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Huntingdonshire Level 2 Strategic Flood Risk Assessment Site Summary

Site CfS:174

Final 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:174. 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:174

- Location: Land to the West of Graveley Road, Offord D'Arcy
- Existing site use: agricultural land
- Existing site use vulnerability: less vulnerable
- Proposed site use: residential
- Proposed site use vulnerability: more vulnerable
- Site area (ha): 3.81
- Watercourse: River Great Ouse (main river), unnamed ordinary watercourse (tributary to the River Great Ouse)
- Environment Agency (EA) model: no detailed model available
- Summary of requirements from Level 2 SFRA scoping stage:
    - 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

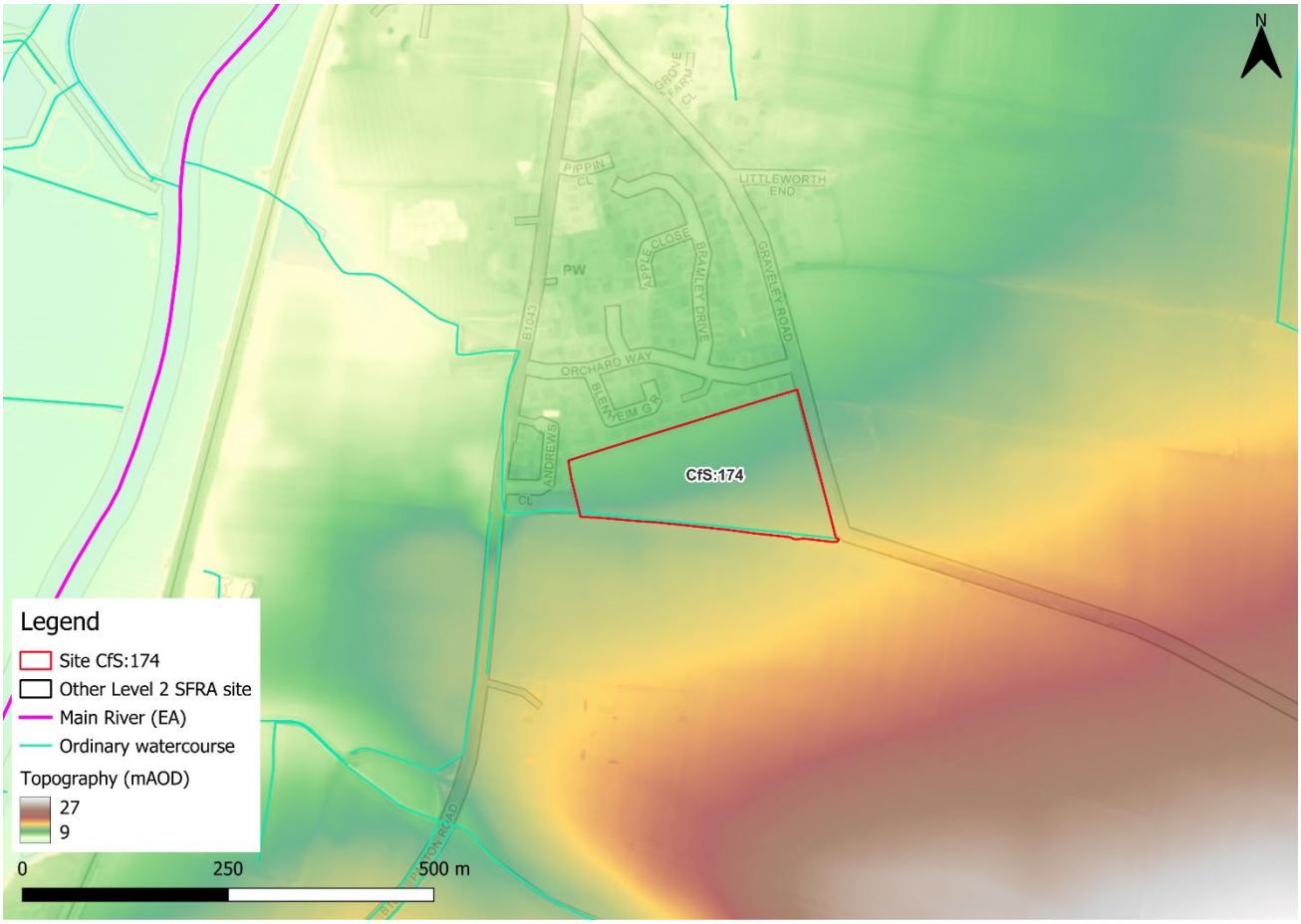

Figure 1-3: Topography

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 site is wholly within Flood Zone 1. There is no detailed model available for the unnamed ordinary watercourse that runs along the southern boundary of the site and feeds into the River Great Ouse to the west.

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)
100	0	0	0

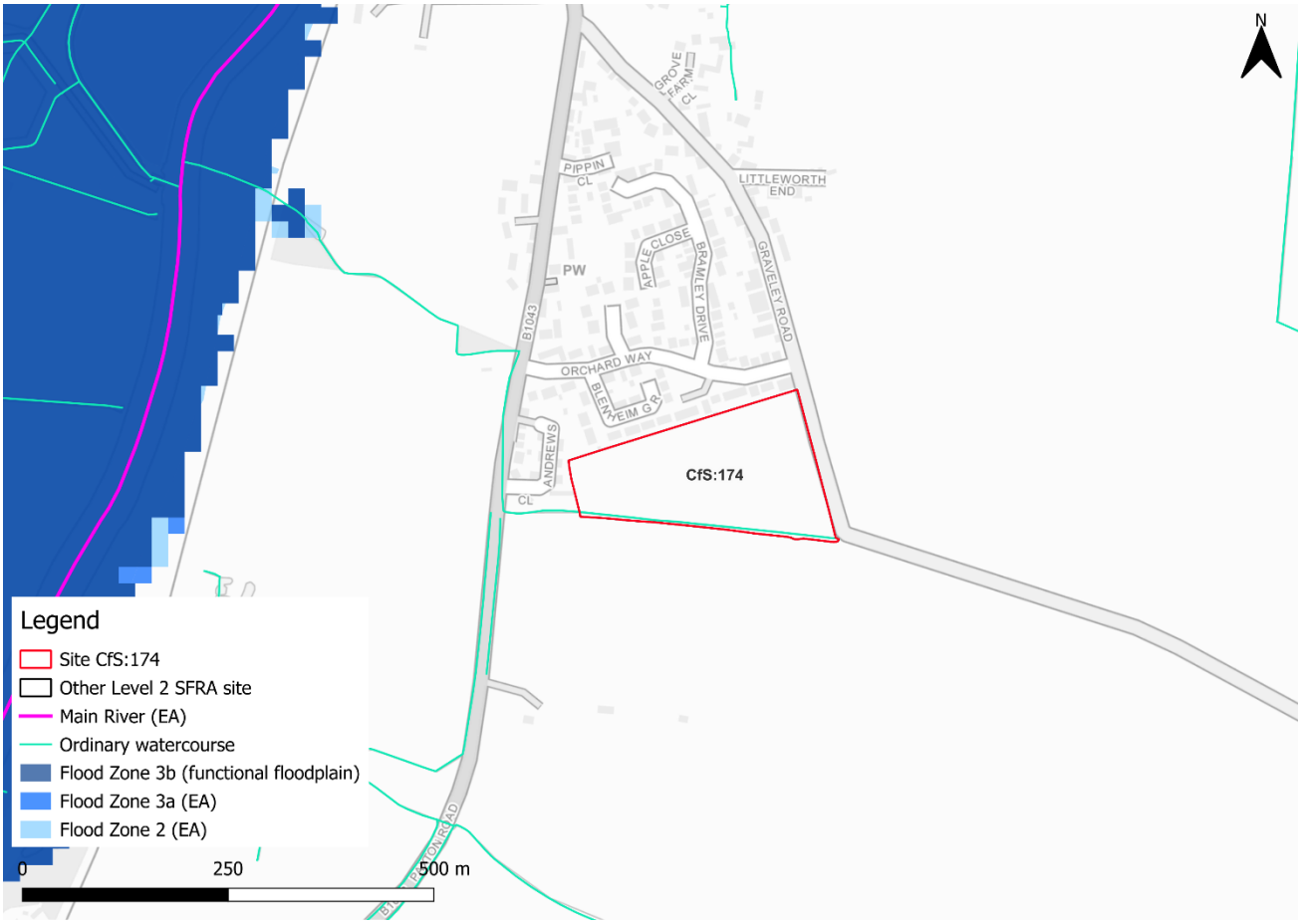

Figure 2-1: Existing risk

2.2 Flood risk management

2.2.1 Flood defences

There are no flood defences in the vicinity of the site, according to the EA's Spatial Flood Defences dataset.

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 2-2. Note, the WwNP mapping is broadscale and indicative, therefore further investigation will be required for any land shown to have potential for WwNP.

There may be potential flood risk alleviation to large areas around the site and onsite through tree planting, particularly along the ordinary watercourse and on the surrounding agricultural land.

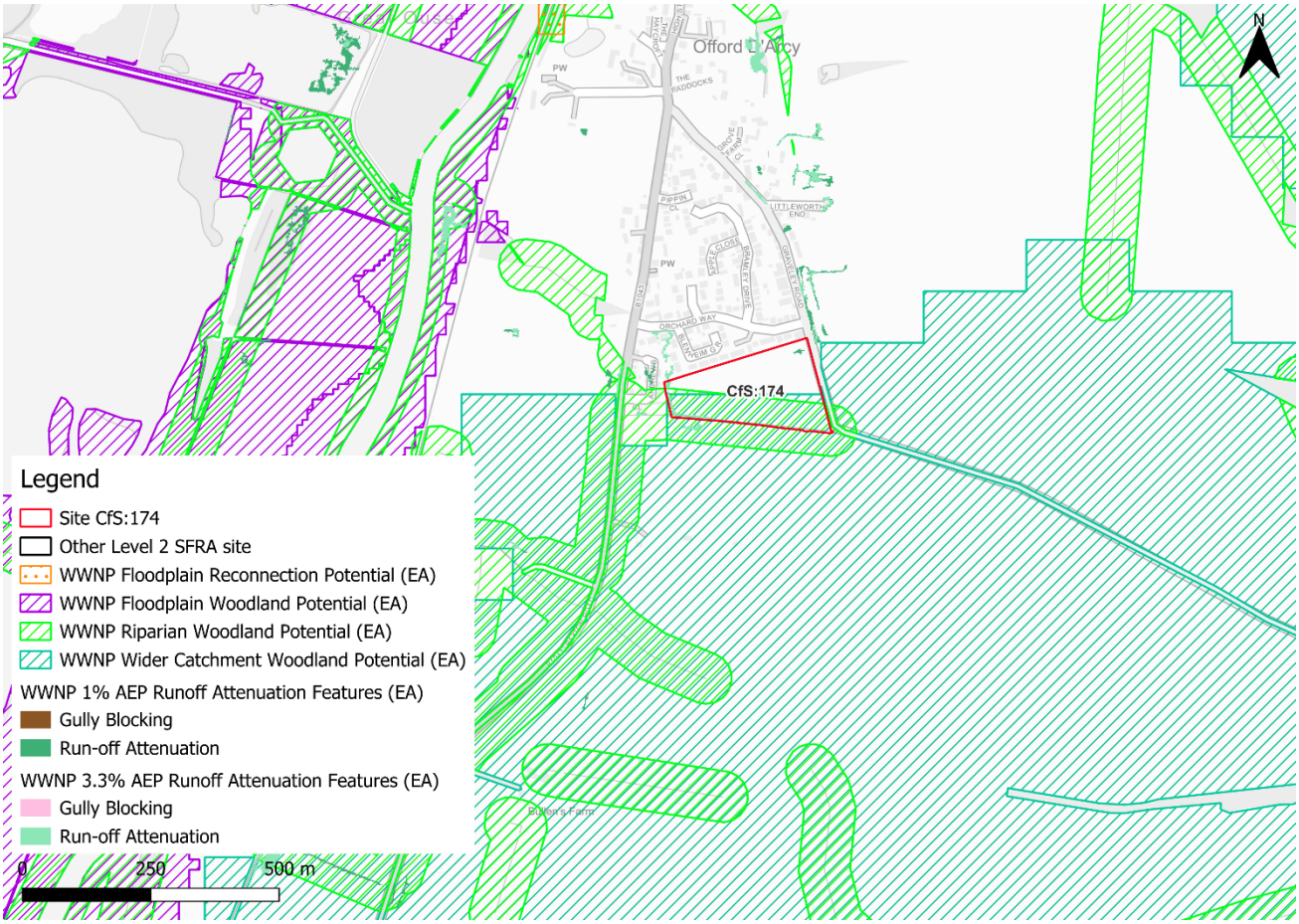

Figure 2-2: Natural Flood Management (NFM) potential mapping

2.3 Impacts from climate change

2.3.1 Fluvial

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

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. No historic events have been recorded on the site. However, there was a large flood event in 1947 from the River Great Ouse that impacted large areas to the west of the site, as shown on Figure 2-3.

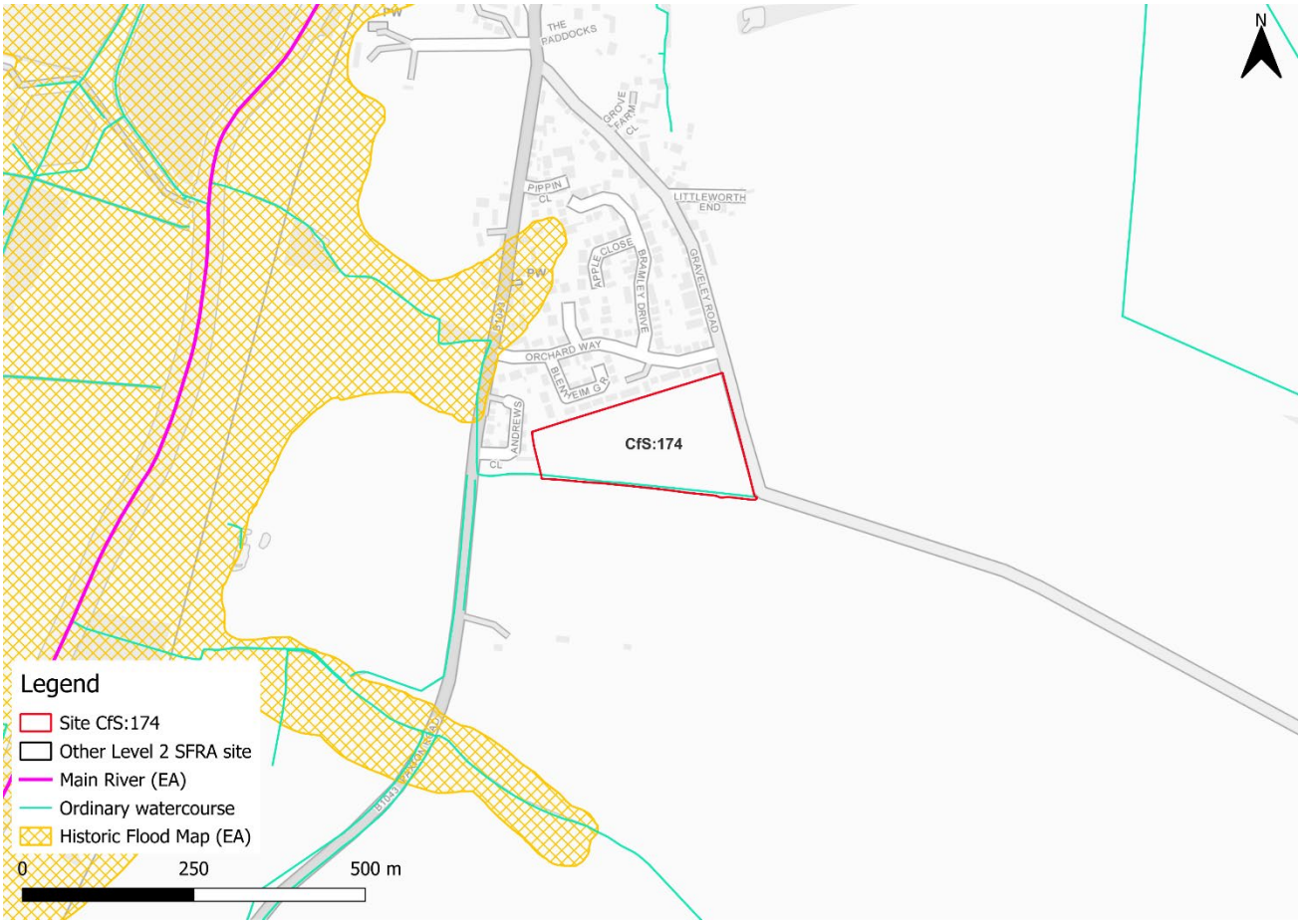

Figure 2-3: Recorded historic flood events

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. This site is not located within a 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. This site is not located in a FAA.

2.5.2 Access and escape routes

Based on available information, safe access and escape routes should be from Graveley Road on the eastern boundary, as shown in in Figure 2-4.

Figure 2-4: Potential access and escape route

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 less vulnerable to more vulnerable, according to the NPPF.
  - The site is wholly within Flood Zone 1. However, there is no detailed model available for the ordinary watercourse. A detailed model of the ordinary watercourse should be developed at the FRA stage to assess potential existing and future flood risk.
  - The modelling should account for potential residual risk from the culverted section of the ordinary watercourse underneath the B1043 road. Culverts can become blocked or be subject to structural failure.
- Mitigation:
  - The site-specific FRA should develop a model of the ordinary watercourse.
  - The ordinary watercourse, and any potential risk areas, should be included within a blue green corridor.
  - Given the proximity of the site to the ordinary watercourse, a flood risk activity permit for development may be required. The type of permission required must be sought from the Environment Agency, Lead Local Flood Authority or Internal Drainage Board. For non-tidal main rivers, a flood risk activity permit may be required if the development of the site is within 8 metres of a riverbank, flood defence structure or culvert.
- Access and escape:
  - Safe access and escape routes should be easily available via Graveley Road.

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, the majority of the site is at very low risk. However, there is a significant flow route within the northern boundary of the site. There is also a significant flow path outside the southern site boundary. The channel of the ordinary watercourse is included within the RoFSW map.

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)
91	3	2	4

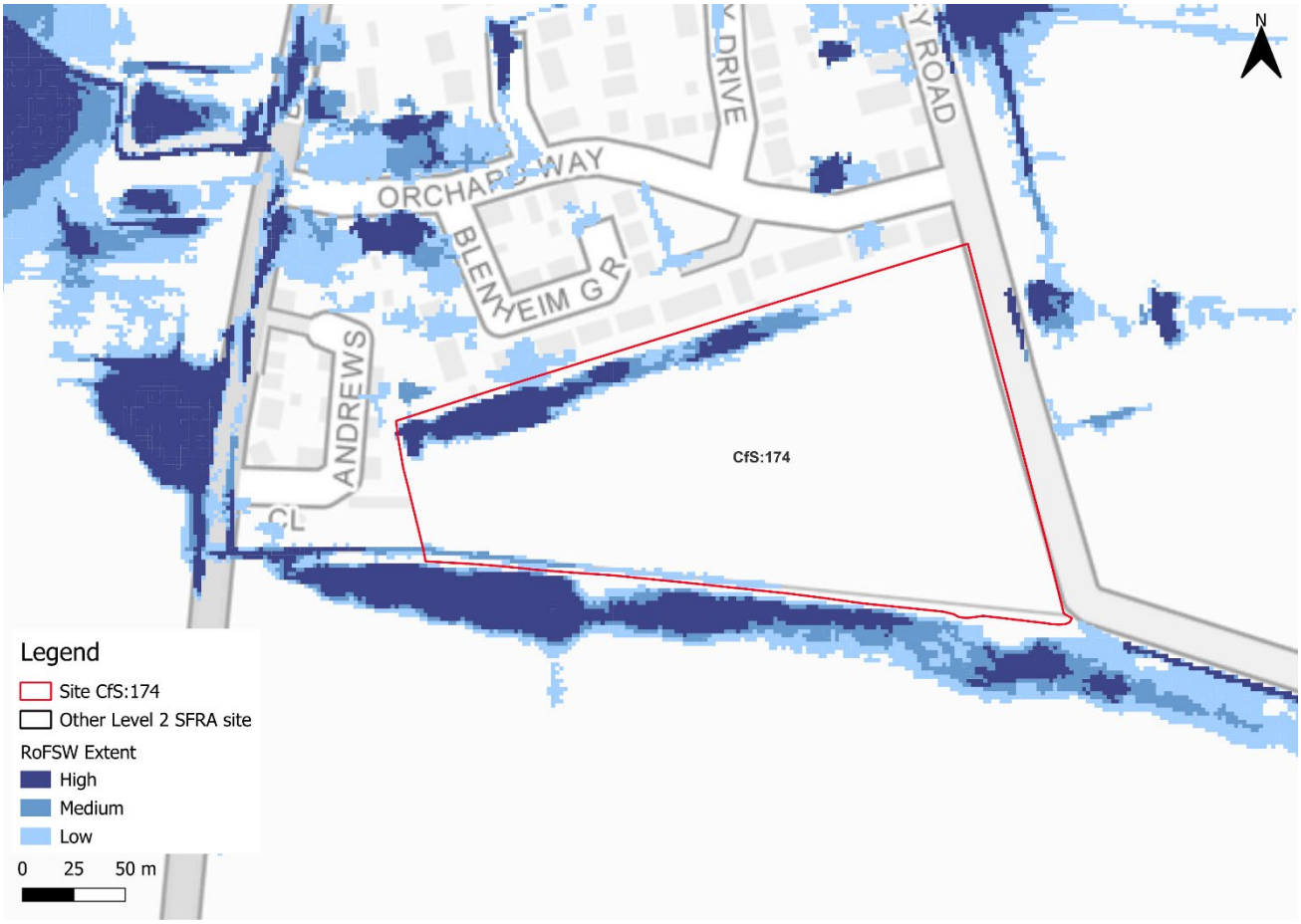

Figure 3-1: Surface water flood extents (NaFRA2 - Risk of Flooding from Surface Water map)

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, medium risk flood depths and hazards are non-existent on the northern boundary though are significant in places along the ordinary watercourse and shallow along the western boundary. The medium risk flood hazard map shows significant hazard along the ordinary watercourse though lower hazards along the western boundary.

There is a clear disconnect 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.

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 hazard[1] (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, surface water flood risk to the site may increase with climate change. The flow routes are shown to expand in size though the depths and hazards mapping do not represent the NaFRA2 RoFSW map, therefore the depth and hazard mapping may not be fully representative of potential risk. This reinforces the requirement for detailed assessment of surface water at the FRA stage.

1 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

The potential access and escape route remains at very low risk.

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 91% of the site being at very low surface water flood risk. Surface water risk in the high and medium risk events is confined to two flow paths.
- 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 shown to increase in extent though the depth and hazard mapping is not comparable.
- 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.
- Were development plans to proceed, a full detailed drainage strategy would be required to 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. Surface water modelling based on layout plans and detailed design may be required through consultation with the LLFA.

- There may be scope to include the ordinary watercourse, and any potential risk areas, within a blue green corridor.
- Safe access and escape appear to be possible when accounting for climate change.
- 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.
- The LLFA are aware of a watercourse on the eastern boundary of this site that is not accounted for in the watercourse mapping. This watercourse has caused internal property flooding to a nearby residential dwelling. This watercourse is currently disconnected from the watercourse on the southern boundary of the site and should remain so to reduce this risk. The LLFA would object to this eastern watercourse accepting surface water discharge as there is no onward connection. The watercourse on the southern boundary of the site contributes to flood risk on Paxton Road/B1043 which limits one of the only safe routes in and out of the Offords when the north High St and Marina are flooded. Opportunities for betterment should be sought. The LLFA agree with the recommendation regarding a blue green corridor.

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 Ouse (Roxton to Earith) 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 Guide[2]. Figure 5-1 shows the map covering this site and the surrounding areas. Table 5-1 explains the risk classifications.

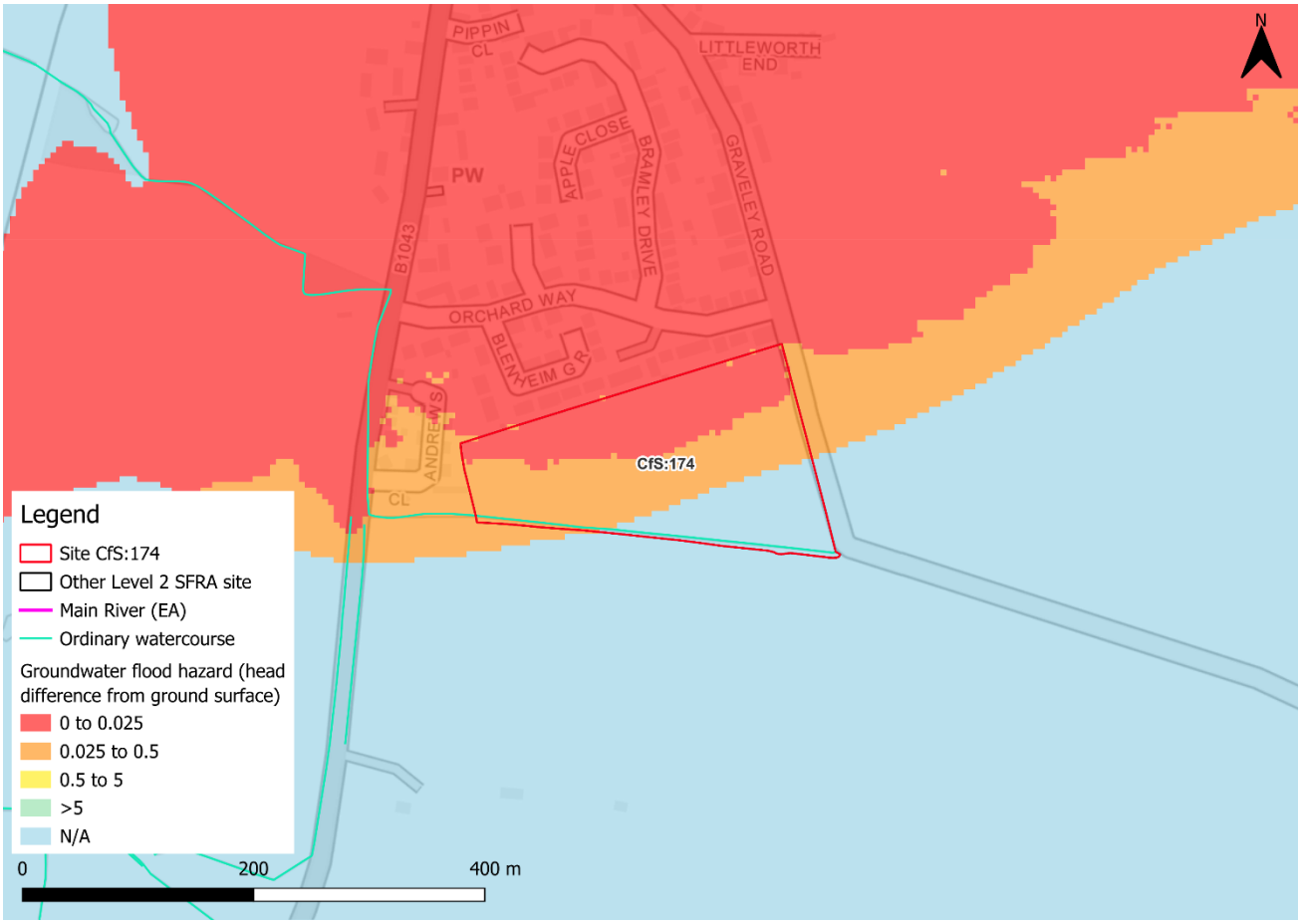

Figure 5-1: JBA 5m Groundwater Emergence Map

The northern third of the site is at significant risk from groundwater emergence with groundwater levels at or 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. This would confirm the surface water flood risk shown in the NaFRA2 RoFSW mapping (Figure 3-1).

The central third is also at risk, though less significant, with groundwater levels between 0.025m and 0.5m below the ground surface in the 100-year return period flood event. There

2 Strategic flood risk assessment good practice guide. ADEPT. December 2021.

is a risk of groundwater flooding to surface and subsurface assets and a possibility of groundwater emerging at the surface locally. The southern third of the site is at no risk.

The site-specific FRA should further investigate groundwater levels through percolation testing in both wet and dry weather conditions across the site. Infiltration SuDS are therefore unlikely to be appropriate in the majority of this site.

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 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
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	 There is a risk of flooding to subsurface assets, but surface
>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	 This zone is deemed as having a negligible risk from groundwater
*Difference is defined as ground surface in mAOD minus modelled groundwater table in mAOD.	

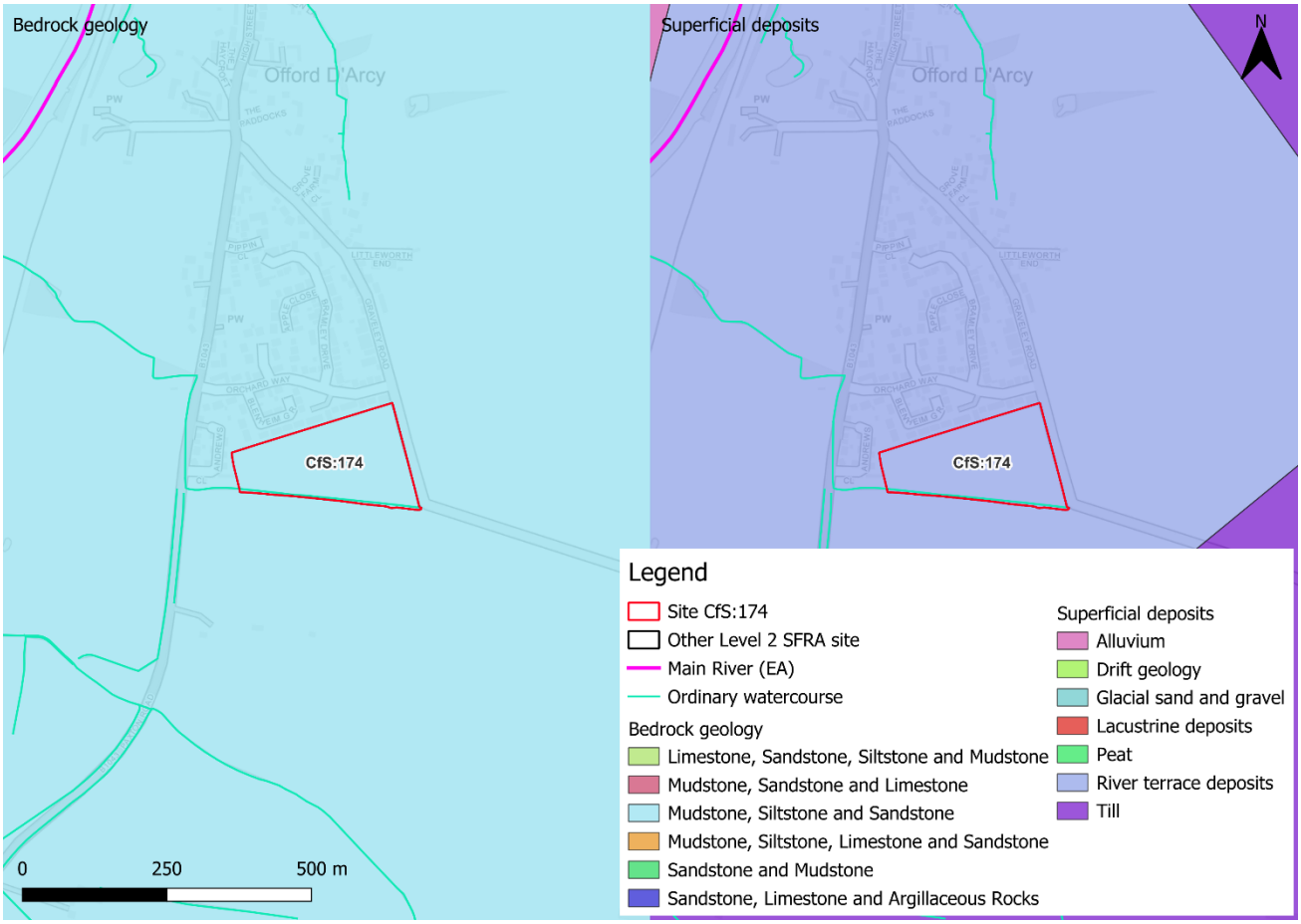

Figure 5-2: Soils and geology

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.

There appears to be a culvert present underneath the B1043 road to the west through which the ordinary watercourse flows towards the River Great Ouse. Any modelling of the ordinary watercourse should include for blockage scenario modelling of this culvert.

6.1 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 6-1 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 shown to not be at risk from reservoir failure. However, the north and west of the site are at risk with the villages of Offord D'Arcy and Offord Cluny directly to the north of the site shown to be at risk.

Figure 6-1: 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 not located within Flood Zone 3a, however it must still be proven that the development can be safe for its lifetime, which is 100 years for 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 more vulnerable purposes given its location within Flood Zone 1.
- A detailed model should be developed for the ordinary watercourse, including appropriate modelling of climate change, and residual risk from the culvert to understand potential fluvial flood risk from this watercourse.
- A detailed drainage strategy will be required for any new development, given the flow routes, increased risk from climate change, groundwater conditions, and the fact the land is currently open greenspace.
- The ordinary watercourse, and any potential risk areas, could be included within a blue green corridor.
- Groundwater conditions must be fully investigated through the site-specific FRA.
- Wider opportunities for NFM features to reduce flood risk to the site in the future through tree planting in the 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:

- Detailed flood modelling of the ordinary watercourse, in consultation with the EA and / or LLFA given it is an ordinary watercourse, to robustly define existing and future fluvial flood risk to the site. This should include blockage scenario modelling of the culvert.
- Detailed investigations into groundwater conditions through ground survey and percolation testing.
- Further consideration of surface water flood risk, including a drainage strategy. Discharge rates should remain at greenfield rates at a minimum. The LLFA should be consulted.
- The 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.

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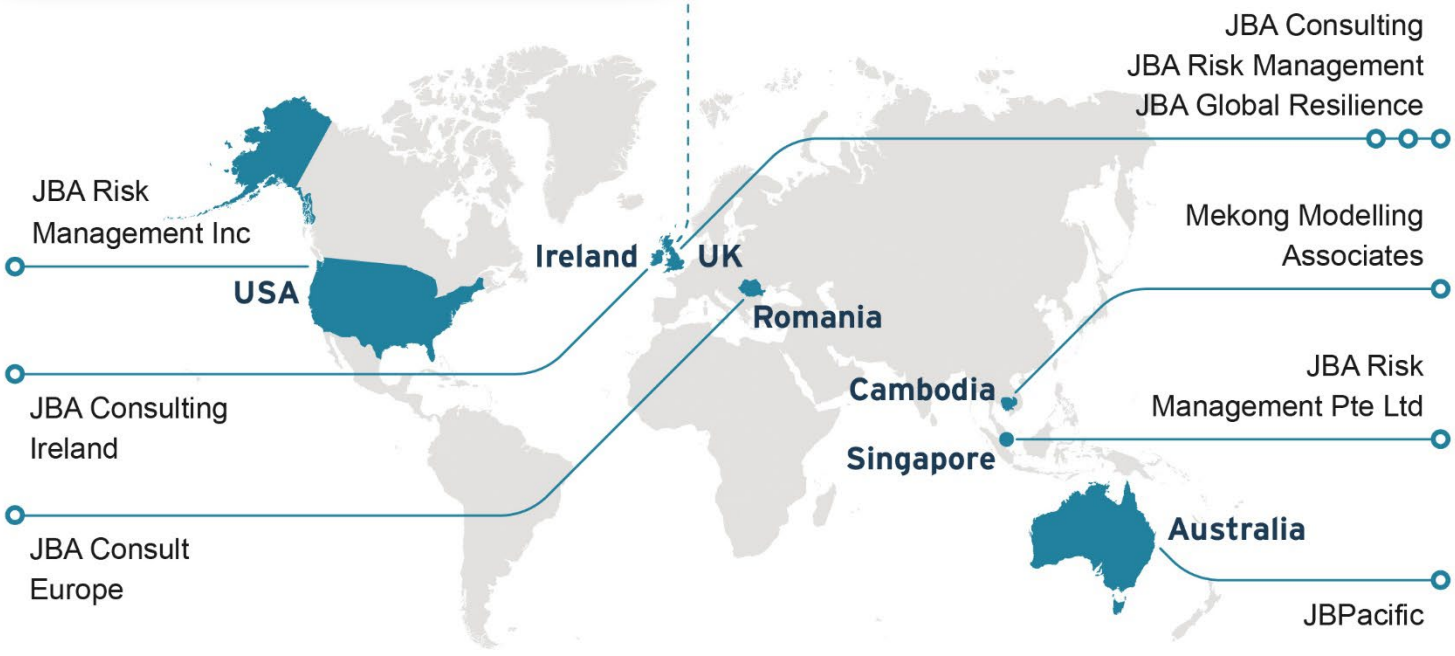

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