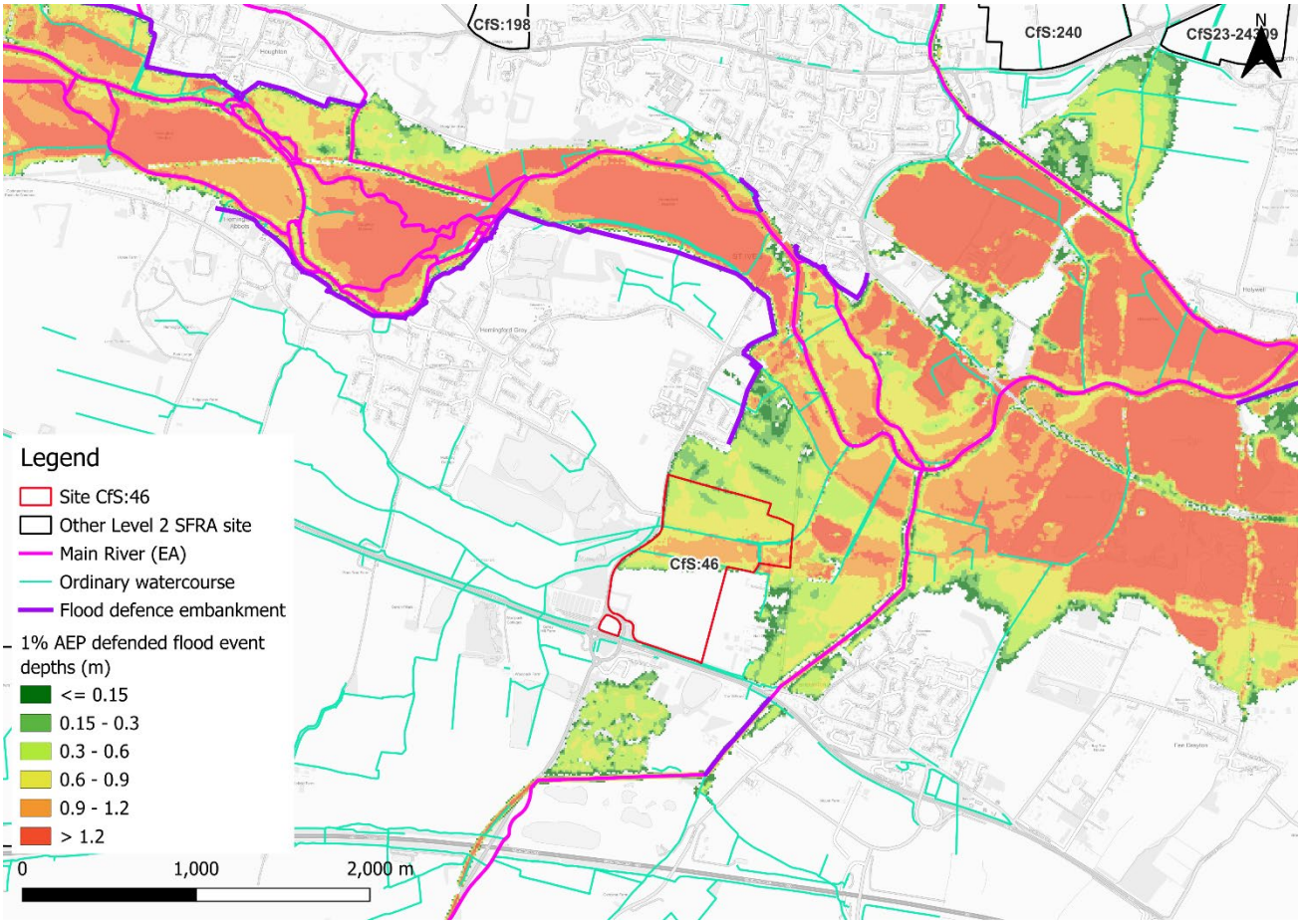

Figure 2-5: Flood depths for 1% AEP defended flood event and flood defence embankments

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 2-6. Note, the WwNP mapping is broadscale and indicative, therefore further investigation will be required for any land shown to have potential for WwNP. The risk area of the site has potential for tree planting within the floodplain. There are also large areas of land surrounding and upstream of the site with potential for tree planting within the floodplain to help slow flows and reduce runoff.

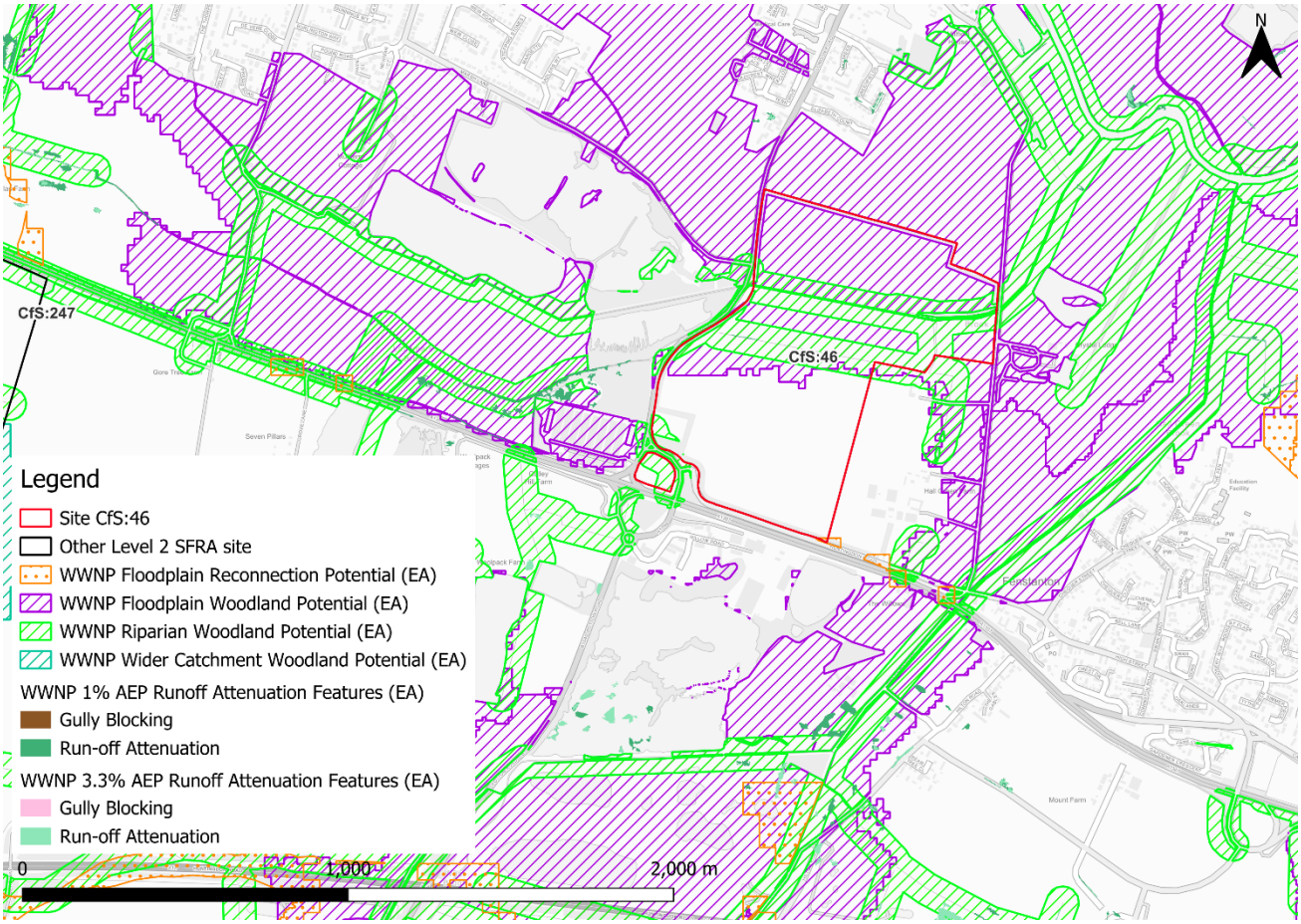

Figure 2-6: Natural Flood Management (NFM) potential mapping

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 River Great Ouse and Hall Green Brook have been modelled using the Lower Ouse 2015 (Downstream Lower Ouse) model.

With consideration of the EA's SFRA guidance, the latest central and higher central climate change allowances have been modelled in this Level 2 SFRA 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% (in absence of 3.3%)	19%	30%
1%	19%	30%

Return period (AEP event)	Central allowance 2080s (% increase)	Higher central allowance 2080s (% increase)
0.1%	Model instabilities. Could not run	

Figures 2-7, 2-8, and 2-9 show the modelled flood depths, velocities, and hazards for the 1% AEP undefended event plus the central climate change allowance (+19%) respectively. Risk is not modelled to increase in extent though depths and hazards do increase on and offsite.

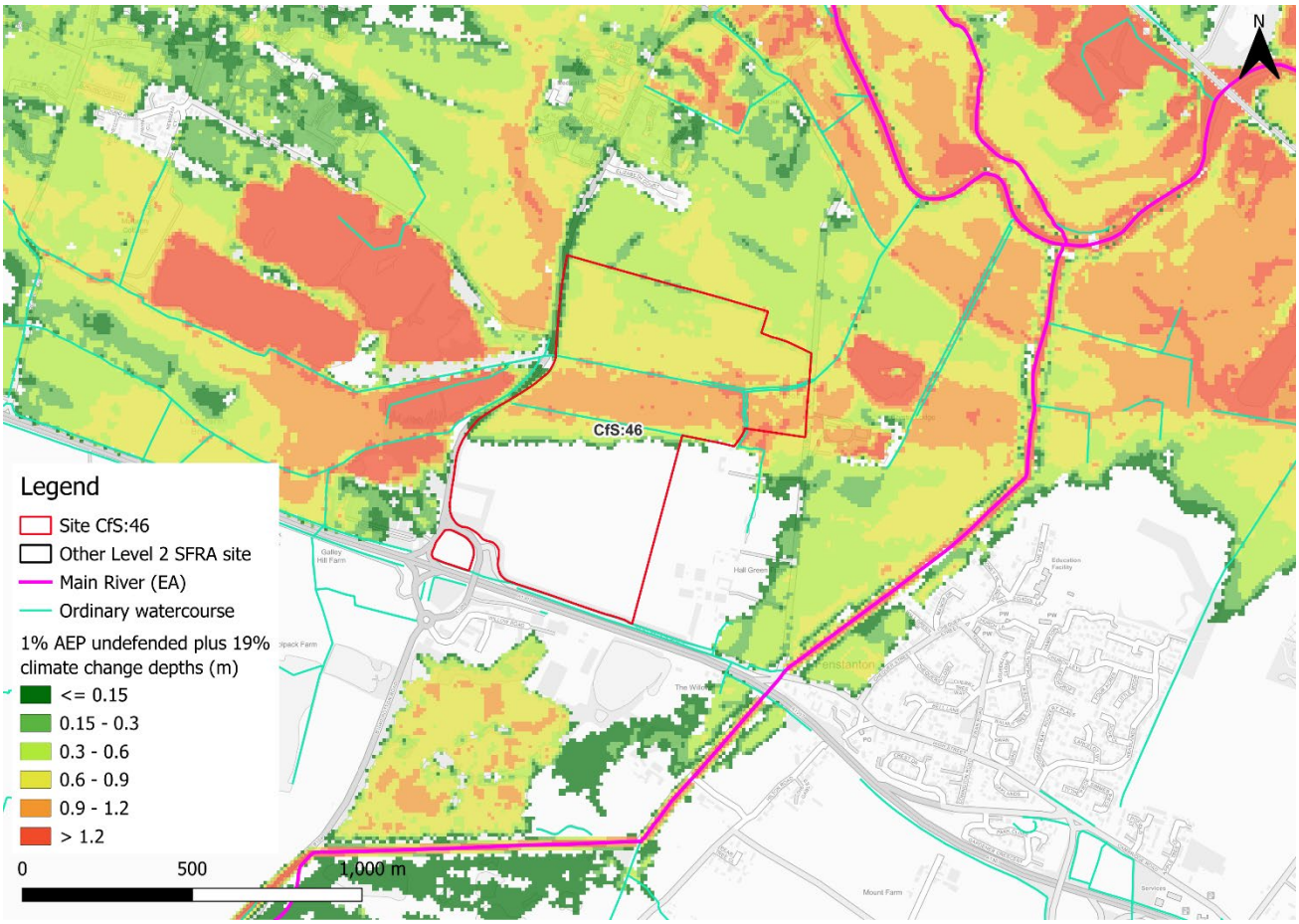

Figure 2-7: Flood depths for 1% AEP undefended flood event +19% (central climate change allowance)

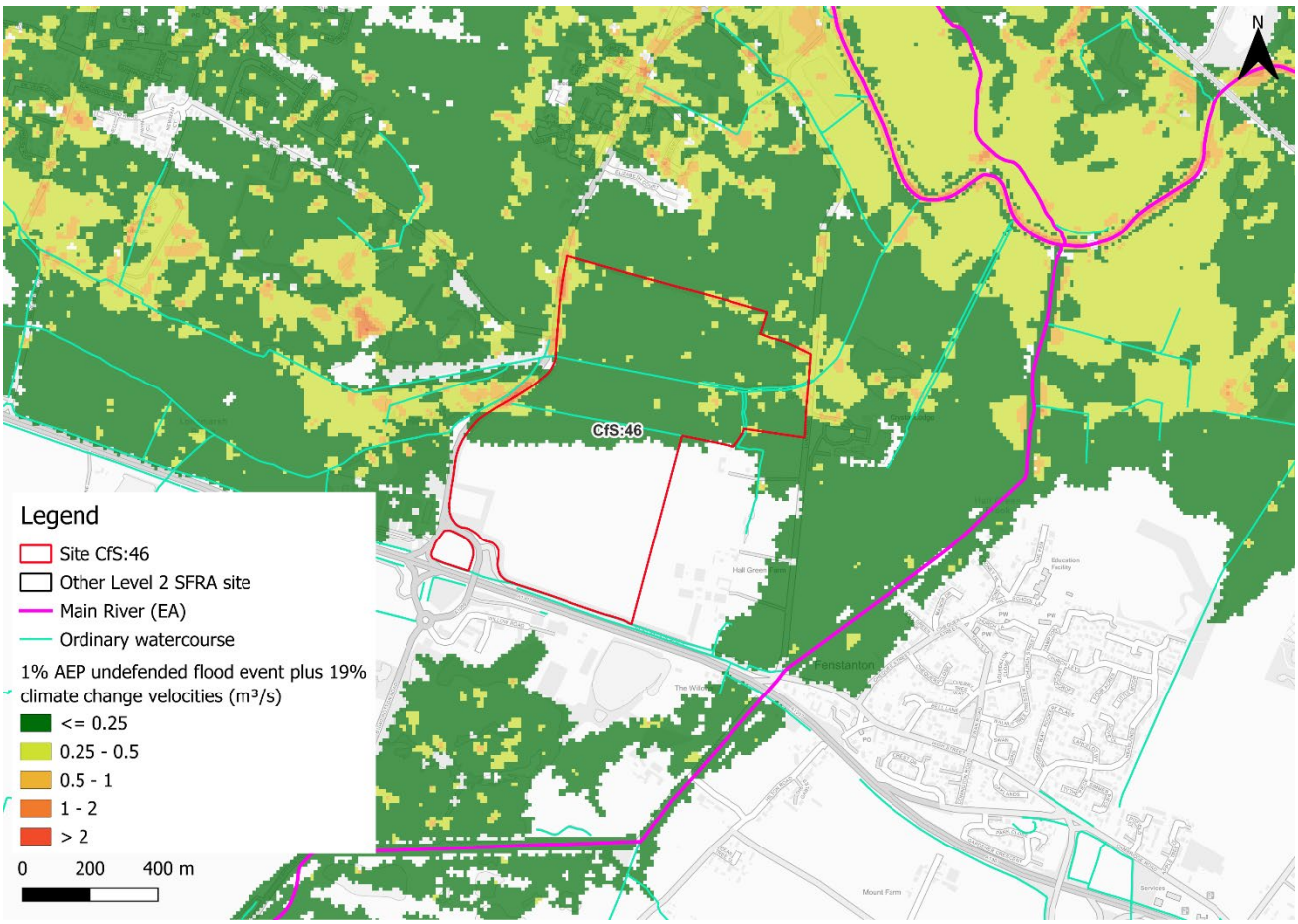

Figure 2-8: Flood velocities for 1% AEP undefended flood event +19% (central climate change allowance)

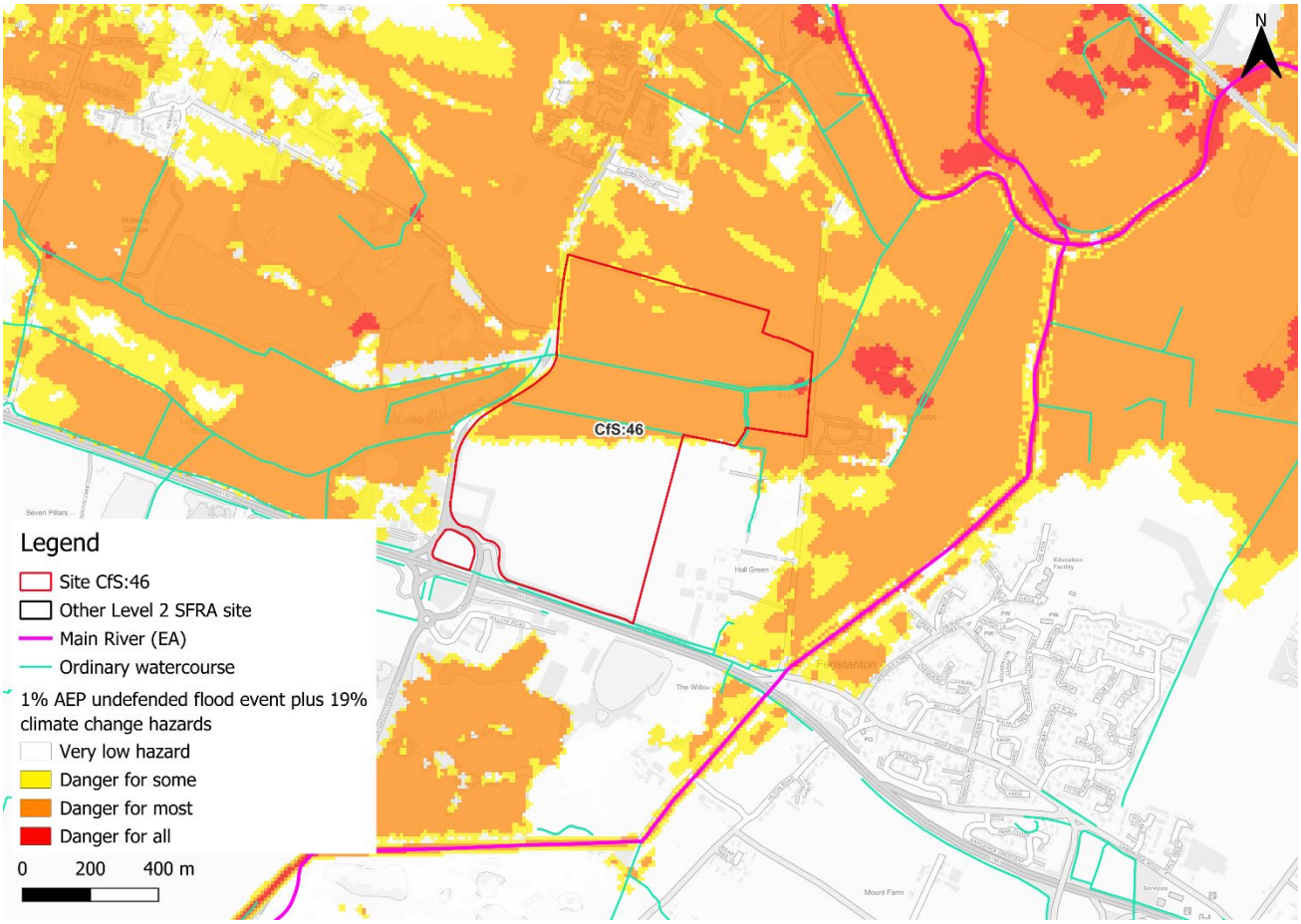

Figure 2-9: Flood hazard[1] for 1% AEP undefended flood event +19% (central climate change allowance)

2.3.2 Tidal

The site is not modelled to be 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 2-10 which shows several historic flood events having impacted the site, namely, an event in March 1947, source unknown; and in Easter 1998, source unknown.

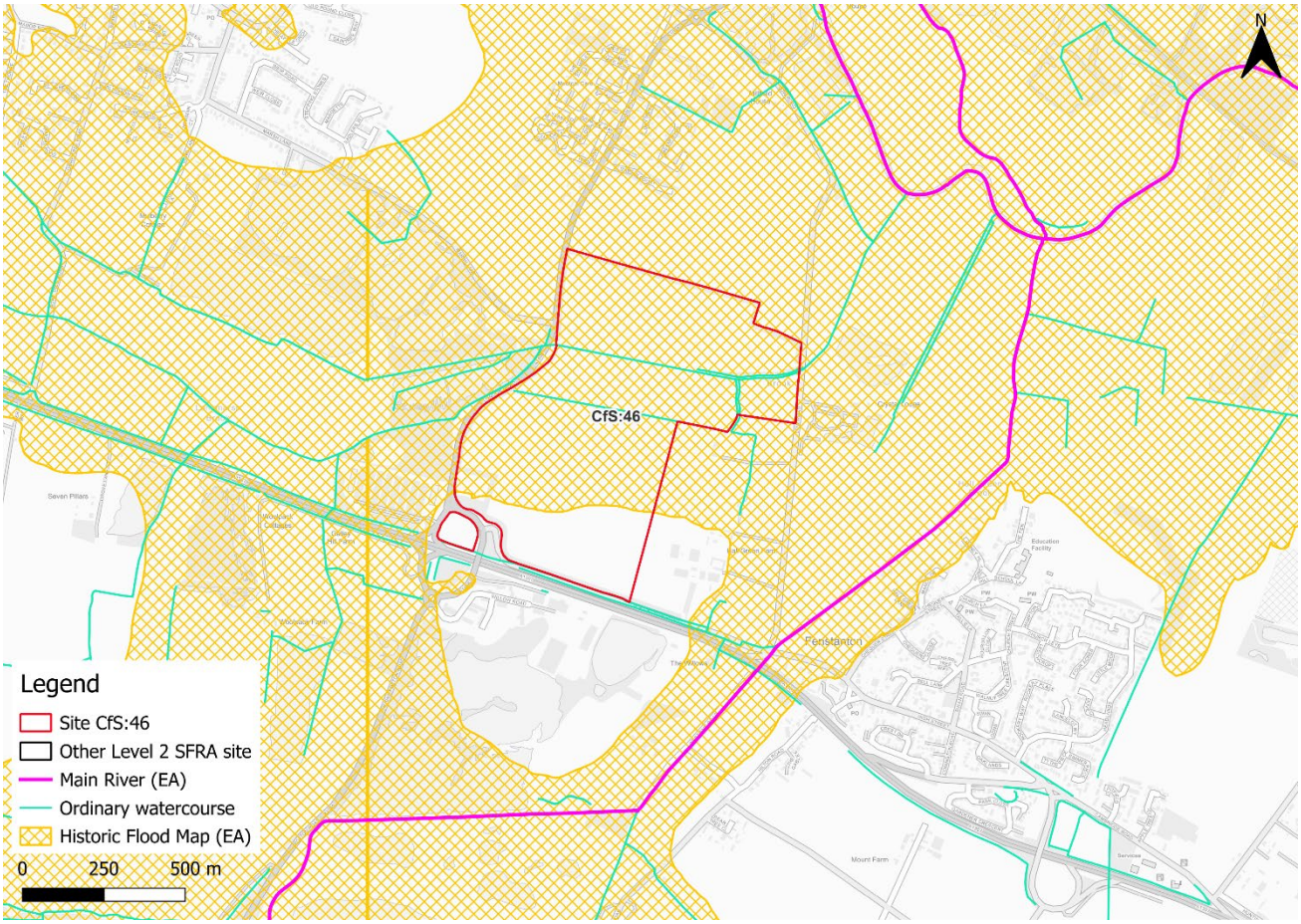

Figure 2-10: Recorded historic flood events onsite and around the site

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. The whole risk area of the site is located within a FWA, namely the River Great Ouse and Hall Green Brook at Fenstanton and Fen Drayton FWA.

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. The risk area of the site is also located within a FAA, namely the River Great Ouse in Cambridgeshire from Brampton to Earith FAA.

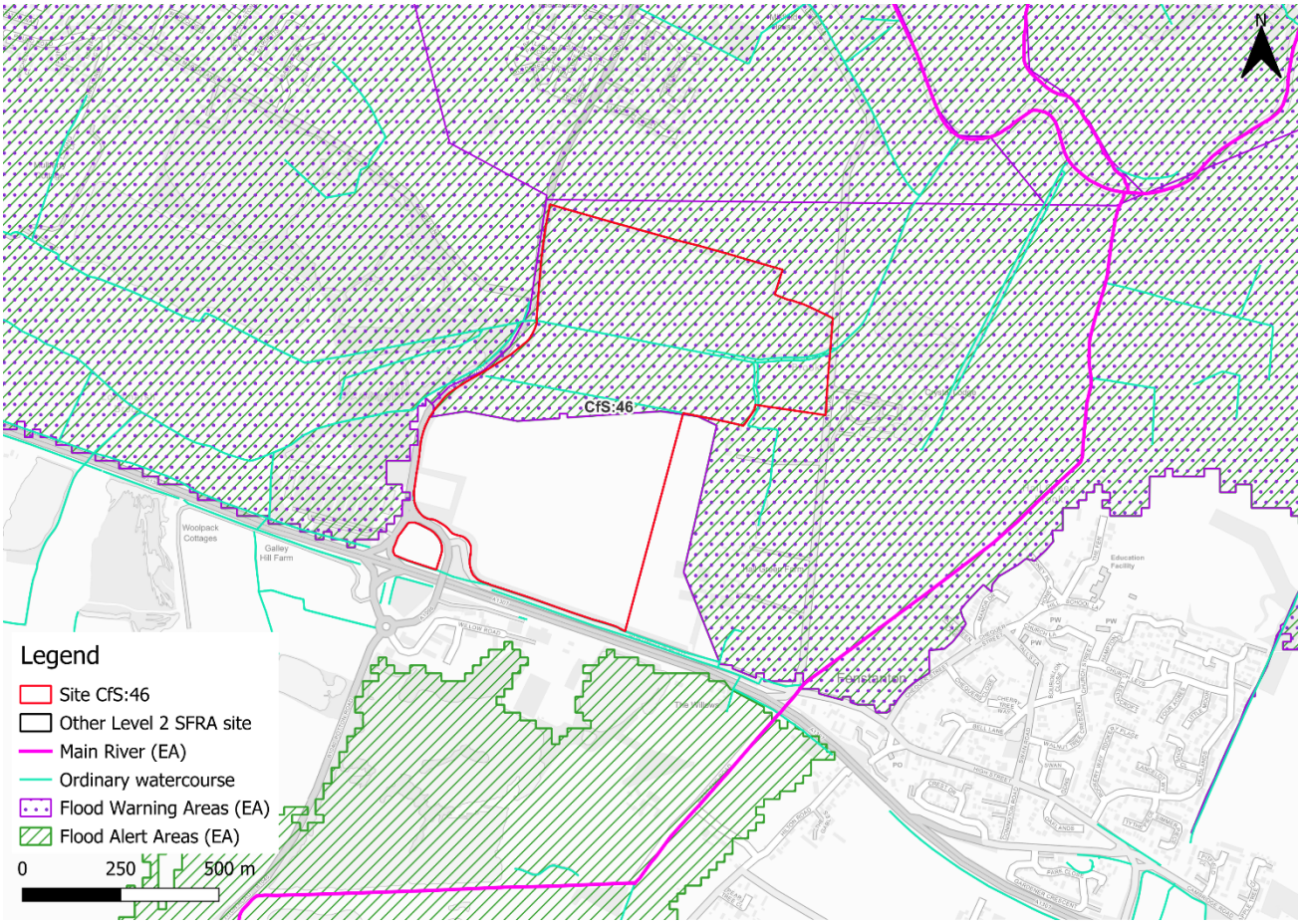

Figure 2-11: EA Flood Warning Areas and Flood Alert Areas

2.5.2 Access and escape routes

Based on available information, safe access and escape routes will be via Huntingdon Road on the southern boundary, as indicated by the orange circle in Figure 2-12.

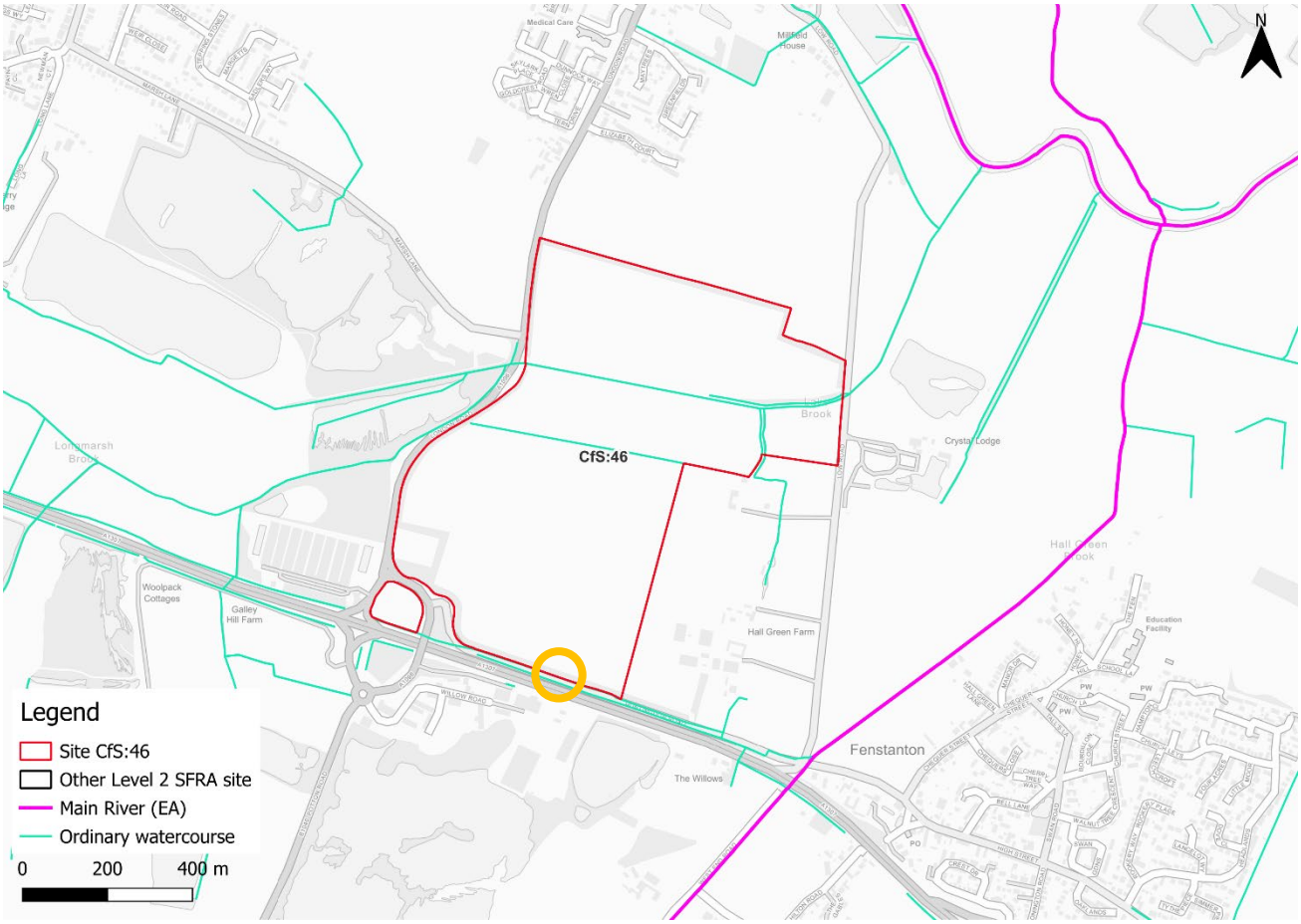

Figure 2-12: Potential access and escape routes

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

- Observations:
  - Over half the site is within the functional floodplain and therefore cannot be developed for less vulnerable purposes. This area of the site should remain as greenfield land that is allowed to flood.
  - Development may be appropriate in Flood Zone 1.
- Defences:
  - The site does not benefit from any flood defences.
- Mitigation:
  - The risk area of the site should be left as open greenspace that is allowed to flood.
- Access and escape:
  - Safe access and escape routes must be available at times of flood which appears possible via Huntingdon Road from the south of the site.

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 nominal with isolated ponding around the site.

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)
94	5	1	0

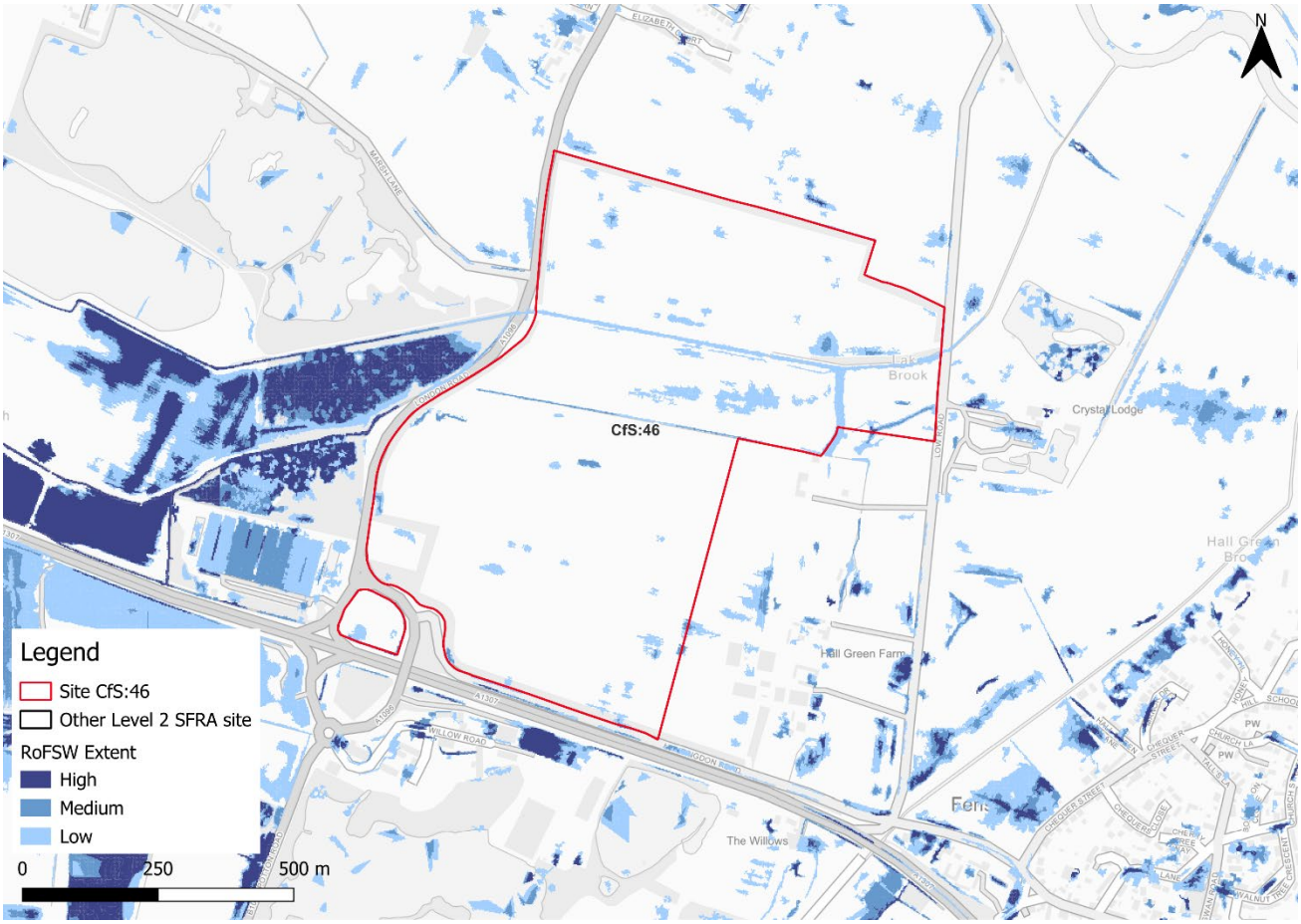

Figure 3-1: Surface water flood extents (NaFRA2 - Risk of Flooding from Surface Water map)

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

The EA's national scale third generation RoFSW map shows virtually no risk onsite for the medium risk event, as shown in Figure 3-2.

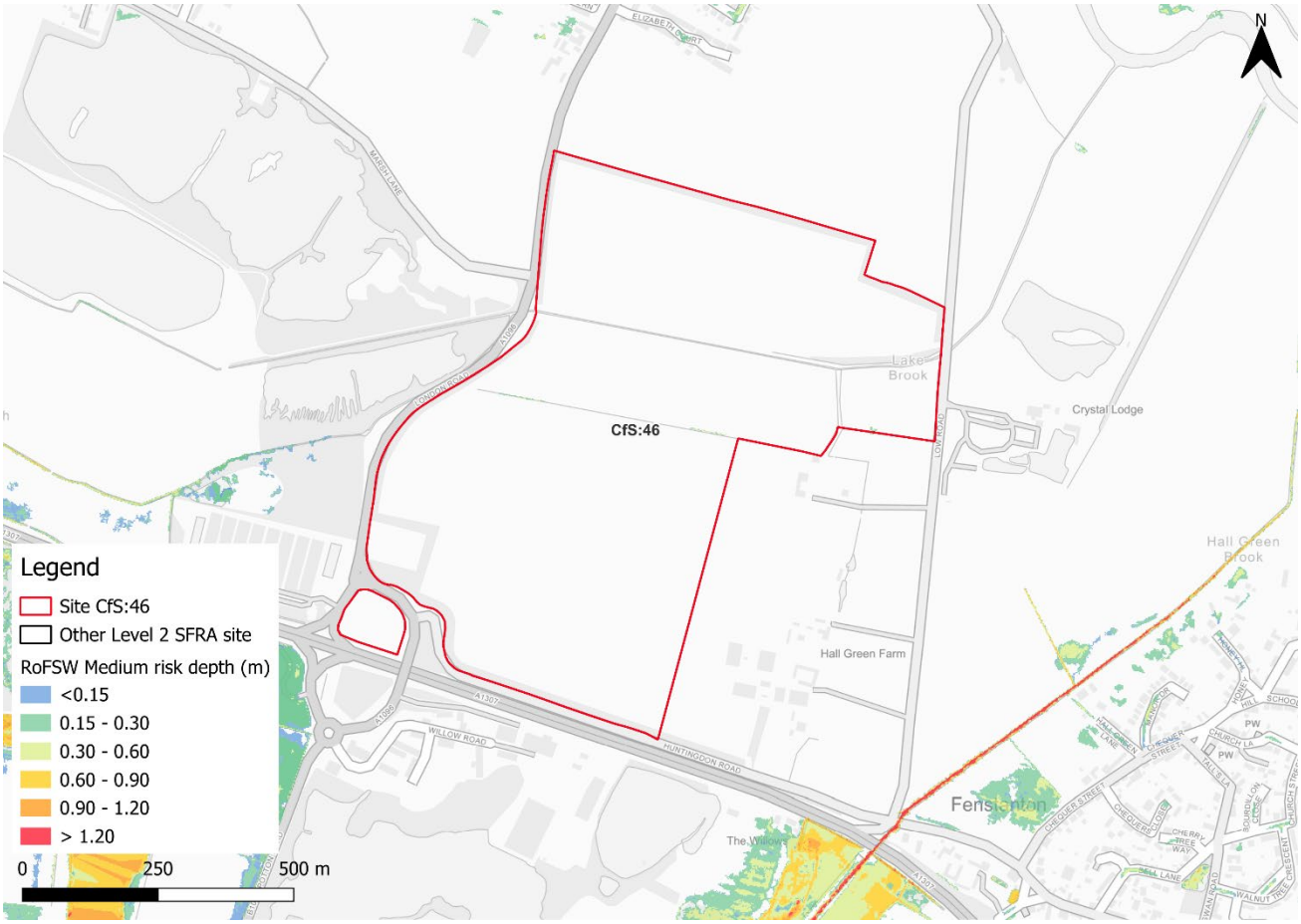

Figure 3-2: Medium risk event surface water flood depths (Third generation - Risk of Flooding from Surface Water map)

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 the information available, it is predicted that the existing areas of risk will increase in size though the third generation mapping shows nominal ponding.

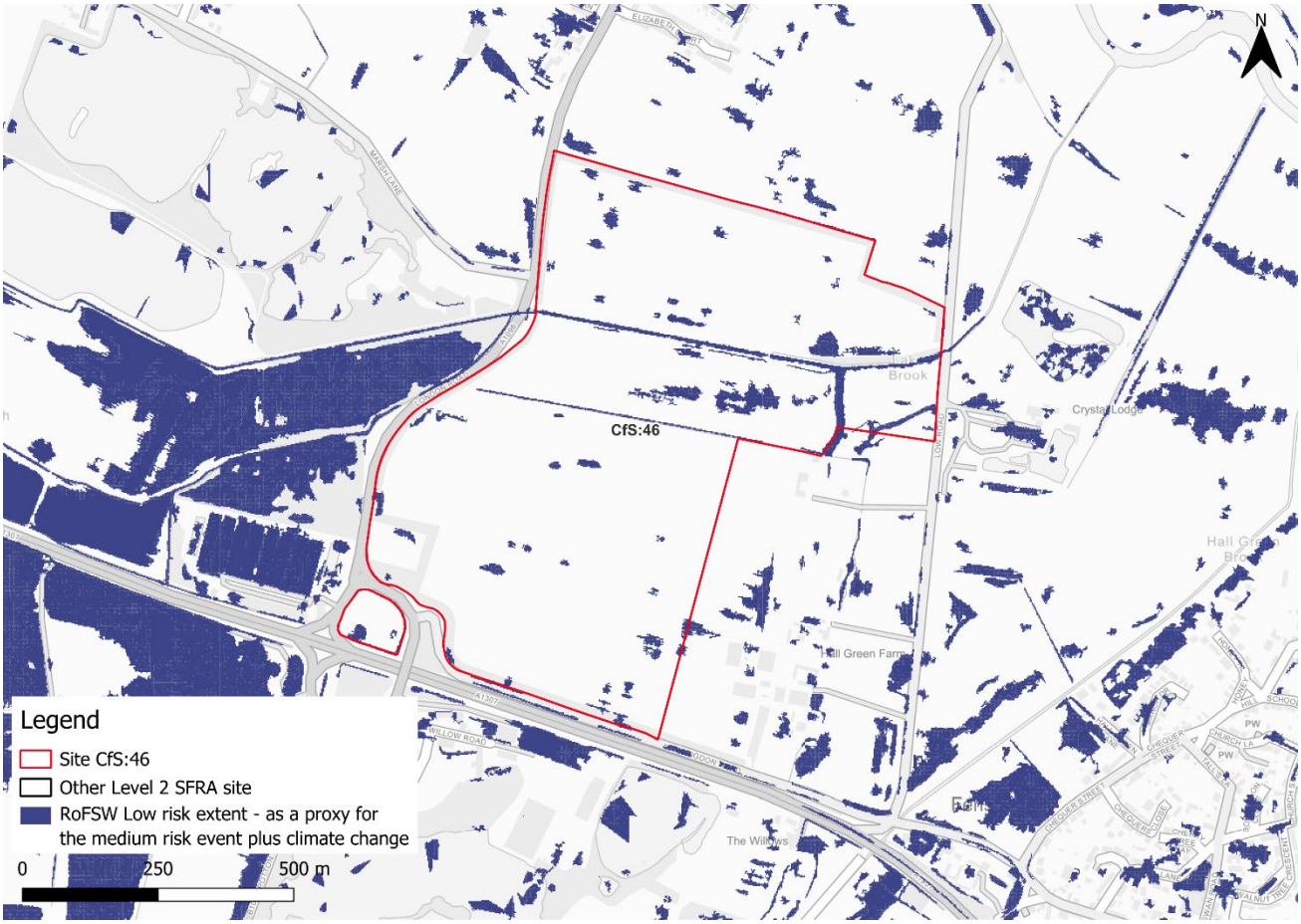

Figure 3-3: Low risk event surface water flood extent, as a proxy for the medium risk event plus climate change (NaFRA2 - Risk of Flooding from Surface Water map)

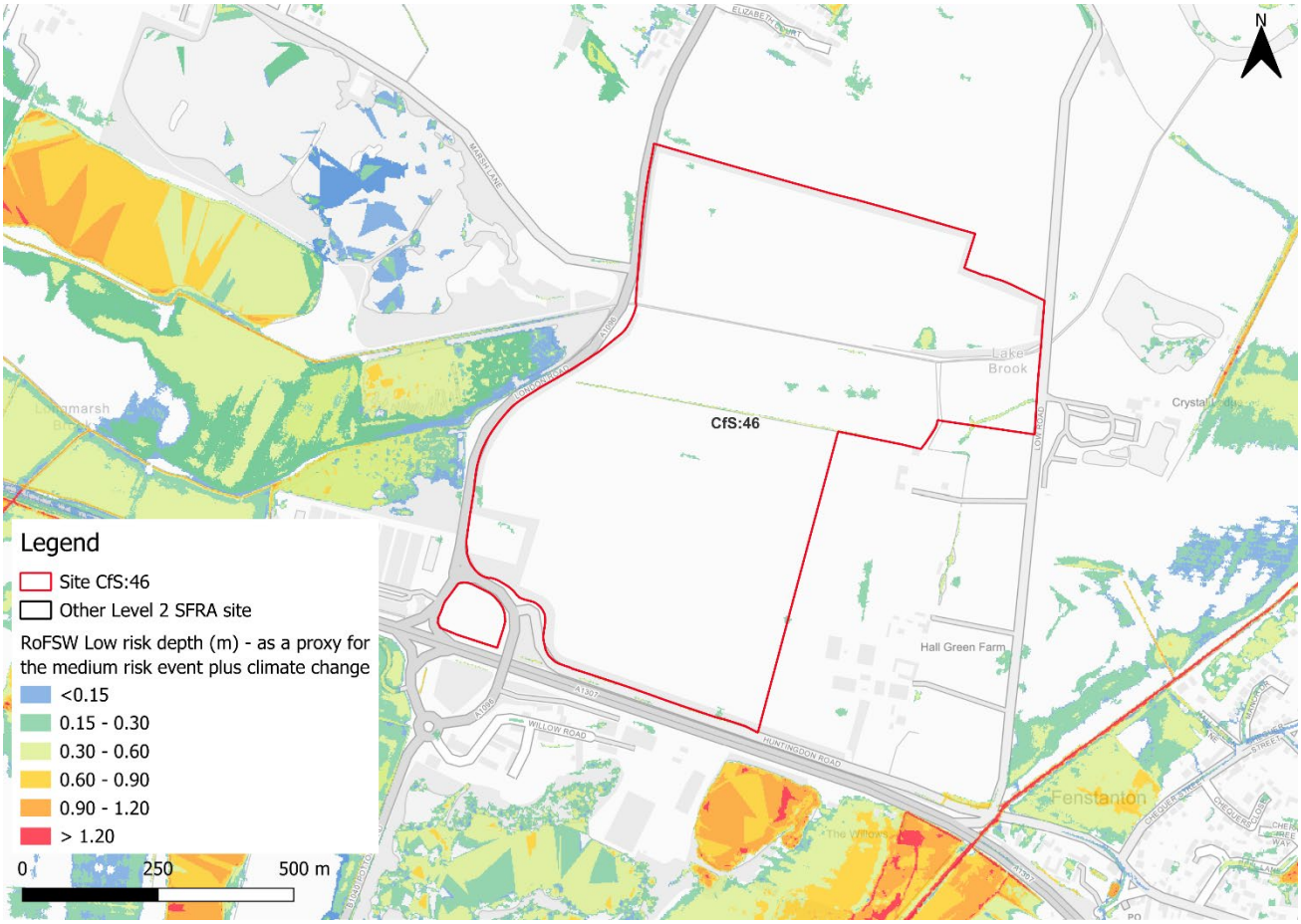

Figure 3-4: Low risk event surface water flood depths, as a proxy for the medium risk event plus climate change (Third generation - Risk of Flooding from Surface Water map)

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

- Surface water risk is nominal.
- 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 remains isolated to small areas of ponding.
- The ponded areas should be included in site design if possible. Topographic low spots and flow paths should ideally be retained and not infilled.
- A drainage strategy will be required which 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 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. The majority of the site is located within one catchment, namely, the Ouse (Roxton to Earith) catchment. This catchment is ranked as high sensitivity. 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 Guide[2]. Figure 5-1 shows the map covering this site and the surrounding areas. Table 5-1 explains the risk classifications.

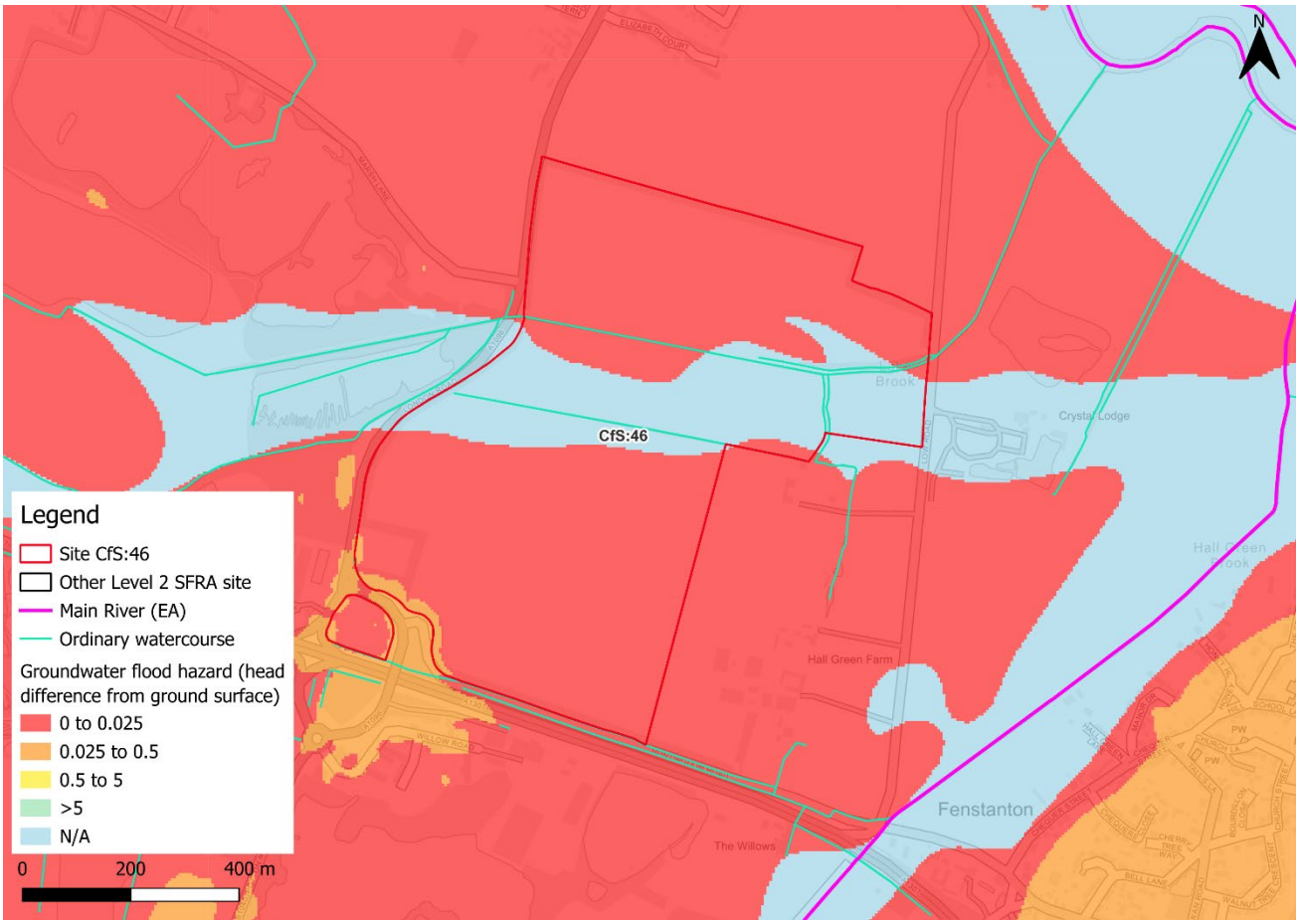

Figure 5-1: JBA 5m Groundwater Emergence Map

The majority of the site is shown to have groundwater levels at or very near (within 0.025m of) the ground surface in the 100-year return period flood event. Infiltration SuDS are therefore unlikely to be appropriate at this site. The site-specific FRA should further investigate groundwater levels through percolation testing in both wet and dry weather conditions across the site.

2 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.

6.1 Potential blockage

There are several culverts around the site where residual risk from potential blockages could impact the site, as shown in Figure 6-1. However, existing risk is significant, therefore residual risk from culvert blockages is negligeable.

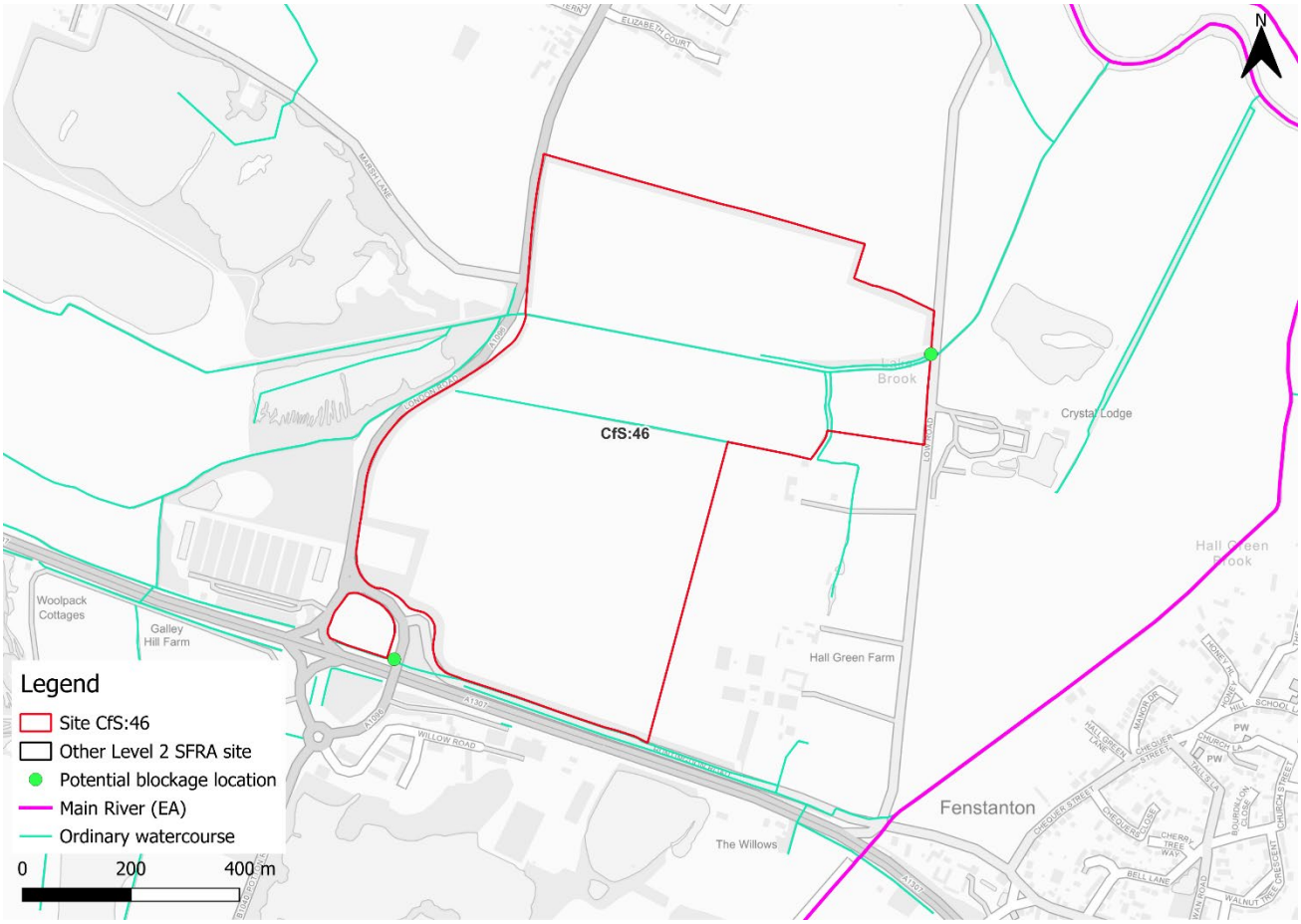

Figure 6-1: potential blockage locations

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.

Virtually the whole site is modelled to be at risk from reservoir flooding.

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 X to ascertain whether the proposed development could affect the reservoir's risk designation, it's 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.

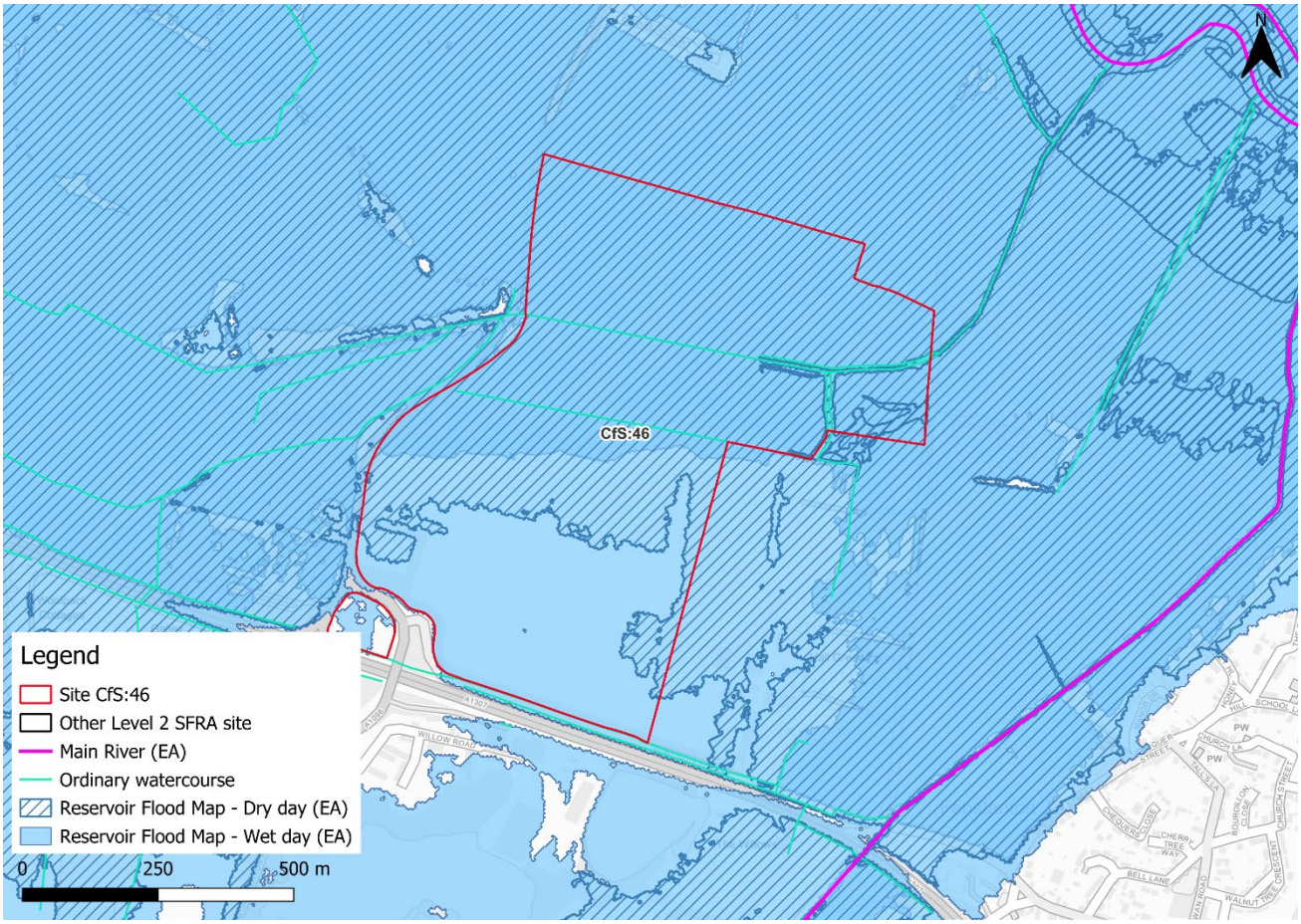

Figure 6-2: EA Reservoir Flood Map

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 uses. 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:

- The area of functional floodplain should not be developed and should remain as open greenspace that is allowed to flood.
- The area of Flood Zone 1 could be developed as surface water risk is nominal and safe access and escape routes appear achievable at times of flood.
- A drainage strategy will be required for any new development, given the large area of the site and the fact it is currently greenfield.
- The topographic low spots of ponding should be included within the site design and layout. Infilling of ponds should be avoided.
- There is potential residual risk to the site from culvert blockages. This risk should be assessed through the FRA. Culvert capacity ad condition assessments may be required.
- Groundwater conditions must be investigated further through the site-specific FRA though appropriate ground survey and percolation testing.
- Opportunities for NFM features to reduce flood risk to the site and surrounding areas should be explored at the site-specific FRA stage.

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 in the Flood Zone 1 area of the site, including a drainage strategy. Discharge rates should remain at greenfield rates at a minimum in consultation with the LLFA.
- Investigation into groundwater conditions will be required as part of the drainage strategy.
- A condition assessment of the drain adjacent to the western site boundary 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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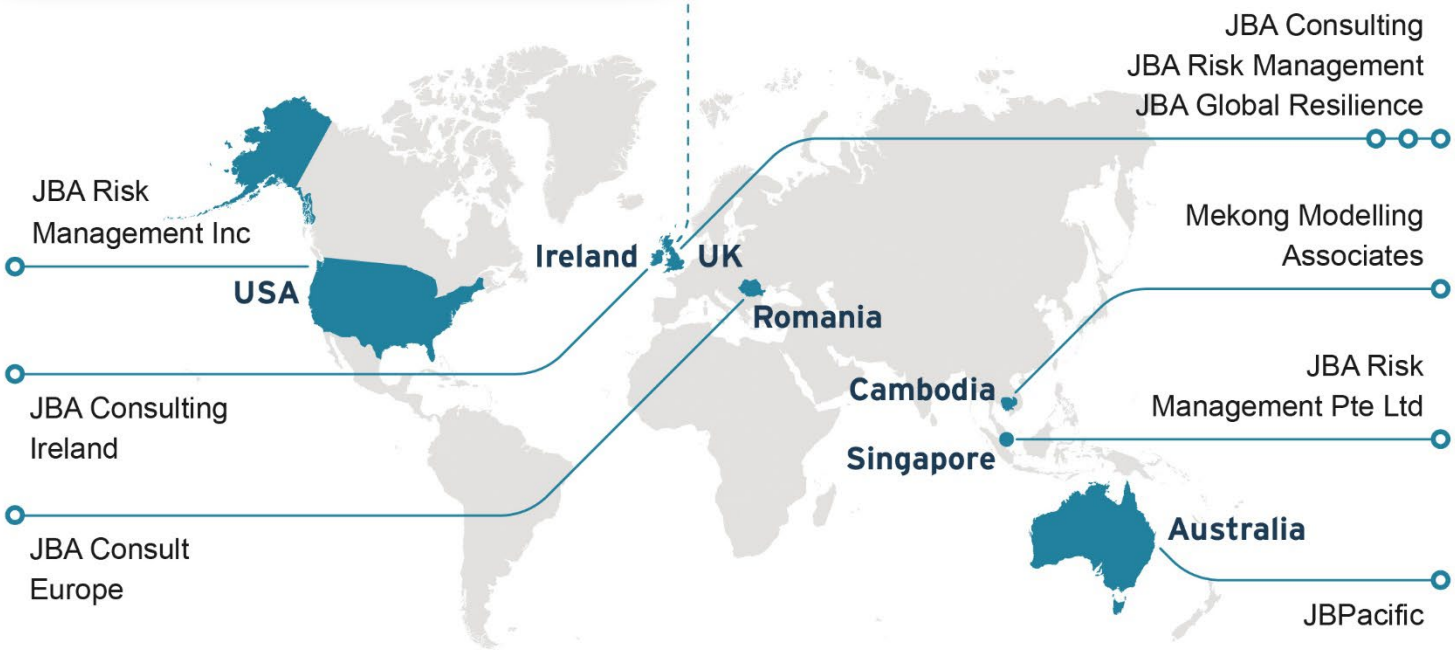

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