

Central Lancashire Level 2 Strategic Flood Risk Assessment - Sites

Preston Combined

Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P005

Final

February 2025

Prepared for:



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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Freya Nation of JBA Consulting carried out this work.

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Acknowledgements

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1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P005. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

1.1 Site 19P005

- Location: Fulwood Barracks, Watling Street Road, Fulwood, Preston, PR2 8AA
- Existing site use: Mixed use (army barracks and greenfield)
- Existing site use vulnerability: More vulnerable (assuming inclusion of sleeping quarters)
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 16.9 hectares
- Proposed development impermeable area: 14.4 hectares (assumed 85% impermeable area)
- EA model: N/A
- Watercourse: Unnamed tributary of Savick Brook
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 1-1: Existing site location boundary

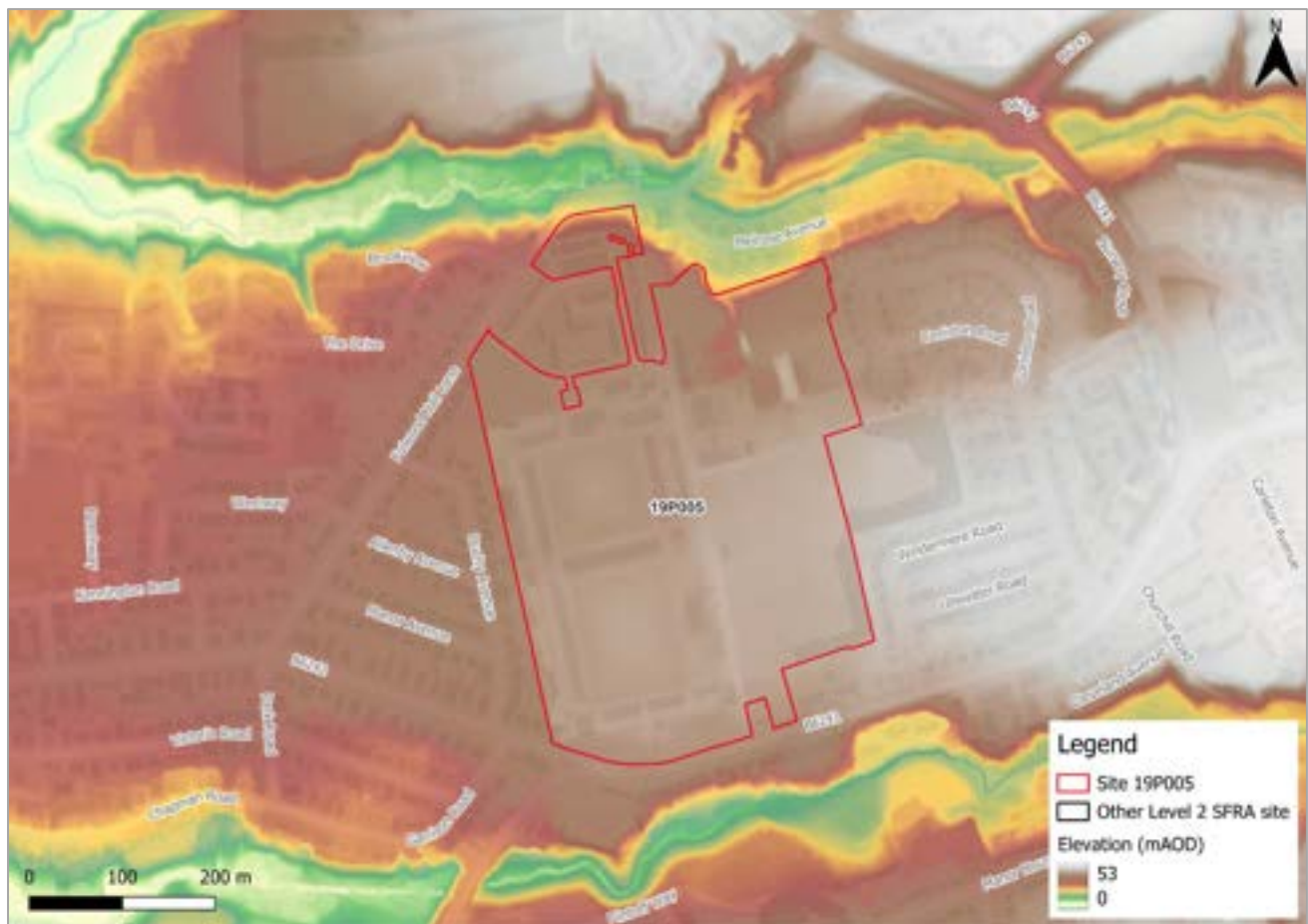


Figure 1-2: Topography

2 Flood risk from rivers

2.1 Existing risk

2.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The site is located fully within Flood Zone 1, indicating it is at low risk of flooding from rivers.

Table 2-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 2-1: Existing risk from rivers to the site

2.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

2.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P005 is located within one catchment, namely Savick Brook. Savick Brook is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance¹.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

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. There is a small area within the north of the site where there is opportunity for wider catchment tree planting, which can intercept, slow, store and filter water. This area is shown in Figure 2-2.

¹ [Lancashire SuDS Guidance](#)

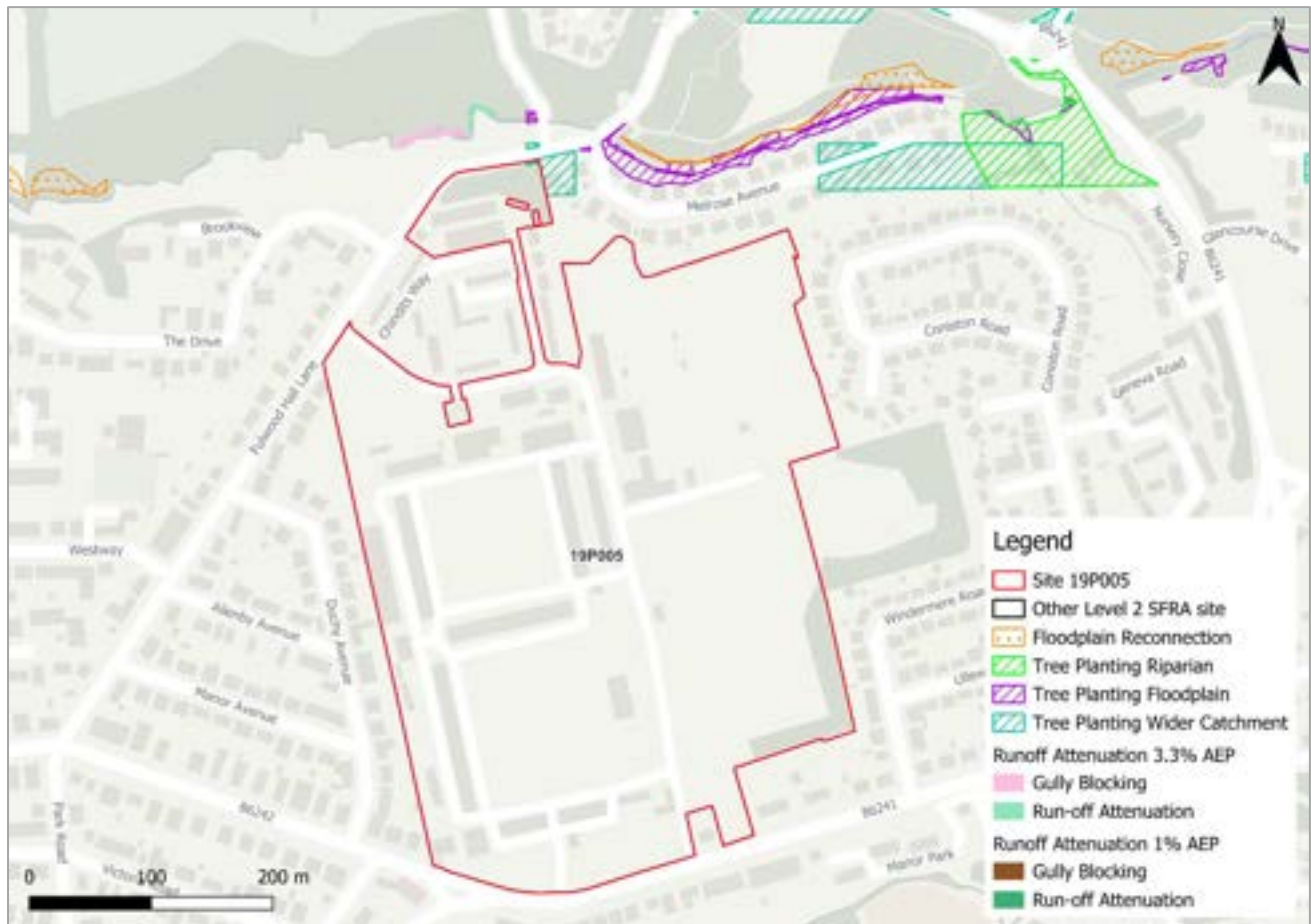


Figure 2-2: Natural Flood Management (NFM) potential mapping

2.3 Residual risk

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

There are potential residual risks to the site from possible blockages of the unnamed watercourse which is culverted beneath roads north of the site (Figure 2-3). The impact of culvert blockages has not been modelled as part of this Level 2 SFRA, as there is no available flood model. It is recommended that the site-specific FRA should consider the impact of a blockage of these culverts on residual flood risk to the site.



Figure 2-3: Potential blockage locations

2.3.1 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. 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 not modelled to be at risk of flooding from reservoirs.

2.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

2.5 Flood warning and access and escape routes

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. Site 19P005 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. The site is also not located within a FAA.

Safe access and escape routes could likely be achieved during a flood event via the B6241 or via Fulwood Hall Lane.

2.6 Observations, mitigation options and site suitability - fluvial

- The site is modelled to be fully within Flood Zone 1.
- There could be residual risk from possible blockages of the culverts north of the site. It is recommended that the site-specific FRA considers the impacts of blockages of these culverts on residual risk to the site.

3 Flood risk from surface water

3.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 1% of the site is within the high surface water risk zone. A further 1% is at medium surface water risk and a further 5% is at low surface water risk as shown in Table 3-1.

In the high risk event, surface water ponding is limited to the topographic low spots in the northeastern corner of the site. In the medium risk event, additional ponding forms along parts of the roads within the western half of the site. In the low risk event, surface water risk is spread across the site. Flow paths along the roads within the western half of the site form and another flow path crosses the northeastern corner of the site. Greatest flood depths in the low risk event are >1.2 m (Figure 3-1) with some areas of significant hazard (Figure 3-2). Safe access and escape should be achievable via the B6241 or Fulwood Hall Lane in all events, given the shallow depths of flooding on these roads.

Table 3-1: Existing surface water flood risk based on the RoFSW map

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

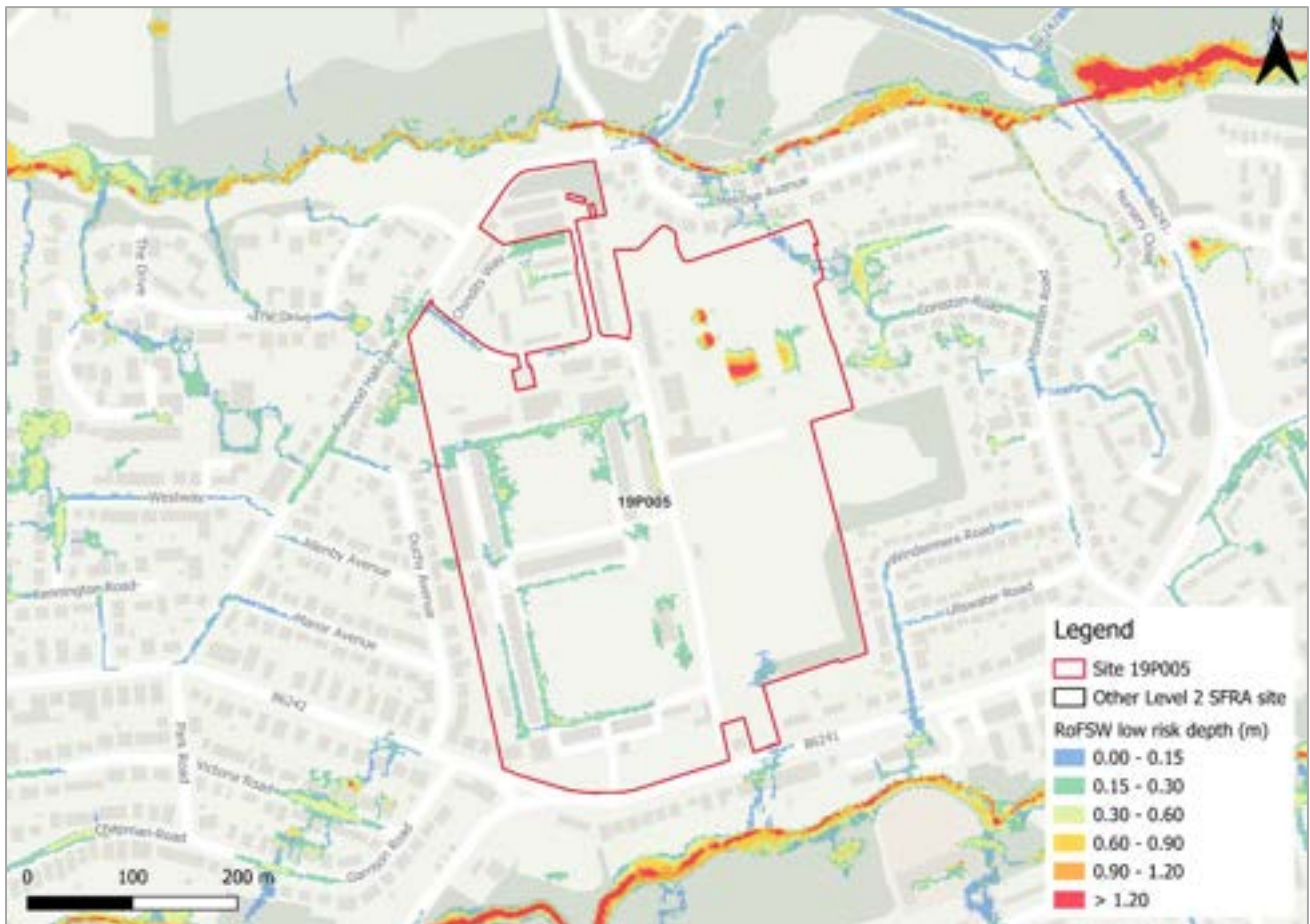


Figure 3-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)

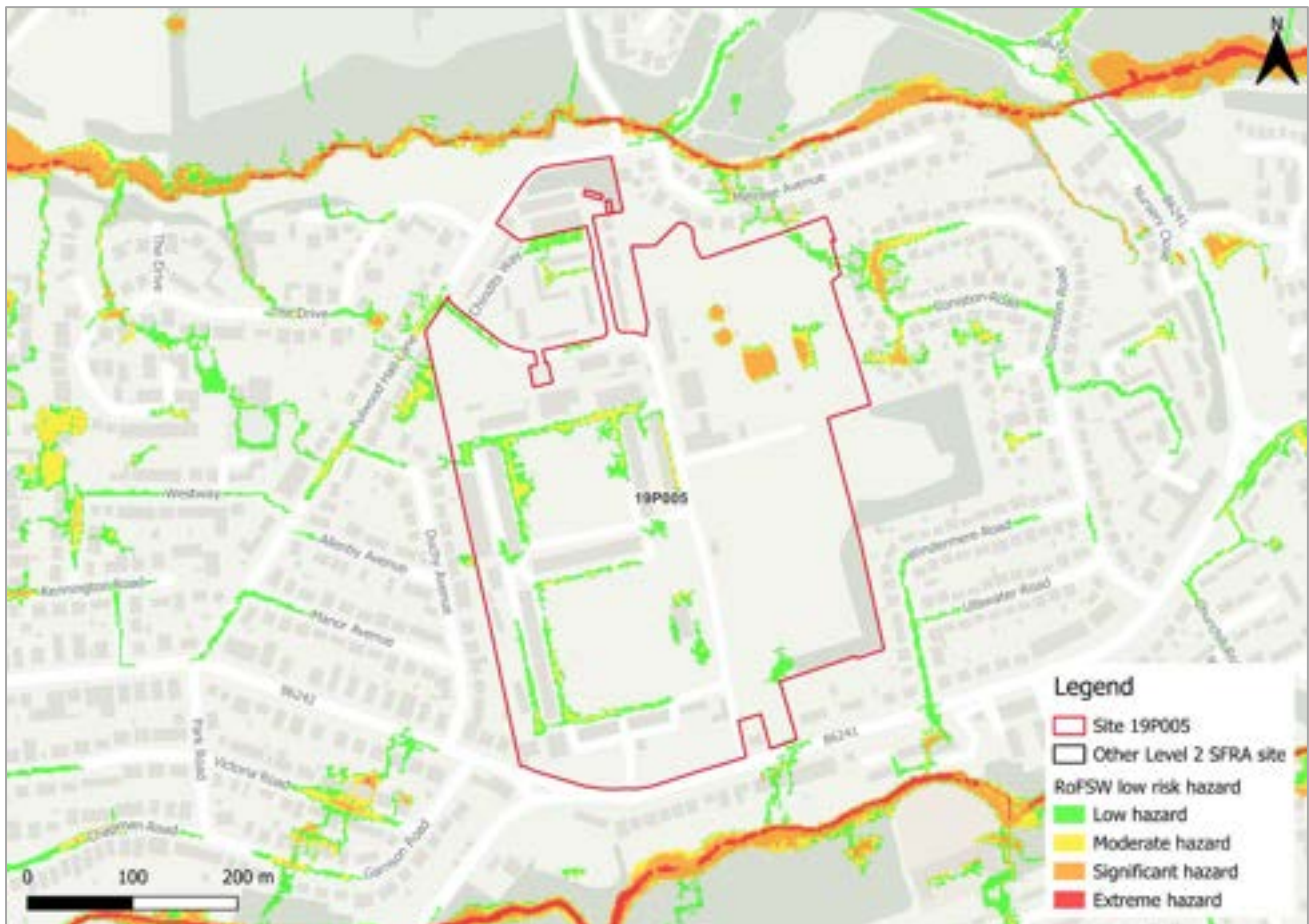


Figure 3-2: Low risk event surface water flood hazard² (Risk of Flooding from Surface Water map)

3.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 3-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water event plus an allowance for climate change. Flooding is modelled to be slightly greater than the present day low risk event. Ponding is constrained by existing buildings and flow paths are present

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

along roads within the western half of the site and across the northeastern corner of the site. Maximum flood depths remain >1.2 m (Figure 3-3) with some areas of significant hazard (Figure 3-4). Safe access and escape may remain achievable via the B6241 or Fulwood Hall Lane, given the low depths of flooding on these roads.

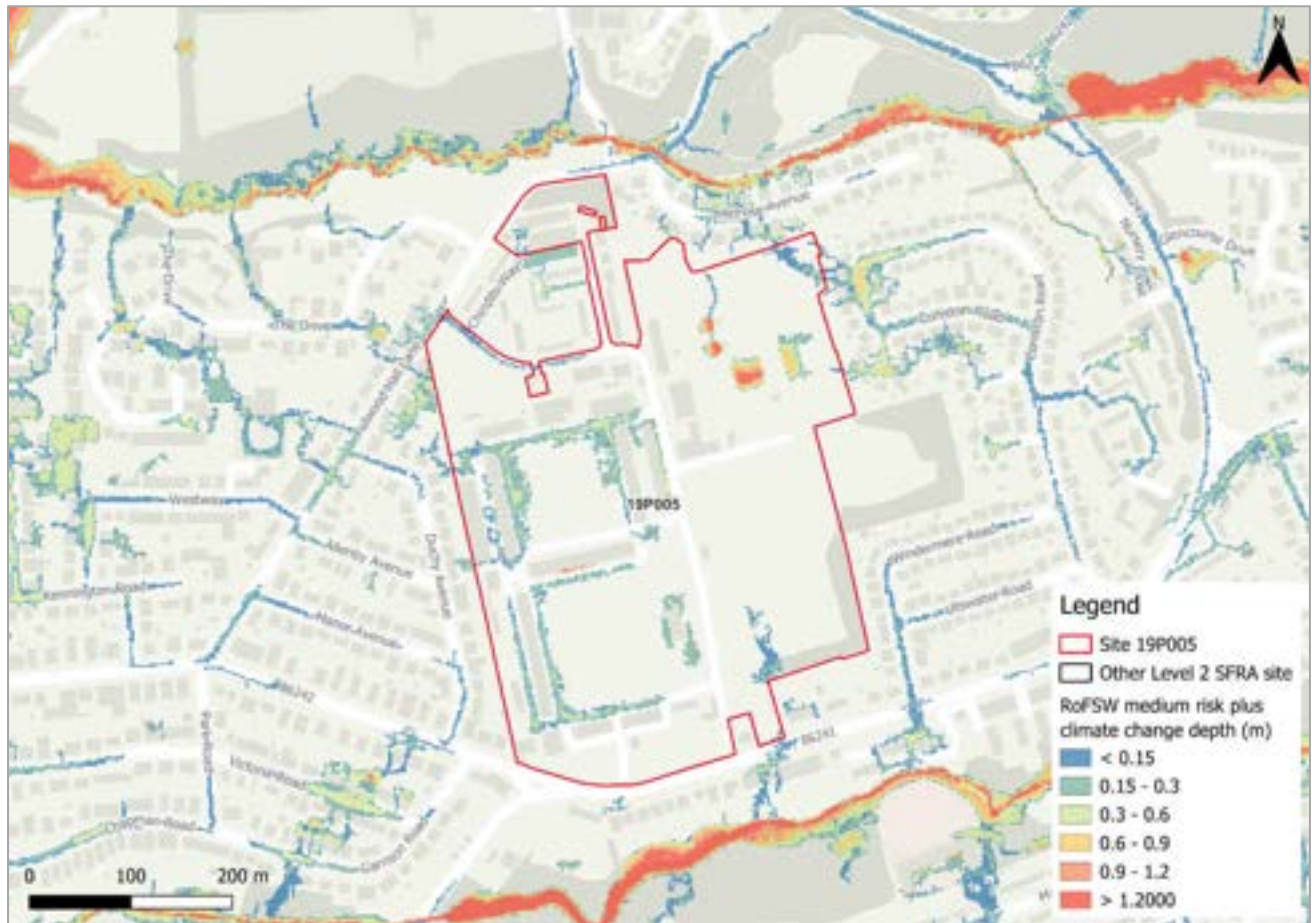


Figure 3-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 3-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

3.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 1% of the site being at high, 1% at medium and 5% at low surface water flood risk. In the high risk event, ponding is confined to the northeastern corner of the site. In the medium risk event, there is additional ponding to roads. In the low risk event flow paths form along roads and across the northeastern corner of the site.
- The medium risk event plus climate change modelling shows a slightly larger flood extent in comparison to the present day low risk event.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS across most of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Were development of this site 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current rates and, where possible, betterment should be achieved.

- Note, 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 or evidence.

4 Risk from groundwater

Risk from groundwater sources 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 4-1 shows the map for Site 19P005 and the surrounding areas and Table 4-1 explains the risk classifications.

The majority of the site is in an area where there is no risk of groundwater emergence. However, along the northern site boundary, there is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely. Therefore, groundwater conditions may not be suited to infiltration SuDS at the northern site boundary, and this should be investigated further at the FRA stage.

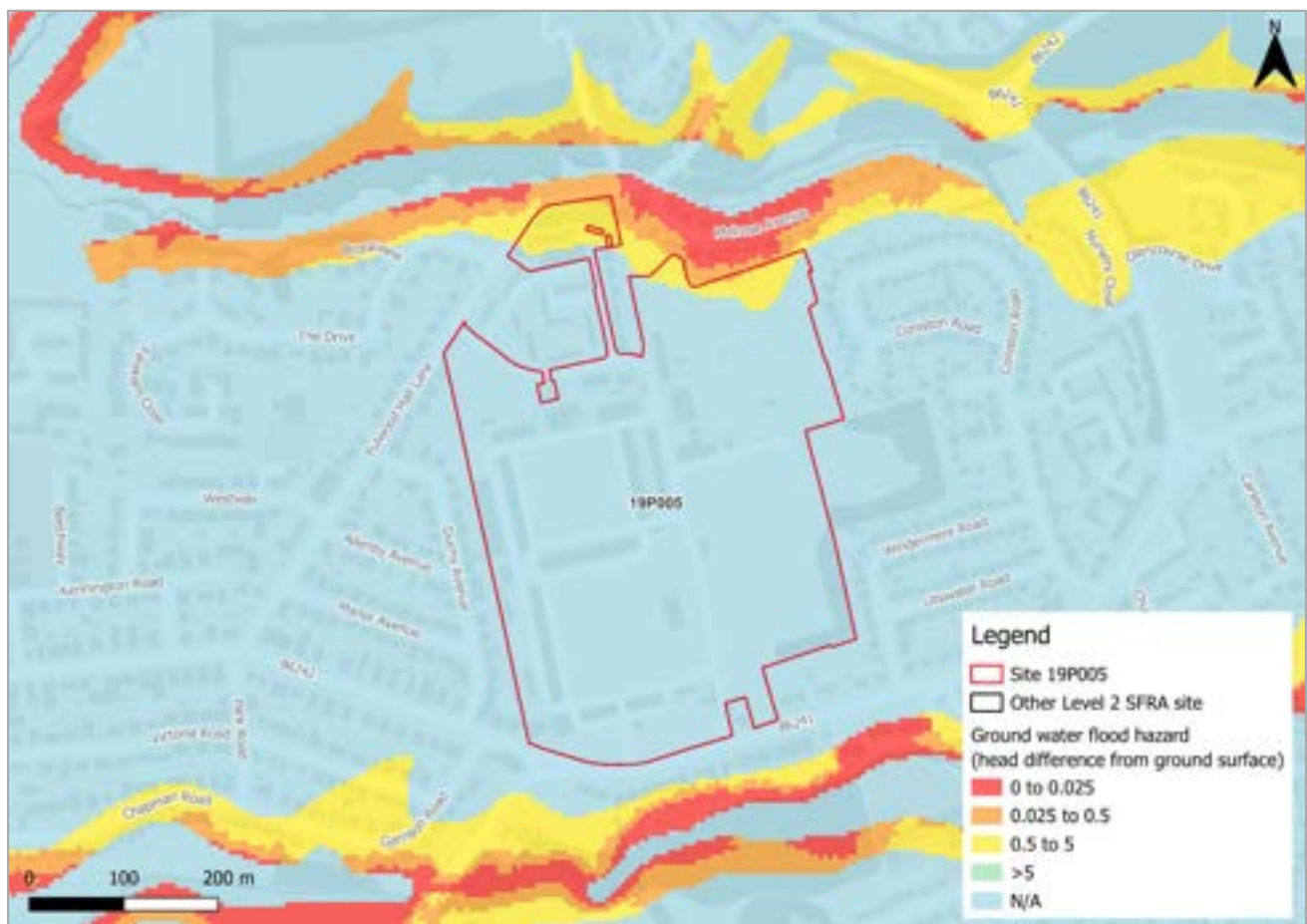


Figure 4-1: JBA 5m Groundwater Flood Map

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

Table 4-1: Groundwater Flood 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.	

5 Overall site assessment

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

To pass part b) of the exception test⁴, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

5.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be possible to allocate this site if development avoids areas at risk of surface water ponding and maintains existing flow paths.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed development or whether further capacity will be required.
- A detailed drainage strategy will be required for any new development, including investigation into the use of infiltration SuDS.
- Ground investigations will be required through the site-specific FRA to ascertain groundwater levels and conditions.
- Any FRA should consider the impact of a blockage of the culverts north of the site on residual flood risk to the site.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁴ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P035

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7 Background

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7.1 Site 19P035

- Location: Land at Eastway
- Existing site use: Greenfield
- Existing site use vulnerability: Water compatible
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 3 hectares
- Proposed development impermeable area: 2.5 hectares (assumed 85% impermeable area)
- Watercourse: Blundel Brook
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk

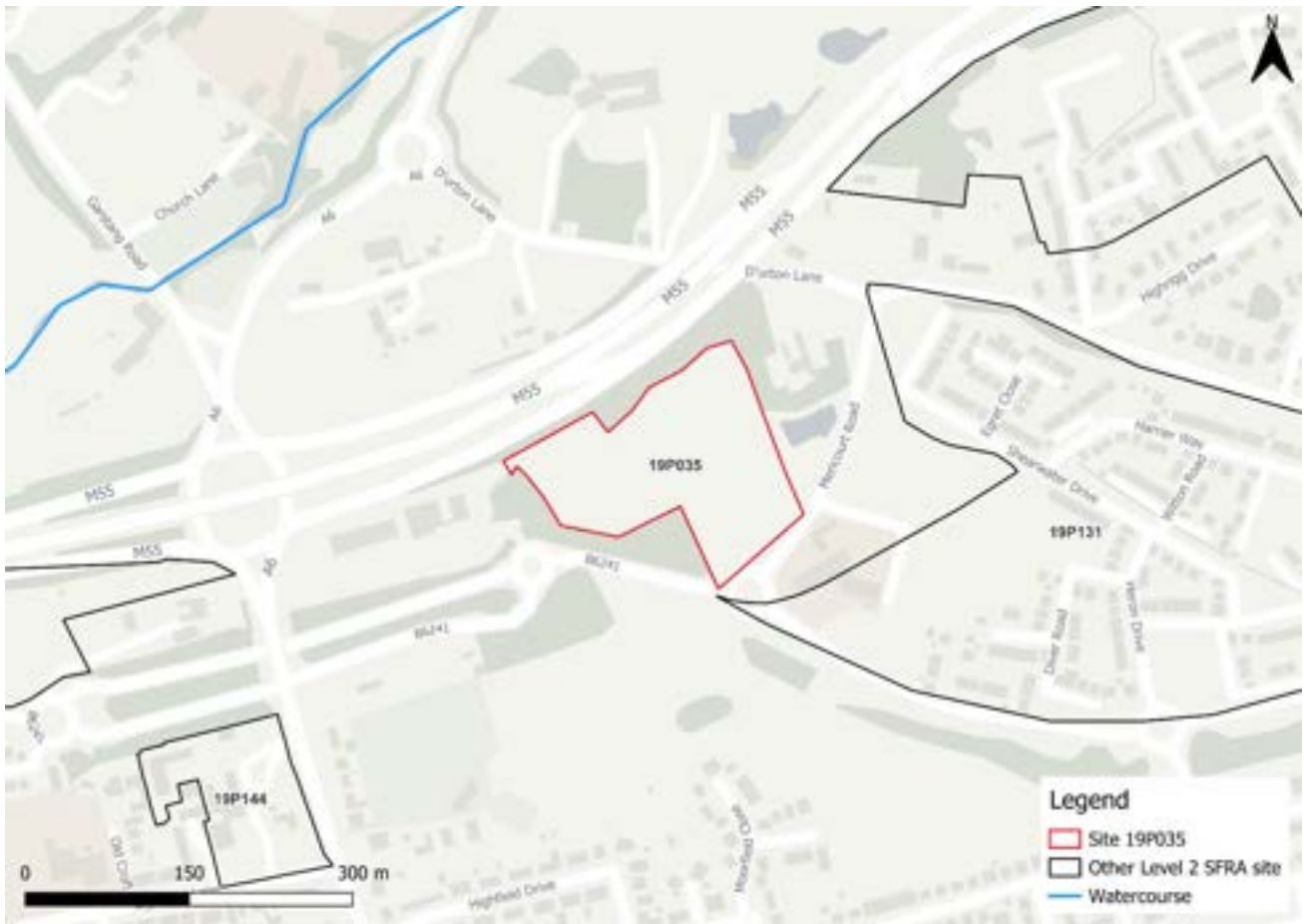


Figure 7-1: Existing site location boundary

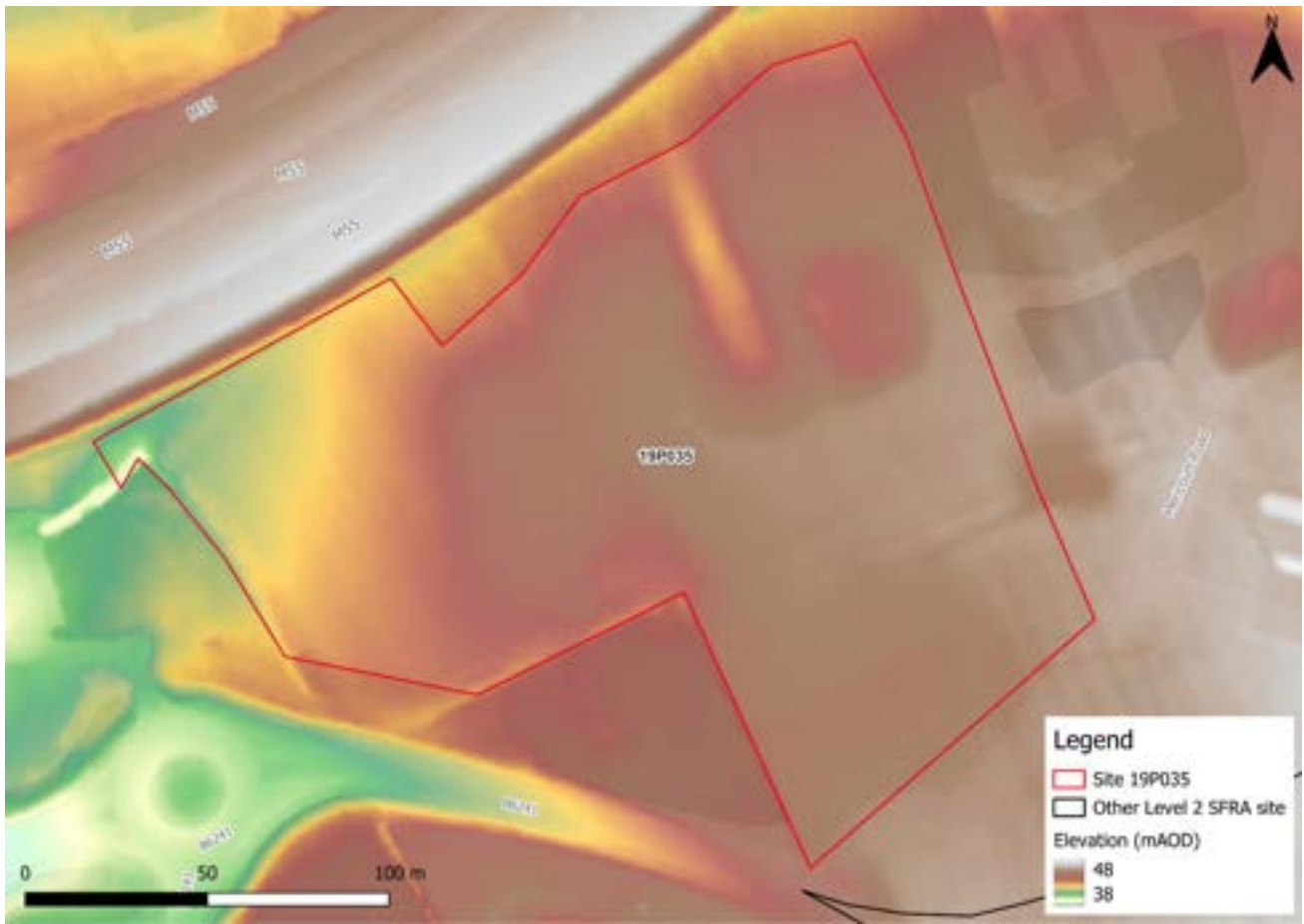


Figure 7-2: Topography

8 Flood risk from rivers

8.1 Existing risk

8.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is entirely located within Flood Zone 1 indicating it is at low risk from flooding from rivers.

Table 8-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 8-1: Existing risk from rivers to the site

8.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

8.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P035 is located within one catchment, namely; Woodplumpton Brook. This is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

8.2.2 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. Both within and upstream of the site, there is potential for tree planting to slow floodwaters, reduce flood peak height and reduce sediment delivery to the watercourse. There are also opportunities to implement runoff attenuation features to reduce runoff downstream. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 8-2.

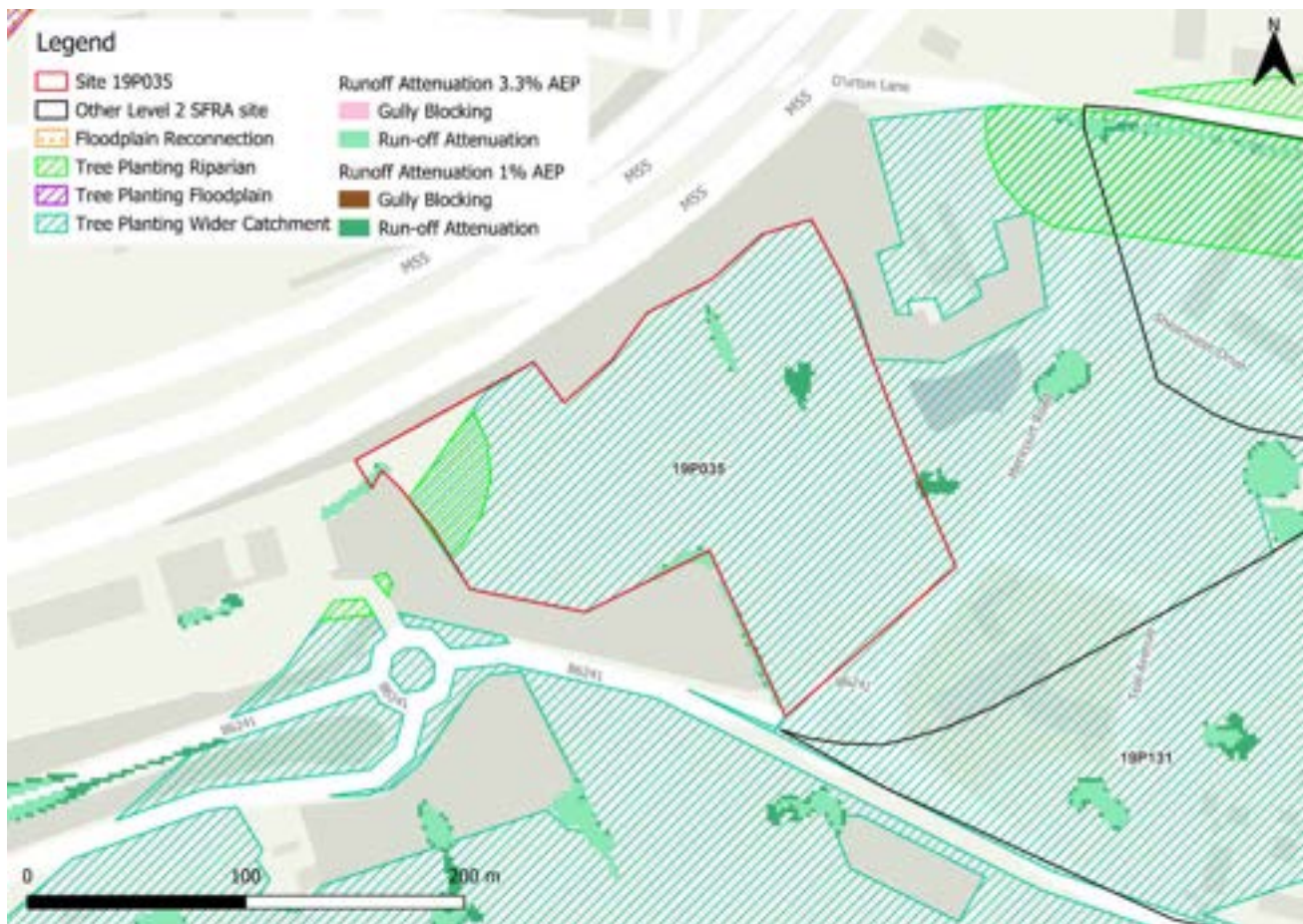


Figure 8-2: Natural Flood Management (NFM) potential mapping

8.3 Residual risk

8.3.1 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. 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 not modelled to be at risk from reservoir flooding.

8.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

8.5 Flood warning and access and escape routes

The site is not located within a Flood Warning Area (FWA) or a Flood Alert Area (FAA).

Based on available information, safe access and escape routes could likely be achieved during a flood event via Mericourt Road to the east of the site.

8.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site 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 site-specific FRA must show that the development can be designed to be safe for its lifetime and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- The site is located wholly within Flood Zone 1.

9 Flood risk from surface water

9.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the high risk surface water flood zone. A further 1% is at medium surface water risk, and a further 4% is at low surface water risk, as shown in Table 9-1.

In the high and medium risk events, surface water risk is confined to two small areas of ponding within a topographic low spot towards the north of the site. There are also two small flow paths along the boundaries of the site in the south and west. This is similar to the low risk event, however there is an additional short flow path within the south of the site.

Greatest flood depths in the medium risk event are between 0.9 and 1.2 m (Figure 3-1) with some areas of significant hazard (Figure 3-2). Safe access and escape should be achievable via Mericourt Road to the east of the site in all events.

Table 9-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
94	4	1	1

-
-
-

Level_2_SFRA_Preston Combined



Figure 9-2: Medium risk event surface water flood hazard⁵ (Risk of Flooding from Surface Water map)

9.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 9-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be greater than for present day conditions, with the medium risk climate change event showing a similar level of risk to the low risk present day

⁵ 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

event. Maximum depths are between 0.9 and 1.2 m with areas of hazard categorised as significant (Figure 3-4). Safe access and escape routes should remain achievable via Mericourt Road.



Figure 9-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 9-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

9.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 94% of the site being at very low risk. Surface water risk in the high and medium risk events is confined to two areas of ponding within topographic low spots in the north of the site.
- The modelled medium risk surface water climate change outputs indicate a similar risk to the present day low risk event. Safe access and escape routes should remain achievable via Mericourt Road in all events.
- Topographic depressions should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Note, 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 or evidence.

10 Risk from groundwater

Risk from groundwater sources 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 Guide⁶. Figure 4-1 shows the map for Site 19P035 and the surrounding areas and Table 10-1 explains the risk classifications.

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



Figure 10-1: JBA 5m Groundwater Emergence Map

⁶ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 10-1: Groundwater Flood 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.	

11 Overall site assessment

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

This site is not required to pass part b) of the exception test⁷ 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.

11.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁷ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P075

Final

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Laura Thompson of JBA Consulting carried out this work.

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Acknowledgements

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13 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P075. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

13.1 Site 19P075

- Location: The Larches, Larches Lane, Ashton in Ribble, Preston, PR2 1PS
- Existing site use: Greenfield
- Existing site use vulnerability: Water compatible
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 2.1 hectares
- Proposed development impermeable area: 1.8 hectares (assumed 85% impermeable area)
- Watercourse: Unnamed watercourse
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 13-1: Existing site location boundary



Figure 13-2: Topography

14 Flood risk from rivers

14.1 Existing risk

14.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is entirely located within Flood Zone 1 indicating it is at low risk from flooding from rivers.

Table 14-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 14-1: Existing risk from rivers to the site

14.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

14.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P075 is located within two catchments, namely; Coastal Catchment 176 and Savick Brook. The majority of the site is located within a medium sensitivity catchment. Planning considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁸.
- Developments should be incentivised to provide wider betterment by demonstrating in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments should achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

14.2.2 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. There are no opportunities for NFM applicable to this site

14.3 Residual risk

14.3.1 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. 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 not modelled to be at risk from reservoir flooding.

⁸ [Lancashire SuDS Guidance](#)

14.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

14.5 Flood warning and access and escape routes

The site is not located within a Flood Warning Area (FWA) or a Flood Alert Area (FAA).

Based on available information, safe access and escape routes could likely be achieved during a flood event via Larches Lane to the north of the site.

14.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site 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 site-specific FRA must show that the development can be designed to be safe for its lifetime and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- The site is located wholly within Flood Zone 1.

15 Flood risk from surface water

15.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is at low surface water risk, as shown in Table 9-1.

In the low risk event, surface water risk is confined to an area of ponding within a topographic low spot towards the north of the site. There is also a small flow paths within the south east of the site.

Greatest flood depths in the low risk event are between 0.3 and 0.6 m (Figure 3-1) with areas of hazard categorised as low (Figure 3-2). Safe access and escape should be achievable via Larches Lane to the north of the site in all events.

Table 15-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
98	2	0	0



Figure 15-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 15-2: Low risk event surface water flood hazard⁹ (Risk of Flooding from Surface Water map)

15.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 15-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be greater than for present day conditions, with the medium risk climate change event showing a similar level of risk to the low risk present day

⁹ 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

event. Maximum depths are between 0.3 and 0.6 m with areas of hazard categorised as low (Figure 3-4). Safe access and escape routes should remain achievable via Larches Lane.



Figure 15-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 15-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

15.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 98% of the site being at very low risk. Surface water risk in the low risk event is confined to an area of ponding within a topographic low spot in the north of the site and a short flow path within the south east.
- The modelled medium risk surface water climate change outputs indicate a similar risk to the present day low risk event. Safe access and escape routes should remain achievable via Larches Lane in all events.
- Topographic depressions and flow paths should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Note, 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 or evidence.

16 Risk from groundwater

Risk from groundwater sources 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 Guide¹⁰. Figure 4-1 shows the map for Site 19P075 and the surrounding areas and Table 10-1 explains the risk classifications.

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



Figure 16-1: JBA 5m Groundwater Emergence Map

¹⁰ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 16-1: Groundwater Flood 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.	

17 Overall site assessment

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

This site is not required to pass part b) of the exception test¹¹ 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.

17.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

¹¹ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P078

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Reviewed by	Mike Williamson BSc MSc CGeog FRGS EADA Principal Analyst
Authorised by	Krista Keating BSc MSc CEnv CSci MCIWEM C.WEM Associate Director

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JBA Project Code	2023s1344

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Acknowledgements

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19 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P078. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

19.1 Site 19P078

- Location: 115 Church Street, Preston, PR1 3BS
- Existing site use: Brownfield; car park
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.12 hectares
- Proposed development impermeable area: 0.1 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 19-1: Existing site location boundary

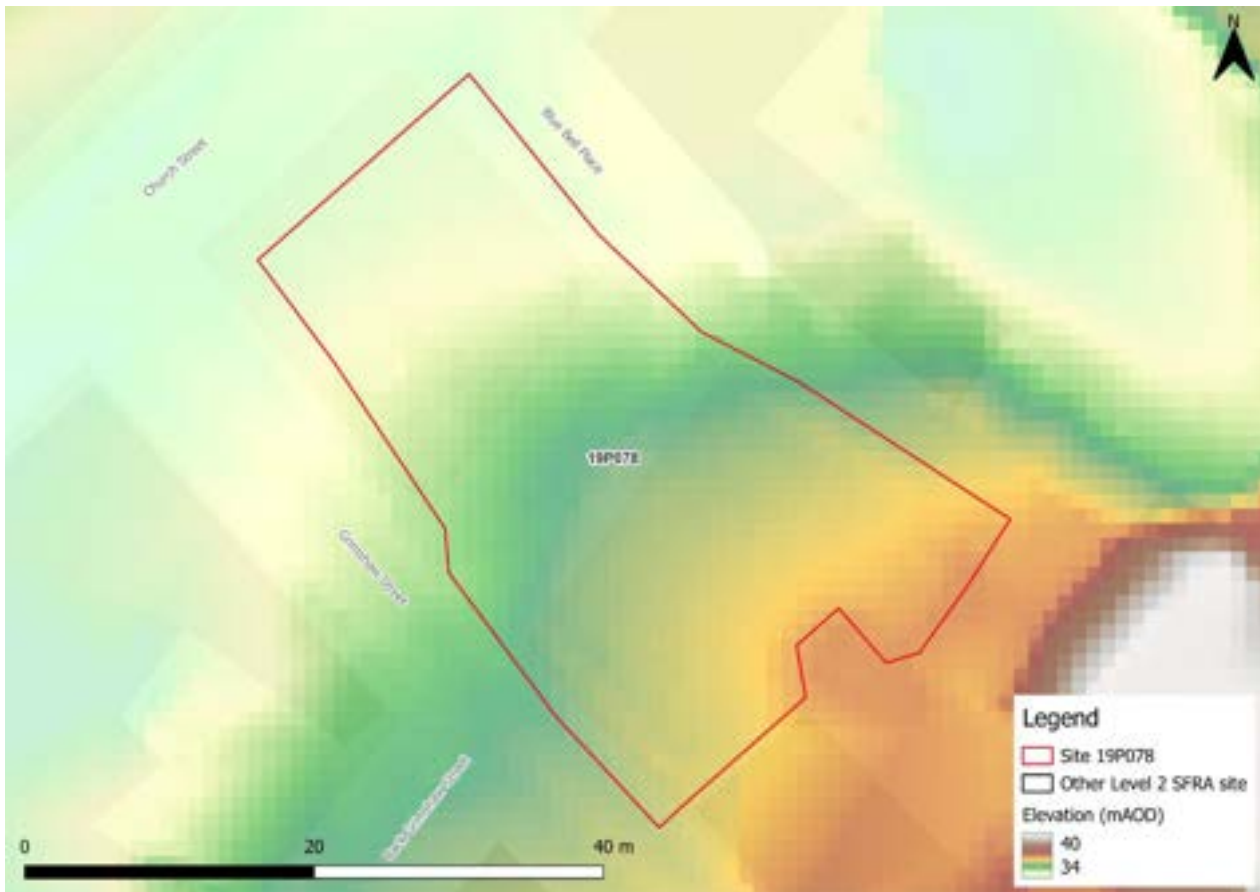


Figure 19-2: Topography

20 Flood risk from rivers

20.1 Existing risk

20.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating it is at low risk of flooding from rivers.

Table 20-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 20-1: Existing risk from rivers to the site

20.2 Flood risk management

The site does not benefit from any formal flood defences, according to the EA's spatial flood defences dataset.

20.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development, site 19P078 is located within one catchment, namely, Coastal Catchment 176. The site is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

20.2.2 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. There are no applicable areas that could benefit the site.

20.3 Residual risk

20.3.1 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. 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 not modelled to be at risk from reservoir flooding.

20.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

20.5 Flood warning and access and escape routes

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 site is not located within a Flood Warning Area.

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 an FWA. The site is not located within a Flood Alert Area.

Based on available information, safe access and escape routes could likely be achieved during a flood event via multiple points surrounding the site.

20.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is located wholly within Flood Zone 1.

21 Flood risk from surface water

21.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the medium risk surface water flood zone. A further 3% of the site is at low surface water risk.

In the medium risk event, surface water risk is confined to a small area in the northern corner of the site. In the low risk event, a slight greater area of the site becomes inundated, however the majority of the site is at very low risk.

Greatest flood depths in the medium risk event are between 0.15 and 0.3 m (Figure 3-1) with hazards categorised as low (Figure 3-2). Safe access and escape routes should be possible via Grimshaw Street to the south of the site in the high and medium risk events. This route becomes inundated in the low risk event, however depths and hazards are low therefore safe access and escape should remain possible.

Table 21-1: Existing surface water flood risk based on the RoFSW map

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

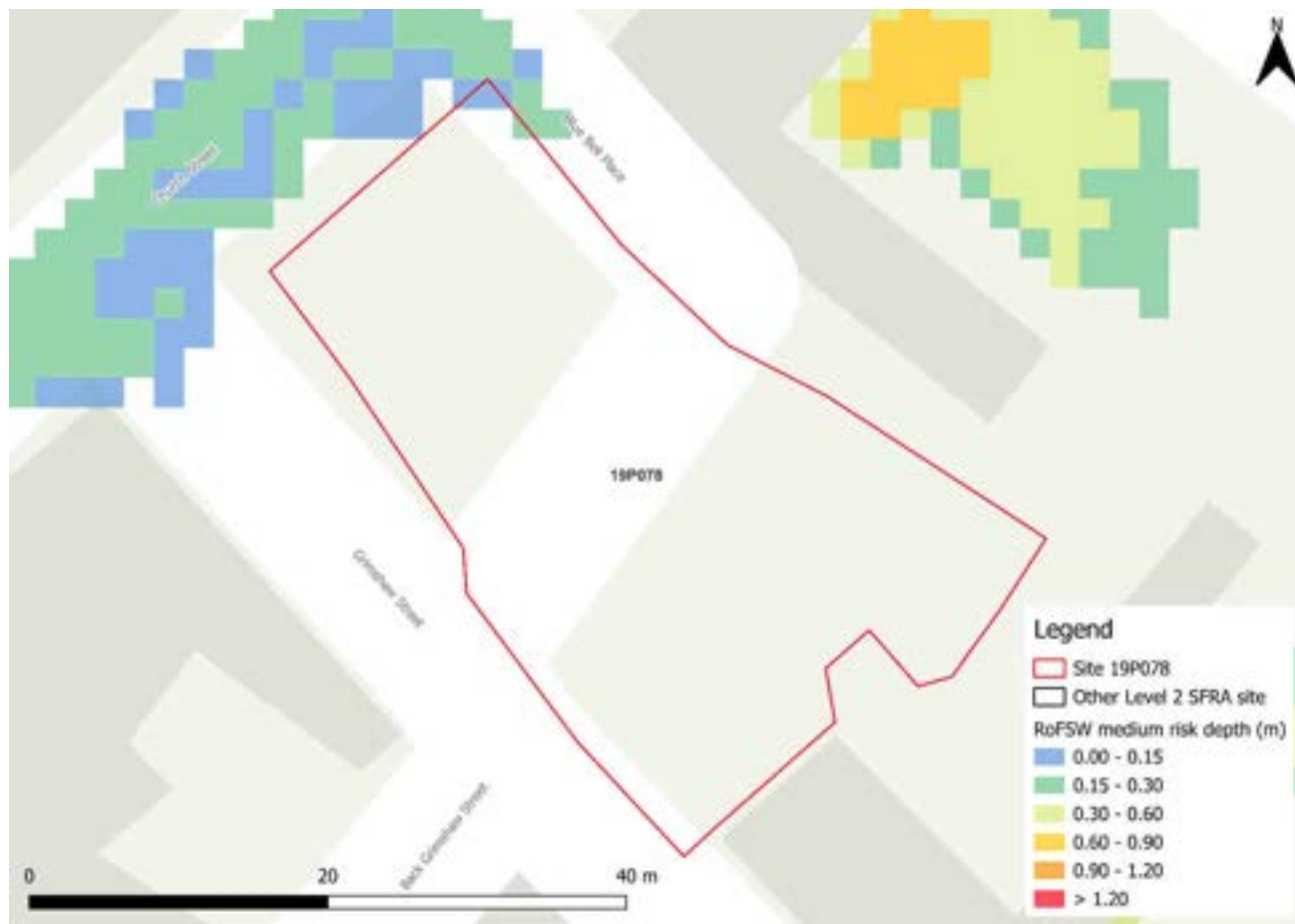


Figure 21-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

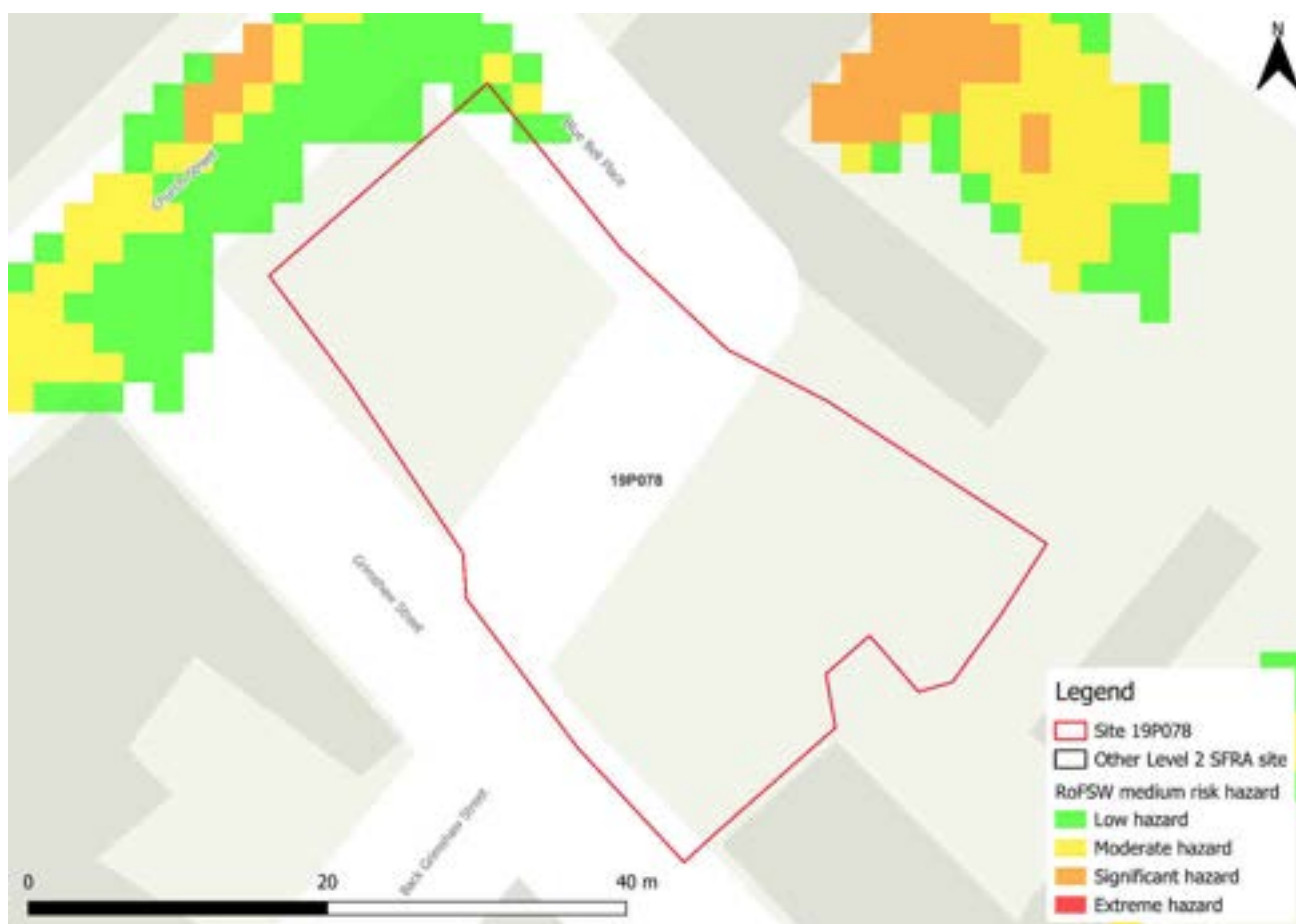


Figure 21-2: Medium risk event surface water flood hazard¹² (Risk of Flooding from Surface Water map)

21.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 21-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be greater than for present day conditions, with the medium risk climate change event showing a similar level of risk to the low risk present day

¹² 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

event. Maximum depths are modelled to be between 0.3 and 0.6 m, with some areas of hazard categorised as significant (Figure 3-4). Safe access and escape routes should remain achievable via Grimshaw Street to the south of the site.

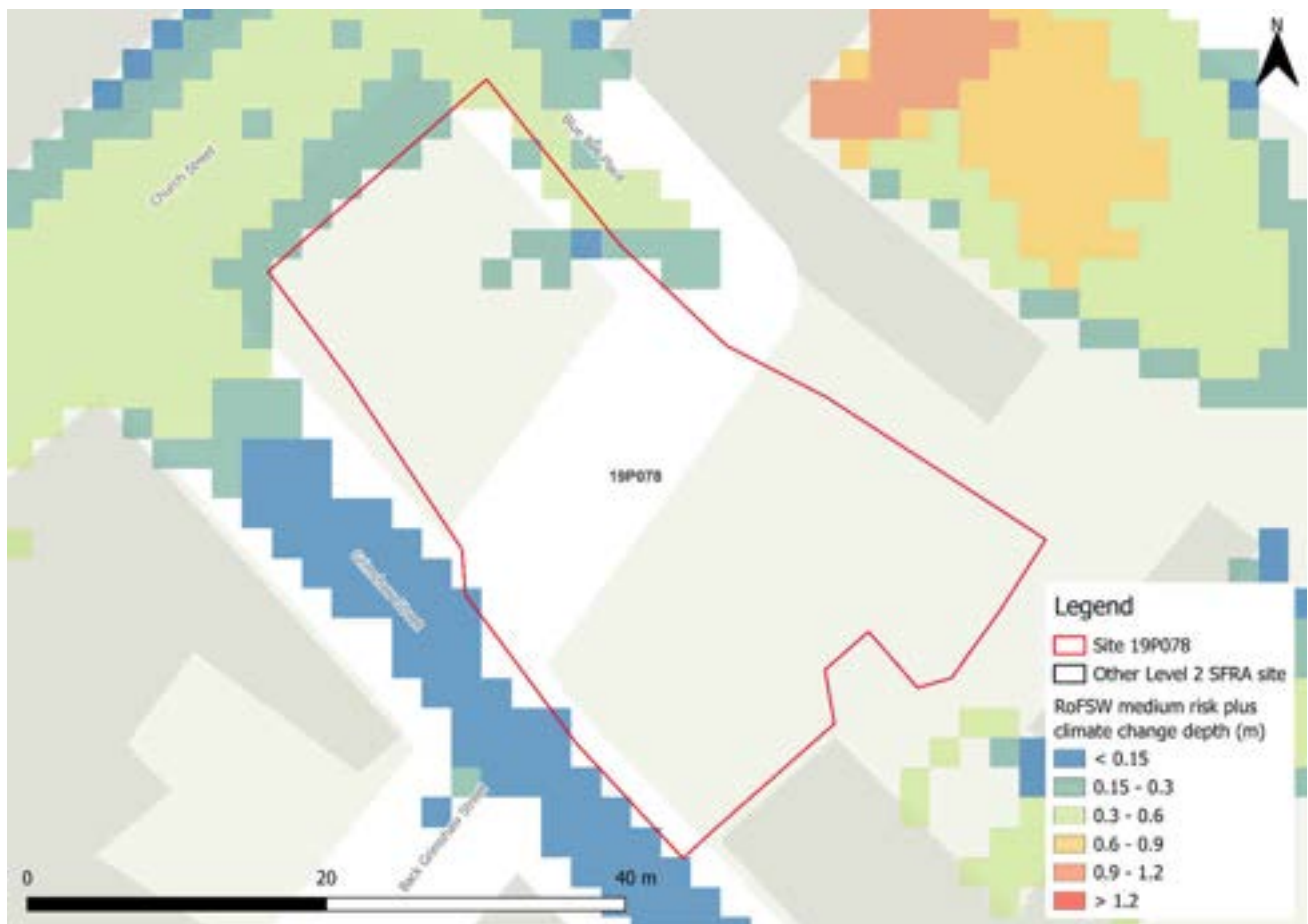


Figure 21-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 21-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

21.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 96% of the site being at very low. Surface water risk in the medium risk event is confined to the northern corner of the site.
- The medium risk modelled climate change outputs indicate a similar extent risk to the present day low risk event. Safe access and escape routes should be achievable via Grimshaw Street to the south of the site.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Were development plans to proceed, a full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.

22 Risk from groundwater

Flood risk from groundwater sources 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 Guide¹³. Figure 4-1 shows the map for the site and the surrounding areas and Table 22-1 explains the risk classifications.

Risk of groundwater emergence is generally very low across the site. The north of the site is in an area where flooding from groundwater is not likely. The remaining area of the site is within an area where there is no risk from groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS.



Figure 22-1: JBA 5m Groundwater Emergence Map

¹³ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 22-1: Groundwater Flood 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.	

23 Overall site assessment

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

This site is not required to pass part b) of the exception test¹⁴ 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.

23.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

¹⁴ Para 178 National Planning Policy Framework 2024

24 Licencing

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P082

Final

February 2025

Prepared for:



www.jbaconsulting.com

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Georgina Williams of JBA Consulting carried out this work.

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We would like to thank the Environment Agency for their assistance with this work

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25 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P082. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

25.1 Site 19P082

- Location: Land at Preston East, PR2 5SH
- Existing site use: Agricultural
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Large strategic employment site
- Proposed site use vulnerability: Less vulnerable
- Site area: 61.5 hectares
- Proposed development impermeable area: 52.3 hectares (assumed 85% impermeable area)
- EA model: N/A
- Watercourse: Savick Brook
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of modelled fluvial flood depths and hazards
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk

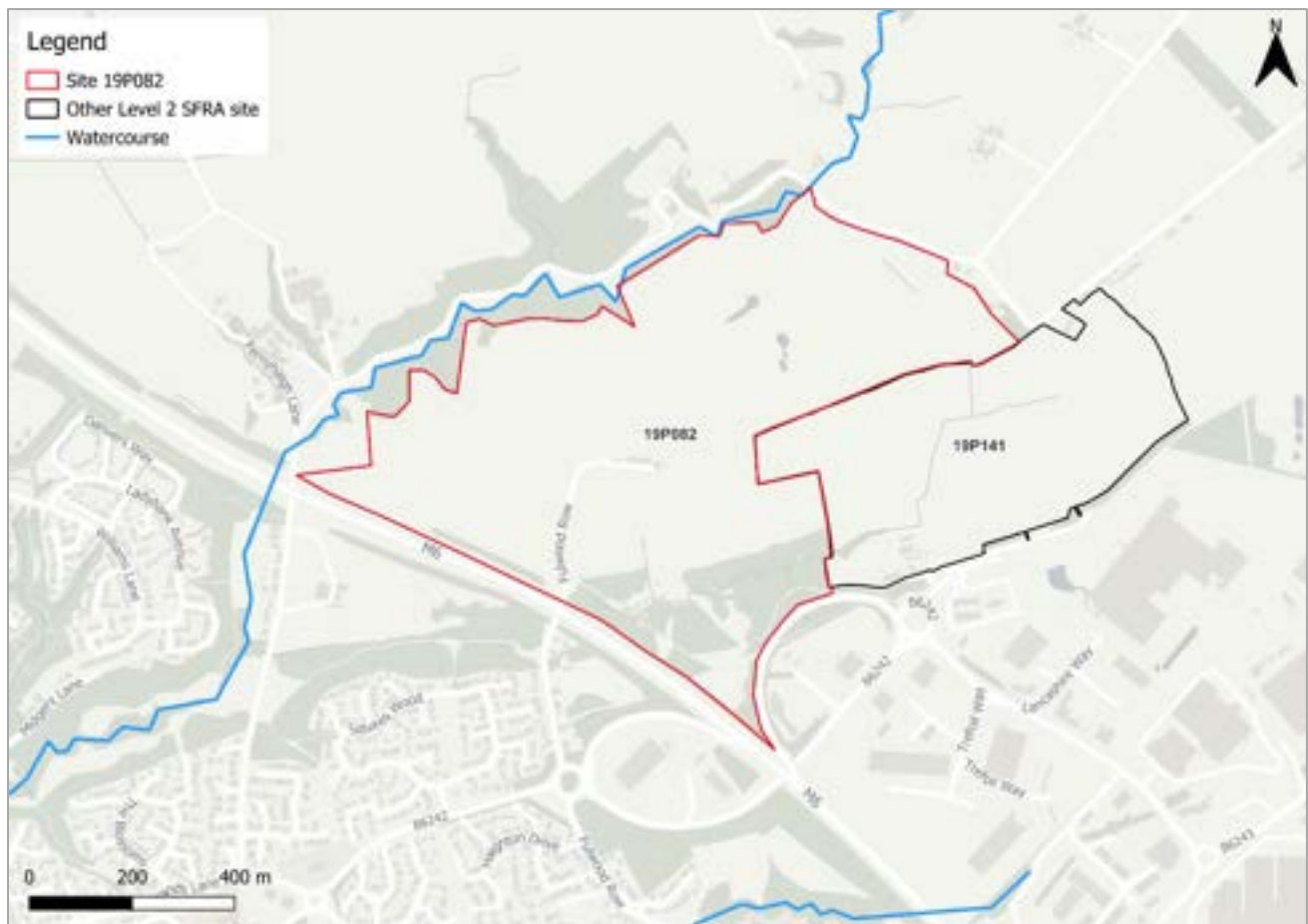


Figure 25-1: Existing site location boundary

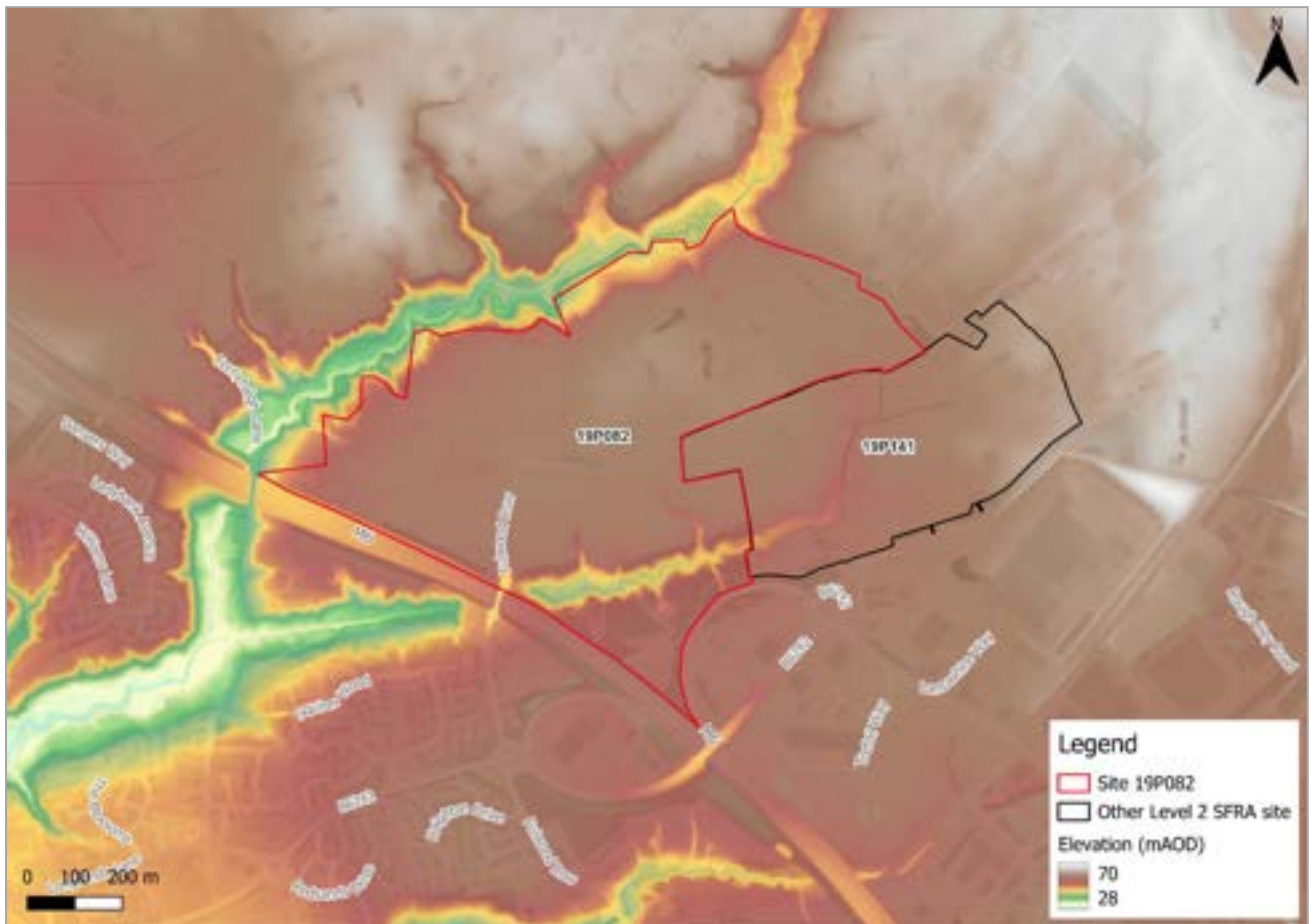


Figure 25-2: Topography

26 Flood risk from rivers

26.1 Existing risk

26.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 26.2).

The majority of the site is located within Flood Zone 1. Flood Zone 3b is present along the northwestern boundary of the site, adjacent to Savick Brook, however this is only approximately 1% of the total site area. There should be no development within the functional floodplain. The functional floodplain in this location is conservatively based on Flood Zone 3 of the EA's Flood Map for Planning (1% AEP undefended event), in the absence of suitable modelled data.

OS mapping and LIDAR imagery (Figure 25-2) indicate an unnamed tributary of Savick Brook flowing through the south of the site. This watercourse is not modelled and therefore is not included in the Flood Map for Planning. The watercourse appears to originate in the adjacent Site 19P141 before flowing westwards, under the M6 motorway by way of a culvert and into Savick Brook. Savick Brook also appears to be culverted under the M6 which is the point at which it becomes designated as main river.

Table 26-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
99	0	0	1

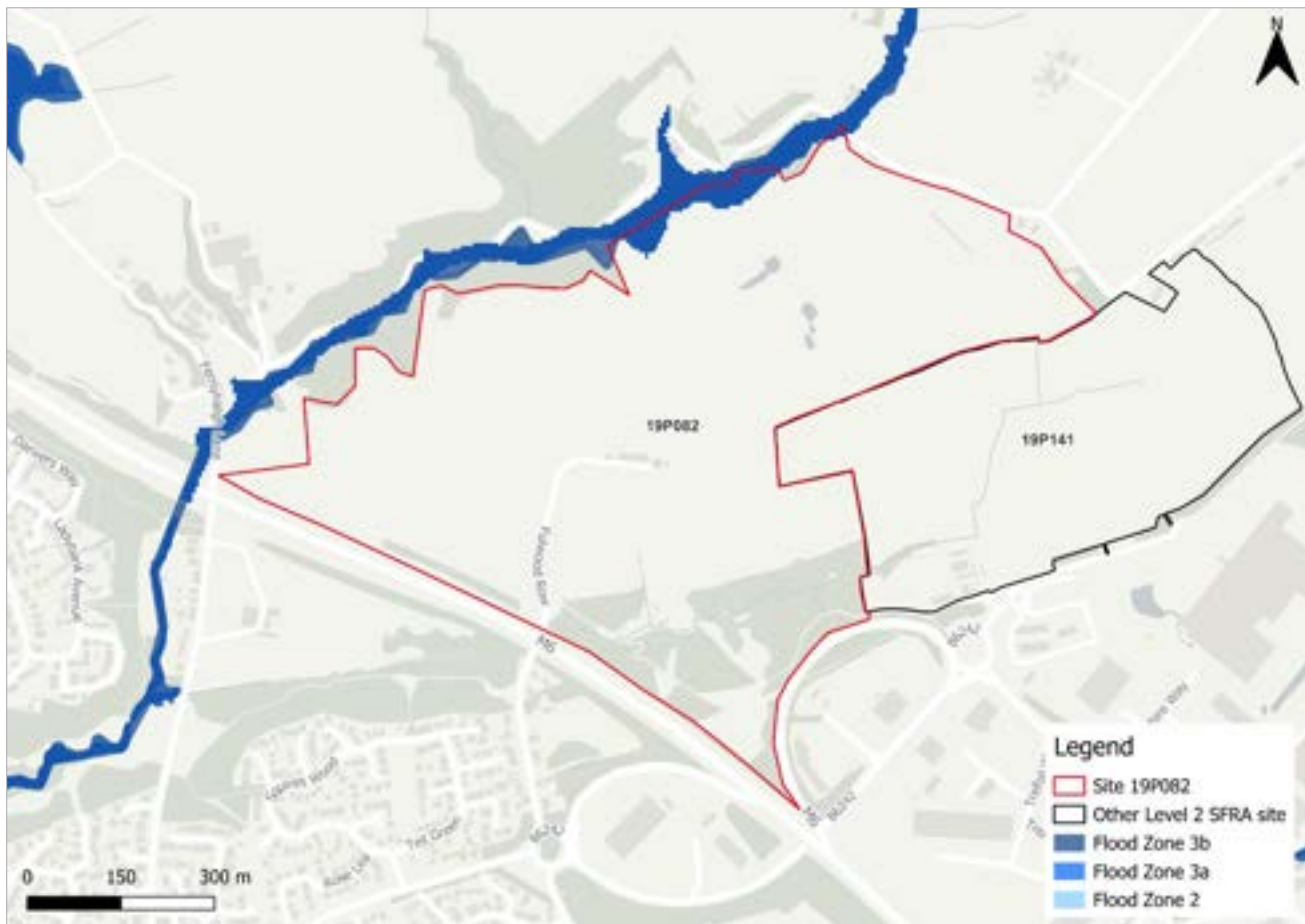


Figure 26-1: Existing risk from rivers to the site

26.1.2 Savick Brook 2011 model

The existing EA model domain for Savick Brook starts downstream of the M6 to the south west of the site. Therefore, modelled depths and hazards have not been considered as part of this SFRA. Modelling this reach of Savick Brook should be considered as part of a site-specific FRA, as well as/instead of a Level 2 SFRA update.

26.2 Impacts from climate change

The impact of climate change on flood risk from Savick Brook and the unnamed watercourse have not been modelled for this SFRA, as the existing EA model domain for Savick Brook starts downstream of the M6. Therefore, in the absence of modelled climate change information, Flood Zone 2 of the Flood Map for Planning (based on the 0.1% AEP undefended event) can be used as a conservative proxy for Flood Zone 3a plus climate change. Based on this approach, fluvial risk is modelled to remain largely similar in extent to the present day (Figure 8-1).

The impacts of climate change must be modelled using the EA's latest allowances for peak river flows to inform the exception test. The EA should be consulted on the data source of the Flood Map for Planning in this location. If the Flood Map for Planning is based on a

detailed model of Savick Brook, any updates to this Level 2 SFRA and/or any FRA should make use of this model and include for the most up to date climate change allowances.

26.3 Flood risk management

The site doesn't benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

26.3.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P082 is located within one catchment, namely; Savick Brook. This is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance¹⁵.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments are to aim to achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

26.3.2 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. The majority of the site is identified to have potential for woodland planting, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. There is also potential reconnect the channel to the floodplain adjacent to Savick Brook, allowing flood water to be stored in the northwestern corner of the site. Across the site there are scattered areas with potential for runoff attenuation features. These areas are shown in Figure 26-2.

¹⁵ [Lancashire SuDS Guidance](#)

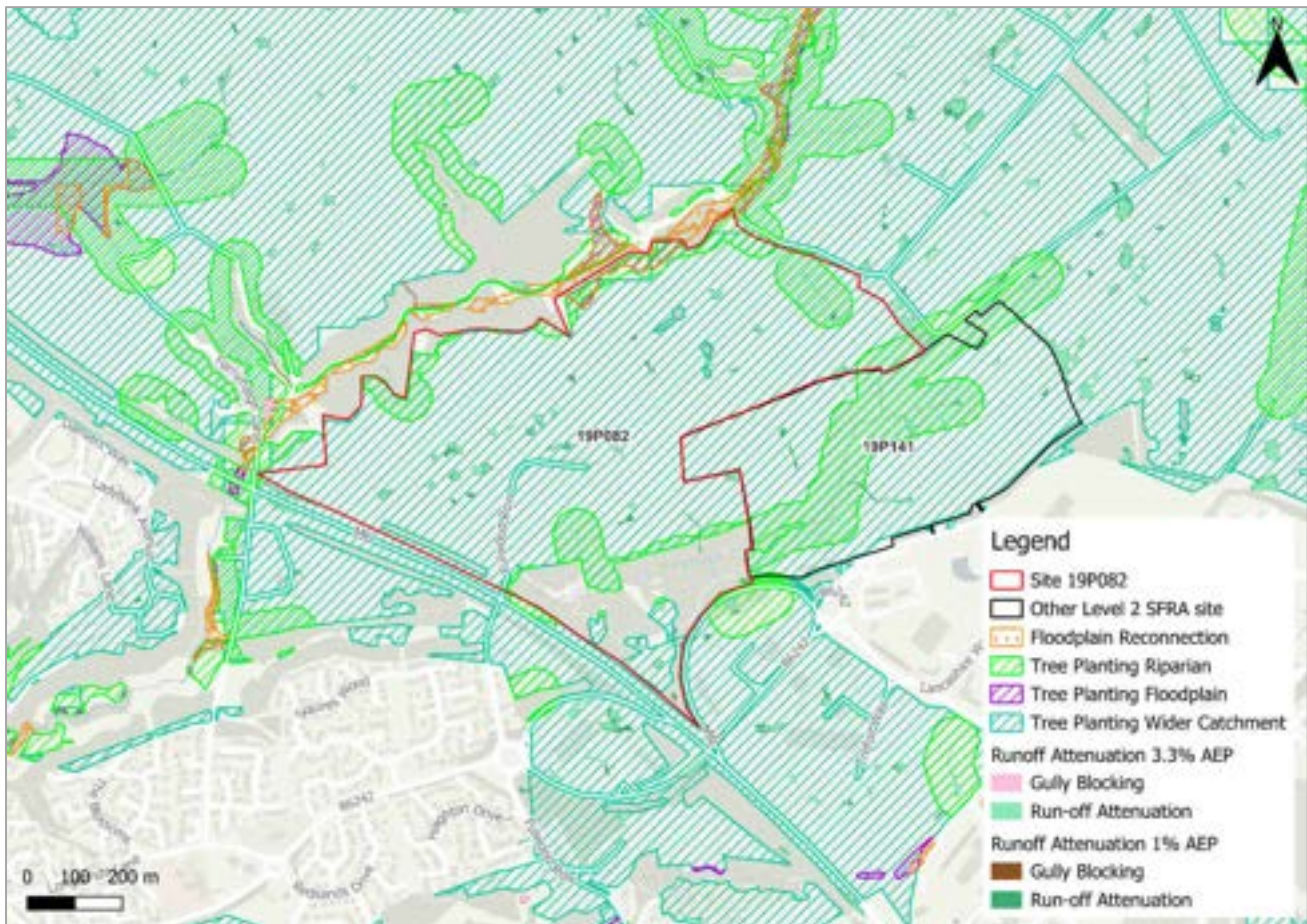


Figure 26-2: Natural Flood Management (NFM) potential mapping

26.4 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 bridge openings.

There is potential residual risk to the site from a possible blockage of the culverts along Savick Brook and the unnamed watercourse which run beneath the M6 (Figure 26-3). The impact of a blockage of these structures have not been modelled as part of this Level 2 SFRA, as there are no available flood models. It is recommended that the site-specific FRA should consider the impact of blockage of these culverts on residual flood risk to the site.

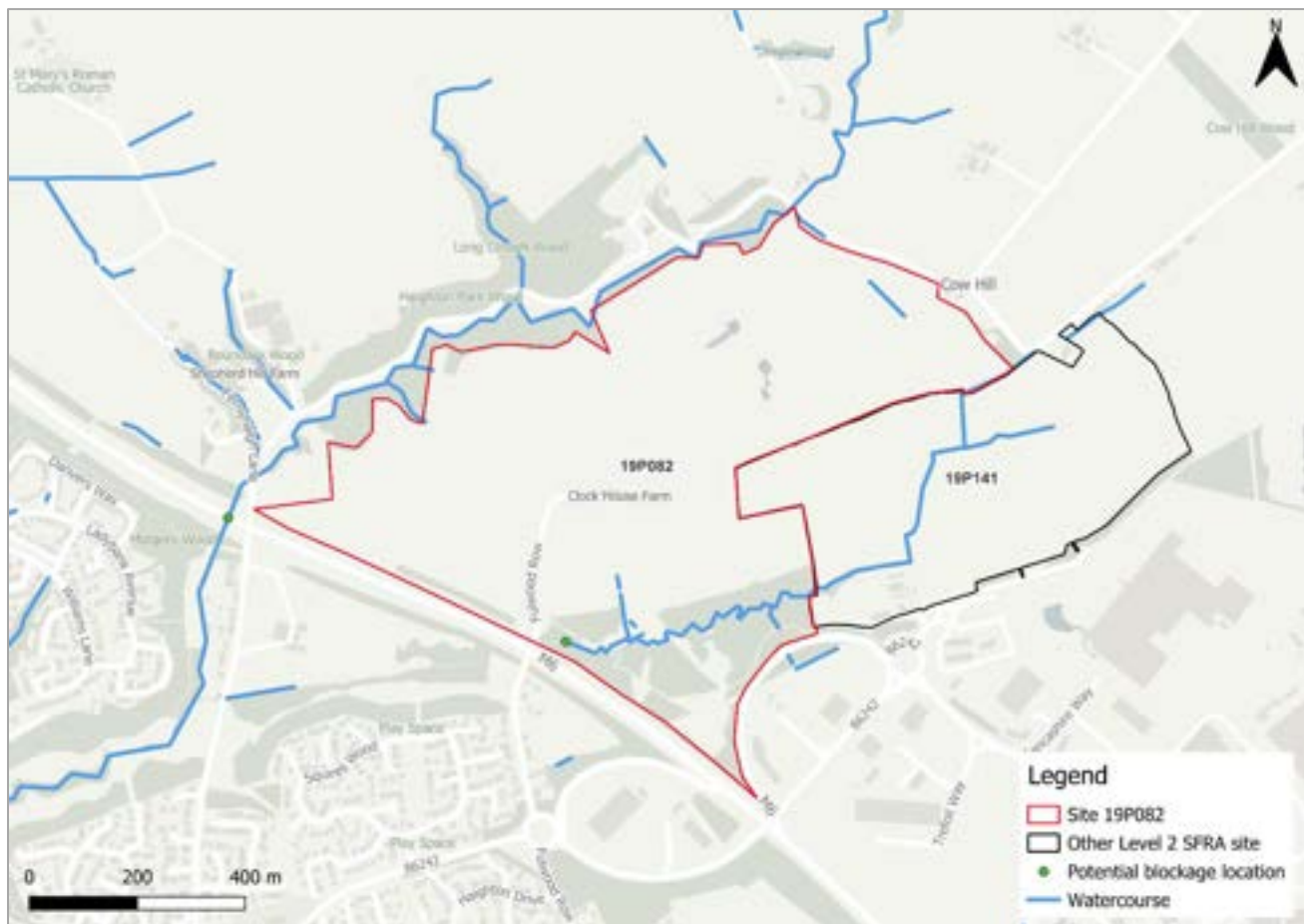


Figure 26-3: Potential blockage locations

26.4.1 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 26-4 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 one reservoir in a 'dry day' scenario and two reservoirs during a 'wet day' scenario. These reservoirs are Alston No. 1 and Alston No. 2, operated by United Utilities and within the Lancashire LLFA area. The risk of flooding is confined to the northwestern corner of the site where Savick Brook runs adjacent to the site boundary.

The EA's SFRA guidance states that where a proposed development site is at flood risk from a reservoir, 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. At the FRA stage, United Utilities, should be contacted 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.

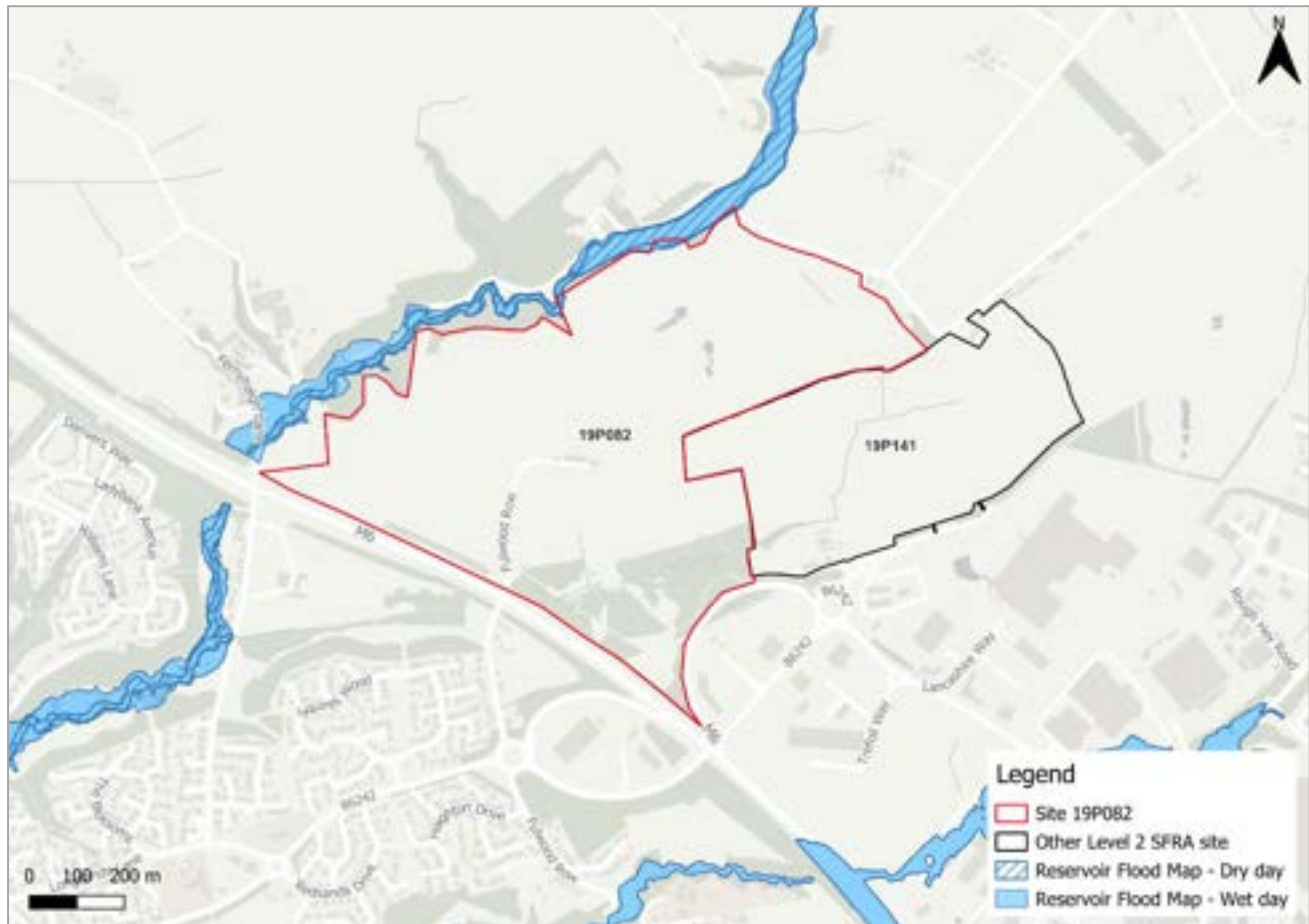


Figure 26-4: Flood risk from reservoirs

26.5 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

26.6 Flood warning and access and escape routes

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. Site 19P082 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. A small area to the northwest of the site is located within a FAA, namely; 012WAFLR- Lower River Ribble and Darwen.

Based on available information, safe access and escape routes could likely be achieved during a flood event via multiple locations.

26.7 Observations, mitigation options and site suitability - fluvial

- The site is modelled to be partially within the functional floodplain in the northwestern corner of the site, adjacent to Savick Brook. Development is not permitted within the functional floodplain. However, the functional floodplain in this area is conservatively based on Flood Zone 3.
- Ordinary Watercourse Flood Defence Consent (OWFDC) may be required if development is planned within 8m of the riverbank. The LLFA can advise on whether this would be required. If feasible, this area would be used as a green / blue corridor which can provide ecological, social and amenity value.
- Flood Zone 2 has been used as a proxy to provide a conservative estimate of Flood Zone 3 plus climate change. Flood depths and hazards were not available at the time of writing, therefore a fully robust assessment of fluvial flood risk to this site cannot be carried out. Any update to the Level 2 SFRA and/or any FRA should include for detailed modelling of Savick Brook including for climate change. At this stage, it cannot be proven that this site can be safe for its lifetime.
- Risk from the unnamed watercourse must be quantified through appropriate modelling. This watercourse should be allowed to flow unobstructed and should be included in a blue / green corridor.
- The site is at residual risk from possible blockage of the culverts beneath the M6 downstream of the site. It is recommended that the site-specific FRA should consider the impact of a blockage of this culvert on residual flood risk to the site.
- Safe access and escape should be possible via multiple locations around the site, based on available information.
- Given the potential reservoir risk to the site, developers should consider¹⁶:
 - Whether additional modelling is required to understand the flood risk from the reservoir, referring to the specification for the reservoir flood maps as a starting point
 - Whether the development may have an impact on the reservoir or reservoir owner
 - Referring to the Central Lancashire Level 1 SFRA for information on reservoir risk and recommendations for how to address it
 - Contacting the LPA for pre-application advice
 - Contacting the LPA to understand the need to consult with their emergency planning team and with the reservoir owner
- Were development of this site to proceed, given the proximity of this site to neighbouring site 19P141 and the fact that the unnamed watercourse flows from site 19P141 into this site, it would be prudent to formulate a strategy to develop

¹⁶ [Reservoir flood maps: when and how to use them | Environment Agency | 2021](#)

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.

27 Flood risk from surface water

27.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the high risk surface water flood zone. A further 1% is at medium surface water risk, and a further 3% is within the low surface water risk flood zone as shown in Table 3-1.

In the high risk event, surface water risk flows along the unnamed tributary of Savick Brook. There are also some scattered areas of ponding within topographic low spots across the site. In the medium and low risk events, risk is slightly greater with more scattered locations of ponding.

Greatest surface water flood depths in the high risk event are > 1.2 m (Figure 3-1) with some areas of significant hazard (Figure 3-2). However, these areas are along the unnamed watercourse channel. Safe access and escape routes should be possible via multiple locations.

Table 3-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
95	3	1	1

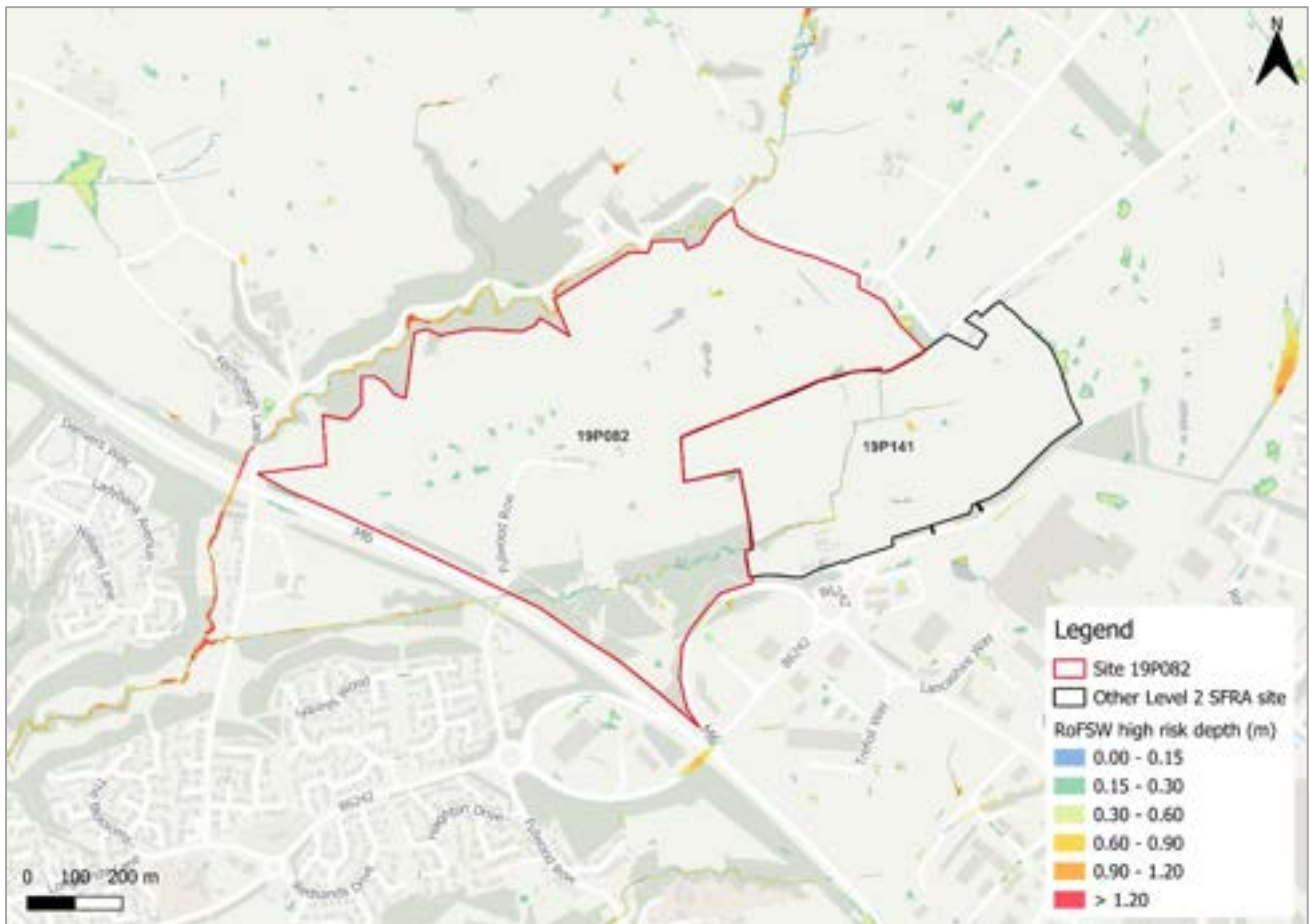


Figure 27-1: High risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 27-2: High risk event surface water flood hazard¹⁷ (Risk of Flooding from Surface Water map)

27.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 3-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

¹⁷ 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

Figure 3-3 shows the high risk surface water flood depths plus 40% climate change. Modelled risk is similar to the present day high surface water event with slightly greater flood extents within topographic low spots across the site. Maximum flood depths are modelled to be >1.2m, with some areas of extreme hazard (Figure 27-4).

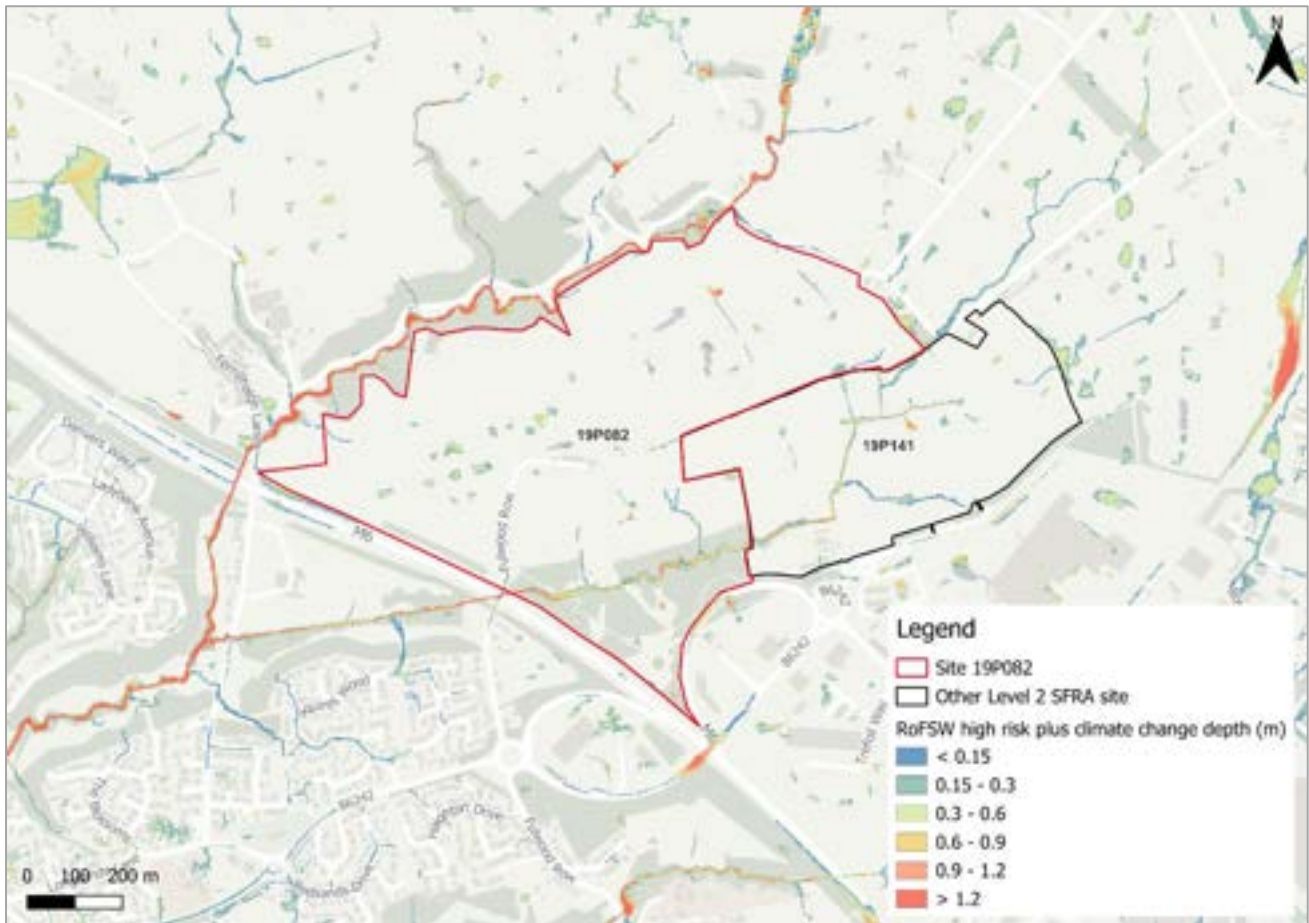


Figure 27-3: High risk event surface water flood depths plus 45% climate change (based on Risk of Flooding from Surface Water map)



Figure 27-4: High risk event surface water flood hazards plus 45% climate change (based on Risk of Flooding from Surface Water map)

27.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 95% of the site being at very low surface water flood risk. In all events, surface water risk is largely confined to the south of the site. Surface water risk in the high and medium risk events is largely confined to the unnamed watercourse. There are also scattered areas of surface water ponding within topographic low spots across the site. Safe access and escape routes are available at multiple locations.
- The effects of climate change on surface water have been modelled for this SFRA using the high risk surface water flood depths plus 40% climate change. Surface water risk is slightly greater than present day flood extents across the topographical low spots within the site. Any existing flow paths and topographic depressions should be maintained in site design.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current greenfield rates and, where possible, betterment should be achieved.
- 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 or evidence.

28 Risk from groundwater

Risk from groundwater sources 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 Guide¹⁸. Figure 4-1 shows the map for Site 19P082 and the surrounding areas and Table 4-1 explains the risk classifications.

Risk of groundwater emergence varies across the site. Within the south of the site there is a risk groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots. In this area there is a risk of flooding to both surface and subsurface assets. There is also groundwater risk to both surface and subsurface assets along the northwestern boundary of the site, adjacent to Savick Brook. The majority of the site is within an area where there is no risk of groundwater emergence. Groundwater conditions may therefore be suited to infiltration SuDS across the majority of the site.

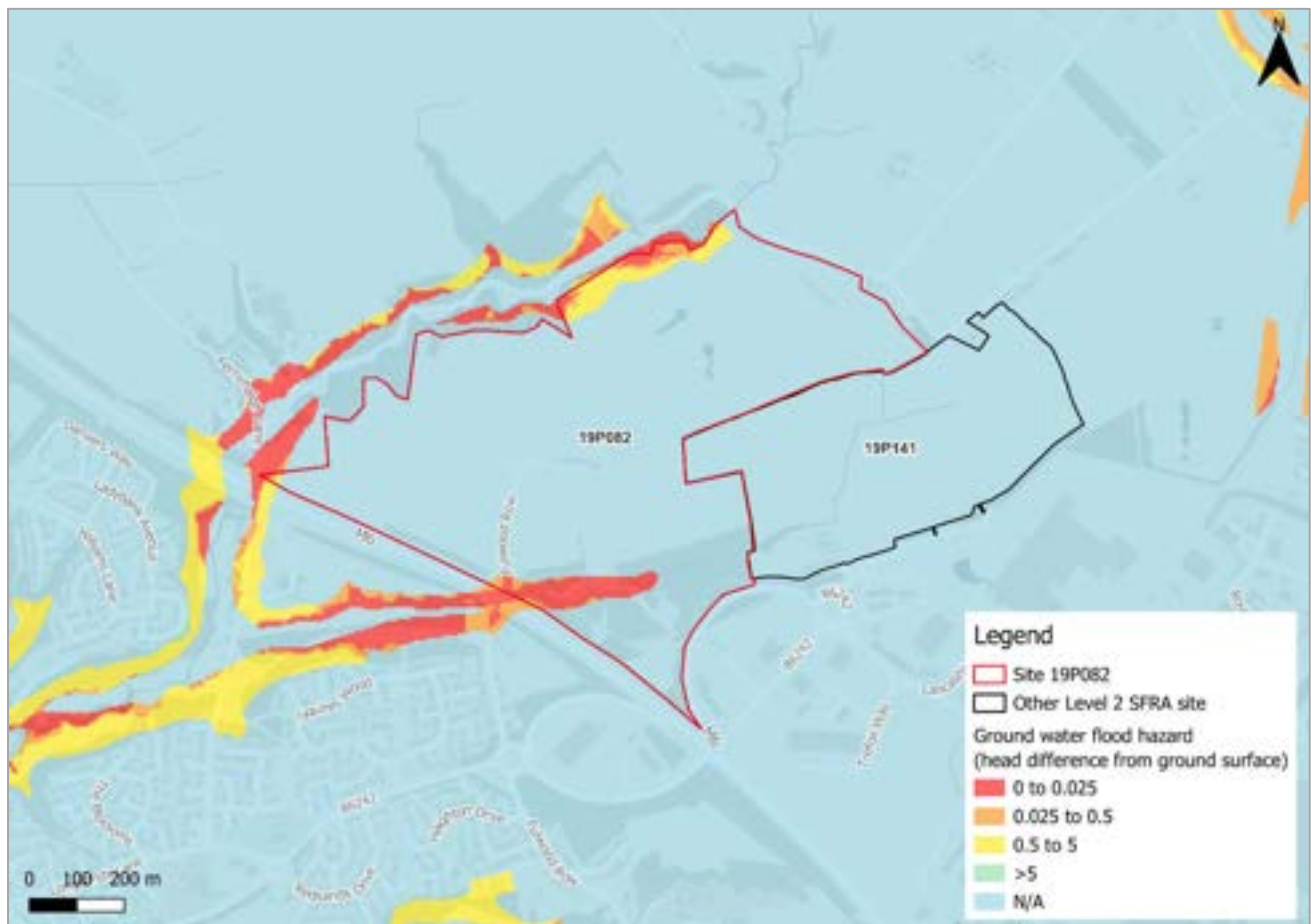


Figure 28-1: JBA 5m Groundwater Emergence Map

¹⁸ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 4-1: Groundwater Flood 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.	

29 Overall site assessment

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

This site is not required to pass part b) of the exception test¹⁹ 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.

The areas of flood risk within this site cannot be developed until the required information detailed in this SFRA on existing and future flood risk from Savick Brook and the unnamed watercourse is fully ascertained. This is because, at this stage, it cannot be proven that the site can remain safe for its lifetime. The site can only be allocated if all development can be directed to areas of low flood risk.

Were additional, more detailed modelled information on flood risk become available through an update to the SFRA or through a site-specific FRA, that show the risk area to be lower than currently shown, more of the site could then be developed. Conversely, were the risk to be greater, any development must account for this. Flood risk elsewhere should not be increased as a result of development.

29.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Updated present day and climate change modelling of Savick Brook should be used to update this Level 2 SFRA at the earliest opportunity to provide a robust strategic assessment of flood risk to this site and surrounding areas.
- It would be acceptable to use updated modelling to suitably assess risk through a site-specific FRA, as well as/instead of a Level 2 SFRA update.
- Risk from the unnamed watercourse must be quantified to inform on safe site design and layout.
- There should be no development within the functional floodplain. There should also be no development within 8m of Savick Brook. This should be converted to a blue / green corridor to provide ecological, amenity and social value.
- A detailed drainage strategy will be required given the large area of this site being converted from open space to development. The use of infiltration SuDS should be investigated.
- The site is at residual risk from possible blockages of the culverts beneath the M6.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.

¹⁹ Para 178 National Planning Policy Framework 2024

- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P089

Final

February 2025

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Georgina Williams of JBA Consulting carried out this work.

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31 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P089. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

31.1 Site 19P089

- Location: Former Tulketh High School, Tag Lane, Preston, PR2 3TX
- Existing site use: Education
- Existing site use vulnerability: More vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 6.4 hectares
- Proposed development impermeable area: 5.5 hectares (assumed 85% impermeable area)
- EA model: Savick Brook 2011
- Watercourse: Sharoe Brook
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of modelled fluvial flood depths and hazards
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
 -



Figure 31-1: Existing site location boundary

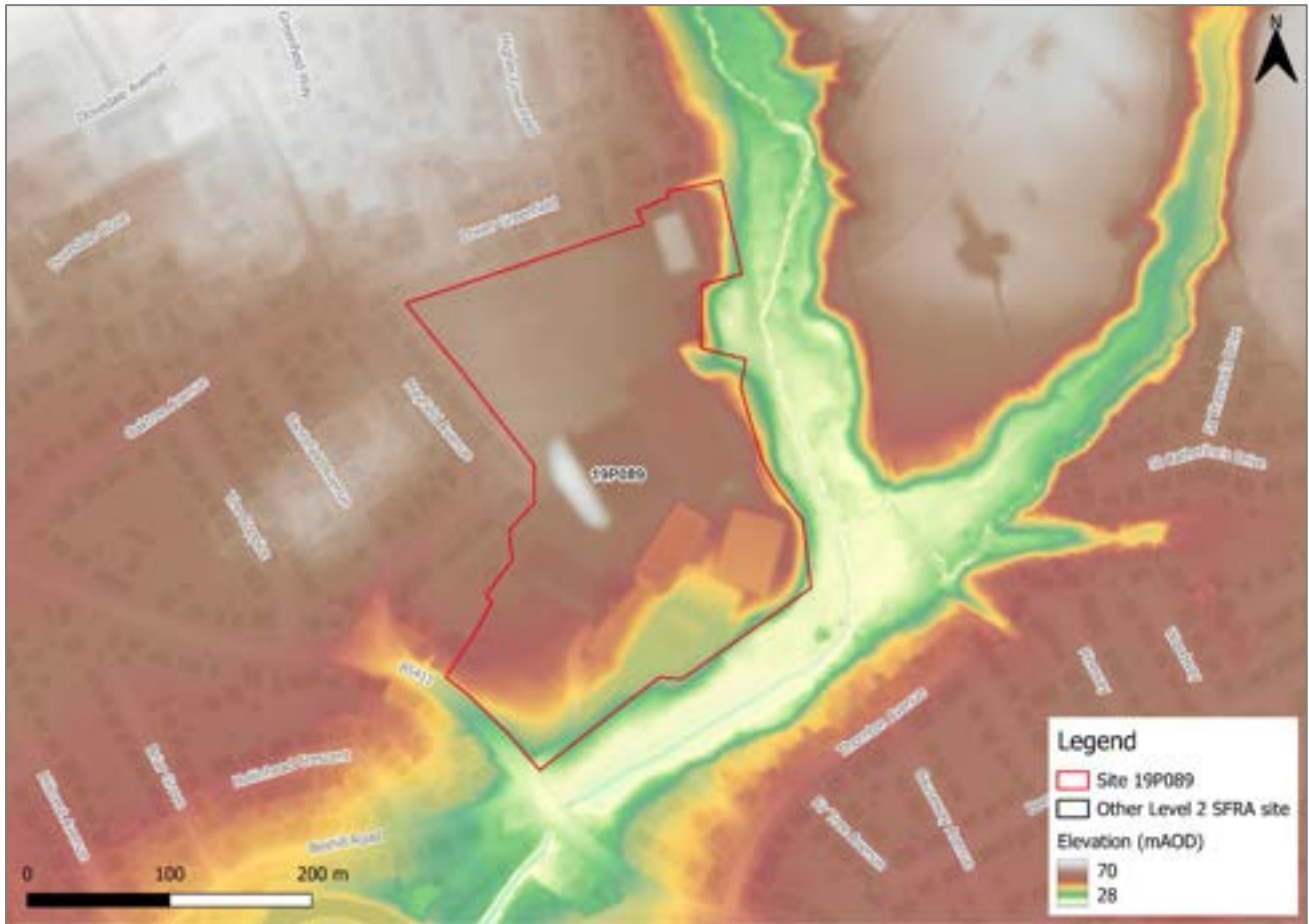


Figure 31-2: Topography

32 Flood risk from rivers

32.1 Existing risk

32.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The majority of the site is located within Flood Zone 1. Flood Zone 3b is present along the eastern boundary of the site, however this is less than 1% of the total site area. There should be no development within the functional floodplain. However, the functional floodplain in this location is conservatively based on the Savick Brook 0.1% AEP defended event, as delineated within the 2019 functional floodplain extent, in the absence of suitable modelled data. A small area within the south of the site is within Flood Zone 2 of the EA's Flood Map for Planning.

Table 32-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
99.4	0.2	0	0.3



Figure 32-1: Existing risk from rivers to the site

32.1.2 Savick Brook 2011 model outputs

Figure 32-2 shows the modelled flood depths for the 1% AEP undefended event which is the event Flood Zone 3 of the Flood Map for Planning is based on. Modelled risk to the site is similar to Flood Zone 3 in the vicinity of the site, with a small area along the eastern and southern boundaries of the site modelled to be at risk. Maximum flood depths within the site are modelled to be between 0.3 and 0.6 m, located to the south of the site. Figure 32-3 shows the modelled flood hazard ratings for the 1% AEP undefended event. Modelled flood hazard in the area of the site at risk is largely categorised as 'Very low hazard', with some areas categorised as 'Danger for some'. There is no modelled flood risk to the rest of the site in the 1% AEP undefended event.

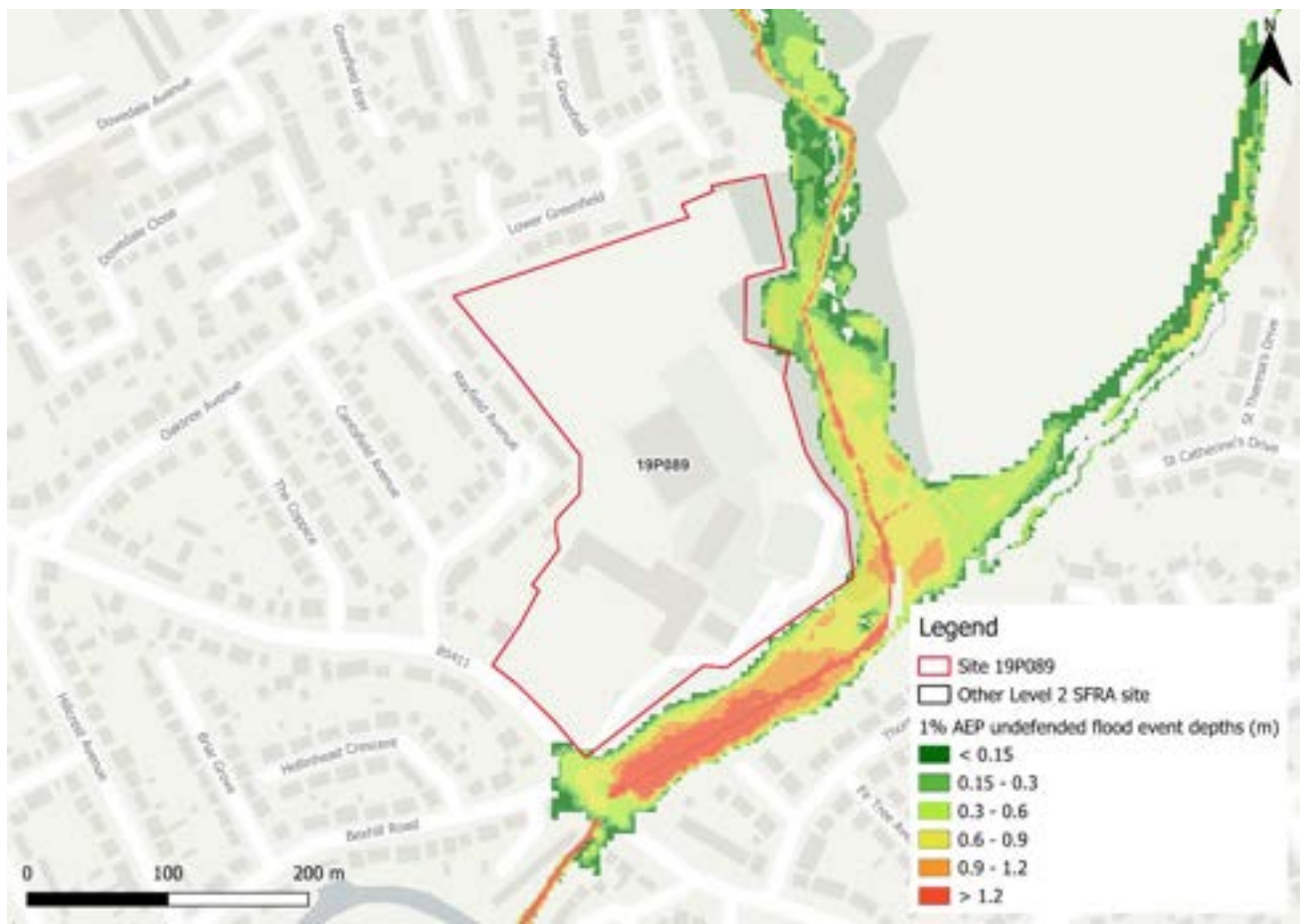


Figure 32-2: Flood depths for 1% AEP undefended flood event



Figure 32-3: Flood hazard²⁰ for 1% AEP undefended flood event

32.2 Impacts from climate change

The impact of climate change on flood risk from Sharoe Brook has not been modelled for this SFRA, as not all files for the Savick Brook model were made available to be able to run the model. Therefore, in the absence of modelled climate change information, the Savick Brook 0.1% AEP undefended event (Figure 32-4) can be used as a conservative proxy for Flood Zone 3 plus climate change. Based on this approach, fluvial risk is modelled to remain largely similar in extent to the present day Flood Zone 3 (Figure 8-1).

The impacts of climate change must be modelled using the EA's latest allowances for peak river flows to inform the exception test. Therefore, any updates to this Level 2 SFRA and/or any site-specific FRA produced to inform a planning application should include the most up to date climate change allowances.

²⁰ 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. Environment Agency.

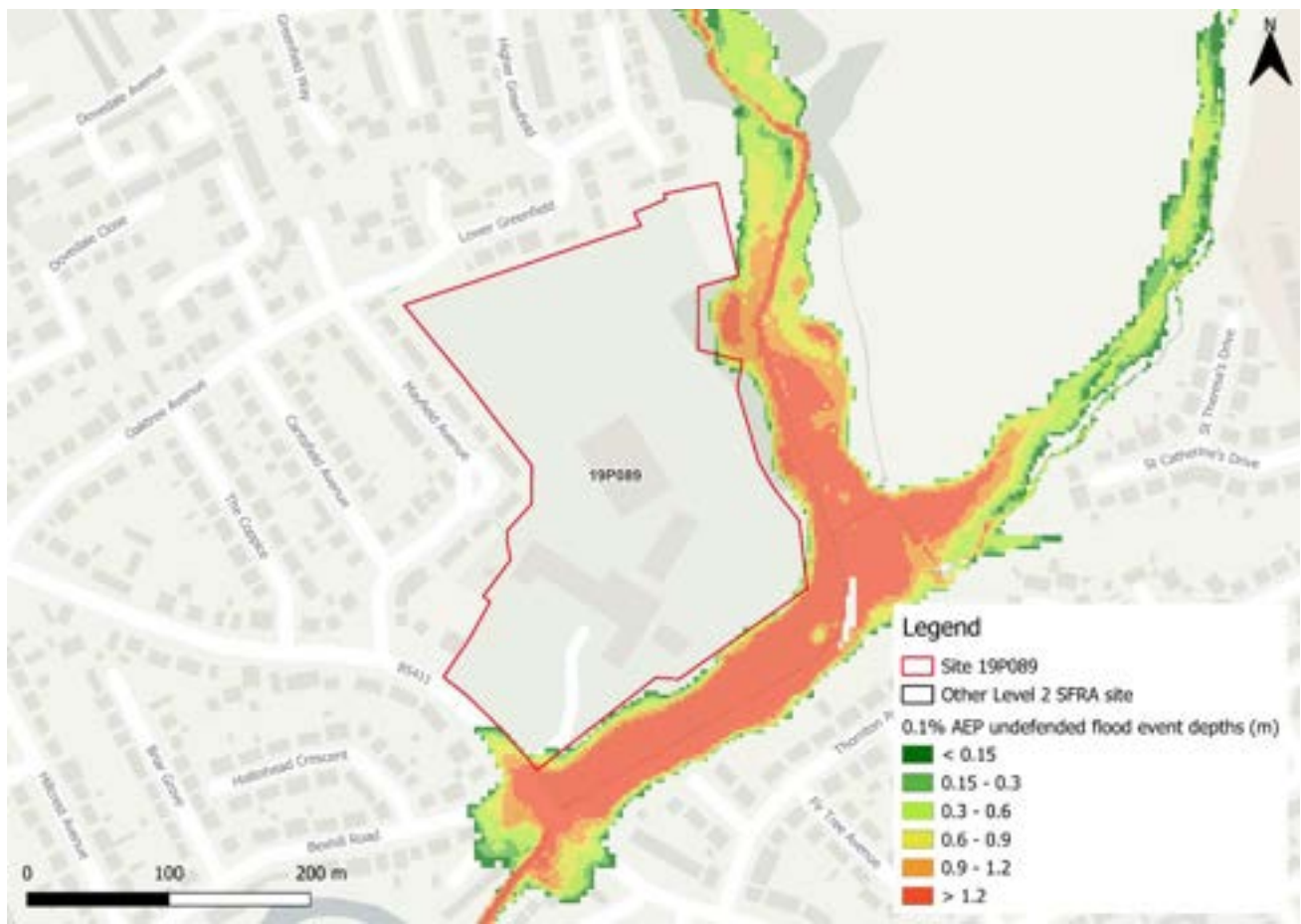


Figure 32-4: Flood depths for 0.1% AEP undefended flood event (as a proxy for the 1% AEP undefended event plus climate change)

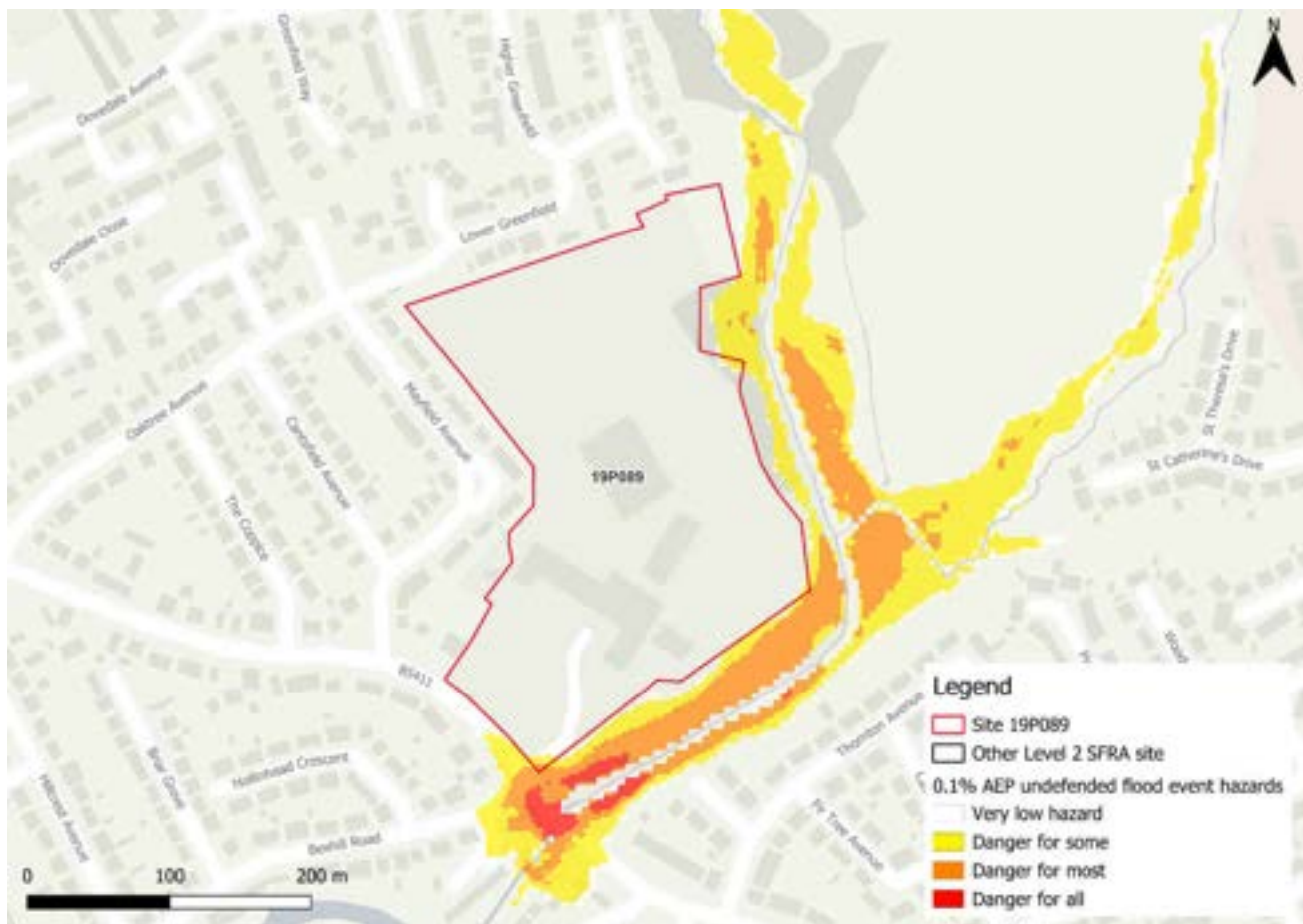


Figure 32-5: Flood hazard for 0.1% AEP undefended flood event (as a proxy for the 1% AEP undefended event plus climate change)

32.3 Flood risk management

The site doesn't benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

32.3.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P089 is located within one catchment, namely; Savick Brook. This is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance²¹.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage

²¹ [Lancashire SuDS Guidance](#)

Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.

- Developments are to aim to achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

32.3.2 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. There is the potential for floodplain reconnection both upstream and adjacent to the site, allowing floodwater from Sharoe Brook to be stored. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown on Figure 32-6.



Figure 32-6: Natural Flood Management (NFM) potential mapping

32.4 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 bridge openings.

There is potential residual risk to the site from a possible blockage of the culvert along Sharoe Brook which runs beneath the B5411 to the south of the site (Figure 2-3). The impact of a blockage of this structure has not been modelled as part of this Level 2 SFRA, as not all files for the Savick Brook model were made available to be able to run the model. It is recommended that the site-specific FRA should consider the impact of a blockage of this culvert on residual flood risk to the site.



Figure 32-7: Potential blockage location

32.4.1 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. 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 not modelled to be at risk from reservoir flooding.

32.5 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

32.6 Flood warning and access and escape routes

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. Site 19P089 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. A small area to the north west of the site is located within a FAA, namely; 012WAFLR- Lower River Ribble and Darwen.

Based on available information, safe access and escape routes could likely be achieved during a flood event via the B5411.

32.7 Observations, mitigation options and site suitability - fluvial

- The site is modelled to be partially within the functional floodplain along the eastern boundary of the site, adjacent to Share Brook. Development is not permitted within the functional floodplain. However, the functional floodplain in this area is conservatively based on the Savick Brook 0.1% AEP defended event, as delineated within the 2019 functional floodplain extent.
- A flood risk activity permit may be required if development is planned within 8m of the riverbank. The EA can advise on whether a permit will be required. If feasible, this area would be used as a green / blue corridor which can provide ecological, social and amenity value.
- The 0.1% AEP undefended event outputs have been used as a proxy to provide a precautionary estimate of the 1% AEP undefended event plus climate change. Based on this approach, fluvial risk is modelled to remain largely similar in extent to the present day Flood Zone 3, with some slightly larger areas of significant depths. However, climate change must be modelled at the site-specific FRA stage to provide a fully robust assessment of future flood risk to the site. At this stage, it cannot be proven that this site can be safe for its lifetime.
- It would be acceptable to use updated climate change modelling to suitably assess risk through a site-specific FRA, as well as/instead of a Level 2 SFRA update.
- The site is at residual risk from possible blockage of the culvert beneath the B5411 downstream of the site. It is recommended that the site-specific FRA should consider the impact of a blockage of this culvert on residual flood risk to the site.

- Safe access and escape should be possible via the B5411 to the south of the site, based on available information.

33 Flood risk from surface water

33.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the high risk surface water flood zone. A further 2% is at low surface water risk, as shown in Table 3-1.

In the high risk event, surface water risk is confined to a short flow path within the centre of the site, constrained by existing development. In the low risk event, risk is slightly greater with some additional short flow paths, constrained by the existing buildings within the site.

Greatest surface water flood depths in the high risk event are between 0.3 m and 0.6 m (Figure 3-1) with some areas of moderate hazard (Figure 3-2). Safe access and escape routes should be possible via the B5411 to the southwest of the site in the high and medium risk events. Safe access and escape routes may not be possible in the low risk event given surface water flooding along the B5411.

Table 3-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
97	2	0	1



Figure 33-1: High risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 33-2: High risk event surface water flood hazard²² (Risk of Flooding from Surface Water map)

33.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 3-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the high risk surface water flood depths plus 40% climate change. Risk is modelled to be slightly greater than the present day high surface water risk flood extent, with multiple short flow paths present across the site constrained by the existing

²² 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

development. Risk is similar in extent and depth to the present day low risk event. Maximum flood depths are modelled to be between 0.3m and 0.6m, with some areas of significant hazard (Figure 33-4).

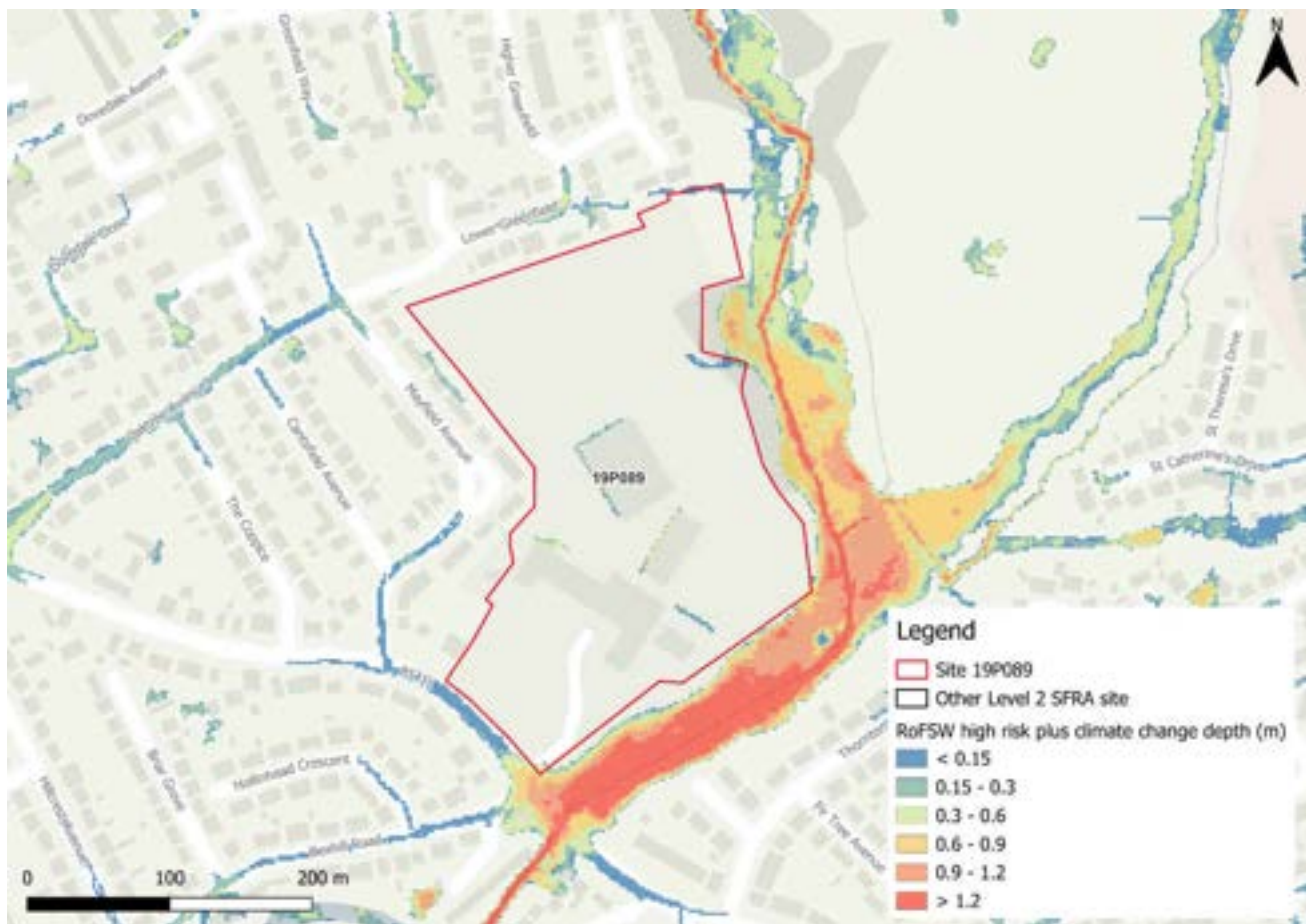


Figure 33-3: High risk event surface water flood depths plus 40% climate change (based on Risk of Flooding from Surface Water map)



Figure 33-4: High risk event surface water flood hazards plus 40% climate change (based on Risk of Flooding from Surface Water map)

33.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 97% of the site being at very low surface water flood risk. In all events, surface water risk is largely confined to areas constrained by existing development as short flow paths. Surface water risk in the high and medium risk events is confined to a flow path constrained by a single existing building.
- Safe access and escape routes should be achievable via B5411 in the high and medium risk events, though may not be possible in the low risk event given the extent surface water flooding along this route.
- The effects of climate change on surface water have been modelled for this SFRA using the high risk surface water flood depths plus 40% climate change. Surface water risk is significantly greater than the present day high risk event, with the climate change event being similar in extent and depth to the present day low risk event. Any existing flow paths should be maintained in site design.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- It is assumed the current structures will be demolished for new housing units. A drainage strategy would therefore be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed residential development or whether further capacity will be required.
- 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 or evidence.

34 Risk from groundwater

Risk from groundwater sources 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 Guide²³. Figure 4-1 show the map for Site 19P089 and the surrounding areas and Table 4-1 explains the risk classifications.

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.



Figure 34-1: JBA 5m Groundwater Emergence Map

²³ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 4-1: Groundwater Flood 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.	

35 Overall site assessment

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

To pass part b) of the exception test²⁴, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development. Given the absence of modelled climate change data and the use of proxies to inform future fluvial flood risk to the site, it cannot be proven that this site can remain safe for its lifetime and therefore the exception test cannot be passed.

The areas of flood risk within this site cannot be developed until the required information detailed in this SFRA on existing and future flood risk from Sharoe Brook is fully ascertained. This is because, at this stage, it cannot be proven that the site can remain safe for its lifetime. The site can only be allocated if all development can be directed to areas of low flood risk.

Were additional, more detailed modelled information on flood risk become available through an update to the SFRA or through a site-specific FRA, that show the risk area to be lower than currently shown, more of the site could then be developed. Conversely, were the risk to be greater, any development must account for this. Flood risk elsewhere should not be increased as a result of development.

35.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Updated climate change modelling of Sharoe Brook should be used to update this Level 2 SFRA at the earliest opportunity to provide a robust strategic assessment of flood risk to this site and surrounding areas.
- It would be acceptable to use updated modelling to suitably assess risk through a site-specific FRA, as well as/instead of a Level 2 SFRA update.
- There should be no development within the functional floodplain. There should also be no development within 8m of Sharoe Brook. The EA recommend for an 8m no development buffer for all main rivers to enable access for maintenance activities. This should be converted to a blue / green corridor to provide ecological, amenity and social value.
- A detailed drainage strategy will be required for any new development. The use of infiltration SuDS should be investigated.
- The site is at potential residual risk from a possible blockage of the culvert beneath the B5411, which should be considered as part of a site-specific FRA.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.

²⁴ Para 178 National Planning Policy Framework 2024

- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P095

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Georgina Williams of JBA Consulting carried out this work.

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We would like to thank the Environment Agency for their assistance with this work

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37 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P095. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

37.1 Site 19P095

- Location: Land to the Rear of Laburnum House Farm and North West of Bartle Lane, Lower Bartle, Preston, PR4 0RU
- Existing site use: Agricultural
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 2.5 hectares
- Proposed development impermeable area: 2.2 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 37-1: Existing site location boundary

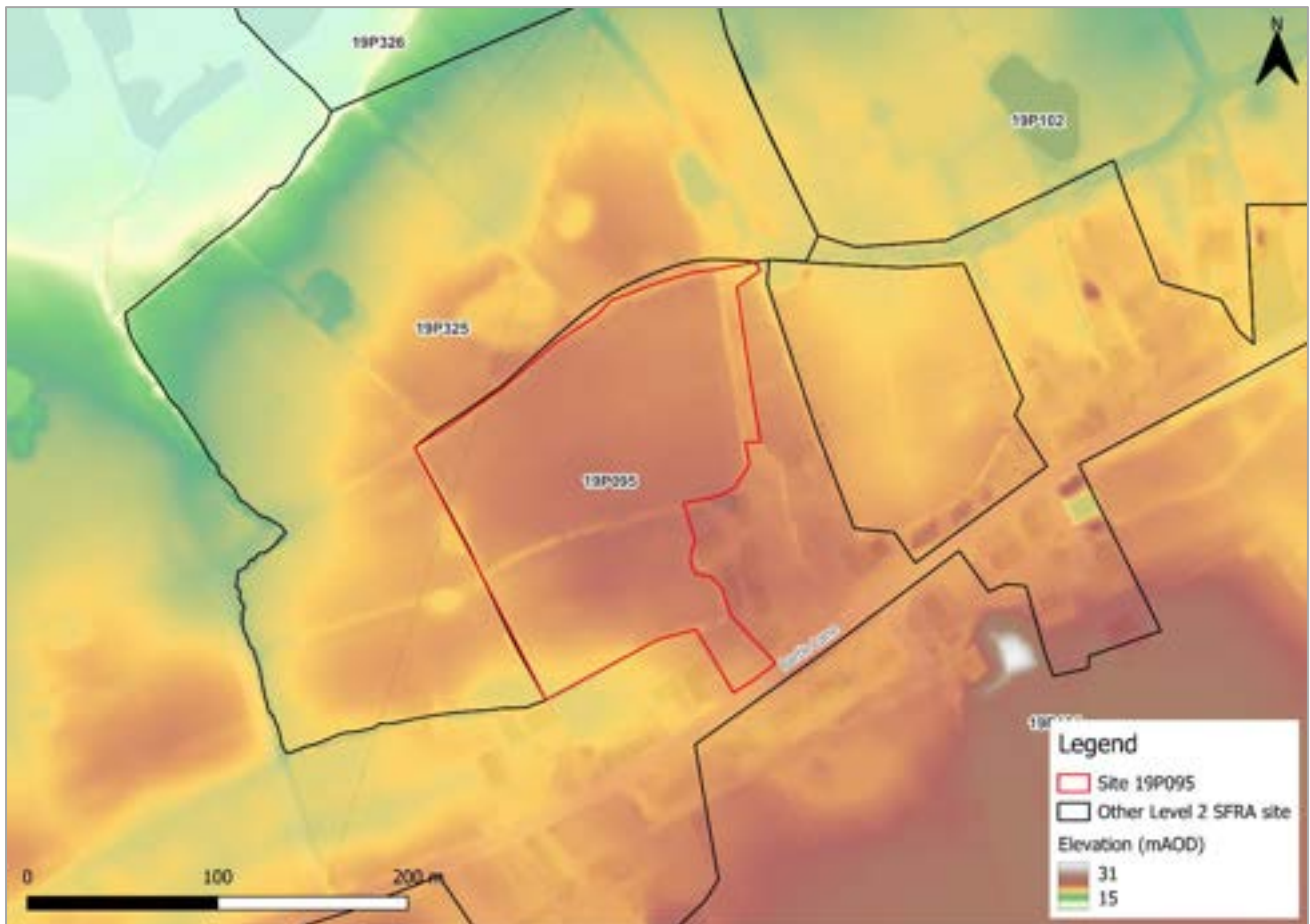


Figure 37-2: Topography

38 Flood risk from rivers

38.1 Existing risk

38.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is modelled to be entirely within Flood Zone 1 indicating it is at low risk from flooding from rivers.

Table 38-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

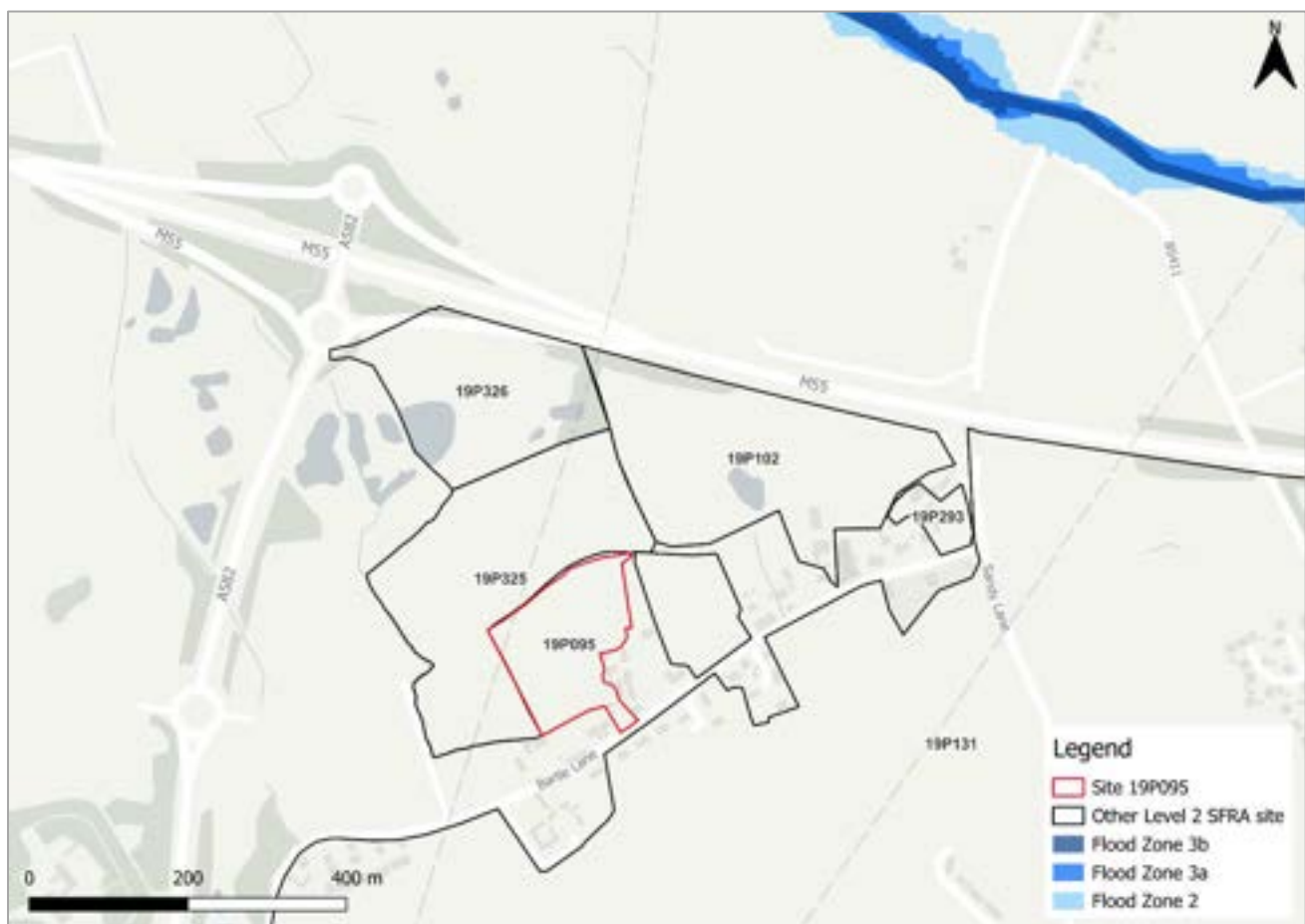


Figure 38-1: Existing risk from rivers to the site

38.2 Flood risk management

The site doesn't benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

38.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P095 is located within one catchment, namely; Woodplumpton Brook. This is ranked as a higher sensitivity catchment. Planning policy considerations for sites at higher sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

38.2.2 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. Across the whole site it is identified there is potential for wider catchment tree planting, which can intercept, slow, store and filter water. Within the south of the site, there is also potential for riparian tree planting, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. In the south corner of the site, there is a small area with potential for runoff attenuation features. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 38-2.

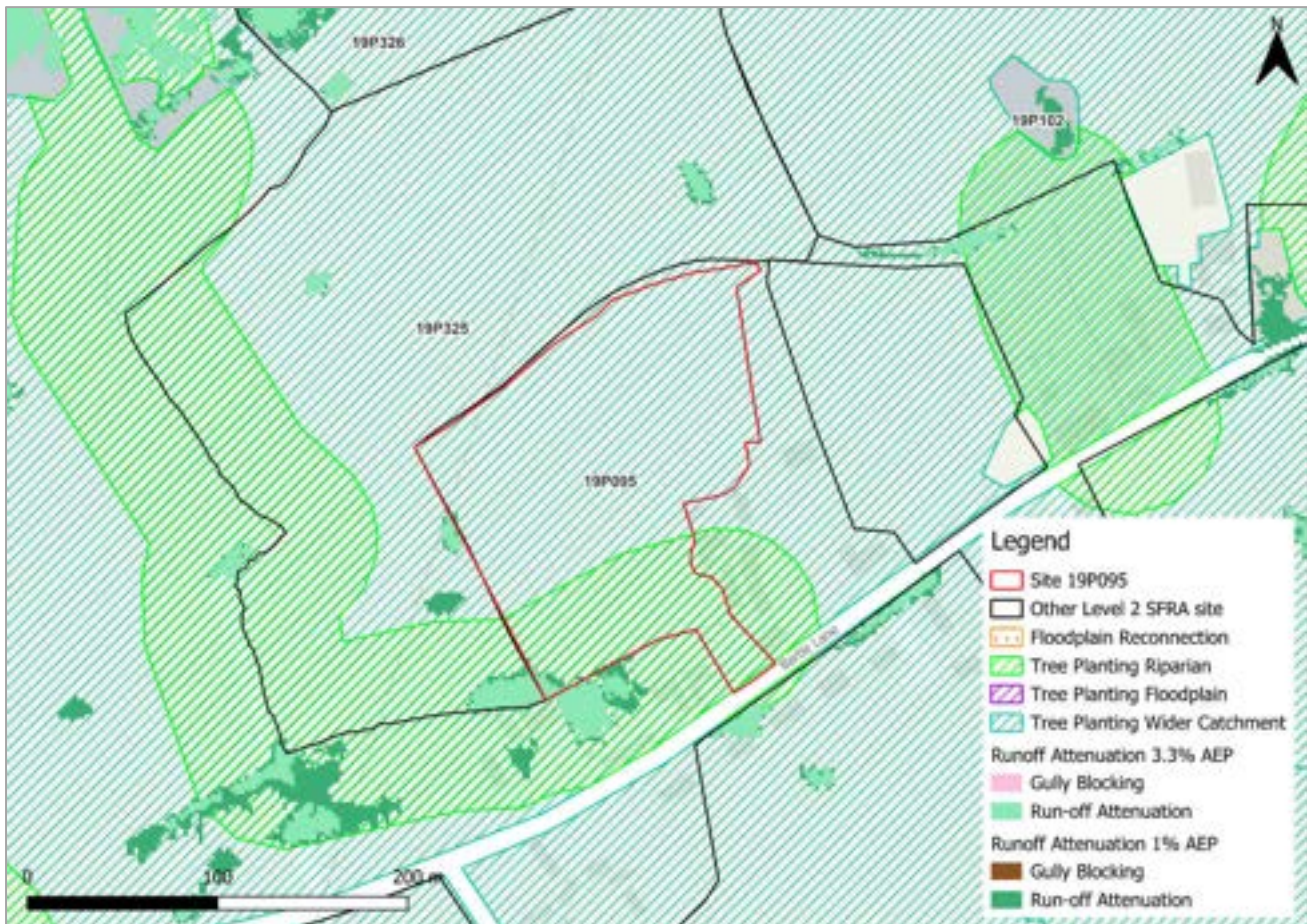


Figure 38-2: Natural Flood Management (NFM) potential mapping

38.3 Residual risk

38.3.1 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. 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 not modelled to be at risk from reservoir flooding.

38.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

38.5 Flood warning and access and escape routes

The site is not located within a Flood Warning Area (FWA) or a Flood Alert Area (FAA).

Based on available information, safe access and escape routes could likely be achievable via Bartle Lane to the south east of the site.

38.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site 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).
- The site is located wholly within Flood Zone 1.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P102, 19P131, 19P325 and 19P326, 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.

39 Flood risk from surface water

39.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the high risk surface water flood zone. A further 1% is at medium risk and 2% is at low surface water risk, as shown in Table 39-1.

In the high risk event, surface water risk is confined to a small area in the southern corner of the site within a topographic low spot. In the medium risk event, risk slightly increases in both depth and extent at the southeastern corner of the site. In the low risk event, risk is slightly greater in the southern corner of the site. There is also risk along the western and north east boundary of the site.

Greatest surface water flood depths in the medium risk event are between 0.3m and 0.6m (Figure 3-1) with some areas of significant hazard (Figure 3-2). Safe access and escape routes should be possible via Bartle Lane to the south of the site during all events, though in the low risk event there are low surface water depths on Bartle Lane which should be considered.

Table 39-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
96	2	1	1

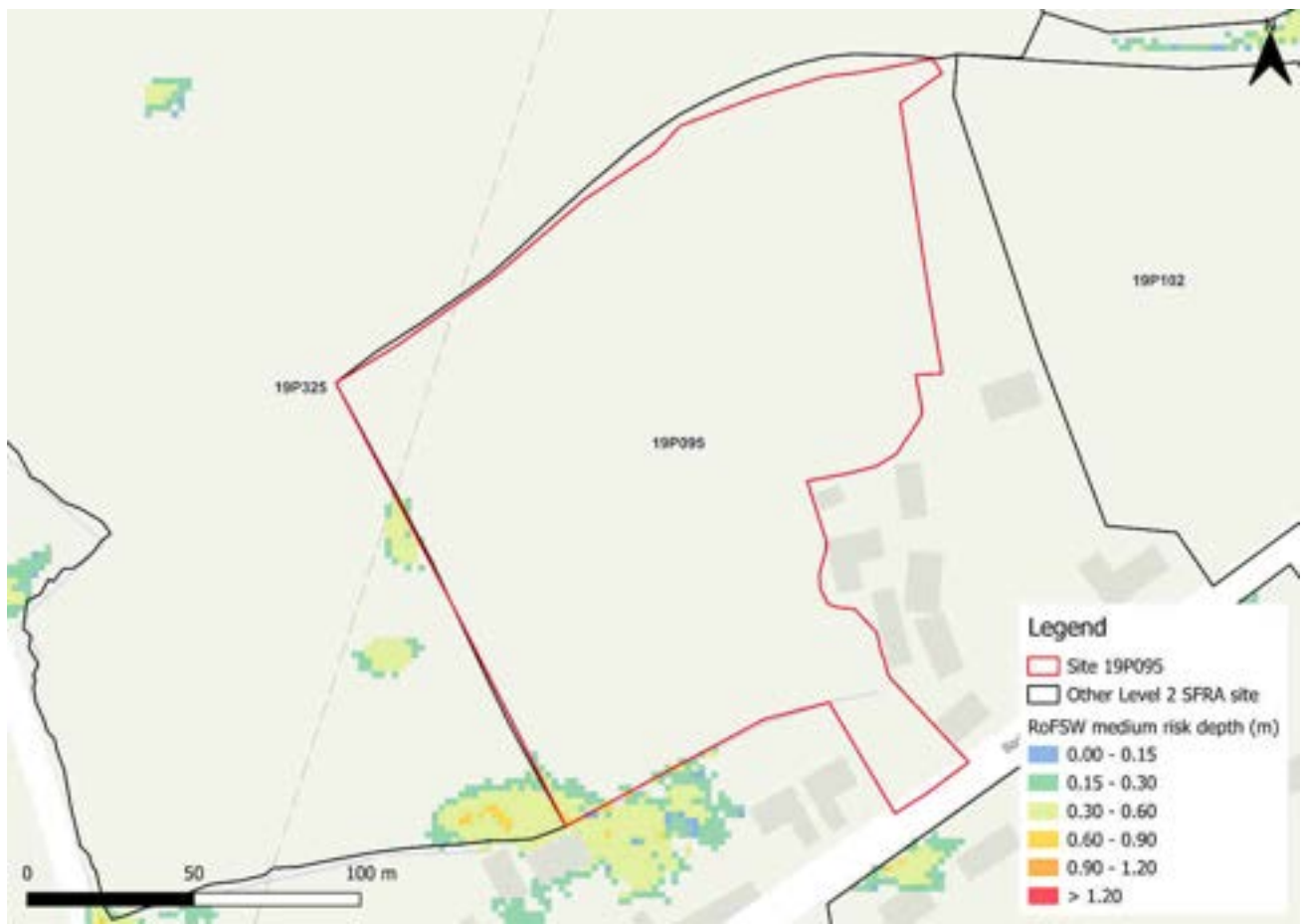


Figure 3-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

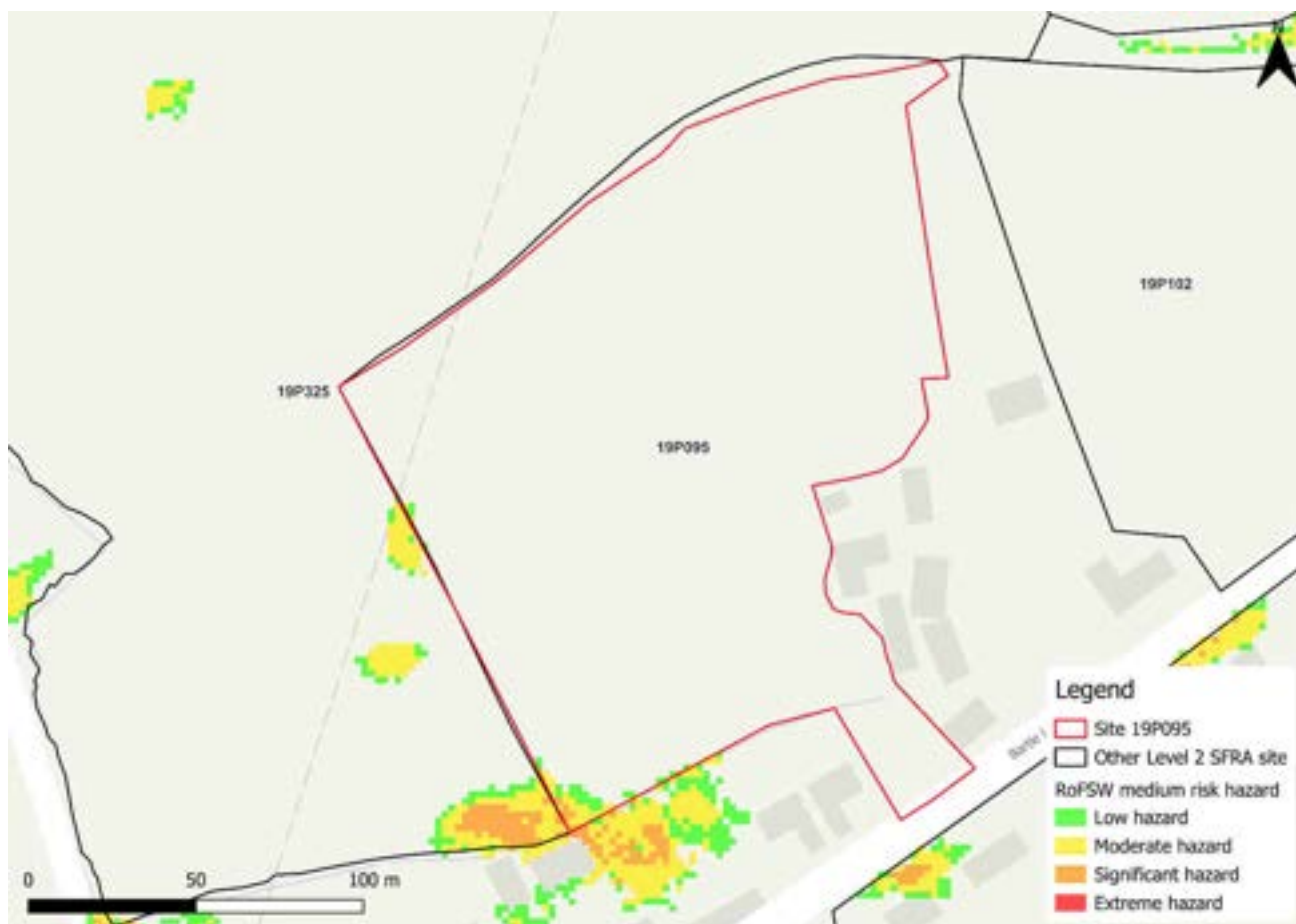


Figure 3-2: Medium risk event surface water flood hazard²⁵ (Risk of Flooding from Surface Water map)

39.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 39-2.

Table 39-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be greater than for present day conditions, with the medium risk climate change event showing a similar level of risk to the low risk present day

²⁵ 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

event. Maximum flood depths are modelled to be between 0.6 and 0.9 m, with some areas of significant hazard (Figure 3-4). Safe access and escape routes should remain achievable via Bartle Lane

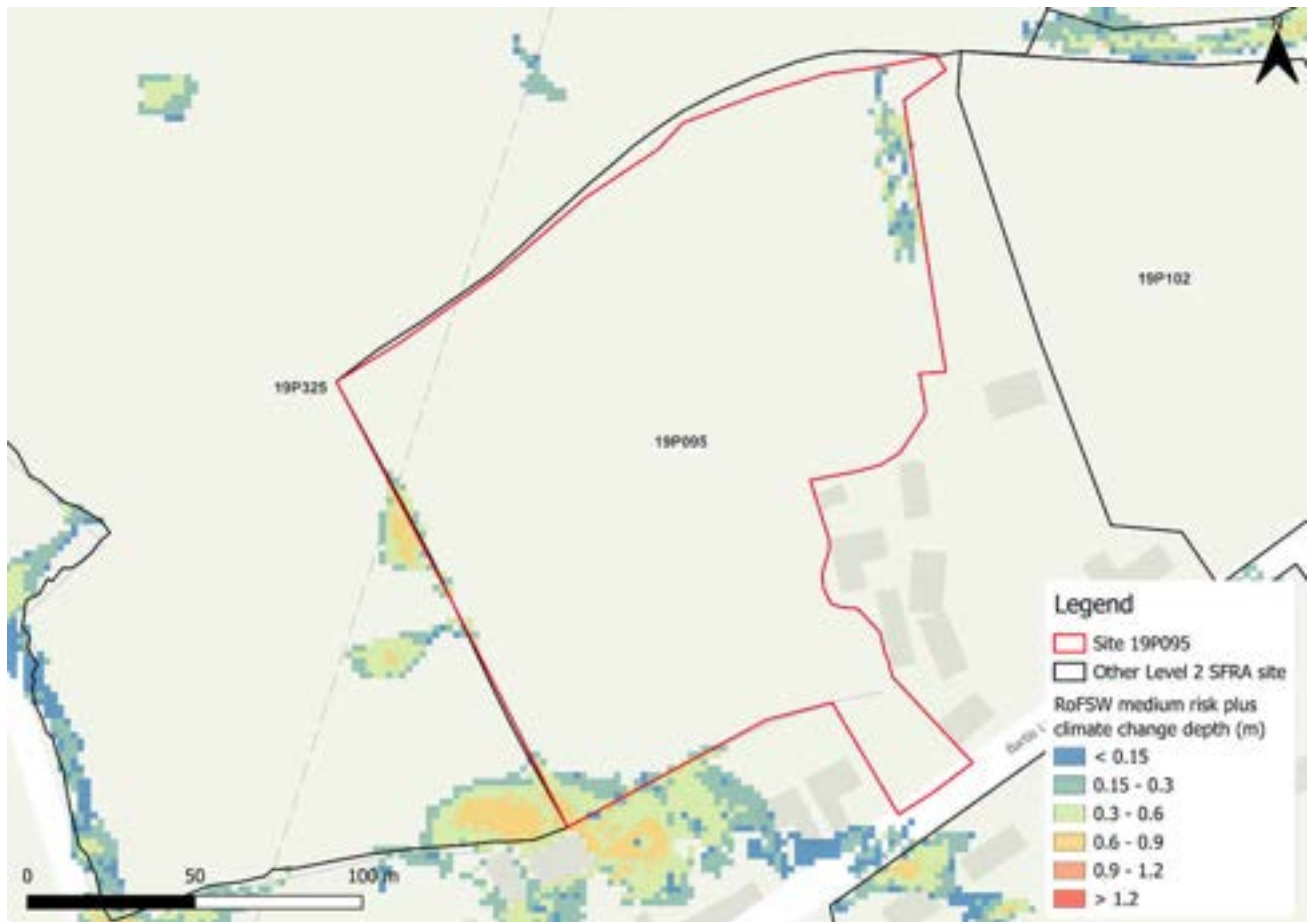


Figure 3-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

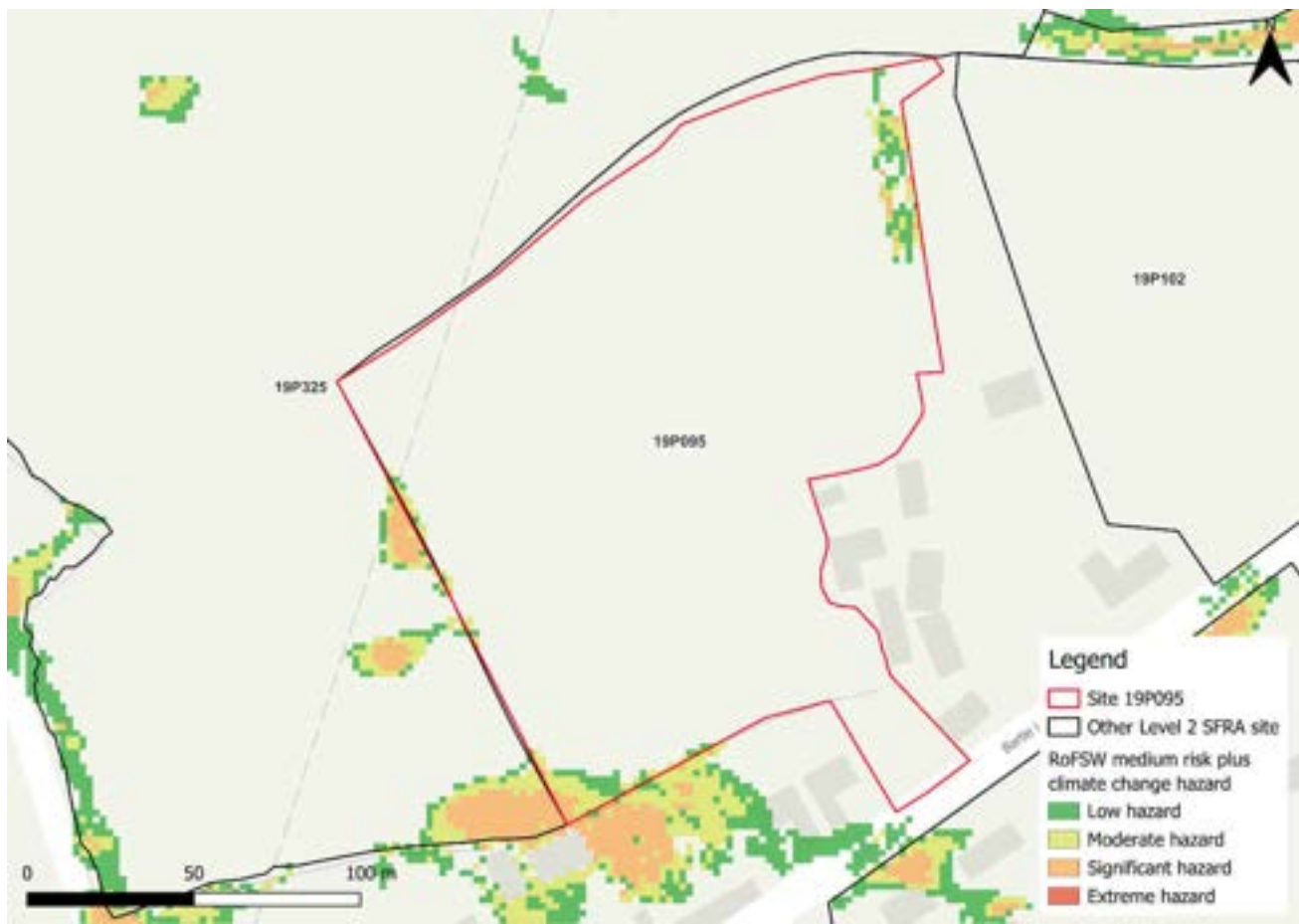


Figure 3-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

39.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 96% of the site being at very low surface water flood risk. Surface water risk in the high and medium risk events is confined to the southeastern corner of the site. Safe access and escape routes should be achievable via Bartle Lane in the high and medium events, though in the low risk event there are shallow surface water depths on Bartle Lane which should be considered.
- The effects of climate change on surface water have been modelled for this SFRA using the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be greater than present day, showing a similar level of risk to the low risk present day event.
- Topographic depressions and flow paths should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development. Development should be directed away from the southwestern corner of the site where there is significant ponding. This area should remain as open greenspace.

- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Were development plans to proceed, a full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.

40 Flood risk from groundwater

Flood risk from groundwater sources 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 Guide²⁶. Figure 4-1 show the map for Site 19P095 and the surrounding areas and Table 40-1 explains the risk classifications.

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.

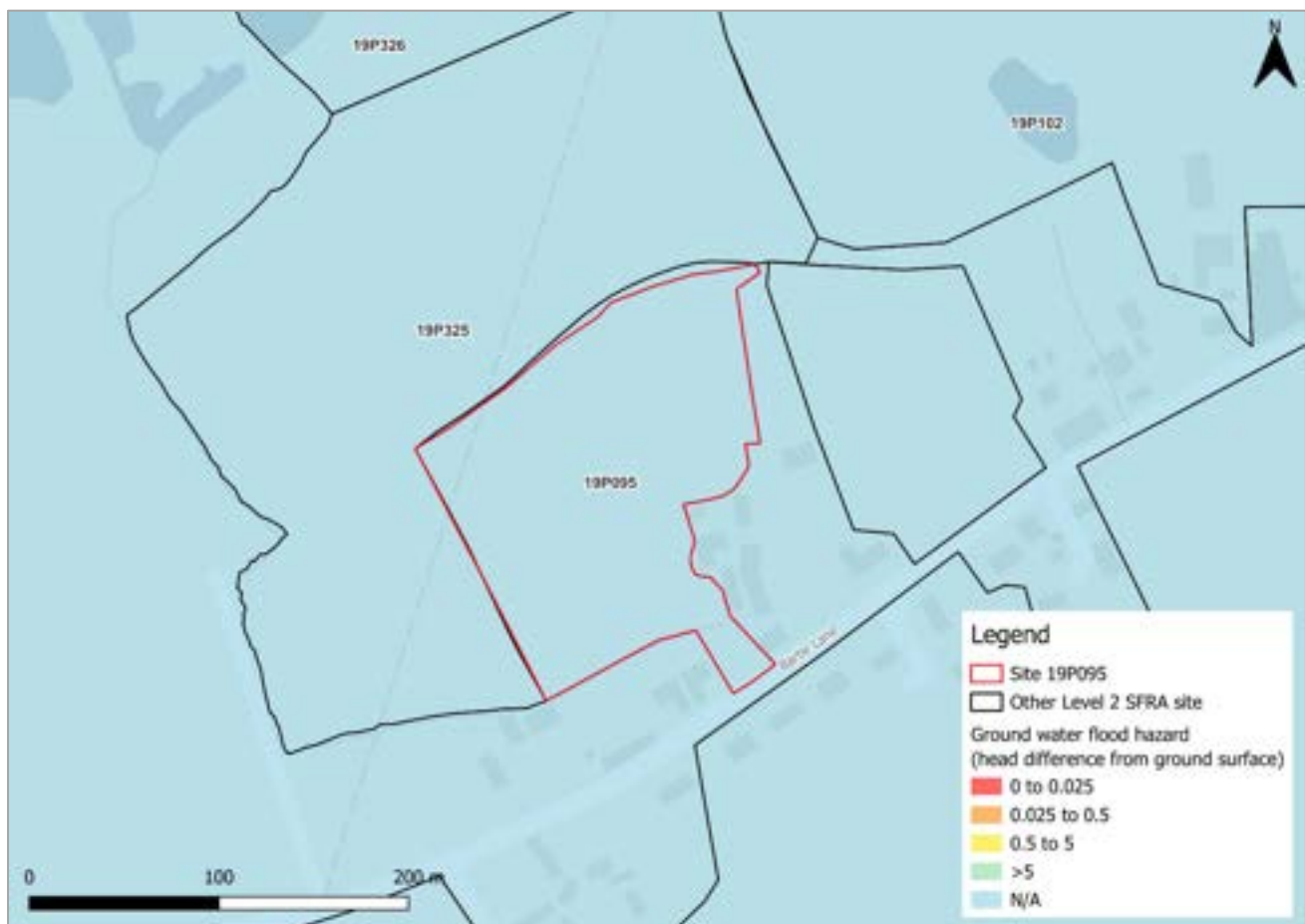


Figure 4-1: JBA 5m Groundwater Emergence Map

²⁶ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 40-1: Groundwater Flood 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.	

41 Overall site assessment

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

This site is not required to pass part b) of the exception test²⁷ 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.

41.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

²⁷ Para 178 National Planning Policy Framework 2024

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Georgina Williams of JBA Consulting carried out this work.

Purpose and Disclaimer

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Acknowledgements

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43 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P102. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' and read the 'Central Lancashire Level 2 SFRA Main Report' and is therefore familiar with the terminology used in this report.

43.1 Site 19P102

- Location: Land Adjoining Mayors Farm, Bartle Lane, Lower Bartle
- Existing site use: Mixed use (agricultural and housing)
- Existing site use vulnerability: More vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 8.5 hectares
- Proposed development impermeable area: 7.2 hectares (assumed 85% impermeable area)
- Watercourse: several unnamed drains
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 43-1: Existing site location boundary

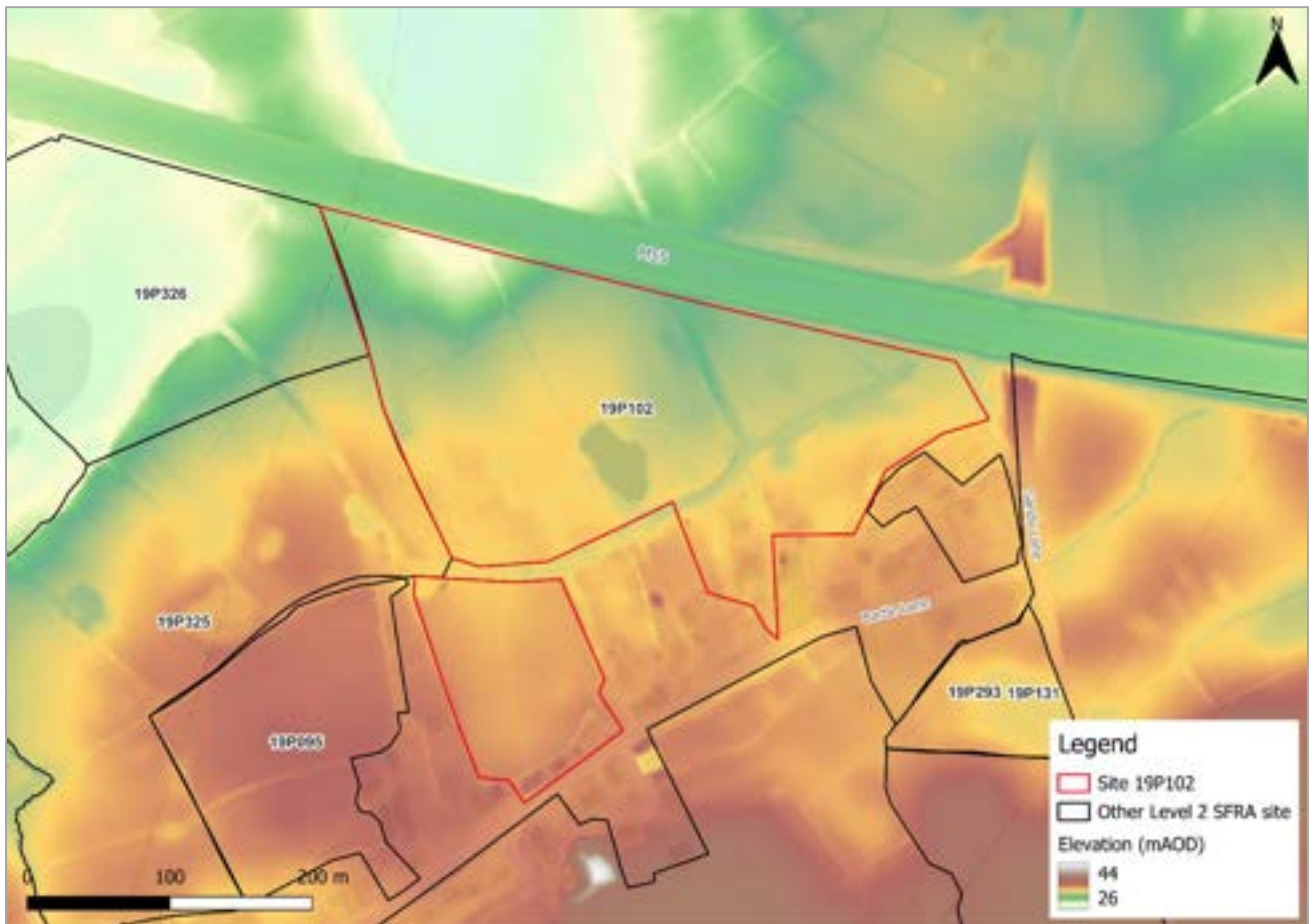


Figure 43-2: Topography

44 Flood risk from rivers

44.1 Existing risk

44.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is entirely within Flood Zone 1 indicating it is at low risk of flooding from rivers. However, there are several unmodelled drains / ditches on and around the site.

Table 44-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 44-1: Existing risk from rivers to the site

44.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

44.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P102 is located within one catchment, namely; Woodplumpton Brook. This is ranked as a higher sensitivity catchment. Planning policy considerations for sites at higher sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

44.2.2 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. Across the majority of both site parcels there are significant opportunities for wider catchment tree planting to reduce runoff downstream. Within the east and south of the larger site parcel and along the northeastern boundary of the smaller site parcel, there is also potential for riparian tree planting, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. There are also several small areas within the larger site parcel with potential for runoff attenuation features. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 44-2.

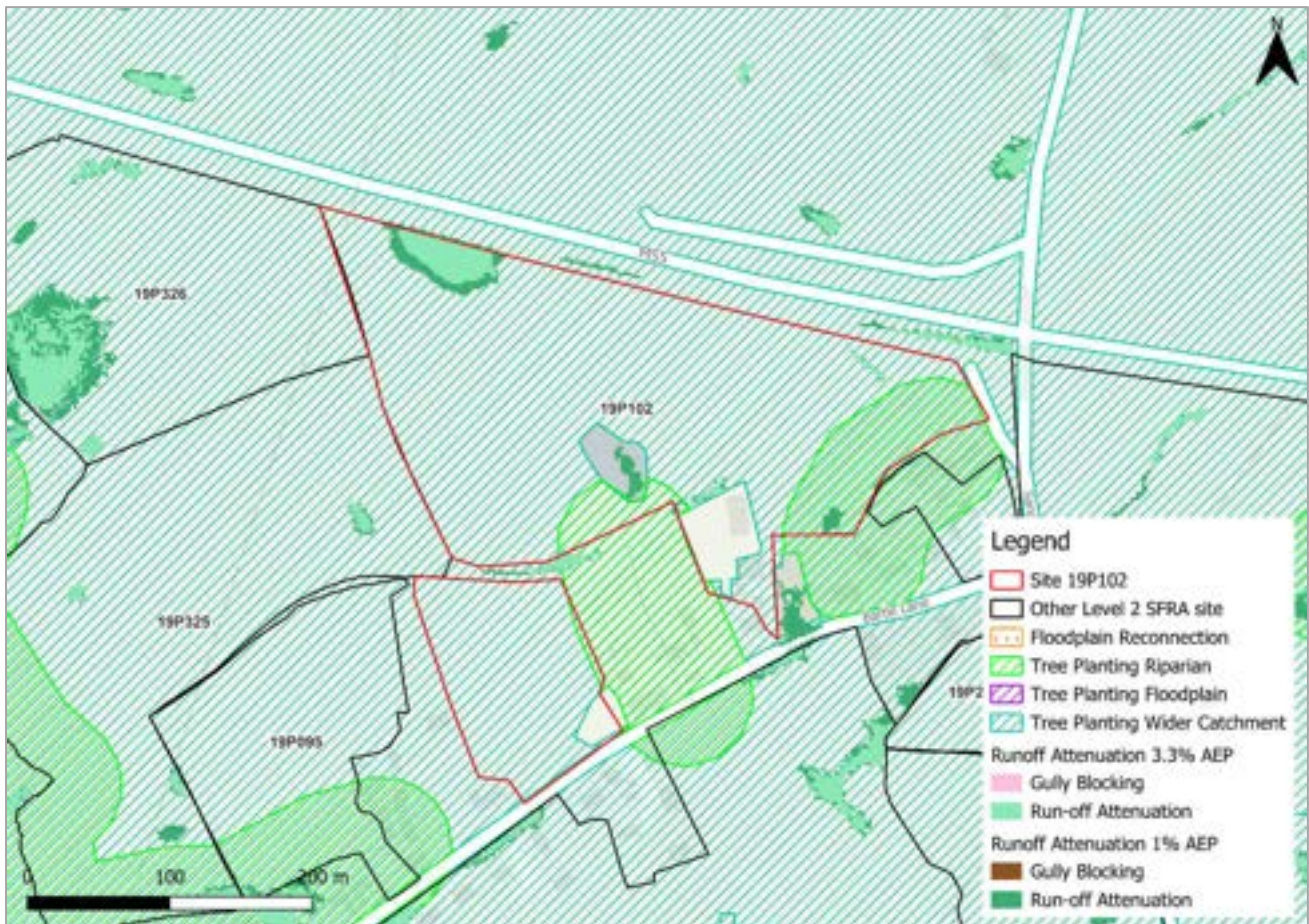


Figure 44-2: Natural Flood Management (NFM) potential mapping

44.3 Residual risk

44.3.1 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. 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 not modelled to be at risk from reservoir flooding.

44.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

44.5 Flood warning and access and escape routes

There are no Flood Warning Areas (FWA) or Flood Alert Areas (FAA) within the vicinity of the site.

Safe access and escape routes should be achievable via Bartle Lane in the south and Sandy Lane to the east of the site.

44.6 Observations, mitigation options and site suitability - fluvial

- The site is wholly within Flood Zone 1. However, there are a number of drains and ditches on and around the site that may influence flood risk to the site. Risk from these drains should be quantified at the FRA stage.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P095, 19P131, 19P293, 19P325 and 19P326, 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.

45 Flood risk from surface water

45.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is within the high risk surface water flood zone. A further 2% is at medium surface water risk and a further 4% is at low surface water risk as shown in Table 45-1.

In the high and medium risk event, surface water ponding is largely confined to the northwest of the site in a topographical low spot, with some additional small areas of ponding. In the low risk event, ponding at the north expands again. The smaller areas of ponding also expand to form flow paths through the site as well as along the southern and northern site boundaries. These flow paths entail the drainage ditches on and around the site.

Greatest surface water flood depths in the medium risk event are >1.2m (Figure 3-1) with a maximum hazard rating of extreme (Figure 3-2). Safe access and escape routes should be possible via Sandy Lane to the east of the site during all events.

Table 45-1: Existing surface water flood risk based on the RoFSW map

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

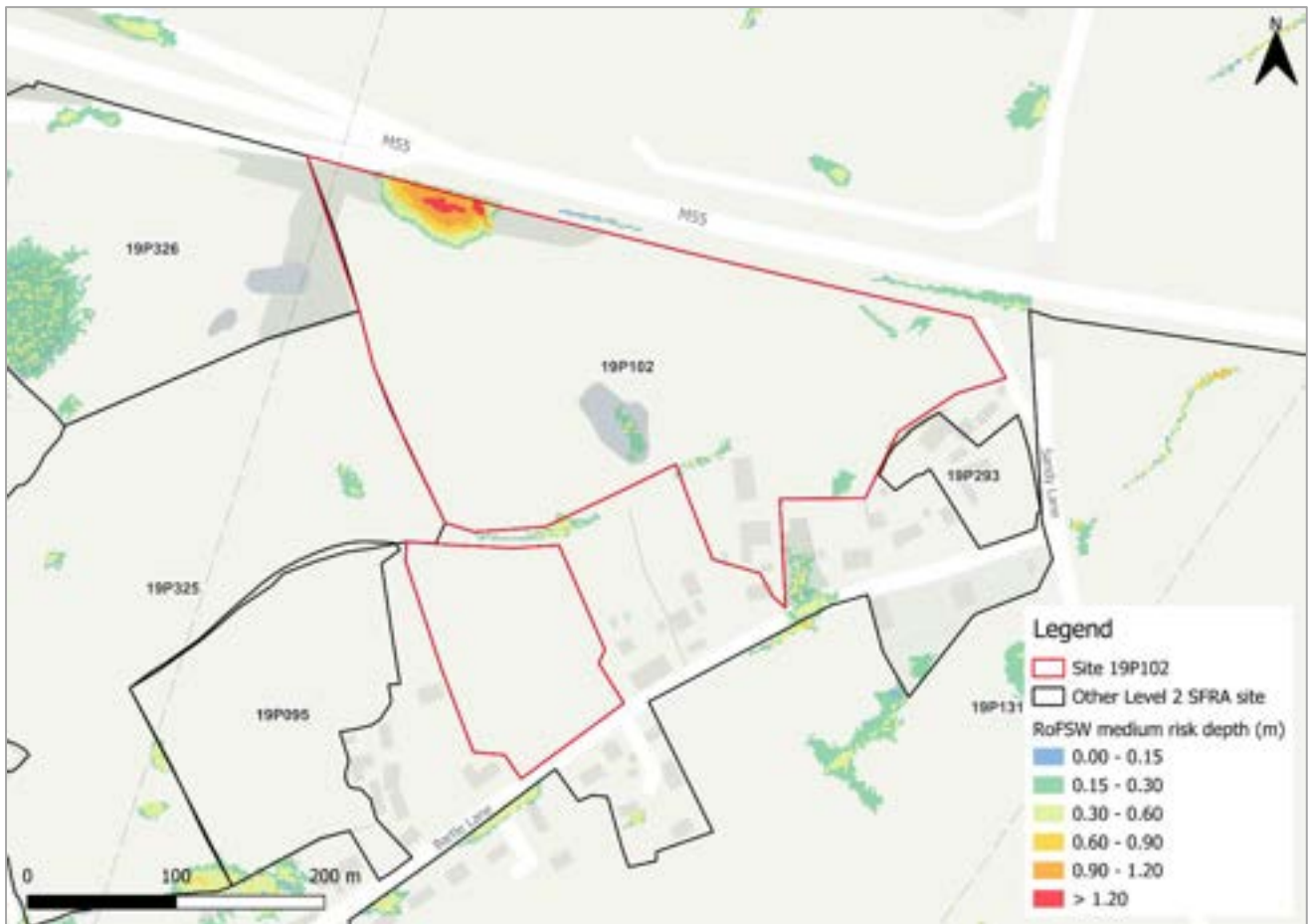


Figure 3-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

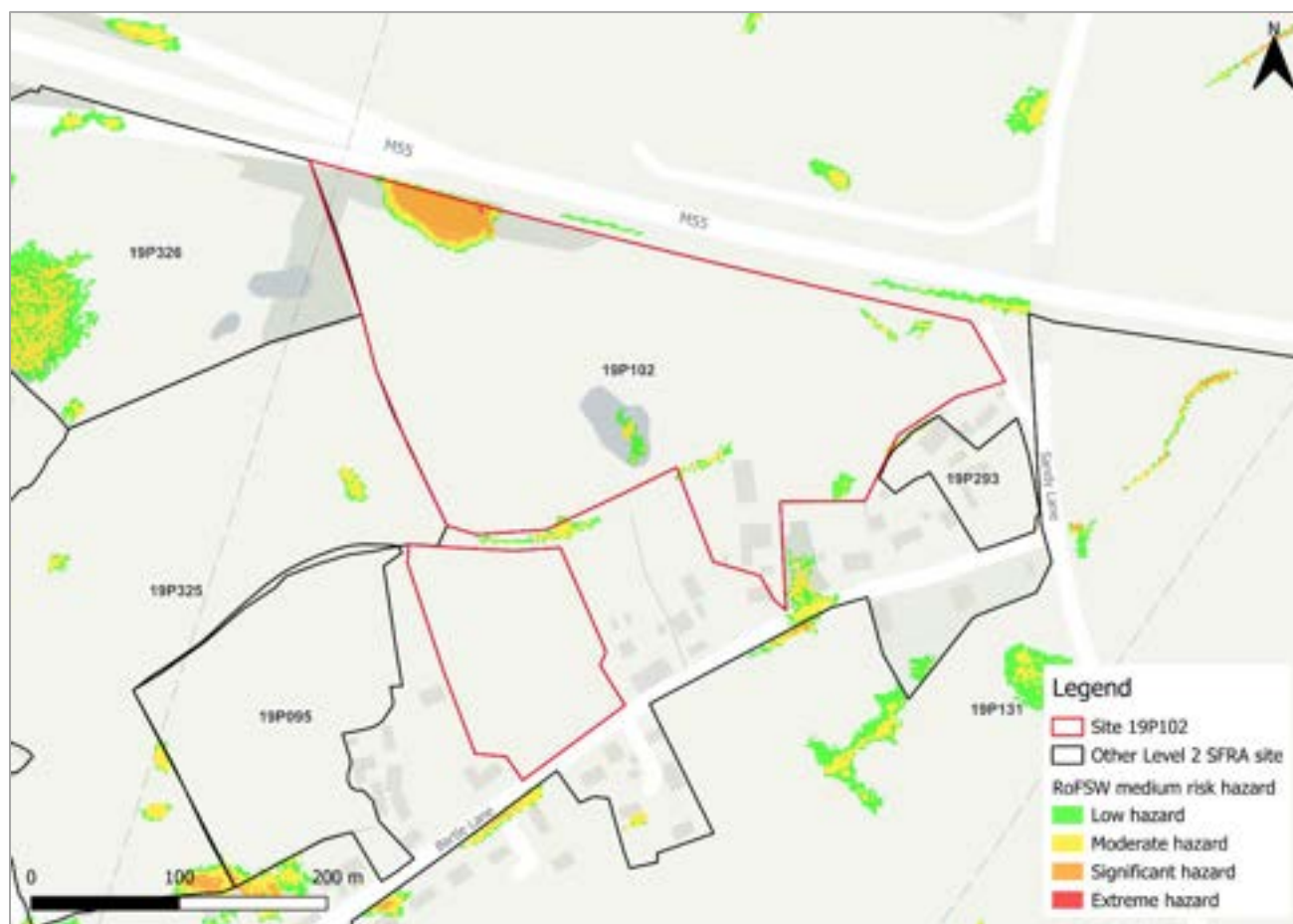


Figure 3-2: Medium risk event surface water flood hazard²⁸ (Risk of Flooding from Surface Water map)

45.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 45-2.

Table 45-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 45-3 shows the surface water flood depths during the medium risk plus 50% climate change event. Risk is modelled to be greater than the present day medium surface water risk flood extent with additional flow paths across the site, similar to the present day low risk

²⁸ 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

event. Maximum flood depths are modelled to remain >1.2m, with some areas of extreme hazard (Figure 3-4). The majority of flow paths are shallow and of low to moderate hazard.

Safe access and escape may still be achievable via Sandy Lane, given the shallower depths of flooding on the road.

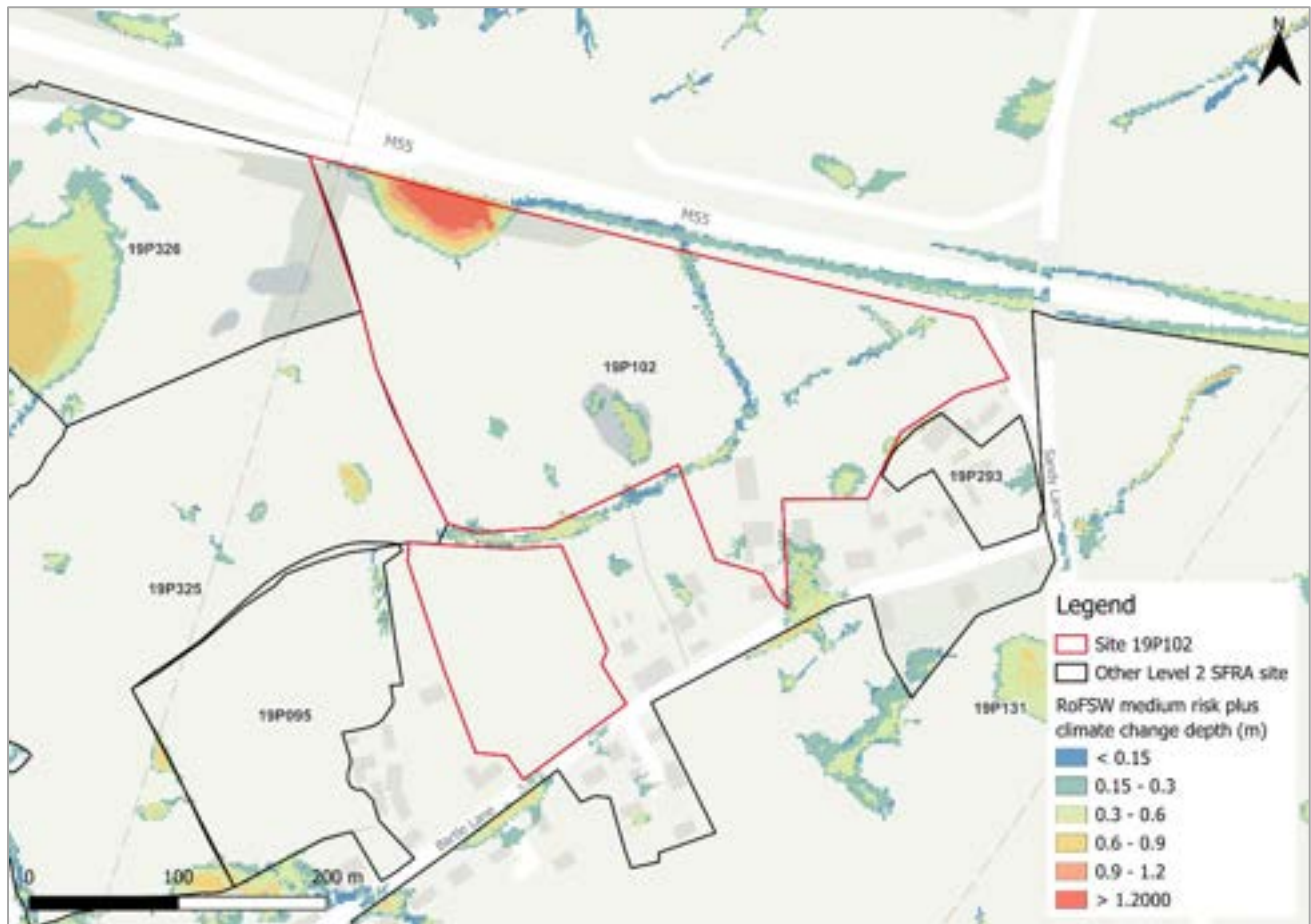


Figure 45-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

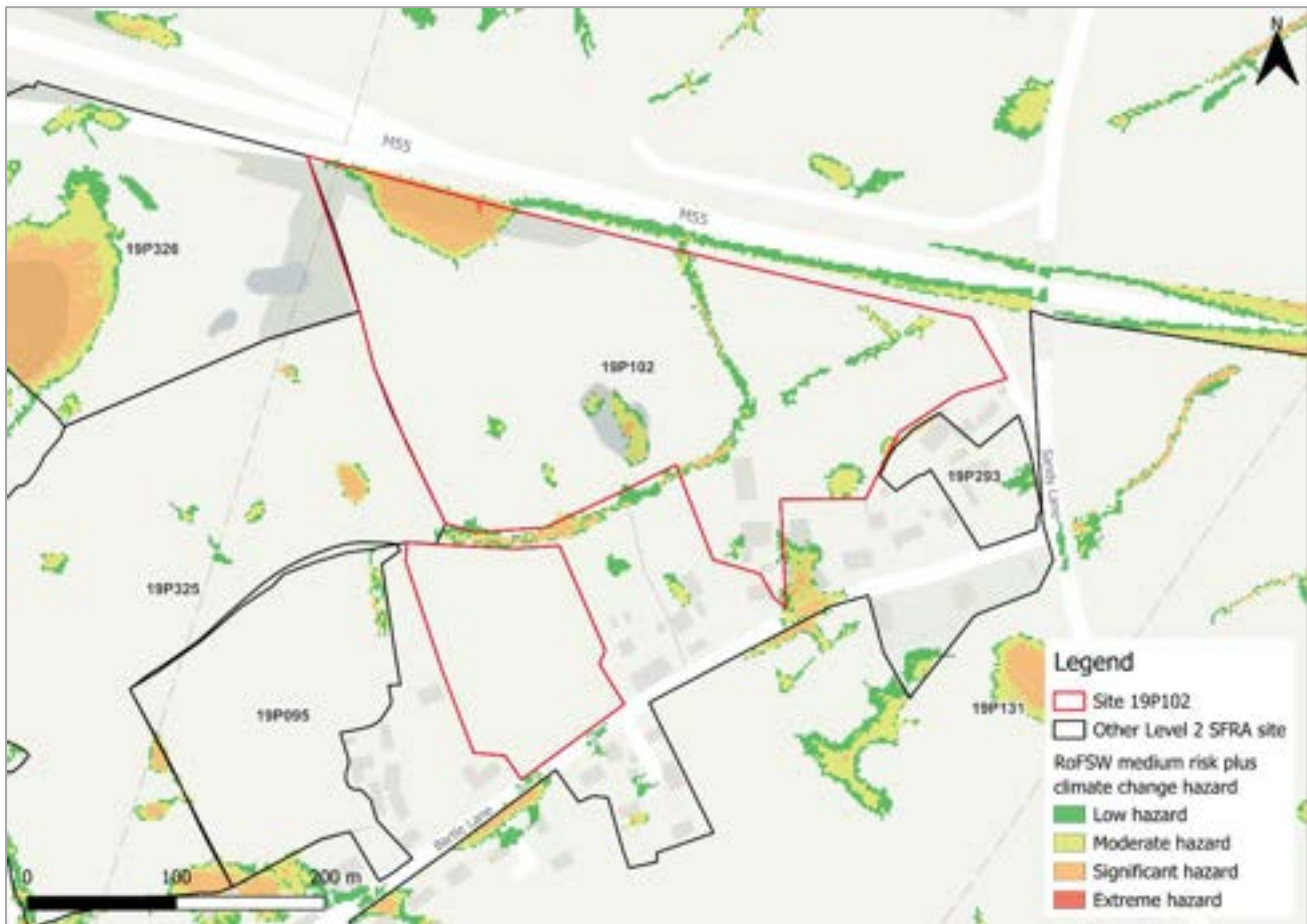


Figure 45-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

45.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 92% of the site being at very low surface water flood risk. Surface water risk in the high and medium risk events is confined to the ponding in the north of the site and short flow paths across the site. Safe access and escape routes should be achievable via Sandy Lane during all events.
- The effects of climate change on surface water have been modelled for this SFRA using the medium risk surface water flood depths plus 50% climate change. Surface water risk is significantly greater than present day flood with additional surface water flow paths forming within the site. Any existing flow paths and ponds should be maintained in site design.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P095, 19P131, 19P293, 19P325 and 19P326, 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.
- Note, 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 or evidence.

46 Risk from groundwater

Risk from groundwater sources 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 Guide²⁹. Figure 4-1 shows the map for Site 19P102 and the surrounding areas and **Error! Reference source not found.** explains the risk classifications.

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.

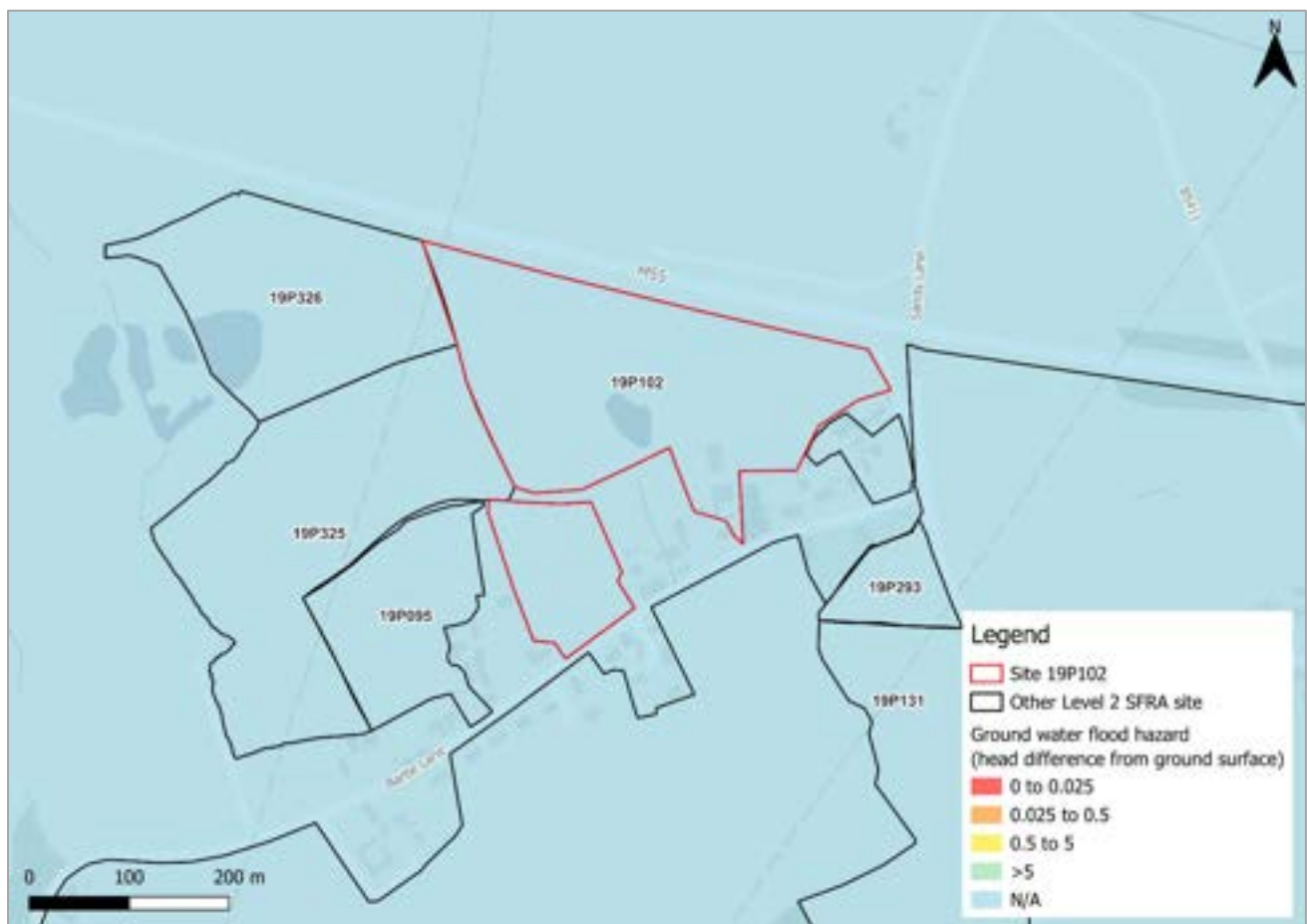


Figure 4-1: JBA 5m Groundwater Flood Map

²⁹ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 46-1: Groundwater Flood 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.

47 Overall site assessment

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

To pass part b) of the exception test³⁰, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- More vulnerable development located in Flood Zone 1 is not required to pass the Exception Test.

47.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, this site could be allocated if development avoids the surface water ponding in the north of the site and the flow path through the site and along the site boundaries. These areas and other flow paths should be incorporated into the site design.
- A drainage strategy will be required for including investigation into the use of infiltration SuDS.
- A wider strategy to develop this cluster of sites in tandem and for consultation between each developer to take place should be considered to ensure a joined-up approach for sustainable development is in place.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

³⁰ Para 178 National Planning Policy Framework 2024

48 Licencing

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P104

Final

February 2025

Prepared for:



www.jbaconsulting.com

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Authorised by	Krista Keating BSc MSc CEnv CSci MCIWEM C.WEM Associate Director

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Contract

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This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P104. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

49.1 Site 19P104

- Location: Heather Moor Cumeragh Lane
- Existing site use: Greenfield (assuming the existing residential property within the site boundary will not be demolished)
- Existing site use vulnerability: Water compatible
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 2 hectares
- Proposed development impermeable area: 1.7 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 49-1: Existing site location boundary

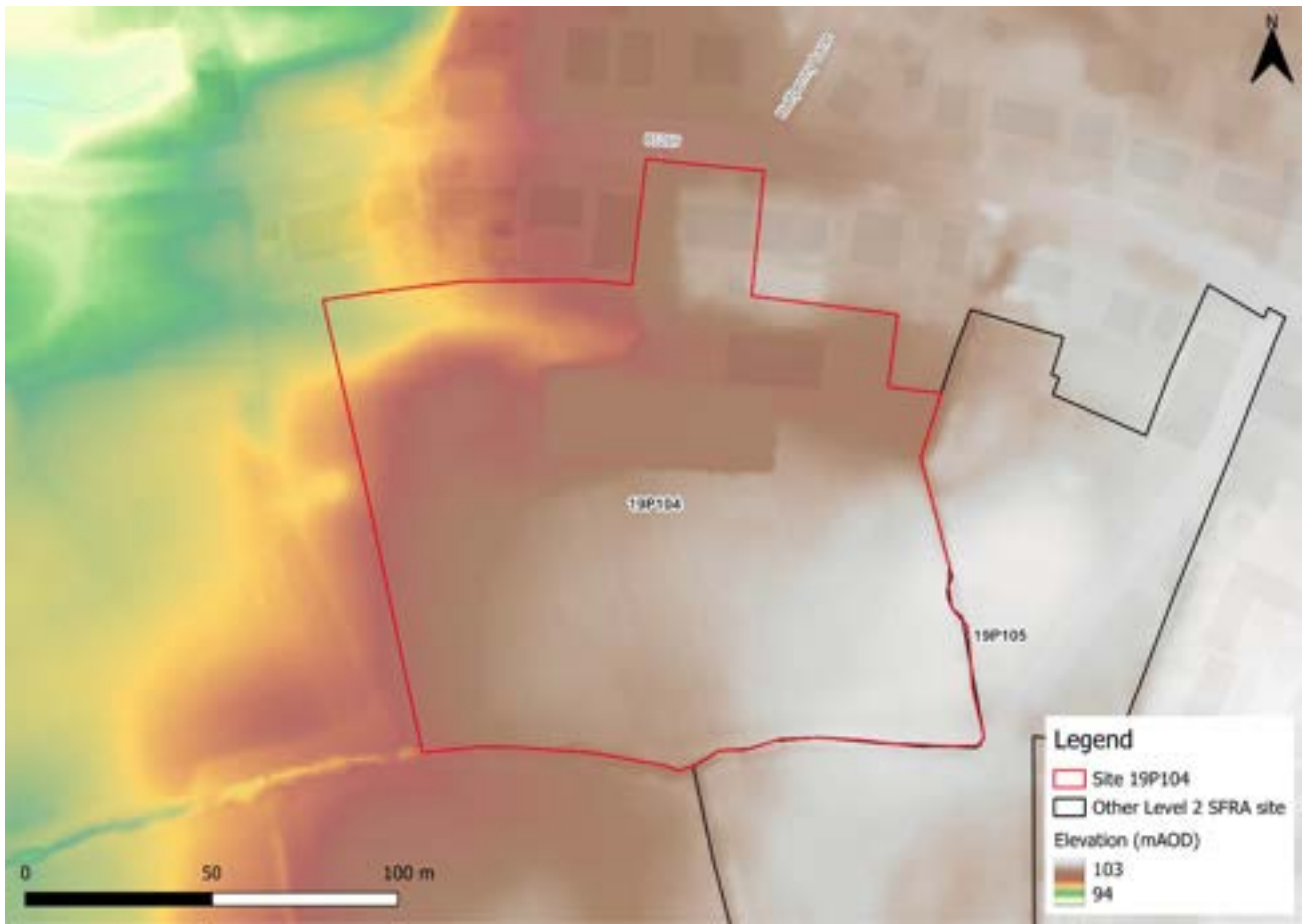


Figure 49-2: Topography

50 Flood risk from rivers

50.1 Existing risk

50.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is entirely located within Flood Zone 1 indicating it is at low risk from flooding from rivers.

Table 50-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 50-1: Existing risk from rivers to the site

50.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

50.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P104 is located within two catchments, namely; Woodplumpton Brook and Savick Brook. The majority of the site is located within a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

50.2.2 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. Both within and upstream of the site, there is potential for tree planting to slow floodwaters, reduce flood peak height and reduce sediment delivery to the watercourse. There are also opportunities upstream to implement runoff attenuation features to reduce runoff downstream. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 50-2.

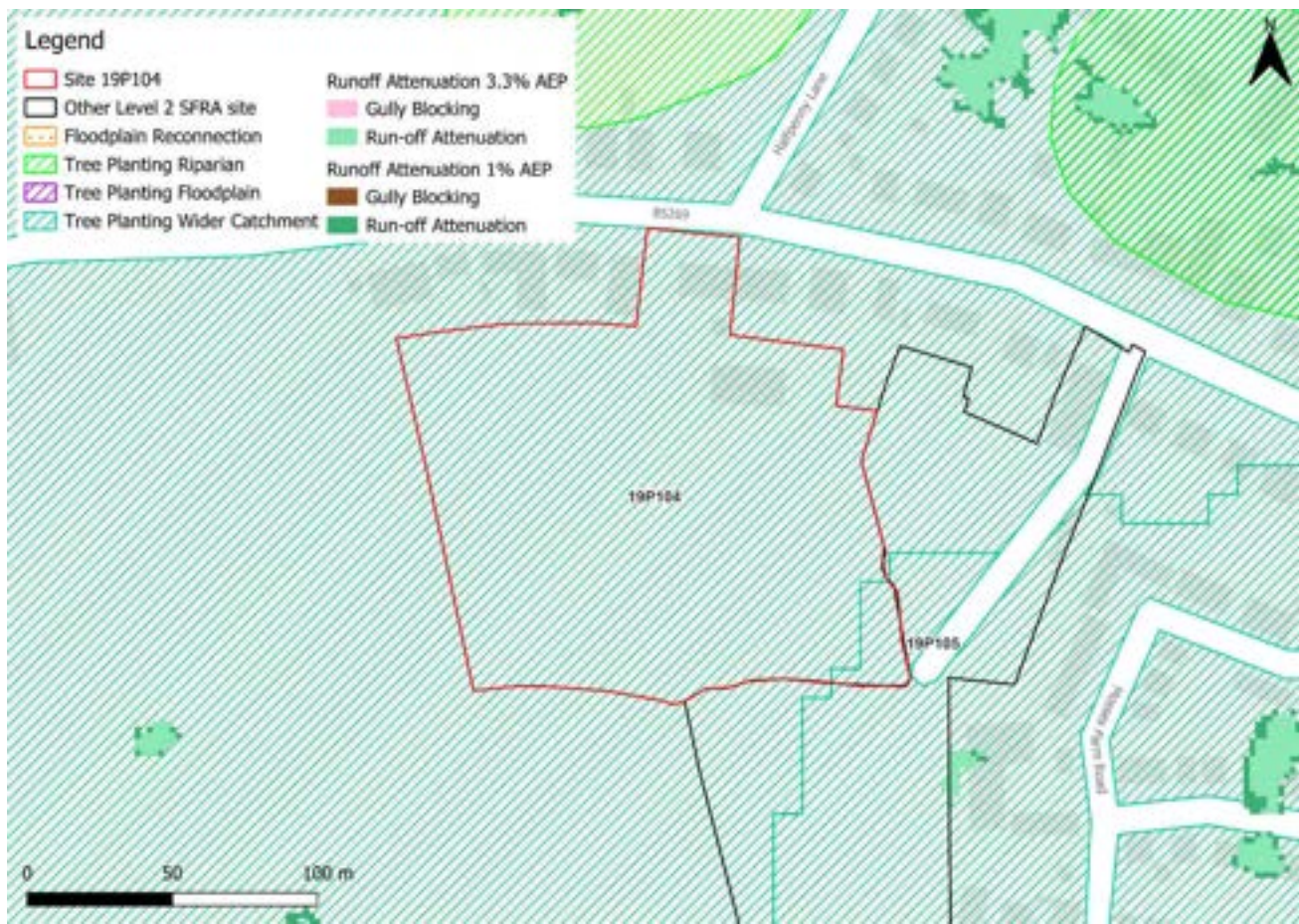


Figure 50-2: Natural Flood Management (NFM) potential mapping

50.3 Residual risk

50.3.1 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. 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 not modelled to be at risk from reservoir flooding.

50.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

50.5 Flood warning and access and escape routes

The site is not located within a Flood Warning Area (FWA) or a Flood Alert Area (FAA).

Based on available information, safe access and escape routes could likely be achieved during a flood event via the B5269 to the north of the site.

50.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site 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 site-specific FRA must show that the development can be designed to be safe for its lifetime and that there is adequate emergency planning provision (para 014 FRCC-PPG).
- The site is located wholly within Flood Zone 1.

51 Flood risk from surface water

51.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is at medium surface water risk and a further 4% is at low surface water risk, as shown in Table 9-1.

In the medium risk event, surface water risk is confined to an area of ponding within a topographic low spot towards the north of the site and is constrained by the existing development on the site. In the low risk event, this area of ponding develops into a flow path extending through the north of the site.

Greatest flood depths in the medium risk event are between 0.15 and 0.3 m (Figure 3-1) with areas of hazard categorised as moderate (Figure 3-2). Safe access and escape should be achievable via the B5269 to the north of the site in all events, given the modelled shallow depths within the low risk event.

Table 51-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
94	4	1	0

-
-



Figure 51-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 51-2: Medium risk event surface water flood hazard³¹ (Risk of Flooding from Surface Water map)

51.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 51-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be greater than for present day conditions. The medium risk climate change event shows a similar level of risk to the low risk present day event,

³¹ 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

with a flow path extending through the north of the site. Maximum depths are between 0.3 and 0.6 m with some areas of significant hazard (Figure 3-4). Safe access and escape routes should remain achievable via the B5269, given the modelled shallow depths.



Figure 51-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 51-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

51.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 94% of the site being at very low risk. Surface water risk in the medium risk event is confined to an area of ponding within a topographic low spot in the north of the site and is constrained by existing development.
- In the low risk event and medium risk surface water event plus climate change, surface water risk is present within a flow path extending through the north of the site.
- Safe access and escape routes should remain achievable via the B5269 in all events.
- Topographic depressions should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.

- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current greenfield rates and, where possible, betterment should be achieved.
- Note, 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 or evidence.

52 Risk from groundwater

Risk from groundwater sources 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 Guide³². Figure 4-1 shows the map for Site 19P104 and the surrounding areas and Table 10-1 explains the risk classifications.

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.

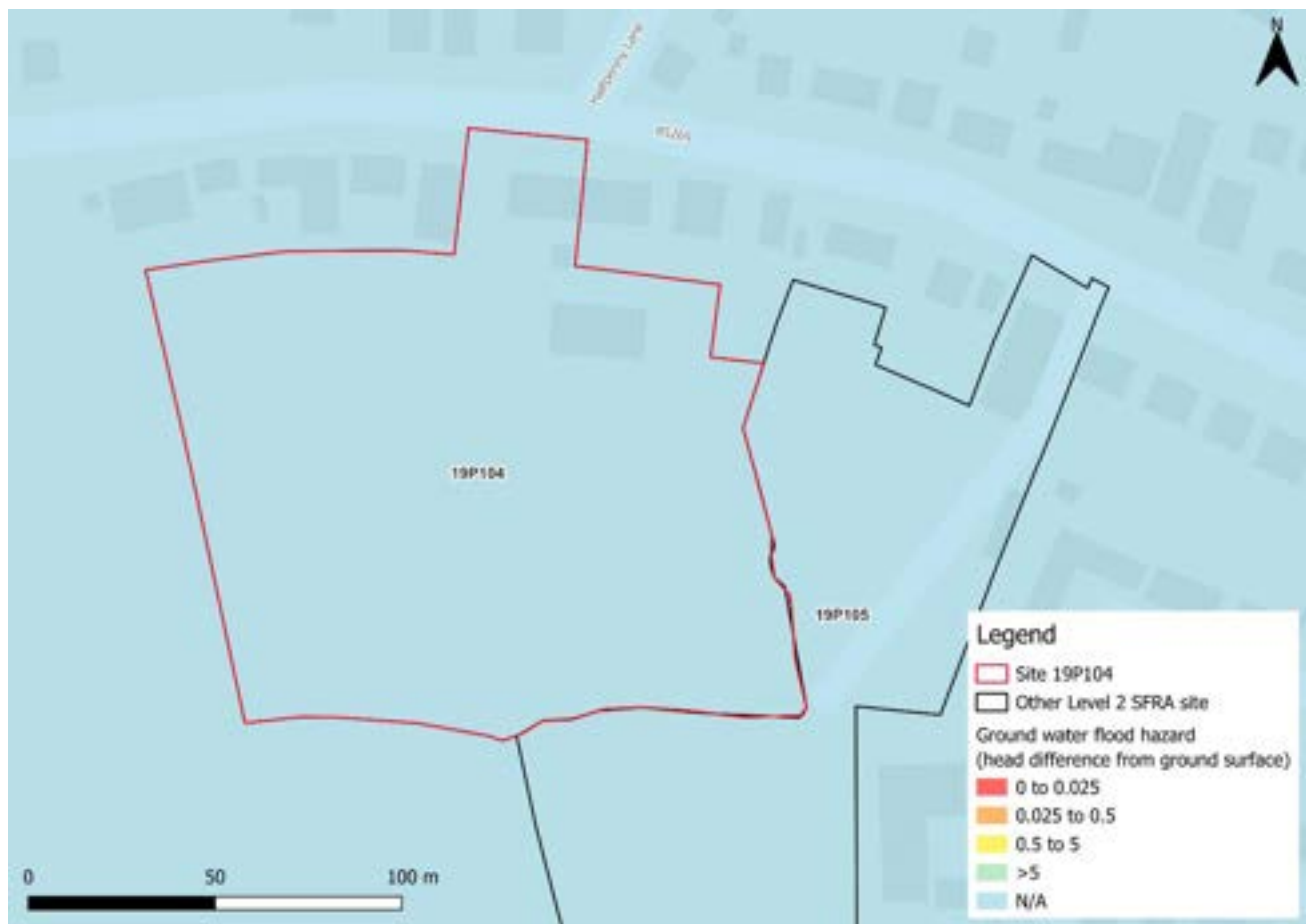


Figure 52-1: JBA 5m Groundwater Emergence Map

³² [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 52-1: Groundwater Flood 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.	

53 Overall site assessment

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

This site is not required to pass part b) of the exception test³³ 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.

53.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

³³ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P105

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll 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 19 August 2024 and 14 February 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.

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

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55 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P105. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

55.1 Site 19P105

- Location: Gorlands, Whittingham Road
- Existing site use: Greenfield (assuming the existing commercial building within the site will not being demolished)
- Existing site use vulnerability: Water compatible
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 1.52 hectares
- Proposed development impermeable area: 1.29 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 55-1: Existing site location boundary



Figure 55-2: Topography

56 Flood risk from rivers

56.1 Existing risk

56.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating that it is at low risk of flooding from rivers.

Table 56-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 56-1: Existing risk from rivers to the site

56.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

56.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P105 is located within two catchments, namely; Savick Brook and Woodplumpton Brook. The majority of the site is located within a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA

56.2.2 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. There is potential for wider catchment tree planting across the site, which will aid in reducing runoff downstream. This is shown in Figure 56-2.

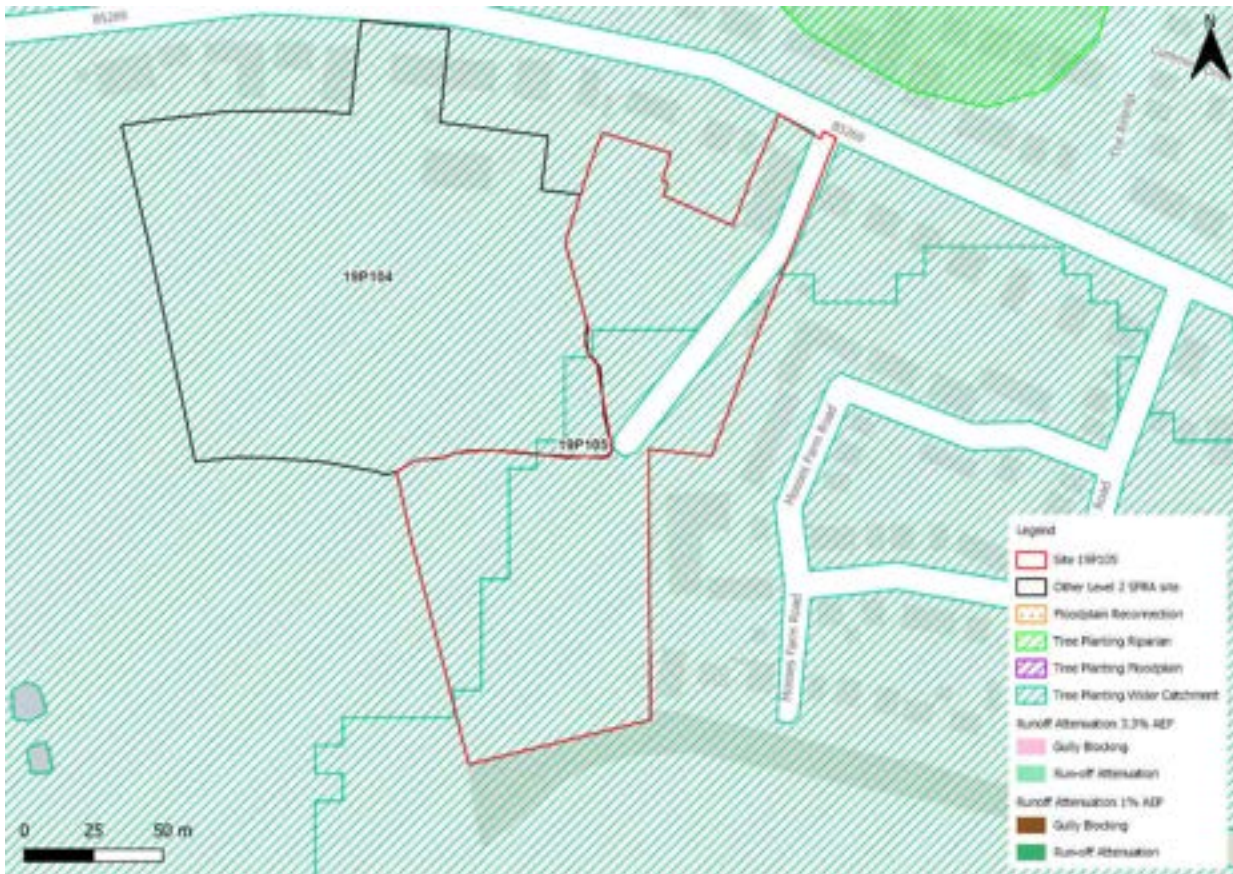


Figure 56-2: Natural Flood Management (NFM) potential mapping

56.3 Residual risk

56.3.1 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. 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 not modelled to be at risk from reservoir flooding.

56.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

56.5 Flood warning and access and escape routes

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 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 an FWA. The site is also not located within a FAA.

Base on available information, safe access and escape routes could likely be achieved during a flood event via the B5269.

56.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in the risk classification from water compatible to more vulnerable, according to NPFF.
- 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 FRC-PPG).
- The site is located wholly within Flood Zone 1.
- Were development of this site to proceed, given the proximity of this site to neighbouring site 19P104, 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.

57 Flood risk from surface water

57.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the low risk surface water flood zone, as shown in Table 57-1.

In the low risk event, surface water is confined to an area of ponding within a topographic low spot along the eastern boundary of the site.

Greatest flood depths in the low risk event are between 0.15 and 0.3 m (Figure 3-1), with some areas of moderate hazard (Figure 3-2). Safe access and escape routes should be possible via the B5269.

Table 57-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
99	1	0	0



Figure 57-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 57-2: Low risk event surface water flood hazard³⁴ (Risk of Flooding from Surface Water map)

57.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2. The site is located within both the Wyre and Ribble management catchments.

Table 57-2: Modelled climate change allowances for rainfall for the Wyre and Ribble management catchments

Return period	Central allowance 2070s (Wyre)	Upper end allowance 2070s (Wyre)	Central allowance 2070s (Ribble)	Upper allowance 2070s (Ribble)
3.3% (high risk)	30%	45%	30%	40%
1% (medium risk)	35%	50%	35%	50%

³⁴ 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

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +45% climate change. Risk is modelled to be greater in extent than the present day low risk event. A surface water flow path is modelled to emerge through the south of the site. Greatest flood depths are modelled to be between 0.3 and 0.6 m (Figure 3-3), with some areas of moderate hazard (Figure 3-4). Safe access and escape routes should remain possible via the B5269.



Figure 57-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 57-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

57.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 99% of the site being at very low risk. Surface water risk in the low risk event is confined to a topographic low spot along the eastern boundary.
- An additional shallow flow path emerges through the south of the site in the modelled medium risk plus climate change event.
- Topographic depressions and flow paths should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- 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 because of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Note, 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 or evidence.

58 Flood risk from groundwater

Flood risk from groundwater sources 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 Guide³⁵. Figure 4-1 show the map for the site and the surrounding areas and Figure 4-1 explains the risk classifications.

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.



Figure 58-1: JBA 5m Groundwater Emergence Map

³⁵ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 58-1: Groundwater Flood 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.	

59 Overall site assessment

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

This site is not required to pass part b) of the exception test³⁶ 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.

59.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

³⁶ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P141

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Reviewed by	Mike Williamson BSc MSc CGeog FRGS EADA Principal Analyst
Authorised by	Krista Keating BSc MSc CEnv CSci MCIWEM C.WEM Associate Director

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JBA Project Code	2023s1344

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61 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P141. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' and read the 'Central Lancashire Level 2 SFRA Main Report' and is therefore familiar with the terminology used in this report.

61.1 Site 19P141

- Location: Preston East Junction 31A M6
- Existing site use: Agricultural
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Employment
- Proposed site use vulnerability: Less vulnerable
- Site area: 25.6 hectares
- Proposed development impermeable area: 21.7 hectares (assumed 85% impermeable area)
- Watercourse: unnamed drain
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk

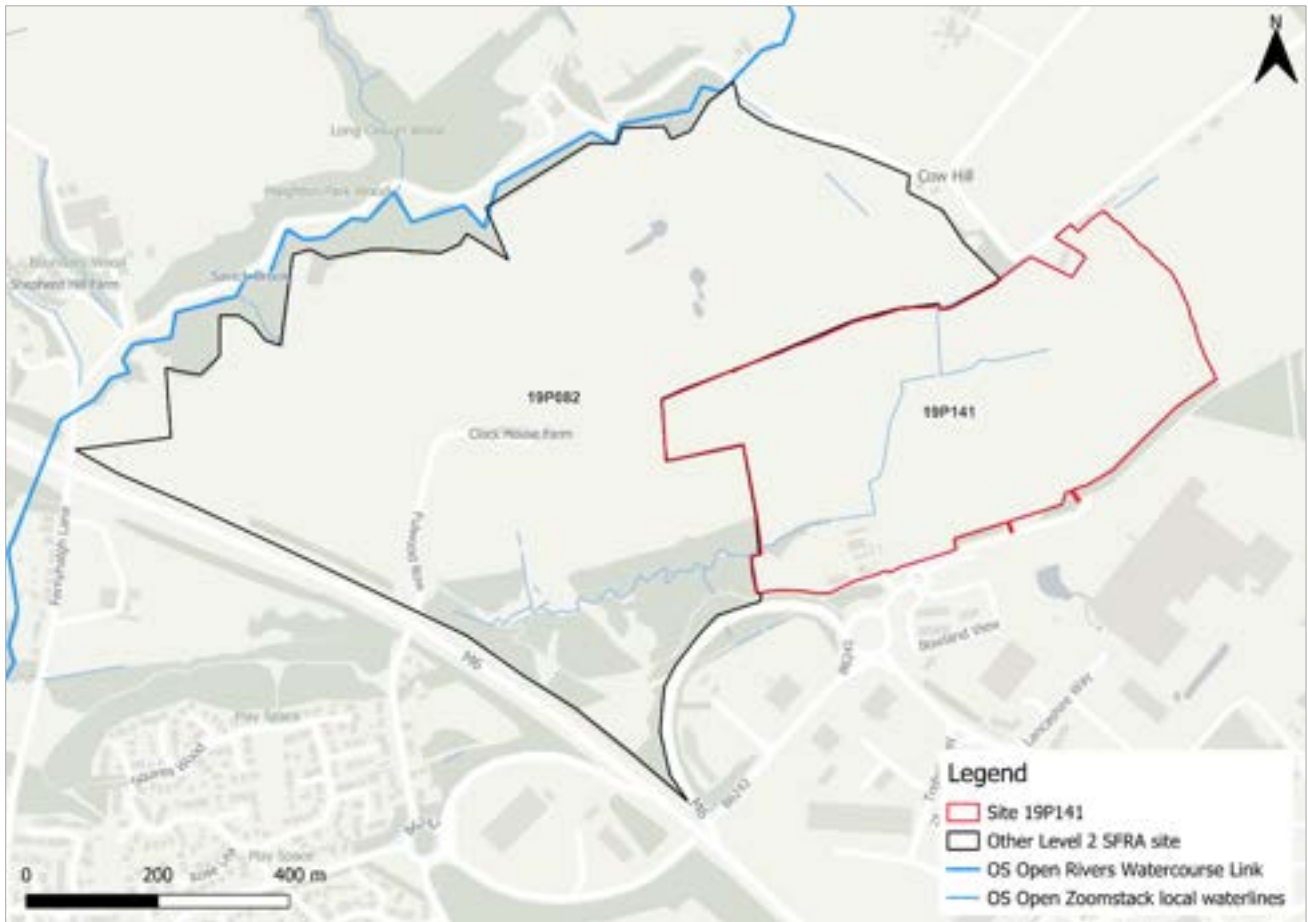


Figure 61-1: Existing site location boundary

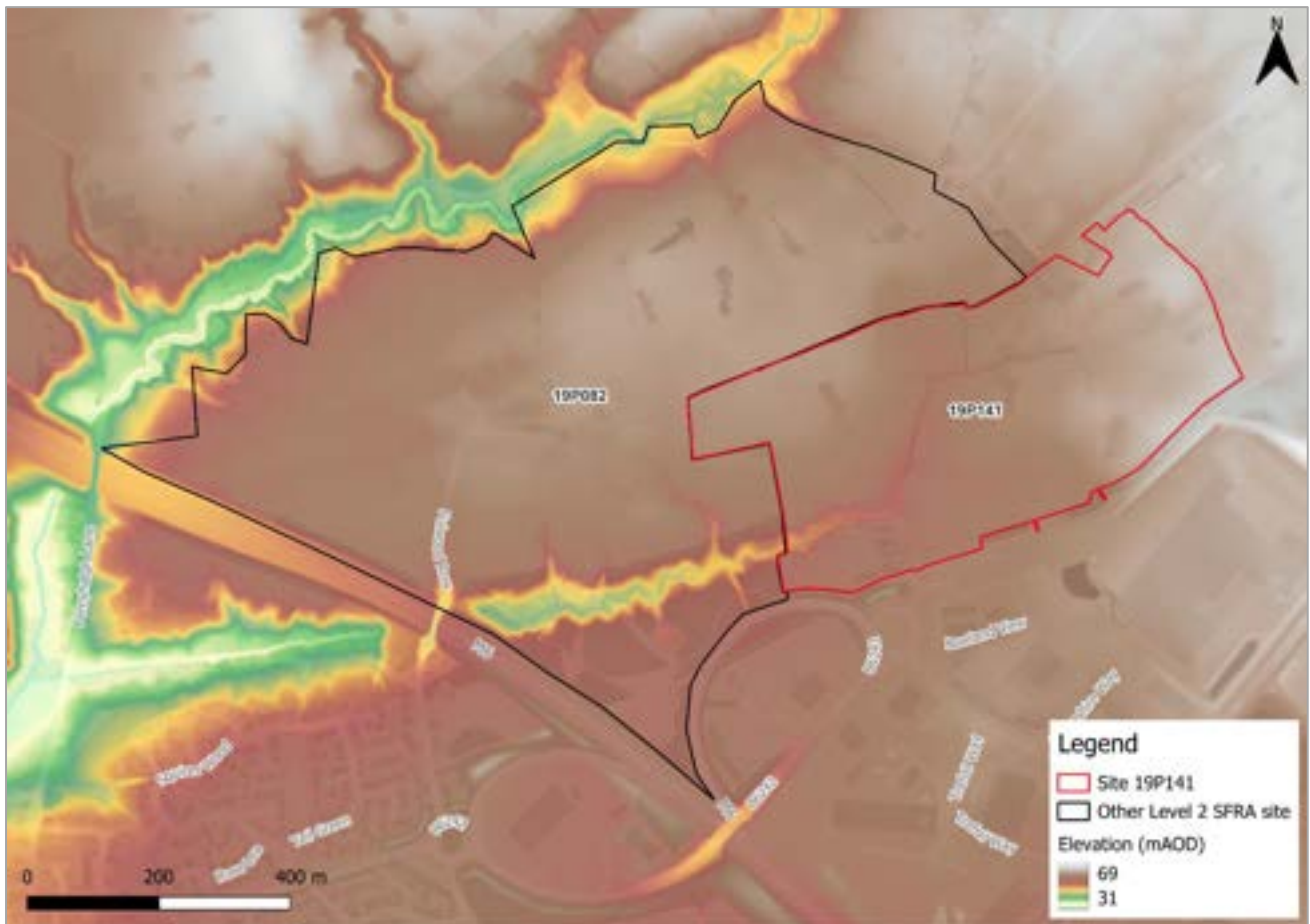


Figure 61-2: Topography

62 Flood risk from rivers

62.1 Existing risk

62.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The site is modelled to be fully within Flood Zone 1 indicating it is at low risk of flooding from rivers.

Mapping and LiDAR (Figure 61-2) appear to show an unnamed tributary of Savick Brook flowing through the site, through site 19P082 and under the M6, to the west of the site before entering Savick Brook. Any FRA should consider modelling this watercourse to ascertain the level of fluvial flood risk it presents to the site.

Table 62-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 62-1: Existing risk from rivers to the site

62.2 Flood risk management

The site doesn't benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

62.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P141 is located within one catchment, namely; Savick Brook. This is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance³⁷.
- Developments should be incentivised to provide wider betterment by demonstrating in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.

³⁷ [Lancashire SuDS Guidance](#)

- Developments should achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

62.2.2 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. Across the majority of the site there are significant opportunities for wider catchment tree planting to reduce runoff downstream. Following an unnamed watercourse there is also potential for riparian tree planting, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. There are also several small areas with potential for runoff attenuation features. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 62-2.

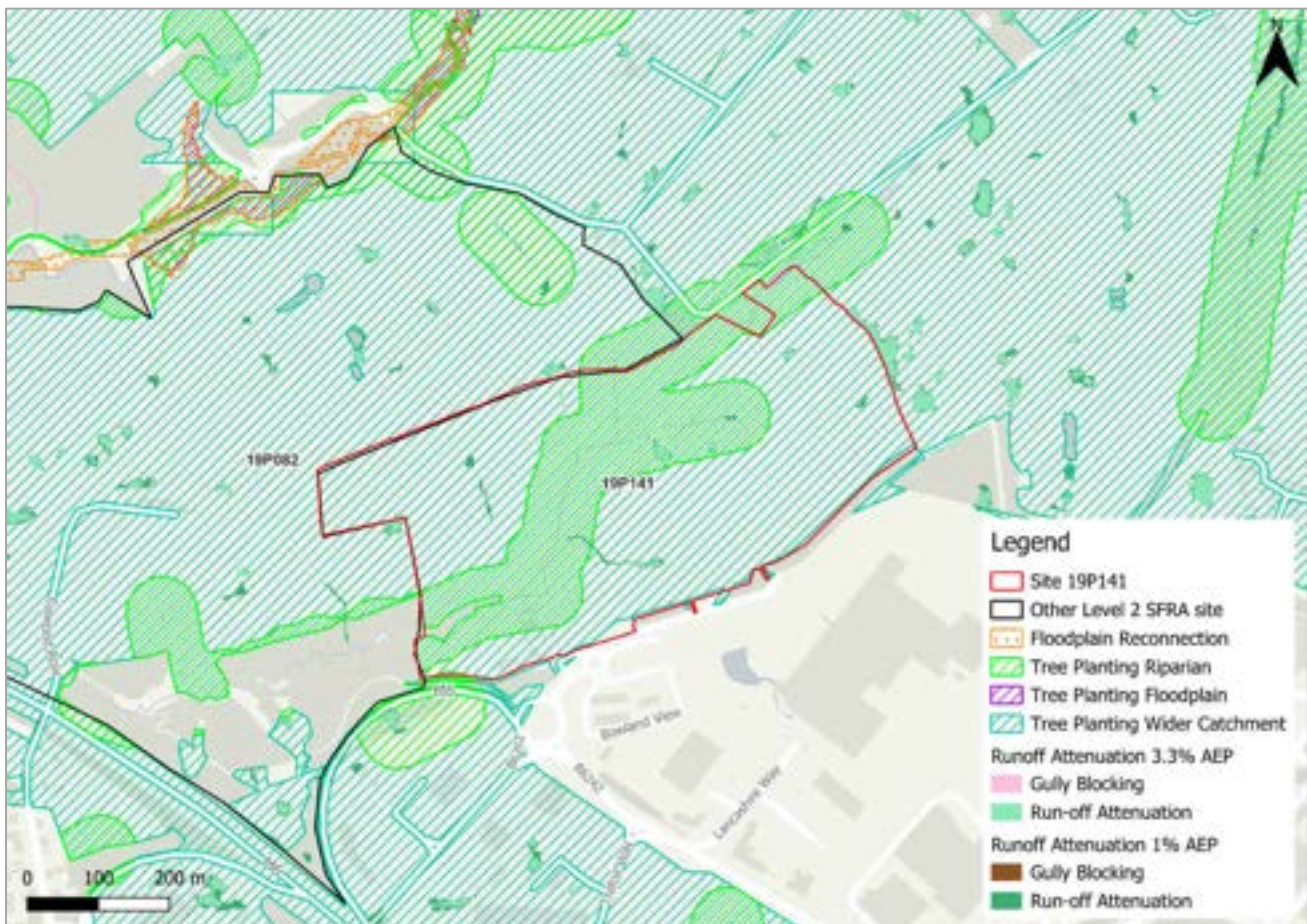


Figure 62-2: Natural Flood Management (NFM) potential mapping

62.3 Residual risk

62.3.1 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. 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 not modelled to be at risk from reservoir flooding.

62.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

62.5 Flood warning and access and escape routes

There are no Flood Warning Areas (FWA) or Flood Alert Areas (FAA) within the vicinity of the site.

Safe access and escape routes should be achievable via Fulwood Row in the south of the site.

62.6 Observations, mitigation options and site suitability - fluvial

- The site is wholly within Flood Zone 1. However, the unnamed tributary of Savick Brook flowing through the site should be investigated further at the FRA stage. Modelling may be required

63 Flood risk from surface water

63.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is within the high risk surface water flood zone. A further 1% is at medium surface water risk and a further 4% is at low surface water risk as shown in Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 1% of the site is within the high surface water risk zone. A further 1% is at medium surface water risk and a further 5% is at low surface water risk as shown in Table 3-1.

In the high risk event, surface water ponding is limited to the topographic low spots in the northeastern corner of the site. In the medium risk event, additional ponding forms along parts of the roads within the western half of the site. In the low risk event, surface water risk is spread across the site. Flow paths along the roads within the western half of the site form and another flow path crosses the northeastern corner of the site. Greatest flood depths in the low risk event are >1.2 m (Figure 3-1) with some areas of significant hazard (Figure 3-2). Safe access and escape should be achievable via the B6241 or Fulwood Hall Lane in all events, given the shallow depths of flooding on these roads.

Table 3-1.

In the high and medium risk event, surface water risk largely follows an unnamed tributary of Savick Brook in the western half of the site. There are also several areas of scattered ponding in topographically low spots. In the low risk event, the risk extent is greater with longer surface water flow paths and more areas of ponding.

Greatest surface water flood depths in the medium risk event are between > 1.2m (Figure 3-1) with some areas of significant hazard (Figure 3-2). Safe access and escape routes should be possible via Cow Hill to the north during all events, though in the low risk event there is ponding to shallow depths on this road.

Table 3-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
94	4	1	2

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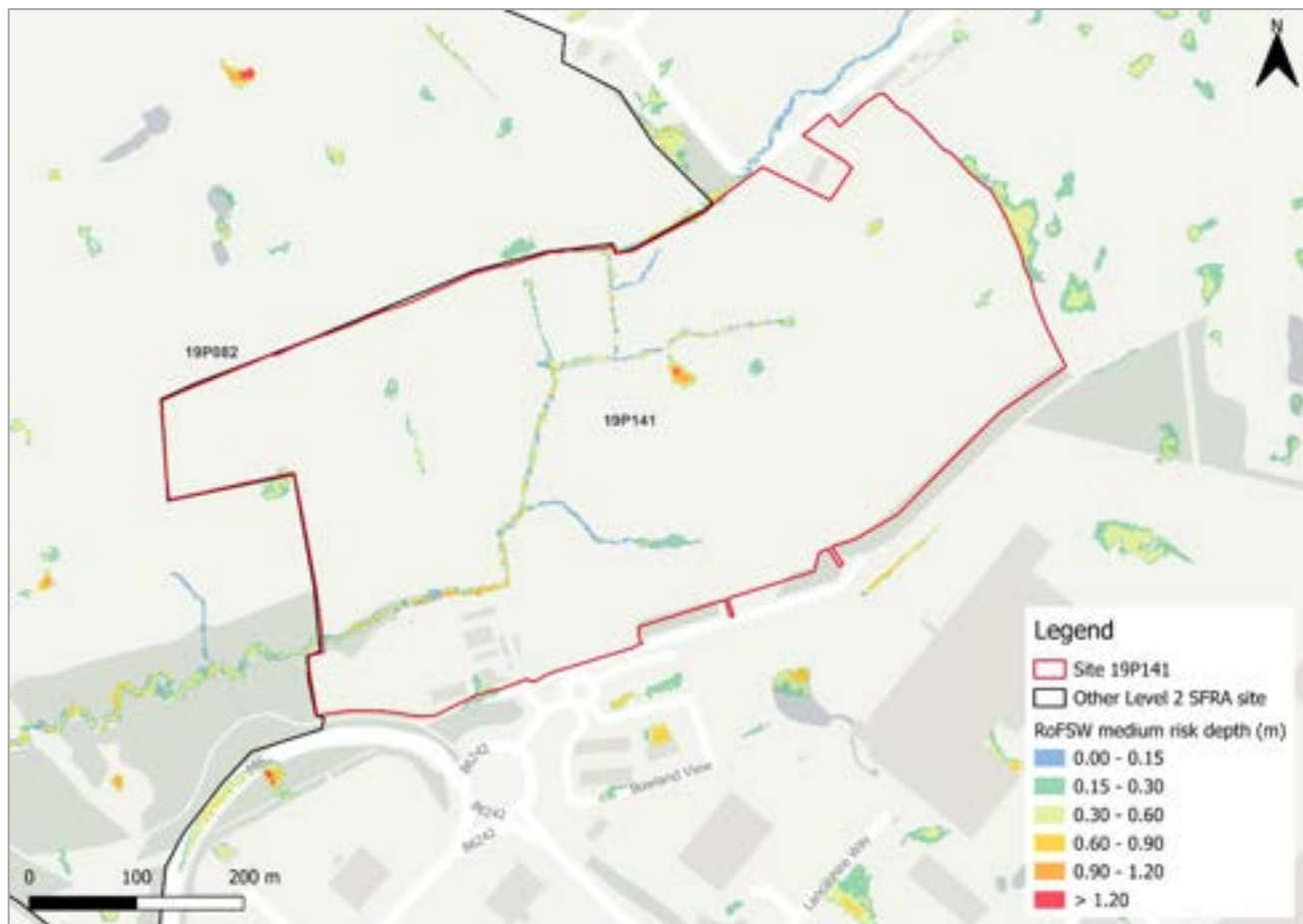


Figure 3-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

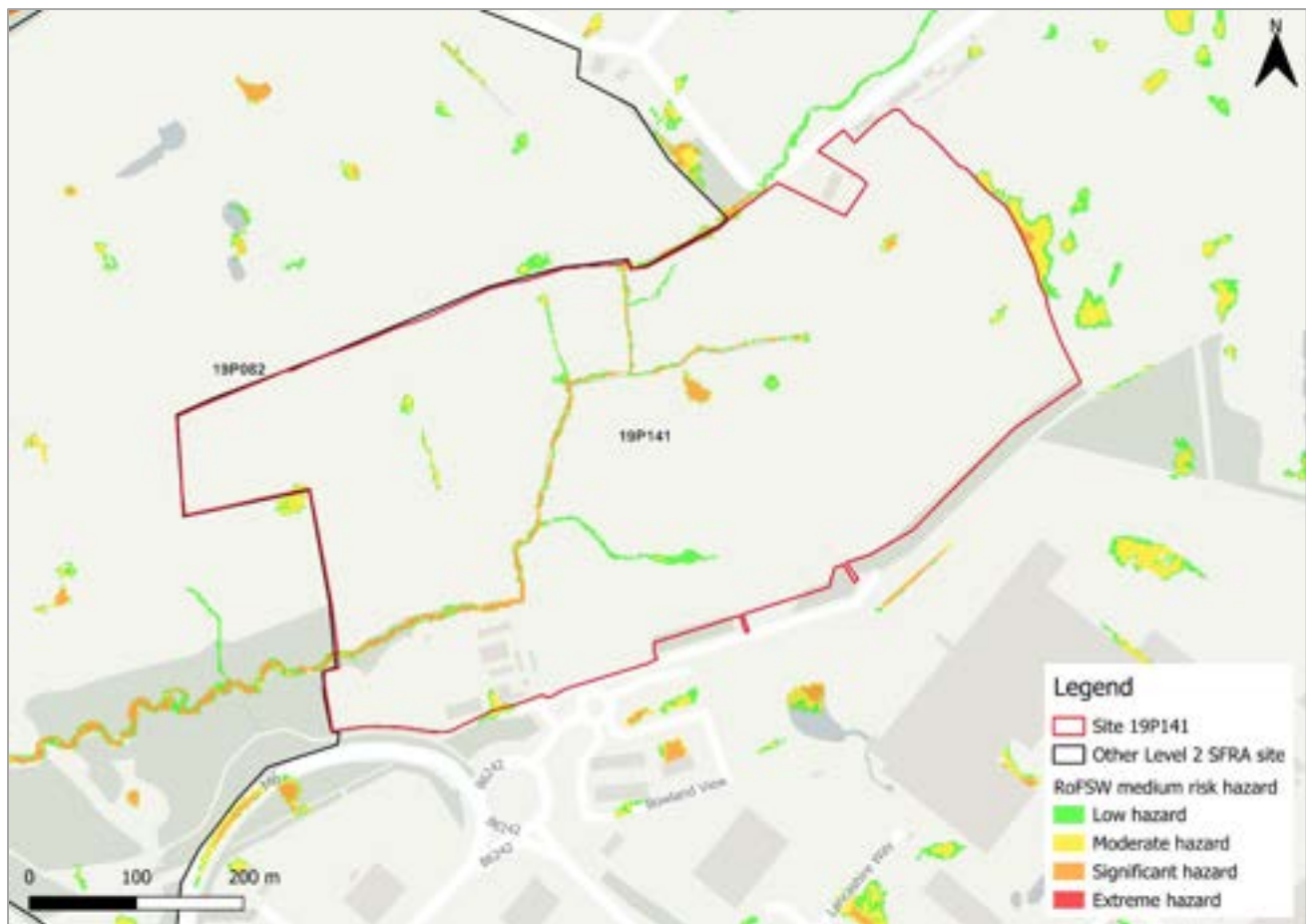


Figure 3-2: Medium risk event surface water flood hazard³⁸ (Risk of Flooding from Surface Water map)

63.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 3-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be greater than the present day medium surface water risk flood extent with existing flow paths expanding, additional flow paths and ponding forming. Maximum

³⁸ 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

flood depths are modelled to be >1.2m, with some areas of extreme hazard, particularly within the channel of the unnamed tributary of Savick Brook which runs through the site (Figure 3-4). All flow paths and ponds should be investigated through a drainage strategy and should be retained onsite through site design.

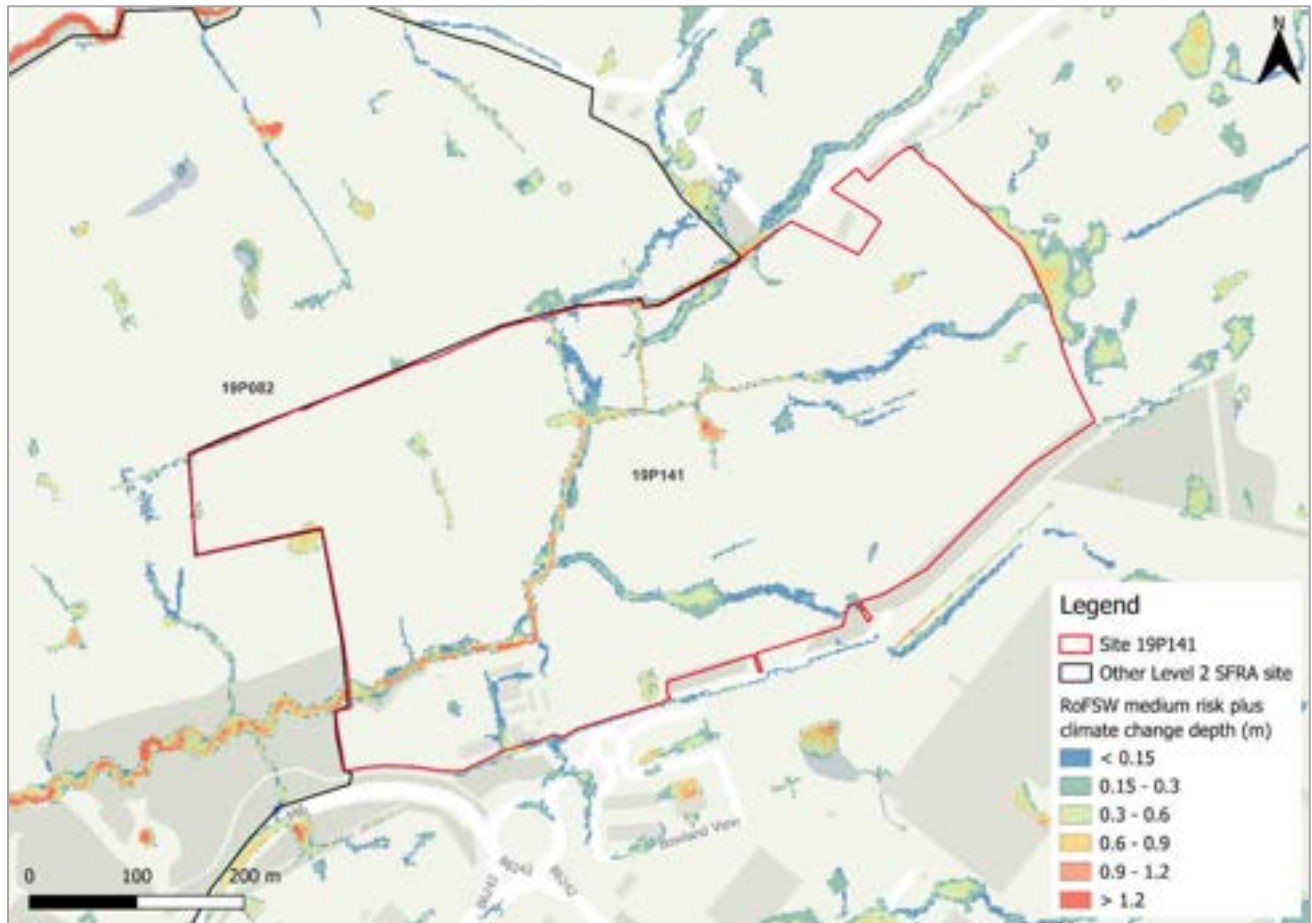


Figure 3-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 3-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

63.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 94% of the site being at very low surface water flood risk. Surface water risk in the high and medium risk events largely follows the unnamed tributary of Savick Brook with additional scattered ponding across the site in topographically low areas. Safe access and escape routes should be achievable via Cow Hill, north of the site, in all events, though in the low risk event there are shallow flood depths that should be considered.
- The effects of climate change on surface water have been modelled for this SFRA using the medium risk surface water flood depths plus 50% climate change. Surface water risk is greater than present day flood with additional surface water flow paths and areas of ponding. Any existing flow paths and ponds should be maintained in site design and runoff rates should be maintained at current greenfield rates and, where possible, betterment should be achieved.
- The Groundwater Flood Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Site 19P082 should also be considered in the drainage strategy given the interconnecting flow paths between each site.

- Note, 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 or evidence.

64 Flood risk from groundwater

Flood risk from groundwater sources is assessed in this SFRA using JBA's 5m Groundwater Flood Map. This dataset is recommended for use by the EA in the SFRA Good Practice Guide³⁹. Figure 4-1 show the map for Site 19P141 and the surrounding areas and Table 4-1 explains the risk classifications.

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.

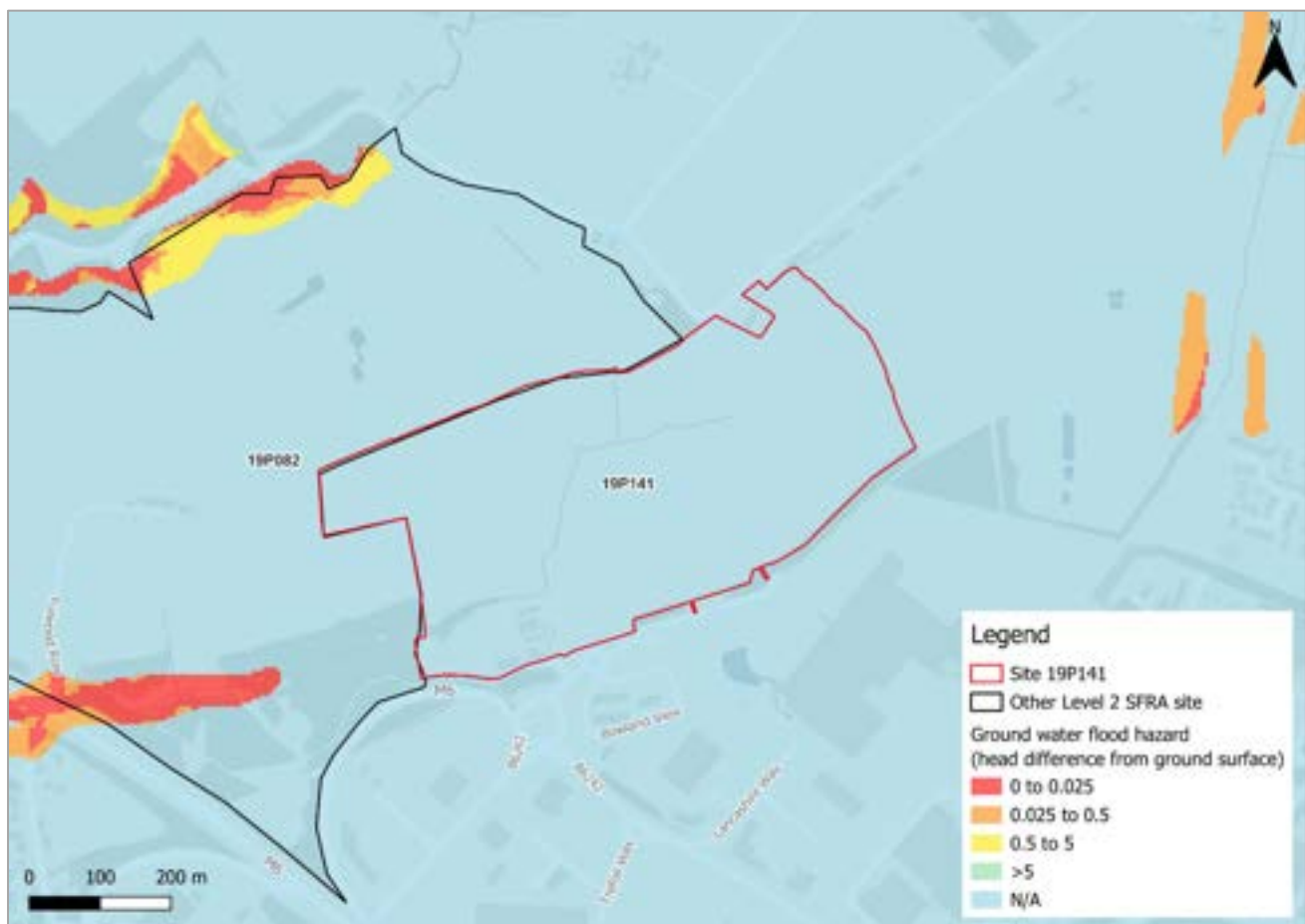


Figure 4-1: JBA 5m Groundwater Flood Map

³⁹ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 4-1: Groundwater Flood 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.

65 Overall site assessment

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

To pass part b) of the exception test⁴⁰, it must be proven that the development can be safe for its lifetime, which is 75 years for non-residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is modelled to be wholly within Flood Zone 1.

65.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, this site could be allocated if development avoids areas at risk from surface water flooding, particularly along the unnamed watercourse from the west of the site. All flow paths and ponds should be included in site design and runoff rates should be maintained at current greenfield rates and, where possible, betterment should be achieved.
- Any FRA must consider further investigation of the unnamed tributary of Savick Brook in order to ascertain the level of fluvial flood risk it presents to the site.
- A drainage strategy will be required for any new development including investigation into the use of infiltration SuDS.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

40 Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P144

Final

February 2025

Prepared for:



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Contract

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JBA Project Code	2023s1344

This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll 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 19 August 2024 and 14 February 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.

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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Figure 3-2: Low risk event surface water flood hazard (Risk of Flooding from Surface Water map)

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Figure 3-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

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67 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P144. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

67.1 Site 19P144

- Location: Lancashire Fire and Rescue HQ, Garstang Road
- Existing site use: Fire station
- Existing site use vulnerability: Highly vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 1.57 hectares
- Proposed development impermeable area: 1.34 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-

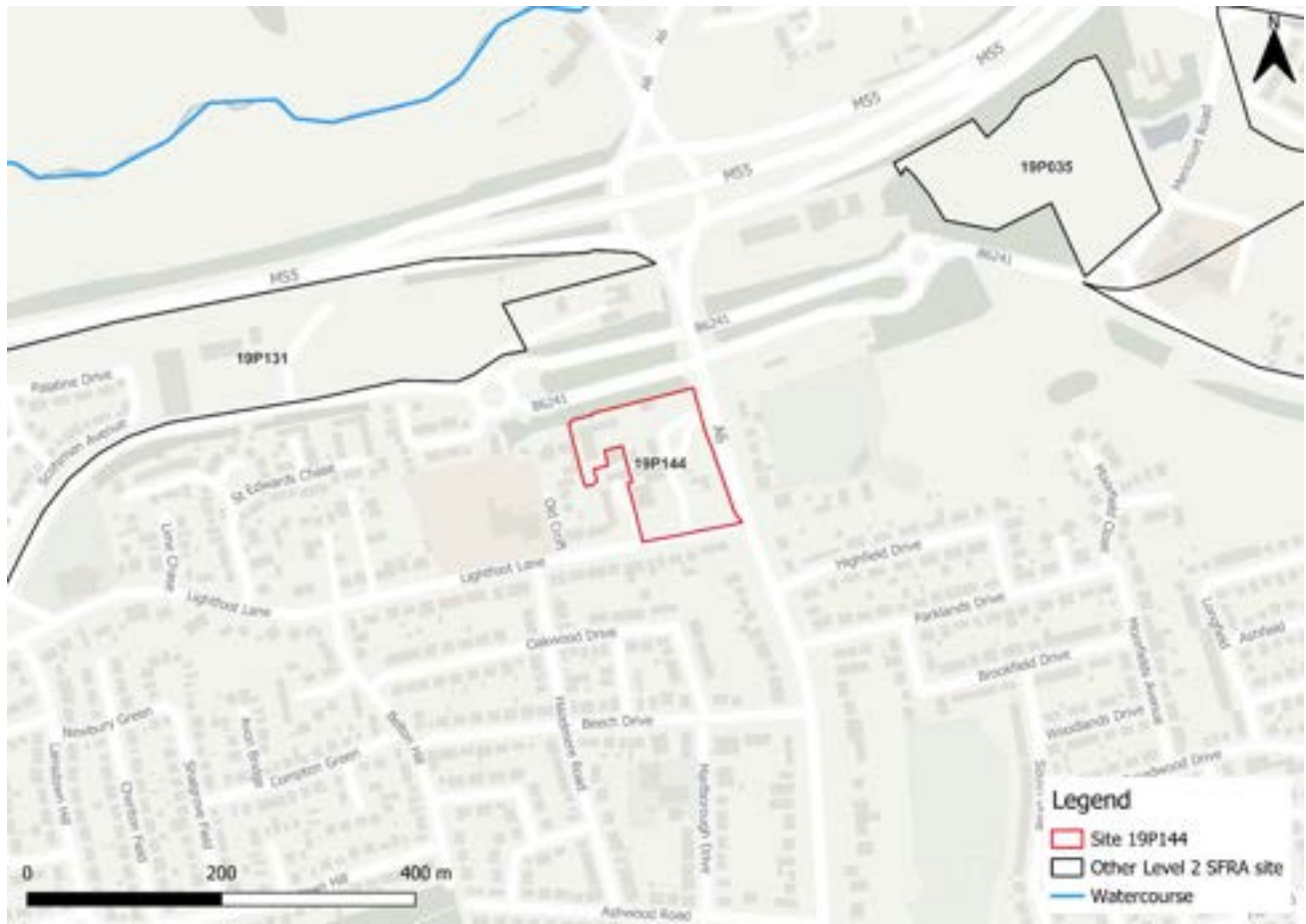


Figure 67-1: Existing site location boundary



Figure 67-2: Topography

68 Flood risk from rivers

68.1 Existing risk

68.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating that the site is at low risk of flooding from rivers.

Table 68-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 68-1: Existing risk from rivers to the site

68.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

68.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P144 is located within two catchments, namely, Savick Brook and Woodplumpton Brook. The majority of the site is located within a high sensitivity catchment. Planning considerations for catchments at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

68.2.2 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. There are no applicable areas that could benefit the site.

68.3 Residual risk

68.3.1 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. 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 modelled to be at risk from reservoir flooding.

68.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

68.5 Flood warning and access and escape routes

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 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 an FWA. The site is also not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via the A6 and Lightfoot Lane.

68.6 Observations, mitigation options and site suitability - fluvial

- The site is located wholly within Flood Zone 1.

69 Flood risk from surface water

69.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 5% of the site is within the low risk surface water flood zone, as shown in Table 69-1.

In the low risk event, surface water risk is confined to two areas of ponding within topographic low spots and a short, shallow flow path through the south of the site. Surface water risk is constrained by the existing development within the site.

Greatest surface water flood depths in the low risk event are between 0.3 and 0.6 m (Figure 3-1) with some areas of moderate hazard (Figure 3-2). Safe access and escape routes should be achievable via the A6 and Lightfoot Lane in all events.

Table 69-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
95	5	0	0

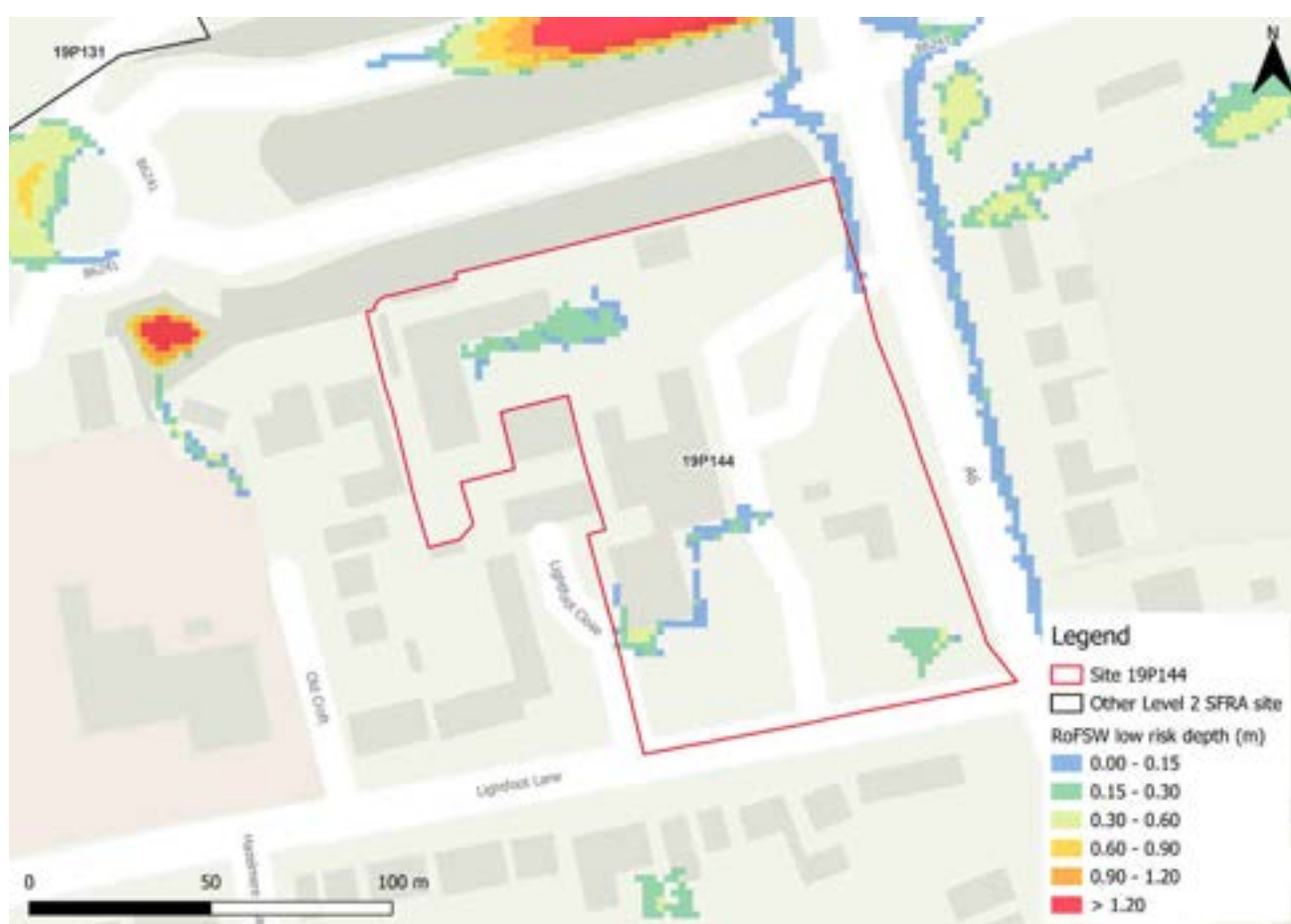


Figure 69-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 69-2: Low risk event surface water flood hazard⁴¹ (Risk of Flooding from Surface Water map)

69.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 69-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be greater than for present day conditions, with the medium risk climate change event showing a similar level of risk to the low risk present day

⁴¹ 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

event. Greatest flood depths are modelled to be between 0.3 and 0.6m (Figure 3-3), with some areas of moderate hazard (Figure 3-4). Safe access and escape routes should remain possible via the A6 and Lightfoot Lane.

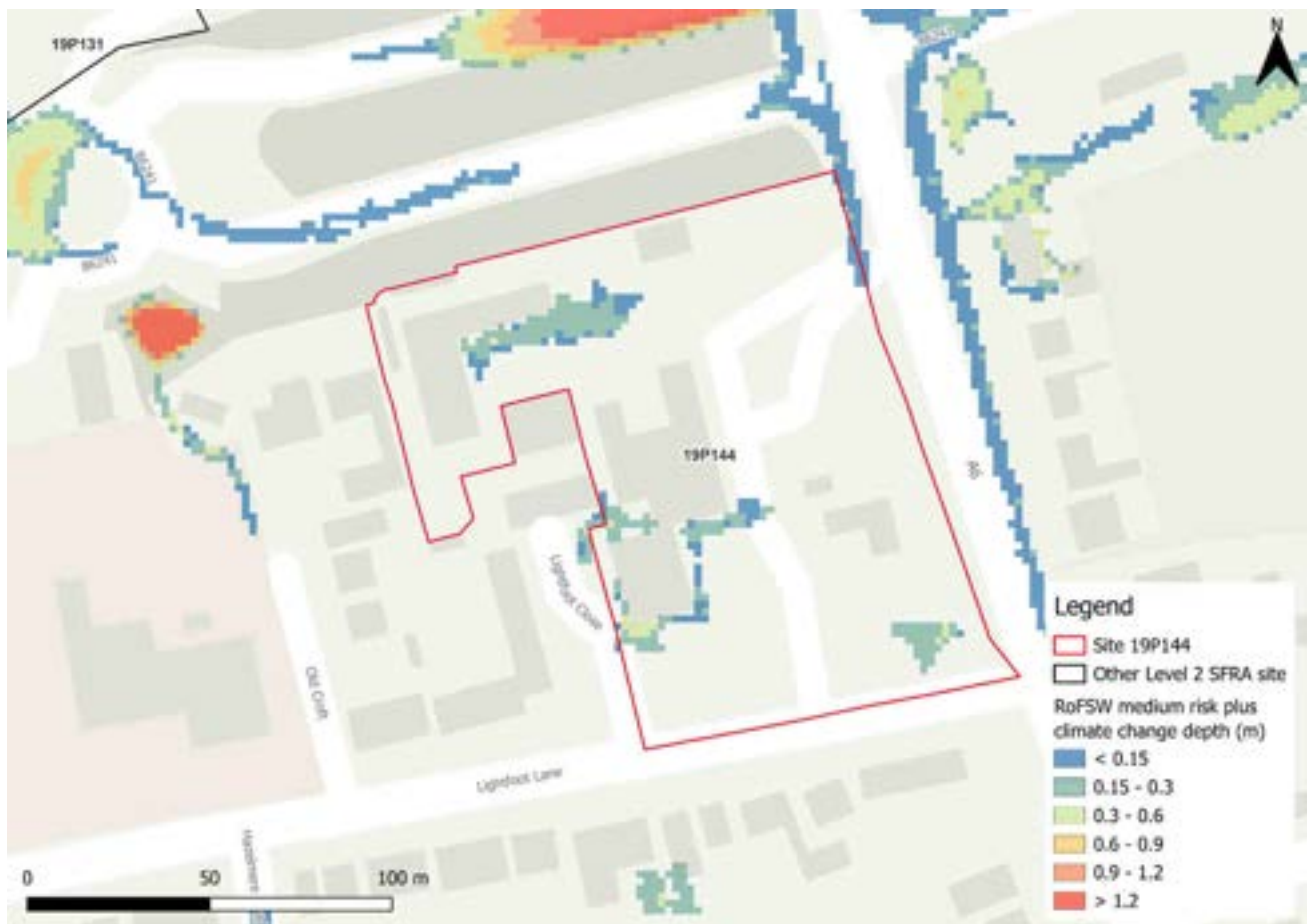


Figure 69-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 69-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

69.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 95% of the site being at very low risk. Surface water risk in the low risk event is confined to two areas of ponding and a shallow flow path.
- The medium risk modelled climate change outputs indicate a similar extent risk to the present day low risk event. Safe access and escape routes should be achievable via both the A6 and Lightfoot Lane.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Topographic depressions and flow paths should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could

accommodate the proposed residential development or whether further capacity will be required.

- It is assumed the existing onsite development will be demolished for new housing units. A detailed drainage strategy would therefore be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.

70 Risk from groundwater

Risk groundwater sources 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 Guide⁴². Figure 4-1 show the map for the site and the surrounding areas and Table 70-1 explains the risk classifications.

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



Figure 70-1: JBA 5m Groundwater Emergence Map

⁴² [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 70-1: Groundwater Flood 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.	

71 Overall site assessment

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

This site is not required to pass part b) of the exception test⁴³ 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.

71.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁴³ Para 178 National Planning Policy Framework 2024

72 Conclusions

73 Licencing

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P146

Final

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll 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 19 August 2024 and 14 February 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.

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on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JBA specifically does not guarantee or warrant any estimates or projections contained in this Report.

Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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74 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P146. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

74.1 Site 19P146

- Location: Parker Street
- Existing site use: Commercial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 1.29 hectares
- Proposed development impermeable area: 1.10 hectares (assumed 85% impermeable area)
- Watercourse: Lancaster Canal
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 74-1: Existing site location boundary

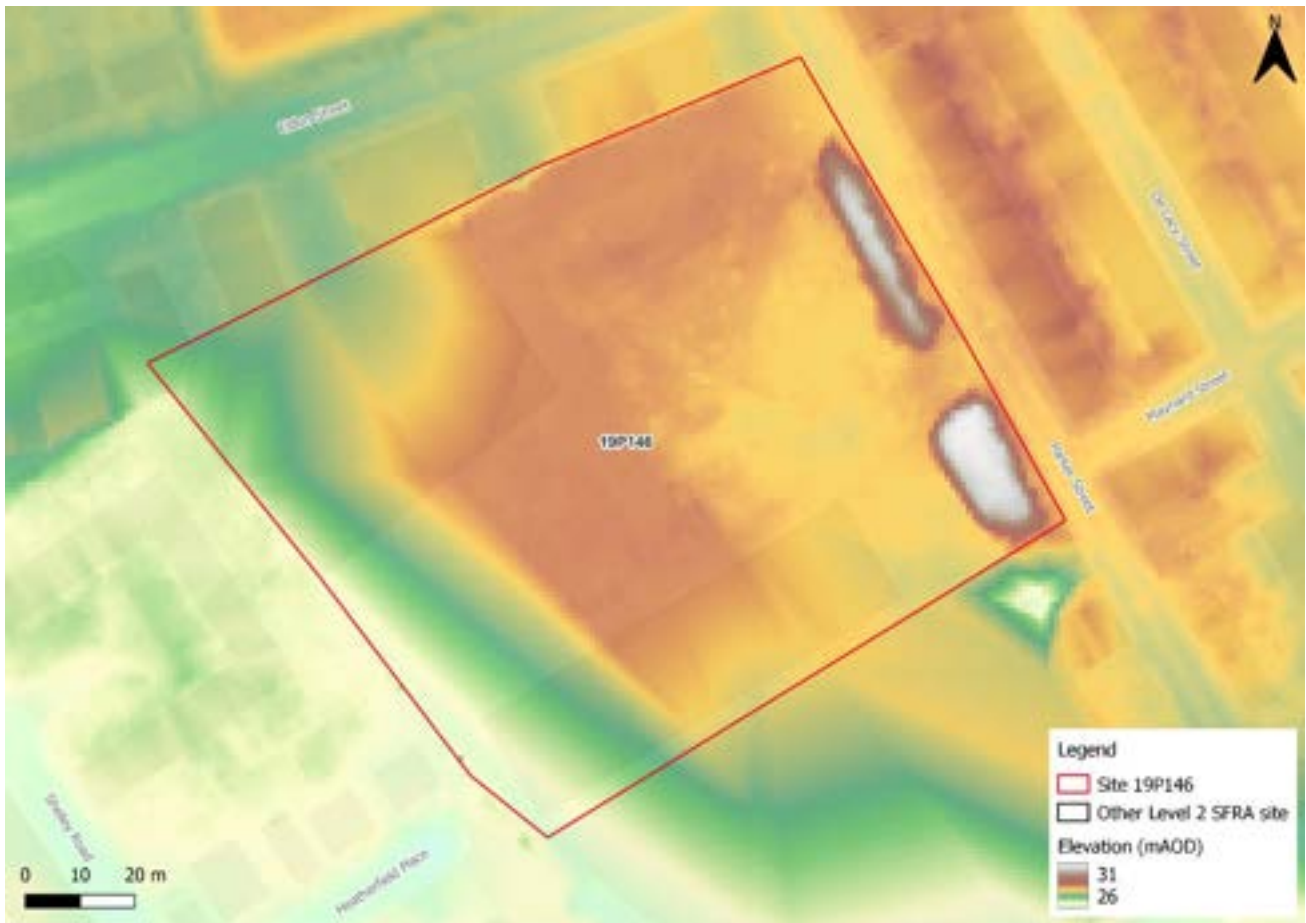


Figure 74-2: Topography

75 Flood risk from rivers

75.1 Existing risk

75.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating that the site is at low risk of flooding from rivers.

Table 75-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 75-1: Existing risk from rivers to the site

75.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

75.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P146 is located Savick Brook and Coastal Catchment 176. Both catchments are ranked as a high sensitivity catchments. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

75.2.2 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. There are no applicable areas that could benefit the site.

75.3 Residual risk

75.3.1 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. 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 not modelled to be at risk from reservoir flooding.

75.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

75.5 Flood warning and access and escape routes

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 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 an FWA. The site is also not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Parker Street.

75.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in the risk classification from less vulnerable to more vulnerable, according to NPFF.
- 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 FRC-PPG).
- The site is entirely located within Flood Zone 1.
-

76 Flood risk from surface water

76.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map flood risk within the site is predominantly very low. Approximately 8% of the site is within the low risk surface water flood zone, as shown in Table 9-1.

In the low risk event, surface water accumulates within the site within topographic low spots and is constrained by the existing development within the site.

Greatest flood depths in the low risk event are between 0.3 and 0.6 m (Figure 3-1) with some areas of moderate hazard (Figure 3-2). Safe access and escape routes should be available via Parker Street during all events.

Table 76-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
92	8	0	0



Figure 76-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 76-2: Low risk event surface water flood hazard⁴⁴ (Risk of Flooding from Surface Water map)

76.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 76-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be greater in extent than the present day medium risk surface water event, similar to the present day low risk event. Greatest flood depths are modelled to be

⁴⁴ 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

between 0.3 and 0.6 m (Figure 3-3), with some areas of moderate hazard (Figure 3-4). Safe access and escape routes should remain possible via Parker Street.



Figure 76-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 76-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

76.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 92% of the site being at very low risk. Surface water risk in the low risk event is confined to topographic low spots across the site.
- The medium risk modelled climate change outputs indicate a greater risk to the site than the present day surface water flood events, with the climate change outputs being similar in extent to the present day low risk event.
- Topographic depressions and flow paths should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS across the eastern site parcel. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could

accommodate the proposed residential development or whether further capacity will be required.

- It is assumed the existing onsite development will be demolished for new housing units. A detailed drainage strategy would therefore be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.
-

77 Risk from groundwater

Risk from groundwater sources 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 Guide⁴⁵. Figure 4-1 shows the map for Site 19P146 and the surrounding areas and Table 77-1 explains the risk classifications.

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 across the site.



Figure 77-1: JBA 5m Groundwater Emergence Map

⁴⁵ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 77-1: Groundwater Flood 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.	

78 Overall site assessment

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

This site is not required to pass part b) of the exception test⁴⁶ 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.

78.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA must further consider surface water flood risk, including a detailed drainage strategy and ground investigations.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁴⁶ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P151

Final

February 2025

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JBA Project Code	2023s1344

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80.1 Site 19P151

- Location: Shelley Road/Wetherall Street
- Existing site use: Commercial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.7 hectares
- Proposed development impermeable area: 0.6 hectares (assumed 85% impermeable area)
- Watercourse: Lancaster Canal
- EA model: N/A
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk



Figure 80-1: Existing site location boundary



Figure 80-2: Topography

81 Flood risk from rivers

81.1 Existing risk

81.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 81-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 81.2) or the impacts of climate change.

This site is located fully within Flood Zone 1, indicating it is at low risk of flooding from rivers.

Table 81-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 81-1: Existing risk from rivers to the site

81.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

81.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P151 is located within one catchment, namely Savick Brook. Savick Brook is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁴⁷.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

81.2.2 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. There are no applicable WwNP areas within the site boundary or its vicinity.

81.3 Residual risk

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

81.3.1 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. 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.

⁴⁷ [Lancashire SuDS Guidance](#)

The site is not modelled to be at risk of flooding from reservoirs.

81.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

81.5 Flood warning and access and escape routes

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. Site 19P151 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. The site is also not located within a FAA.

Safe access and escape routes could likely be achieved during a flood event via Shelley Road or Wetherall Street.

81.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is modelled to be fully within Flood Zone 1.

82 Flood risk from surface water

82.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 2% of the site is within the low surface water risk zone as shown in Table 3-1.

In the low risk event, surface water ponding is limited to the topographic low spot northern corner of the site and along the southern site boundary. Greatest flood depths in the low risk event are 0.6 to 0.9 m (Figure 3-1) with some areas of significant hazard (Figure 3-2). There are flow paths evident along Shelley Road and Aqueduct Street, south of the site to significant depths. Safe access and escape should be achievable via Wetherall Street.

Table 82-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
98%	2%	0%	0%

•



•

Figure 82-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 82-2: Low risk event surface water flood hazard⁴⁸ (Risk of Flooding from Surface Water map)

82.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 82-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water event plus an allowance for climate change. Flooding is modelled to be marginally greater than the present day low risk event. With ponding in the northern and southwestern corners of the

⁴⁸ 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

site. Maximum flood depths remain 0.6 to 0.9 m (Figure 3-3) with some areas of significant hazard (Figure 3-4). There are flow paths evident along Shelley Road and Aqueduct Street, south of the site to significant depths. Safe access and escape should remain achievable via Wetherall Street during this event.



Figure 82-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 82-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

82.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 2% of the site being at low surface water flood risk. In the low risk event, ponding is confined to the northern and southwestern corners of the site.
- The medium risk event plus climate change modelling shows a marginally larger flood extent in comparison to the present day low risk event.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed development or whether further capacity will be required.

- Site runoff should be maintained at current rates and, where possible, betterment should be achieved.
- Note, 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 or evidence.

83 Risk from groundwater

Risk from groundwater sources 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 Guide⁴⁹. Figure 4-1 shows the map for Site 19P151 and the surrounding areas and Table 4-1 explains the risk classifications.

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.

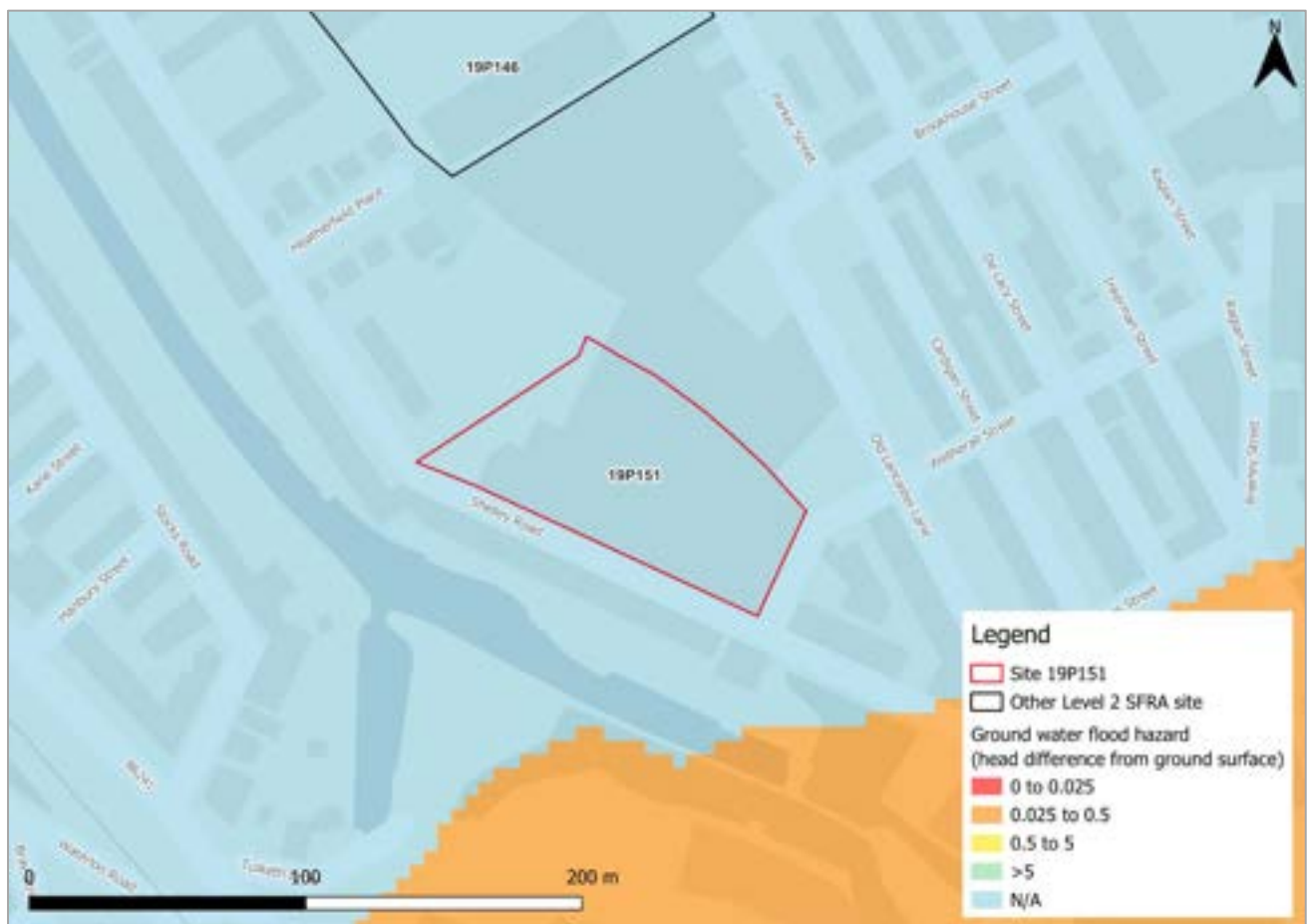


Figure 83-1: JBA 5m Groundwater Flood Map

⁴⁹ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 83-1: Groundwater Flood 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.	

84 Overall site assessment

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

To pass part b) of the exception test⁵⁰, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

84.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate for this site to be allocated, given the low fluvial and predominantly very low surface water flood risk to the site.
- A drainage strategy will be required including investigation into the use of infiltration SuDS.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁵⁰ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P155

Final

February 2025

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Freya Nation of JBA Consulting carried out this work.

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86 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P155. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

86.1 Site 19P155

- Location: Brethrens Meeting Room, Egerton Road
- Existing site use: Church hall and car park
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.5 hectares
- Proposed development impermeable area: 0.4 hectares (assumed 85% impermeable area)
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk

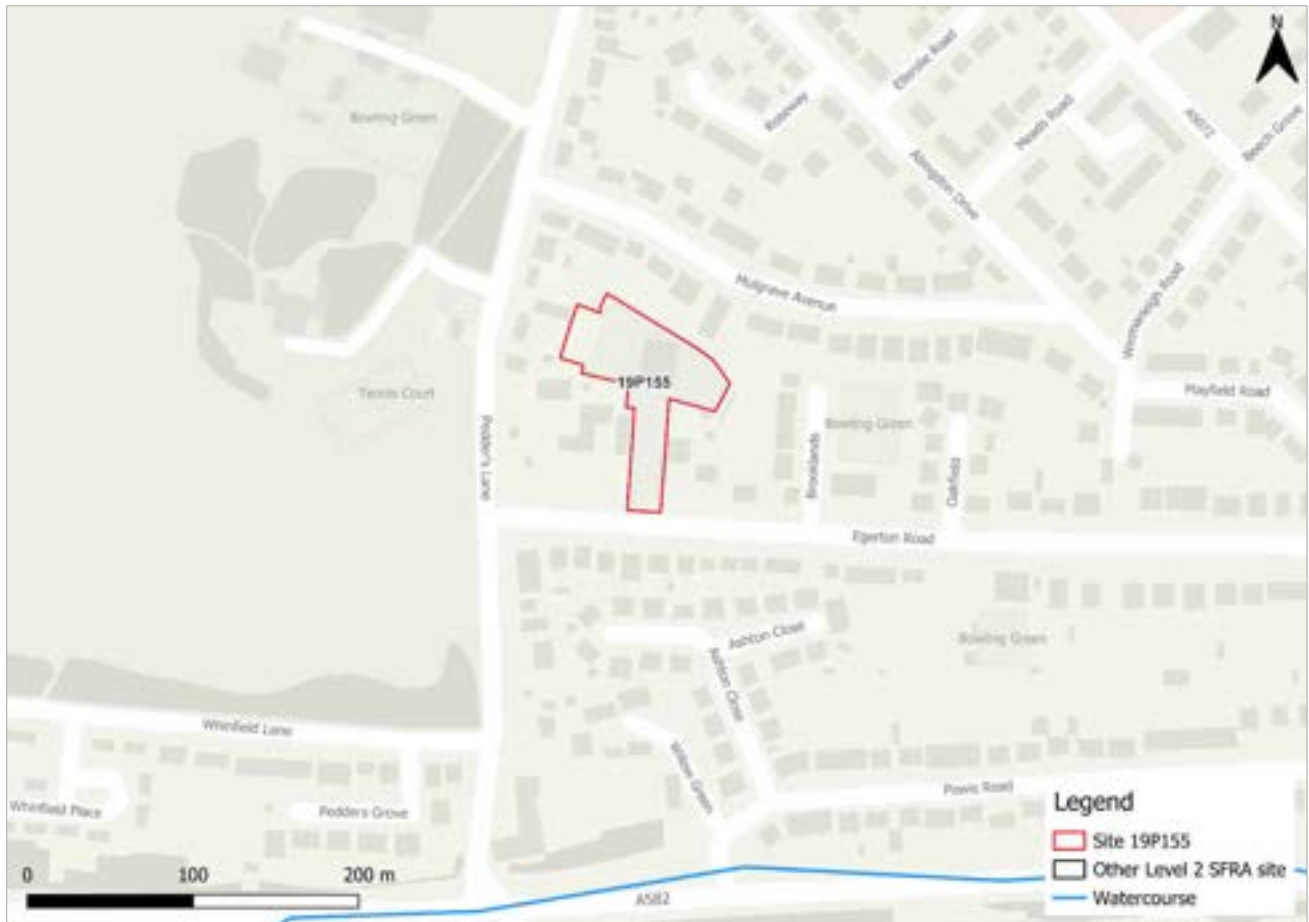


Figure 86-1: Existing site location boundary

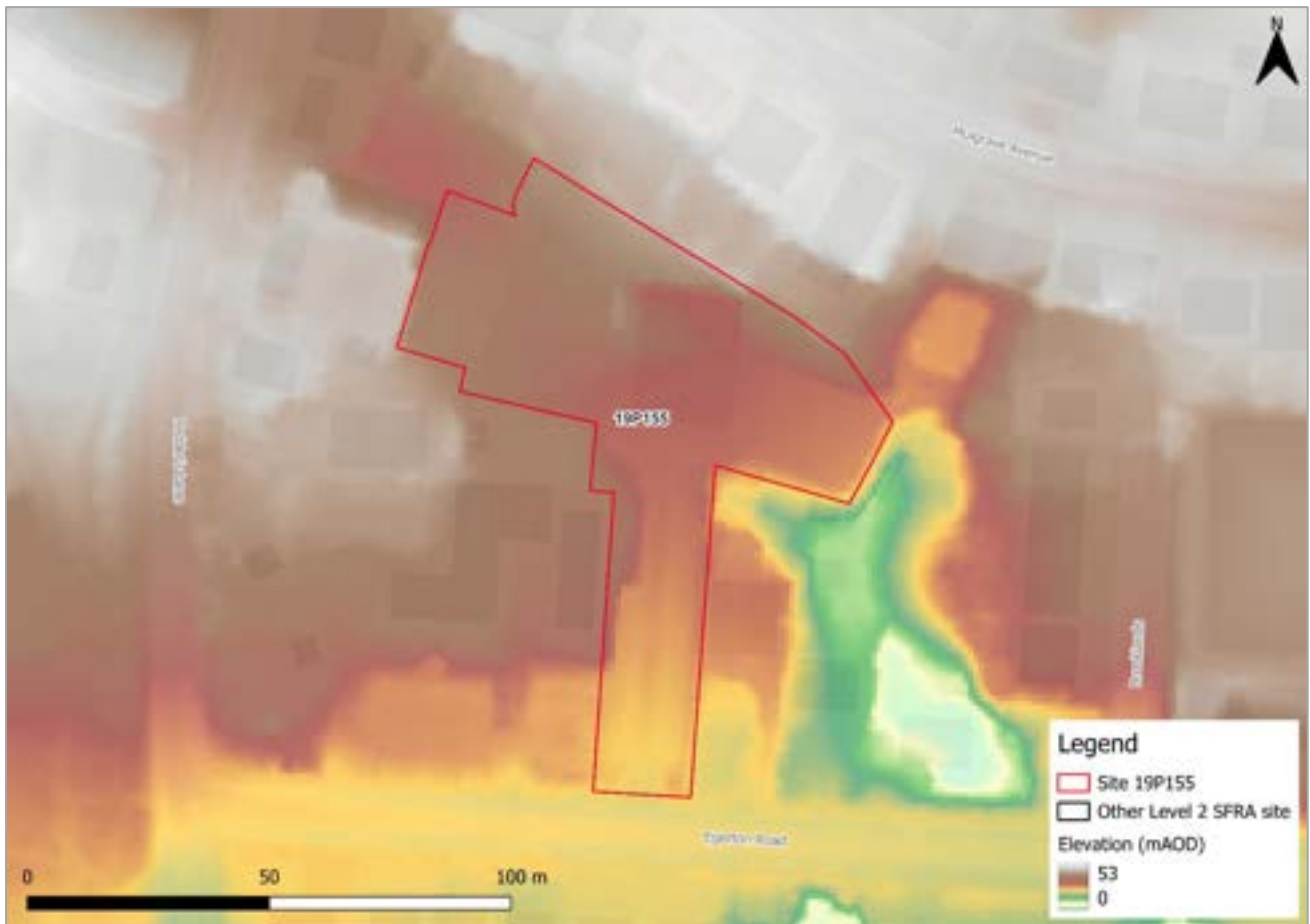


Figure 86-2: Topography

87 Flood risk from rivers

87.1 Existing risk

87.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 87-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

This site is located wholly within Flood Zone 1, including it is at low risk of flooding from rivers.

Table 87-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

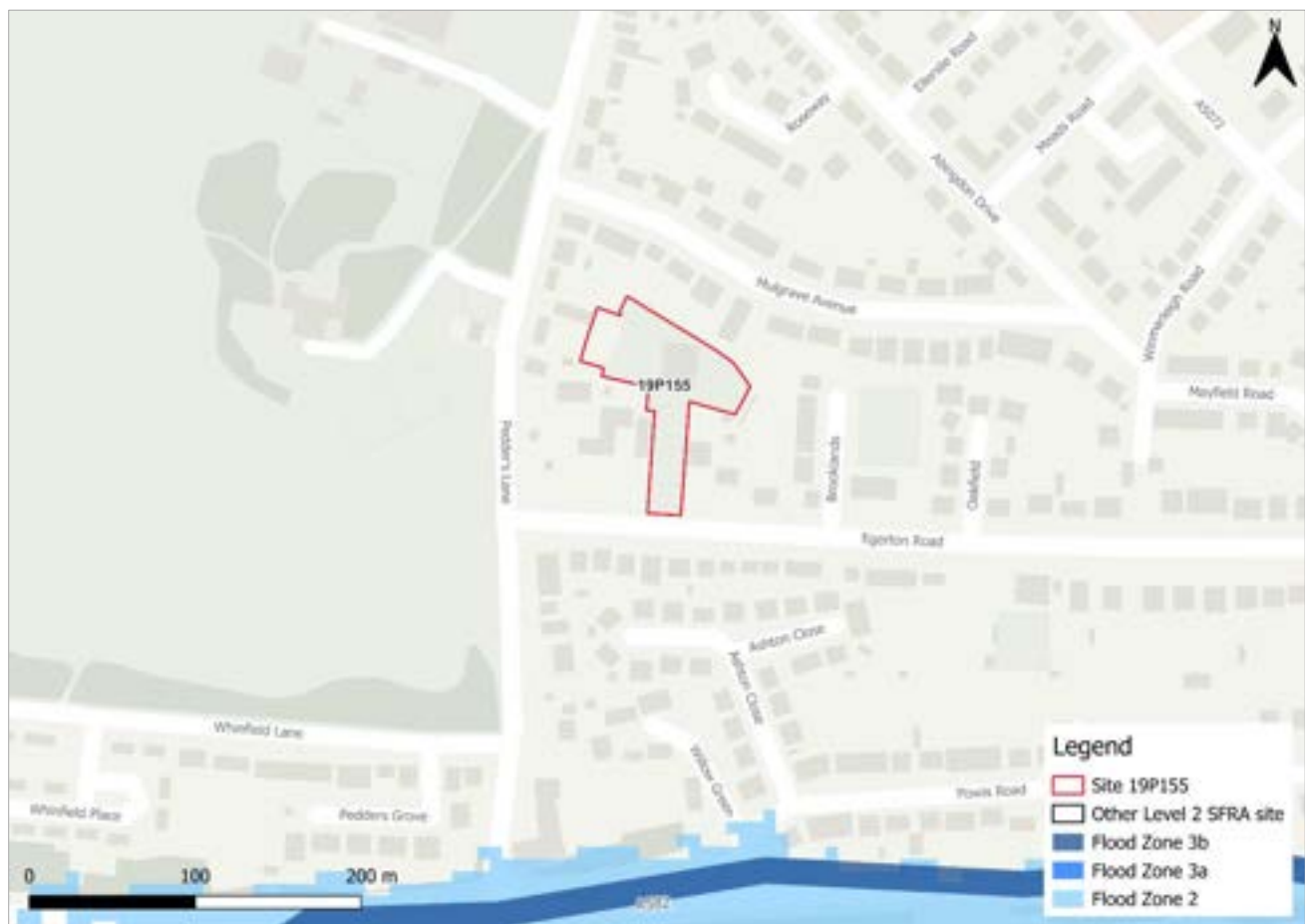


Figure 87-1: Existing risk from rivers to the site

87.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

87.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P155 is located within one catchment, namely Coastal Catchment 176. Coastal Catchment 176 is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁵¹.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

87.2.2 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. There are no applicable WwNP areas within the site boundary or its vicinity.

87.3 Residual risk

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

87.3.1 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. 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.

⁵¹ [Lancashire SuDS Guidance](#)

The site is not modelled to be at risk of flooding from reservoirs.

87.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

87.5 Flood warning and access and escape routes

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. Site 19P151 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. The site is also not located within a FAA.

Safe access and escape routes could likely be achieved during a flood event via Egerton Road.

87.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is modelled to be fully within Flood Zone 1.

88 Flood risk from surface water

88.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 6% of the site is within the low surface water risk zone as shown in Table 3-1.

In the low risk event, a small flow path enters the site from Egerton Road. The flooding effects the site access point / driveway. Greatest flood depths in the low risk event are 0.15 to 0.3 m (Figure 3-1) with some small areas of moderate hazard (Figure 3-2). Safe access and escape may still be achievable via Egerton Road given the shallow depths of flooding to the road.

Table 88-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
94%	6%	0%	0%

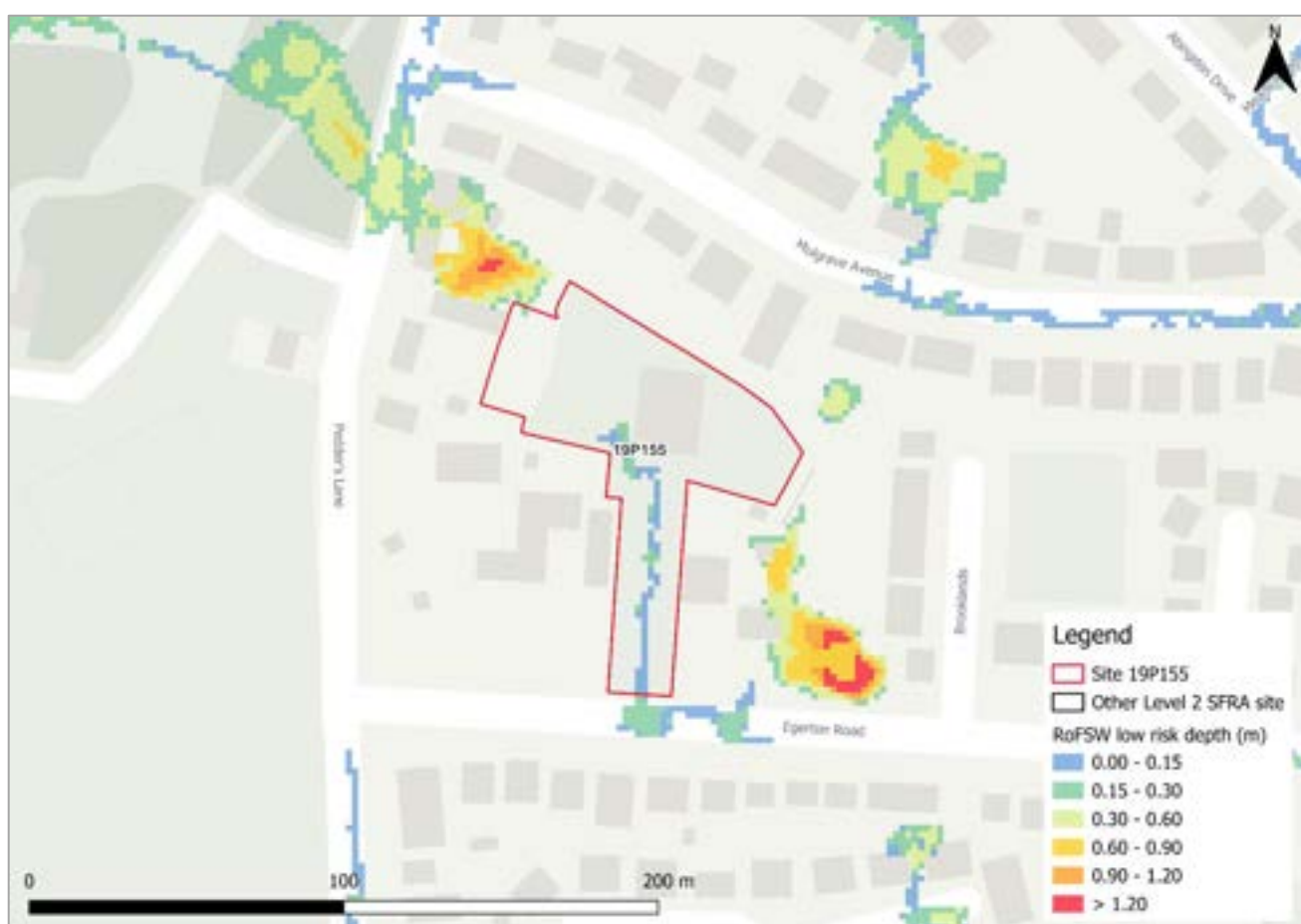


Figure 88-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 88-2: Low risk event surface water flood hazard⁵² (Risk of Flooding from Surface Water map)

88.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 88-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water event plus an allowance for climate change. Flooding is modelled to be marginally greater than the present day low risk event. With a small additional area ponding entering the northwestern

⁵² 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

corner of the site. Maximum flood depths remain 0.15 to 0.3 m (Figure 3-3) with some small areas of moderate hazard (Figure 3-4). Safe access and escape may remain achievable via Egerton Road during this event, given the shallow depths of flooding to the road.

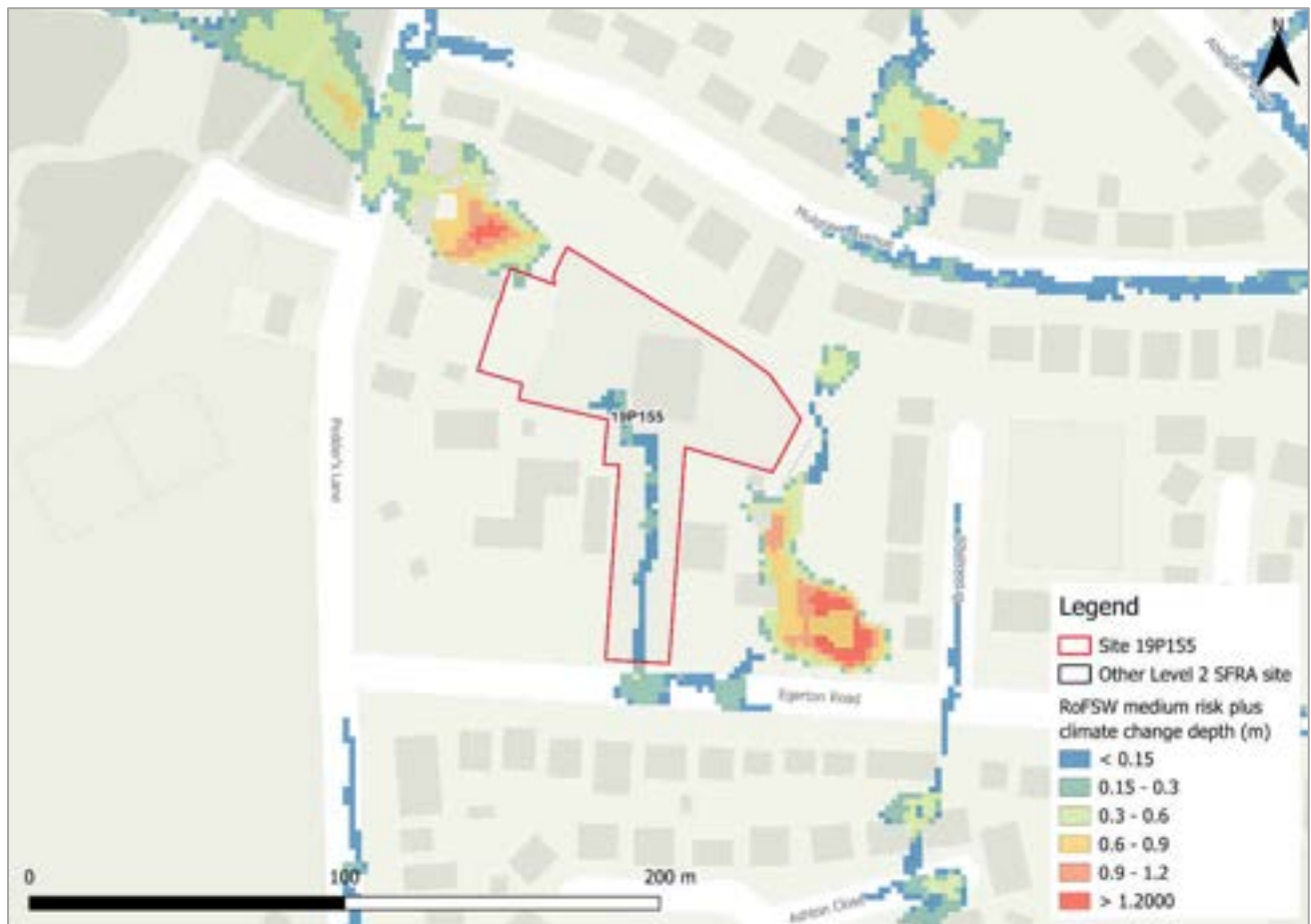


Figure 88-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 88-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

88.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 6% of the site being at low surface water flood risk. In the low risk event, ponding is confined to the site access point / driveway.
- The medium risk event plus climate change modelling shows a marginally larger flood extent in comparison to the present day low risk event with an additional flow path entering the northwestern corner of the site.
- The flow path through the south of the site should be investigated through a drainage strategy. There should be no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Note, 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 or evidence.

89 Risk from groundwater

Risk from groundwater sources 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 Guide⁵³. Figure 4-1 shows the map for Site 19P155 and the surrounding areas and Table 4-1 explains the risk classifications.

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.



Figure 89-1: JBA 5m Groundwater Flood Map

⁵³ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 89-1: Groundwater Flood 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.	

90 Overall site assessment

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

To pass part b) of the exception test⁵⁴, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not subject to the exception test as it is wholly within Flood Zone 1.

90.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, it should be appropriate for this site to be allocated, given the low fluvial and predominantly very low surface water flood risk to the site.
- A drainage strategy will be required for any new development, including investigation into the use of infiltration SuDS.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P163

Final

February 2025

Prepared for:



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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Freya Nation of JBA Consulting carried out this work.

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Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JBA specifically does not guarantee or warrant any estimates or projections contained in this Report.

Acknowledgements

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92 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P163. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

92.1 Site 19P163

- Location: Rear Bull and Royal Public House Church Street
- Existing site use: Car park
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.24 hectares
- Proposed development impermeable area: 0.2 hectares (assumed 85% impermeable area)
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk



Figure 92-1: Existing site location boundary

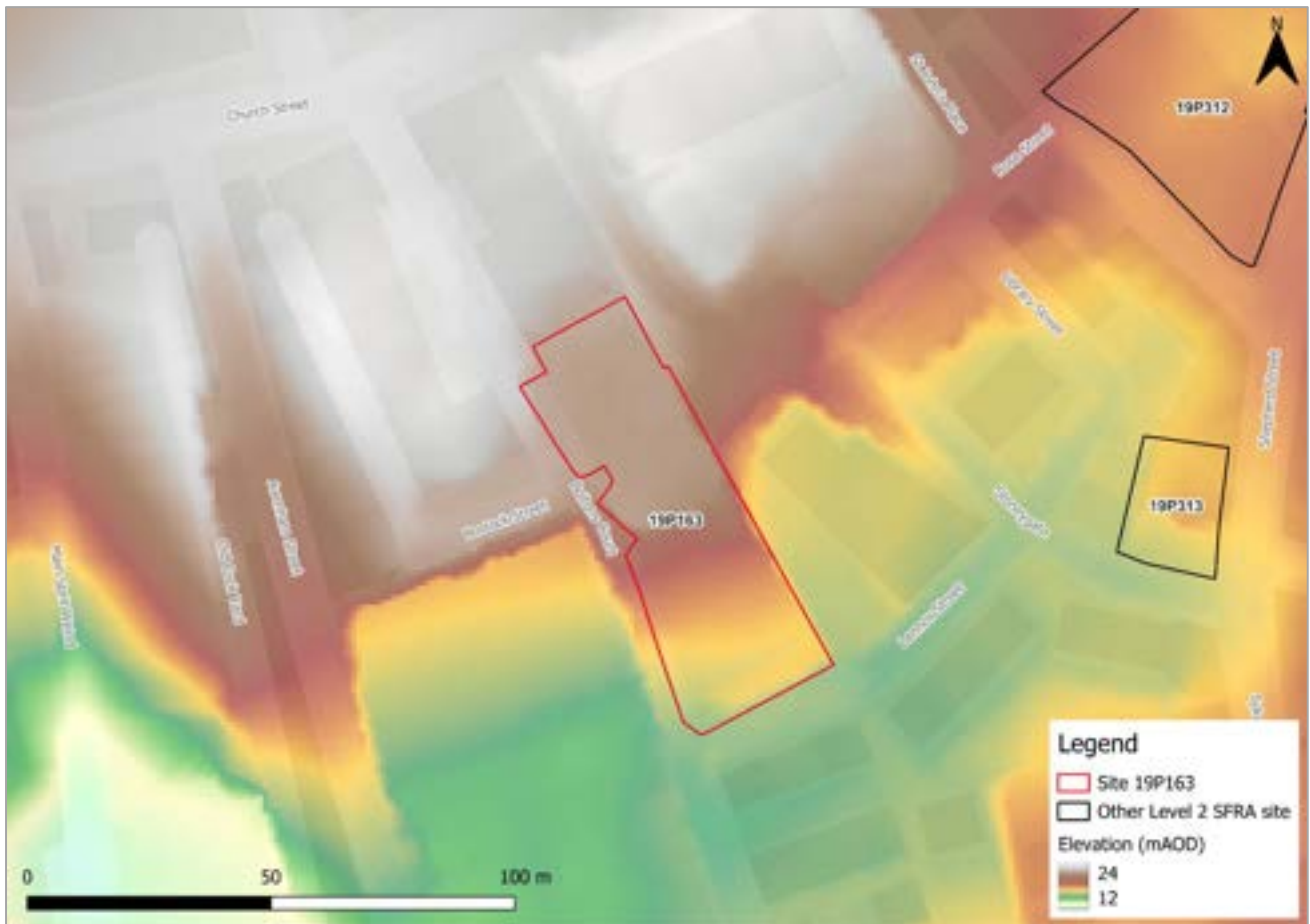


Figure 92-2: Topography

93 Flood risk from rivers

93.1 Existing risk

93.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and viewed on Figure 93-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

This site is located fully within Flood Zone 1, indicating it is at low risk of flooding from rivers.

Table 93-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

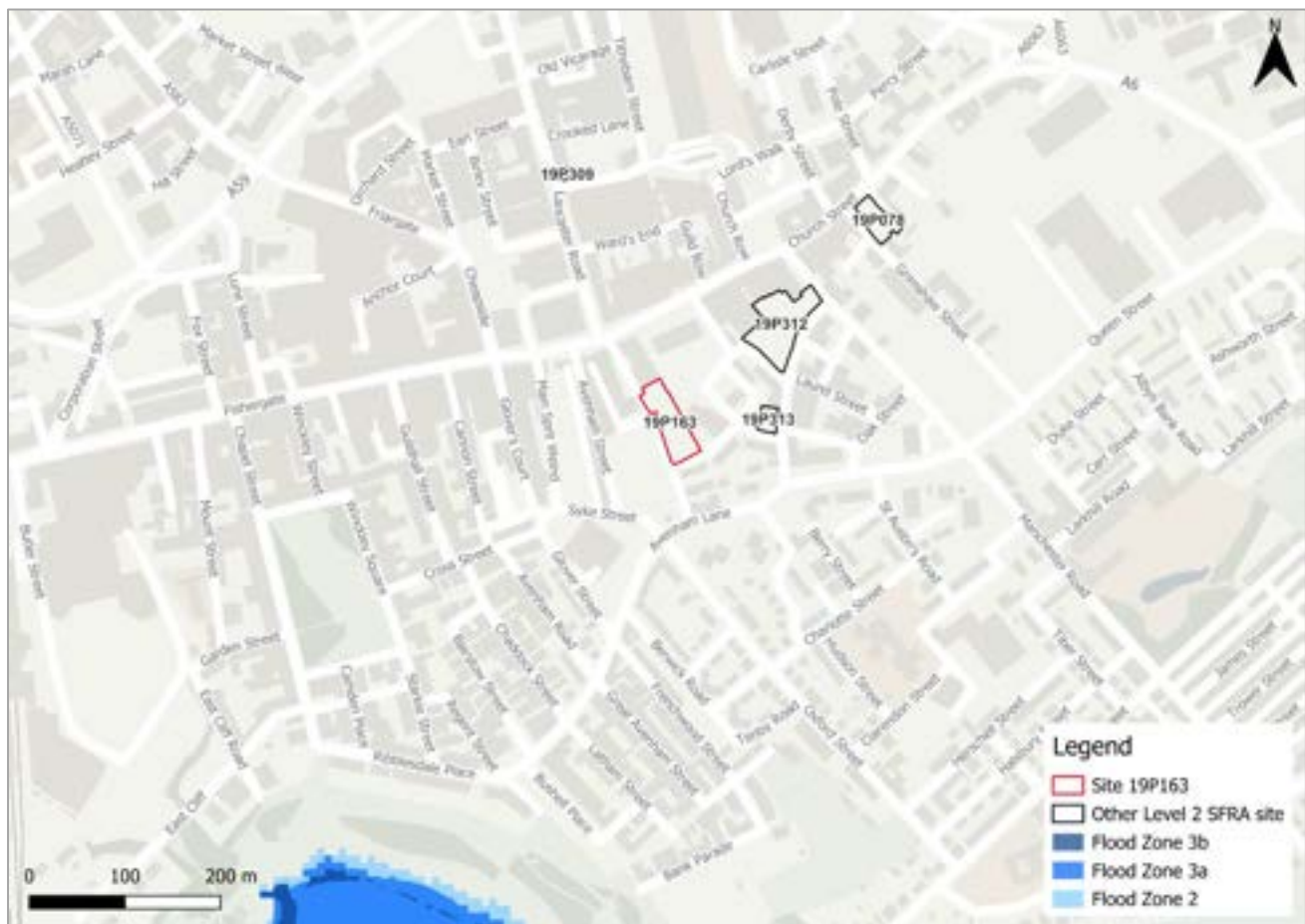


Figure 93-1: Existing fluvial flood risk

93.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

93.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P163 is located within one catchment, namely Coastal Catchment 176. Coastal Catchment 176 is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁵⁵.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

93.2.2 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. There are no applicable WwNP areas within the site boundary or its vicinity.

93.3 Residual risk

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

93.3.1 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. 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.

⁵⁵ [Lancashire SuDS Guidance](#)

The site is not shown to be at risk of flooding from reservoirs.

93.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

93.5 Flood warning and access and escape routes

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. Site 19P163 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. The site is also not located within a FAA.

Safe access and escape routes could likely be achieved during a flood event via Egerton Road.

93.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is modelled to be fully within Flood Zone 1.

94 Flood risk from surface water

94.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 1% of the site is within the low surface water risk zone as shown in Table 3-1.

In the low risk event, the flow path along Lennox Street encroaches along the southern site boundary. Greatest flood depths in the low risk event are 0.3 to 0.6 m (Figure 3-1) with some small areas of significant hazard (Figure 3-2). Safe access and escape should be achievable via Boltons Court given the shallow depths of flooding on this road.

Table 94-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
99%	1%	0%	0%

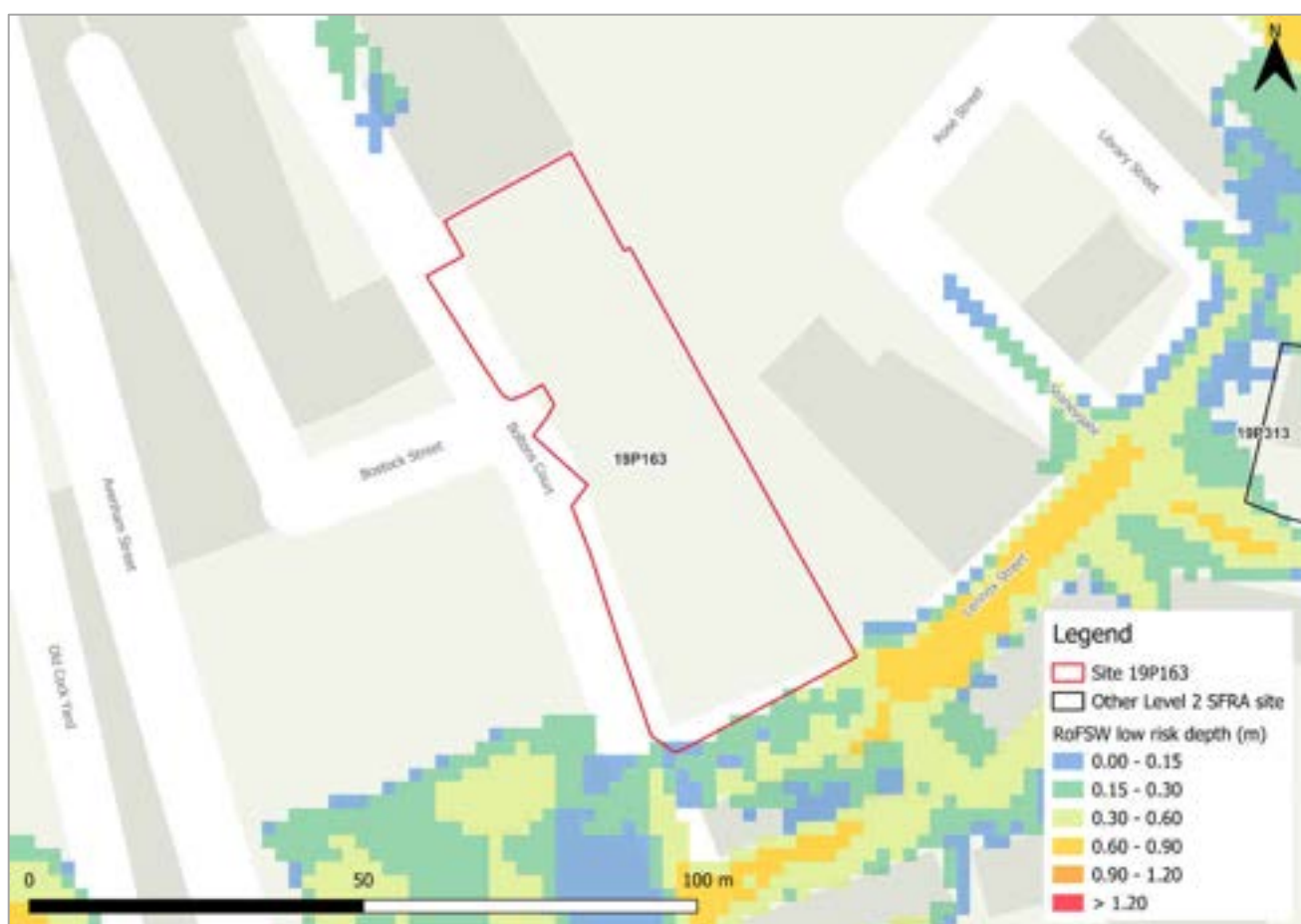


Figure 94-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)

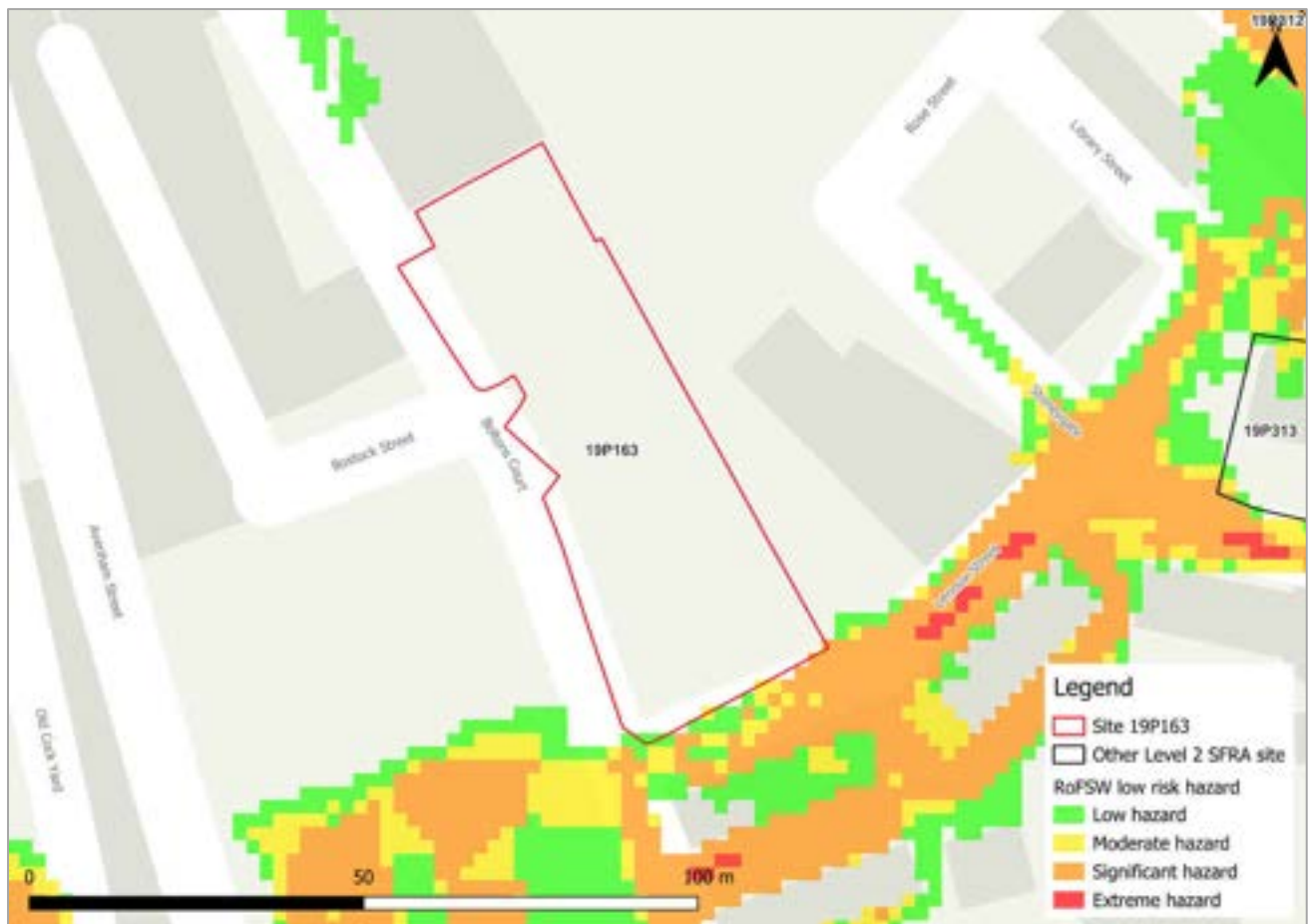


Figure 94-2: Low risk event surface water flood hazard⁵⁶ (Risk of Flooding from Surface Water map)

94.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 94-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water event plus an allowance for climate change. Flooding is modelled to be marginally greater than the present day low risk event with encroachment at the southern site boundary increasing.

⁵⁶ 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

Maximum flood depths remain 0.3 to 0.6 m (Figure 3-3) with a small area of significant hazard at the southeastern boundary (Figure 3-4). Safe access and escape may remain achievable via Boltens Court during this event, given the shallow depths of flooding to the road.



Figure 94-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 94-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

94.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 1% of the site being at low surface water flood risk. In the low risk event, ponding is confined to the southern site boundary.
- The medium risk event plus climate change modelling shows a marginally larger flood extent in comparison to the present day low risk event with slightly more flooding encroaching onto the southern boundary of the site.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Note, 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 or evidence.

95 Risk from groundwater

Risk from groundwater sources 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 Guide⁵⁷. Figure 4-1 shows the map for Site 19P163 and the surrounding areas and Table 4-1 explains the risk classifications.

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.



Figure 95-1: JBA 5m Groundwater Flood Map

⁵⁷ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 95-1: Groundwater Flood 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.	

96 Overall site assessment

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

To pass part b) of the exception test⁵⁸, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

96.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate for this site to be allocated, given the low fluvial and predominantly very low surface water flood risk to the site.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁵⁸ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P287

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98 Background

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98.1 Site 19P287

- Location: Former Gasworks, Ribbleton Lane, Preston. PR1 5ST
- Existing site use: Former gasworks (brownfield)
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 1.5 hectares
- Proposed development impermeable area: 1.3 hectares (assumed 85% impermeable area)
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk



Figure 98-1: Existing site location boundary

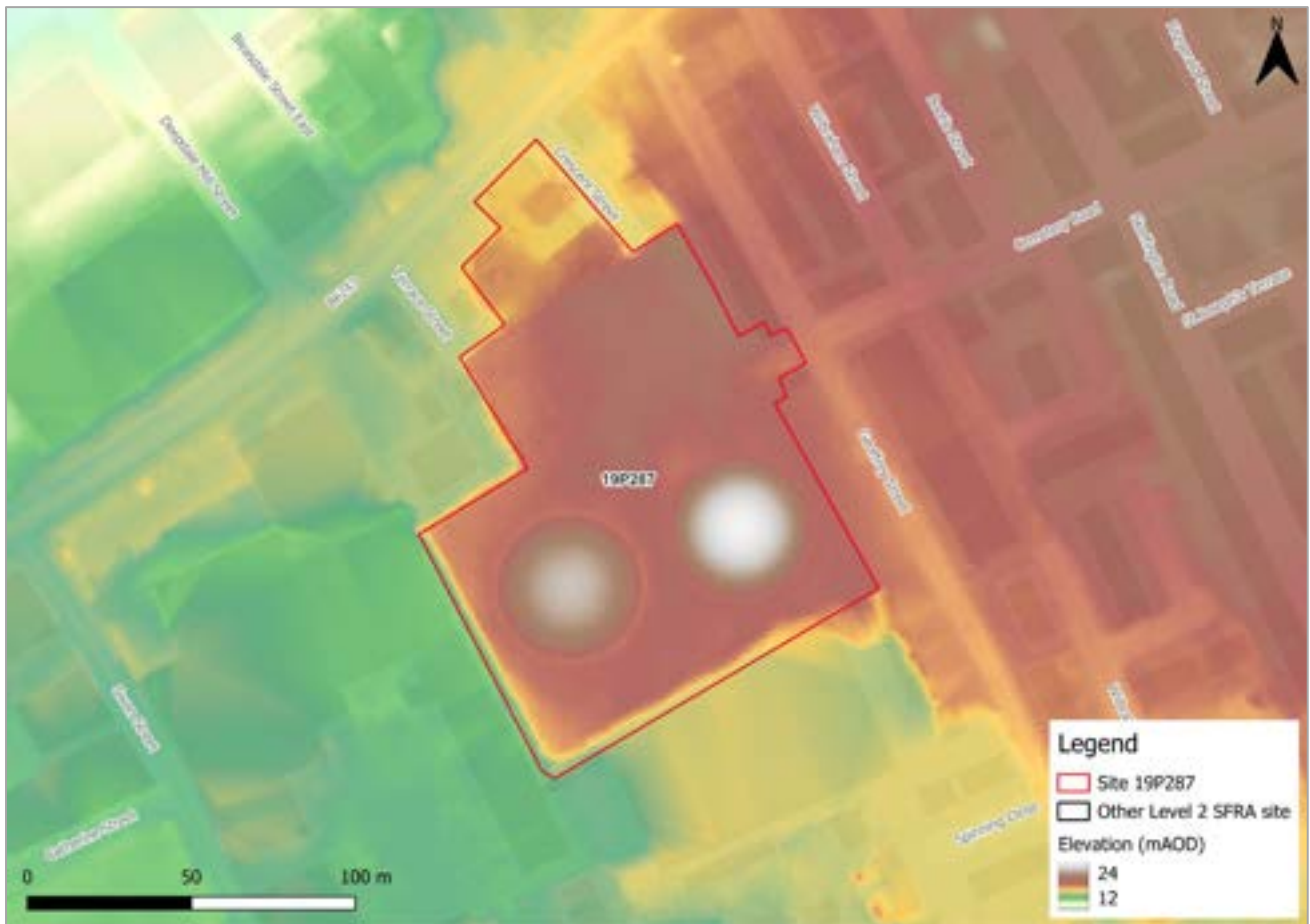


Figure 98-2: Topography

99 Flood risk from rivers

99.1 Existing risk

99.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be seen in Figure 99-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 99.2) or the impacts of climate change.

This site is located fully within Flood Zone 1, indicating it is at a low risk of flooding from rivers.

Table 99-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 99-1: Existing risk from rivers to the site

99.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

99.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P287 is located within one catchment, namely Coastal Catchment 176. Coastal Catchment 176 is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁵⁹.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

99.2.2 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. There are no applicable WwNP areas within the site boundary or its vicinity.

99.3 Residual risk

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

99.3.1 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. 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.

⁵⁹ [Lancashire SuDS Guidance](#)

The site is not shown to be at risk of flooding from reservoirs.

99.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

99.5 Flood warning and access and escape routes

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. Site 19P287 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. The site is also not located within a FAA.

Safe access and escape routes could likely be achieved during a flood event via the B6243 or Geoffrey Street.

99.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is modelled to be fully within Flood Zone 1.

100 Flood risk from surface water

100.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 1% of the site is within the medium surface water risk zone and a further 3% in the low risk zone as shown in Table 3-1.

In the medium risk event, there is a flow path along parts of the western site boundary. In the low risk event, ponding expands at the western and southern site boundaries and an area of ponding forms within the centre of the site. Greatest flood depths in the medium risk event are 0.3 to 0.6 m (Figure 3-1) with some areas of moderate hazard along the western site boundary (Figure 3-2). Safe access and escape should be achievable via the B6243 or Geoffrey Street, given the shallow depths of flooding on these roads.

Table 100-1: Existing surface water flood risk based on the RoFSW map

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



Figure 100-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 100-2: Medium risk event surface water flood hazard⁶⁰ (Risk of Flooding from Surface Water map)

100.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 100-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water event plus an allowance for climate change. Flooding is modelled to be marginally greater than the present day low risk event with ponding at the centre of the site and along the western and

⁶⁰ 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

southern site boundaries increasing in extent. Maximum flood depths remain 0.6 to 0.9 m (Figure 3-3) with a small area of significant hazard at the southeastern boundary (Figure 3-4). Safe access and escape may remain achievable via the B6243 or Geoffrey Street during this event, given the shallow depths of flooding to these roads.



Figure 100-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 100-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

100.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 1% of the site being at medium surface water flood risk and a further 3% at low surface water risk. In the medium risk event, ponding is confined to an area along the western site boundary.
- The medium risk event plus climate change modelling shows a marginally larger flood extent in comparison to the present day low risk event with slightly more flooding encroaching onto the southern boundary of the site.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed development or whether further capacity will be required.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through
- Note, 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 or evidence.

101 Risk from groundwater

Risk from groundwater sources 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 Guide⁶¹. Figure 4-1 shows the map for Site 19P287 and the surrounding areas and Table 4-1 explains the risk classifications.

The site is in an area where there is low risk of groundwater emergence and groundwater levels are at least 5 m below the ground surface in the 100-year flood event. Groundwater conditions may therefore be suited to infiltration SuDS and this should be investigated further at the FRA stage.



Figure 101-1: JBA 5m Groundwater Flood Map

⁶¹ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 101-1: Groundwater Flood 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.	

102 Overall site assessment

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

To pass part b) of the exception test⁶², it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

102.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate for this site to be allocated, given the low fluvial and predominantly very low surface water flood risk to the site.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

62 Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P293

Final

February 2025

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll of JBA Consulting carried out this work.

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Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JBA specifically does not guarantee or warrant any estimates or projections contained in this Report.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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104 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P293. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

104.1 Site 19P293

- Location: PR4 0RX
- Existing site use: Housing
- Existing site use vulnerability: More vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.55 hectares
- Proposed development impermeable area: 0.46 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-



Figure 104-1: Existing site location boundary

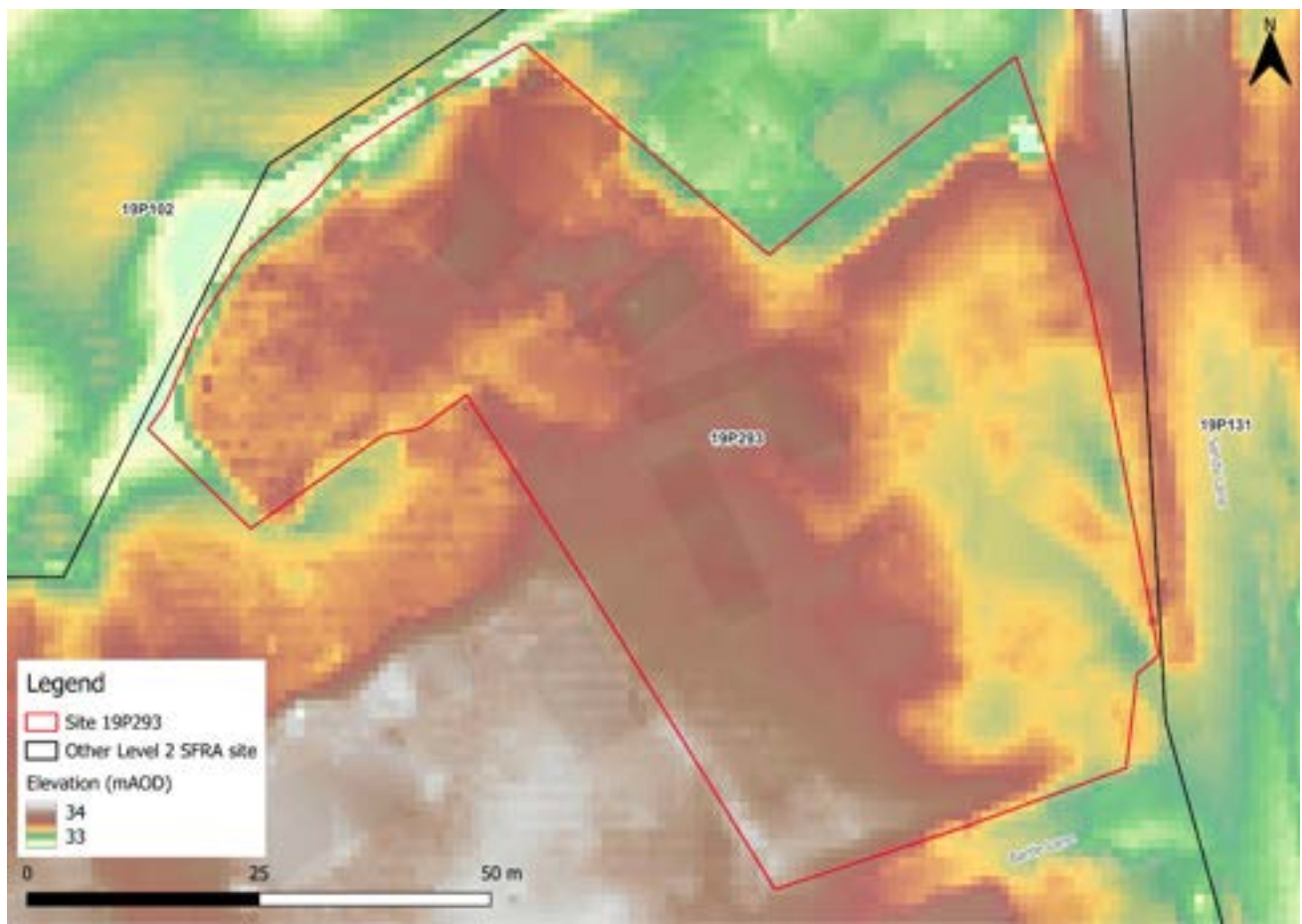


Figure 104-2: Topography

105 Flood risk from rivers

105.1 Existing risk

105.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is wholly within Flood Zone 1 indicating the site is at low risk of flooding from rivers.

Table 105-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

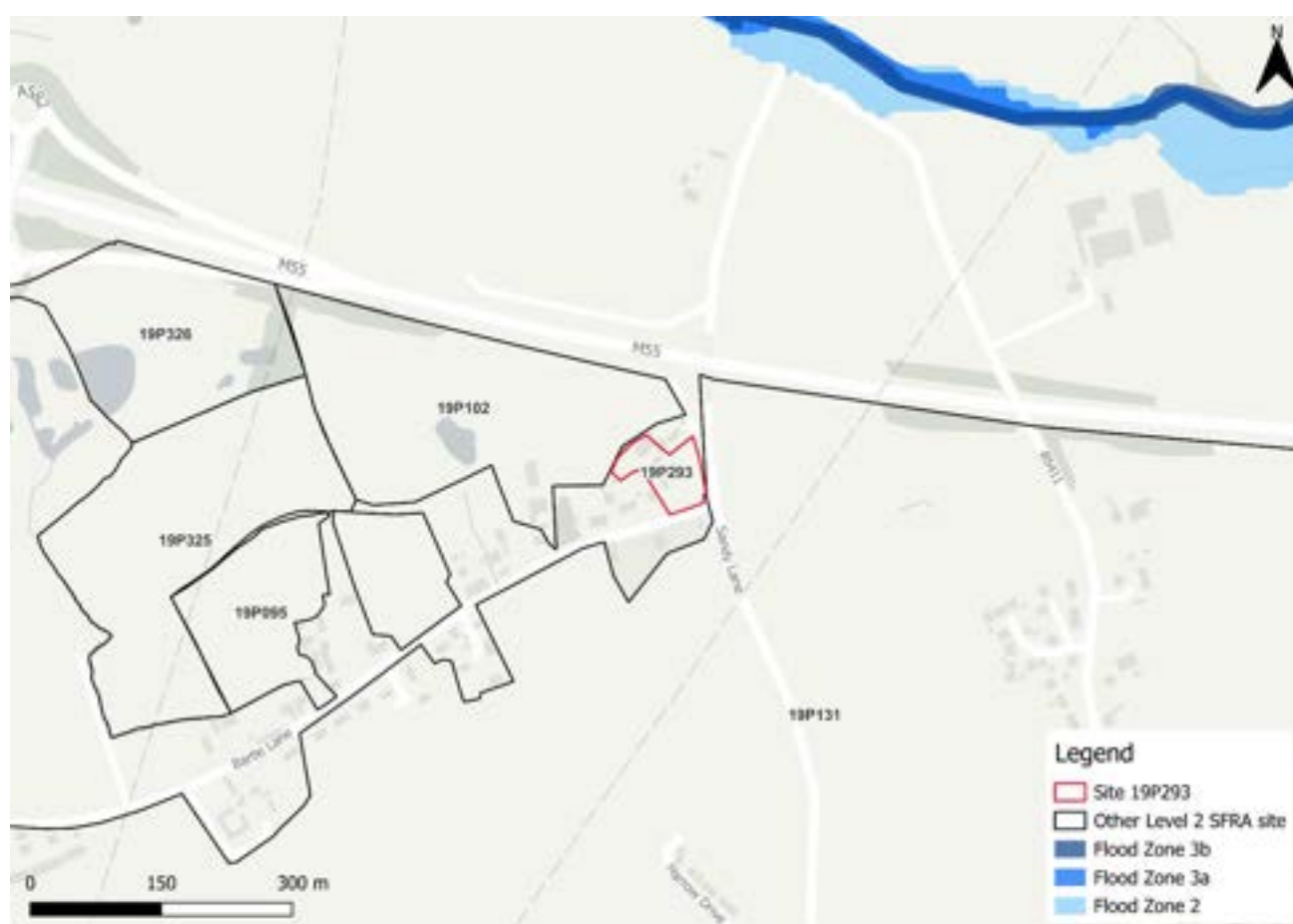


Figure 105-1: Existing risk from rivers to the site

105.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

105.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA, which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P293 is located within one catchment, namely, Woodplumpton Brook. This is ranked as a medium sensitivity catchment. Planning considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁶³.
- Developments should be incentivised to provide wider betterment by demonstrating in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments should achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA

105.2.2 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. Both within and upstream of the site there is potential for both riparian and wider catchment woodland planting to attenuate flows and reduce the volume of runoff downstream. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 105-2.

⁶³ [Lancashire SuDS Guidance](#)



Figure 105-2: Natural Flood Management (NFM) potential mapping

105.3 Residual risk

105.3.1 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. The '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 not modelled to be at risk from reservoir flooding.

105.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

105.5 Flood warning and access and escape routes

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 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 an FWA. The site is not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Sandy Lane during all events.

105.6 Observations, mitigation options and site suitability - fluvial

- The site is wholly located within Flood Zone 1.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P102, 19P293, 19P095, 19P326, 19P325 and 19P131, 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.
-

106 Flood risk from surface water

106.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly seen to be very low. Approximately 1% of the site is within the medium risk surface water flood zone. A further 5% of the site is observed to be at low surface water risk, as shown in Table 107-1.

In the medium risk event, there is a short surface water flow path along the north western boundary of the site, coincident within an existing drainage ditch. In the low risk event, this flow path becomes greater in extent and depth, with an additional area of ponding along the eastern boundary of the site.

Greatest flood depths within the medium risk event are between 0.6 and 0.9m (Figure 3-1) with some areas of significant hazard (Figure 3-2), which are confined to the existing drainage ditch within the north of the site. Safe access and escape routes should be possible via Sandy Lane in all events.

Table 106-1: Existing surface water flood risk based on the RoFSW map

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

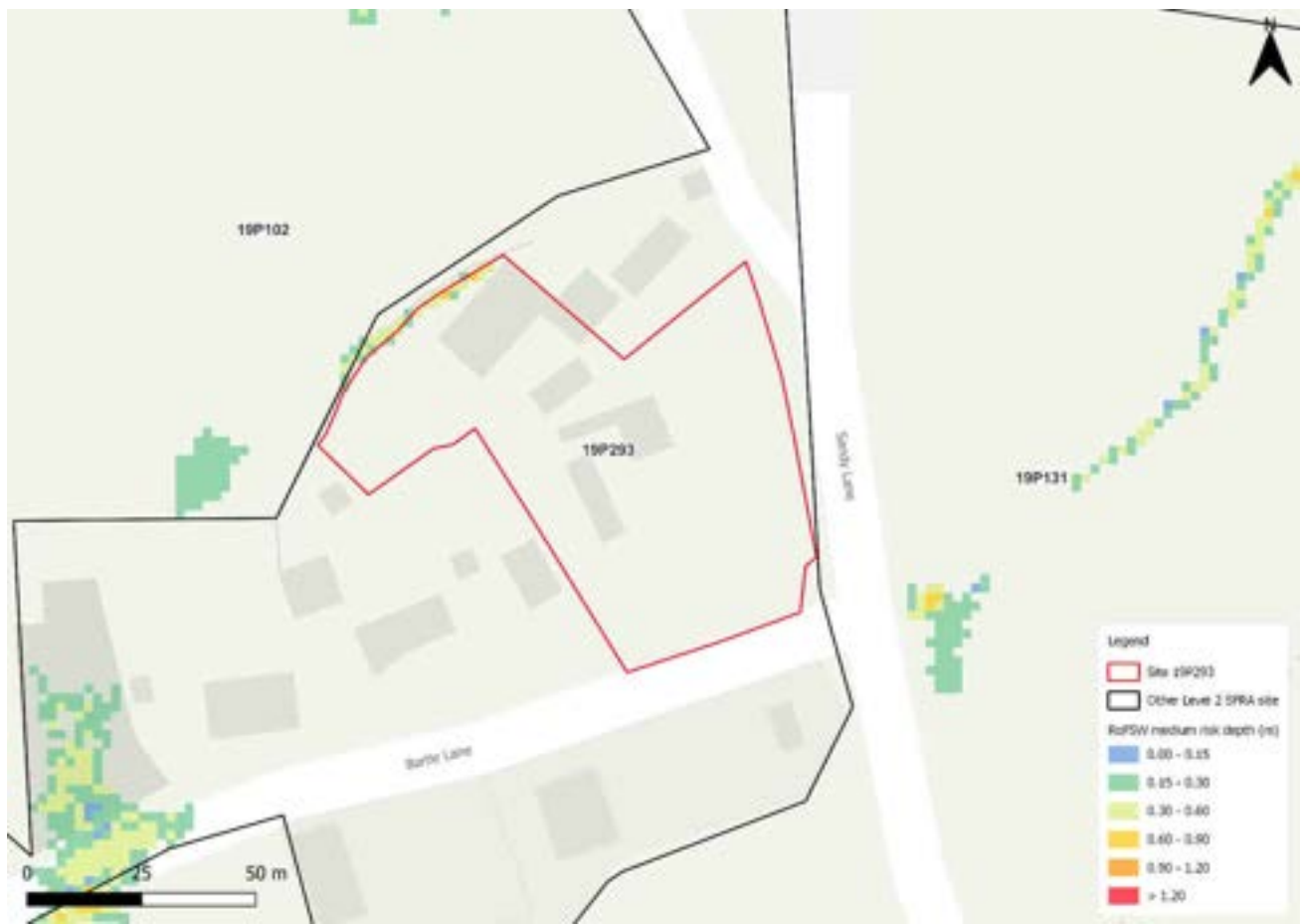


Figure 106-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 106-2: Medium risk event surface water flood hazard⁶⁴ (Risk of Flooding from Surface Water map)

106.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 106-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium risk climate change event being similar in extent to the present day low risk event.

⁶⁴ 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

Maximum flood depths outside of the drainage ditch within the north of the site are modelled to be between 0.3 and 0.6 m (Figure 3-3), with some areas of moderate hazard (Figure 3-4).



Figure 106-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 106-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

106.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 94% of the site being at very low risk. Surface water risk in the medium risk event is largely confined to the existing drainage ditch on site.
- The modelled medium risk climate change outputs indicate a similar extent of risk to the present day low risk event, with an additional area of ponding within the east of the site. The existing drainage ditch and any topographic depressions should be maintained in site design.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed residential development or whether further capacity will be required.
- Note, 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 or evidence.

107 Risk from groundwater emergence

Flood risk from groundwater sources is assessed in this SFRA using JBA's 5m Groundwater Flood Map. This dataset is recommended for use by the EA in the SFRA Good Practice Guide⁶⁵. Figure 4-1 shows the map for the site and the surrounding areas and Table 107-1 explains the risk classifications.

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



Figure 107-1: JBA 5m Groundwater Emergence Map

⁶⁵ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 107-1: Groundwater Flood 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.	

108 Overall site assessment

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

This site is not required to pass part b) of the exception test⁶⁶ 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.

108.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on the evidence in this SFRA, it should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- The existing drainage ditch within the north of the site and the area of ponding in the east should be left free of development and included within site design.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁶⁶ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P309

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Reviewed by	Mike Williamson BSc MSc CGeog FRGS EADA Principal Analyst
Authorised by	Krista Keating BSc MSc CEnv CSci MCIWEM C.WEM Associate Director

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

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110 Background

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110.1 Site 19P309

- Location: 50 Lancaster Road
- Existing site use: Commercial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Mixed use
- Proposed site use vulnerability: More vulnerable
- Site area: 0.022 hectares
- Proposed development impermeable area: 0.02 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-



Figure 110-1: Existing site location boundary

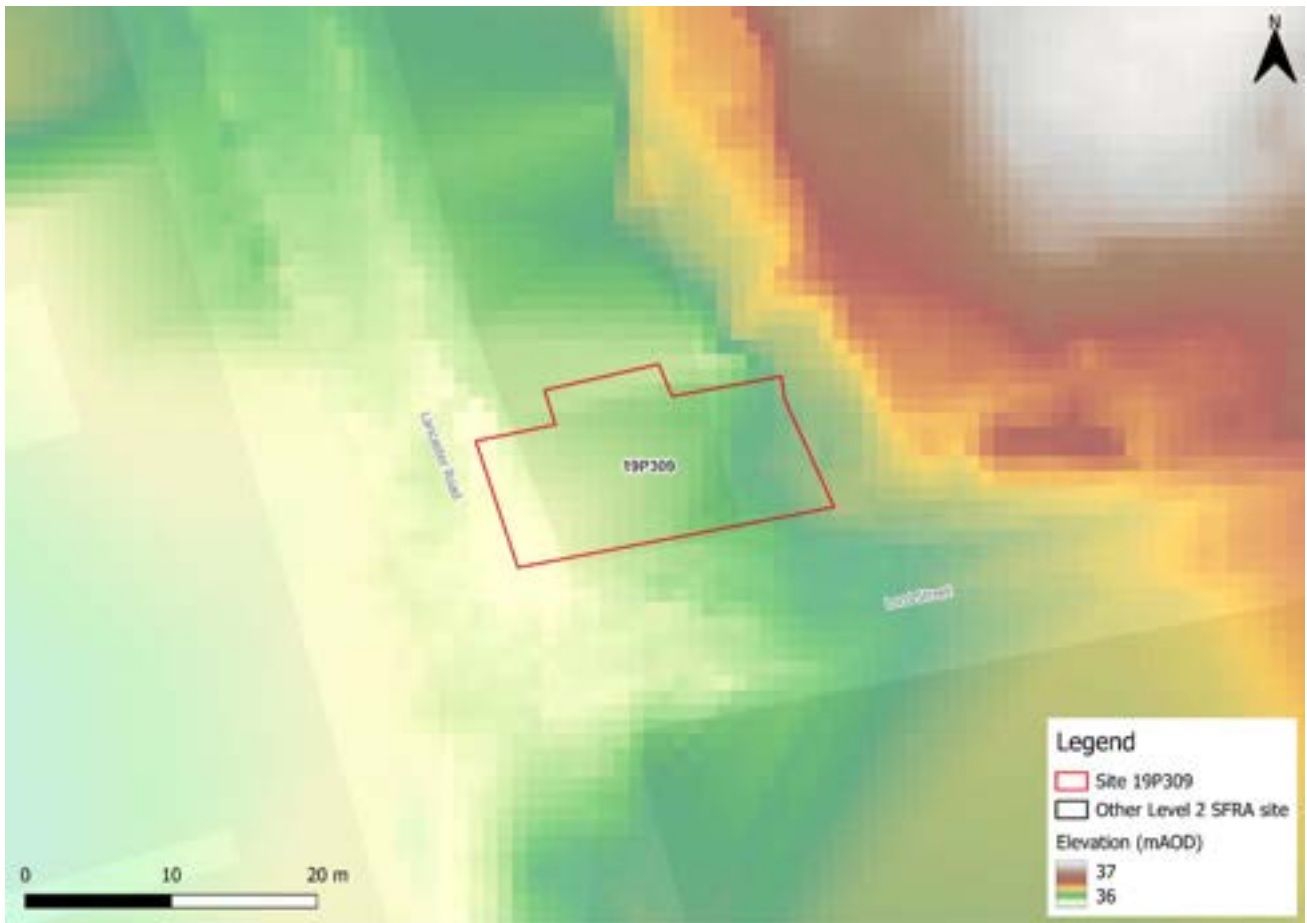


Figure 110-2: Topography

111 Flood risk from rivers

111.1 Existing risk

111.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located within Flood Zone 1 indicating the site is at low risk of flooding from rivers.

Table 111-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 111-1: Existing risk from rivers to the site

111.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences.

111.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P309 is located within one catchment, namely Coastal Catchment 176. This is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

111.2.2 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. There are no applicable areas for NFM which would benefit the site.

111.3 Residual risk

111.3.1 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. 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 not modelled to be at risk from reservoir flooding.

111.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

111.5 Flood warning and access and escape routes

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 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 an FWA. The site is not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved via Lancaster Road.

111.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is wholly located within Flood Zone 1.

112 Flood risk from surface water

112.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 5% of the site is within the high risk surface water flood zone. There is no modelled additional risk to the site in the medium and low risk events, as shown in Table 112-1.

In all events, surface water risk is confined to the western boundary of the site, confined to the front of the existing property within the site. Surface water is constrained by the existing development within the site.

Greatest flood depths within the medium risk event are between 0.3 and 0.6 m (Figure 3-1) with hazard categorised as moderate (Figure 3-2). Safe access and escape routes via the front of the existing development within the site may be challenging to achieve given the modelled depth of flooding along Lancaster Road. There may be opportunities for safe access and escape routes via Lord Street to the east, however this should be investigated further based on detailed surface water modelling once site layout has been confirmed.

Table 112-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
95	0	0	5



Figure 112-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 112-2: Medium risk event surface water flood hazard⁶⁷ (Risk of Flooding from Surface Water map)

112.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 112-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 45% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium

⁶⁷ 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

risk climate change event being slightly greater in extent than the present day low risk event.

Maximum flood depths are modelled to be between 0.3 and 0.6 m (Figure 3-3) with some areas of significant hazard (Figure 3-4). Safe access and escape routes in the medium risk plus climate change event should be considered further as part of a site-specific FRA. Detailed surface water modelling should be undertaken to confirm depths to the access and escape routes surrounding the site. Raised access routes may be required at this site. Where the current building to be demolished, surface water would likely encroach onto the site footprint. This should be considered in site design.

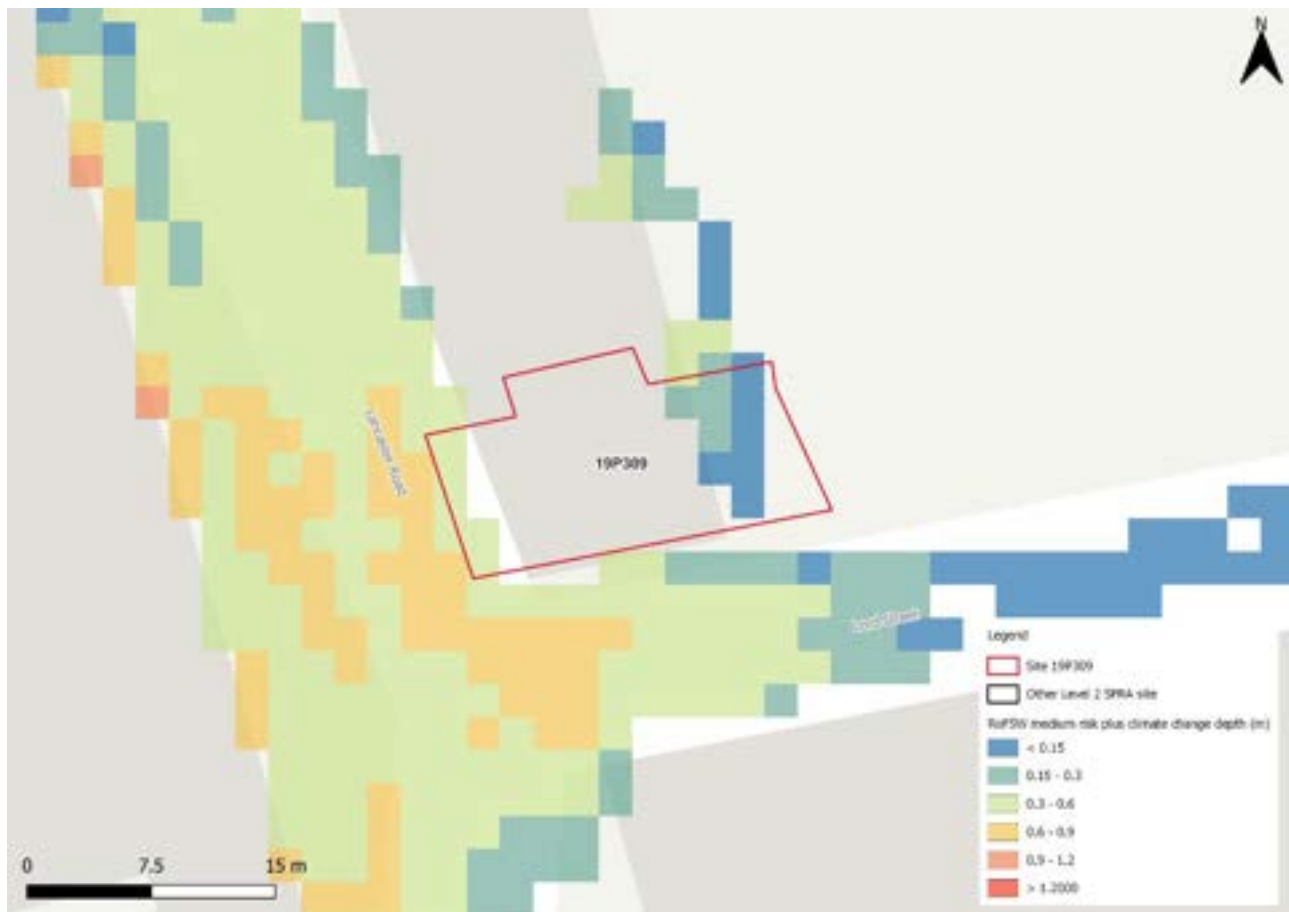


Figure 112-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 112-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

112.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 95% of the site being at very low risk. Surface water risk in all events is confined to the front of the existing property within the site, constrained by the existing development.
- Any change in site layout where current buildings are to be demolished and changes to road layouts will require detailed surface water modelling to ascertain flow routes and low-lying areas.
- The modelled medium risk climate change outputs indicate a greater extent of risk to the site and surrounding areas than the present day low risk event.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed residential development or whether further capacity will be required.
- It is assumed the existing onsite development will be demolished for new housing units. A drainage strategy would therefore be required to ensure there is no

increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Note, 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 or evidence.

113 Risk from groundwater

Risk from groundwater sources 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 Guide⁶⁸. Figure 4-1 show the map for the site and the surrounding areas and Table 113-1 explains the risk classifications.

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



Figure 113-1: JBA 5m Groundwater Emergence Map

⁶⁸ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 113-1: Groundwater Flood 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.	

114 Overall site assessment

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

This site is not required to pass part b) of the exception test⁶⁹ 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.

114.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on the evidence in this SFRA, it should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1.
- Any FRA should further investigate safe access and escape routes to the site in the low risk present day and medium risk plus climate change surface water events. Raised access routes may be required. Where the current building to be demolished, surface water would likely encroach onto the site footprint. This should be considered in site design.
- The use of infiltration SuDS should be investigated.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁶⁹ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P312 Final

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll of JBA Consulting carried out this work.

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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116 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P312. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

116.1 Site 19P312

- Location: Corner of Manchester Road and Church Street, Preston, PR1 3BT
- Existing site use: Car parking
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.35 hectares
- Proposed development impermeable area: 0.3 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-



Figure 116-1: Existing site location boundary



Figure 116-2: Topography

117 Flood risk from rivers

117.1 Existing risk

117.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating the site is at low risk of flooding from rivers.

Table 117-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 117-1: Existing risk from rivers to the site

117.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

117.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19C264x is located within one catchment, namely, Coastal Catchment 176. This is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

117.2.2 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. There are not any applicable areas that could benefit this site.

117.3 Residual risk

117.3.1 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. 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 not modelled to be at risk from reservoir flooding.

117.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

117.5 Flood warning and access and escape routes

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 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 an FWA. The site is not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Manchester Road.

117.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is wholly located within Flood Zone 1.

118 Flood risk from surface water

118.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is significant. Approximately 36% of the site is within the high risk surface water flood zone. A further 23% of the site is at medium risk and a further 25% of the site is at low risk.

In the high risk event, there is a significant area of ponding within a topographic low spot within the centre of the site. There is an additional area of ponding within the north east of the site which extends from Manchester Road. In the medium risk event, these areas combine and create a significant area of ponding across the majority of the site. In the low risk event, both surface water flood depths and extents increase significantly in comparison to the medium risk event.

Greatest surface water flood depths in the medium risk event are between 0.6 and 0.9 m (Figure 3-1) with a large area of significant hazard (Figure 3-2). Safe access and escape routes may be challenging to achieve during a surface water flood event. There may be some opportunity via Rose Street to the west of the site, however this should be confirmed through detailed surface water modelling of the site and surrounding areas.

Based on current information, this site should not be developed for more vulnerable uses.

Table 118-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
16	25	23	36

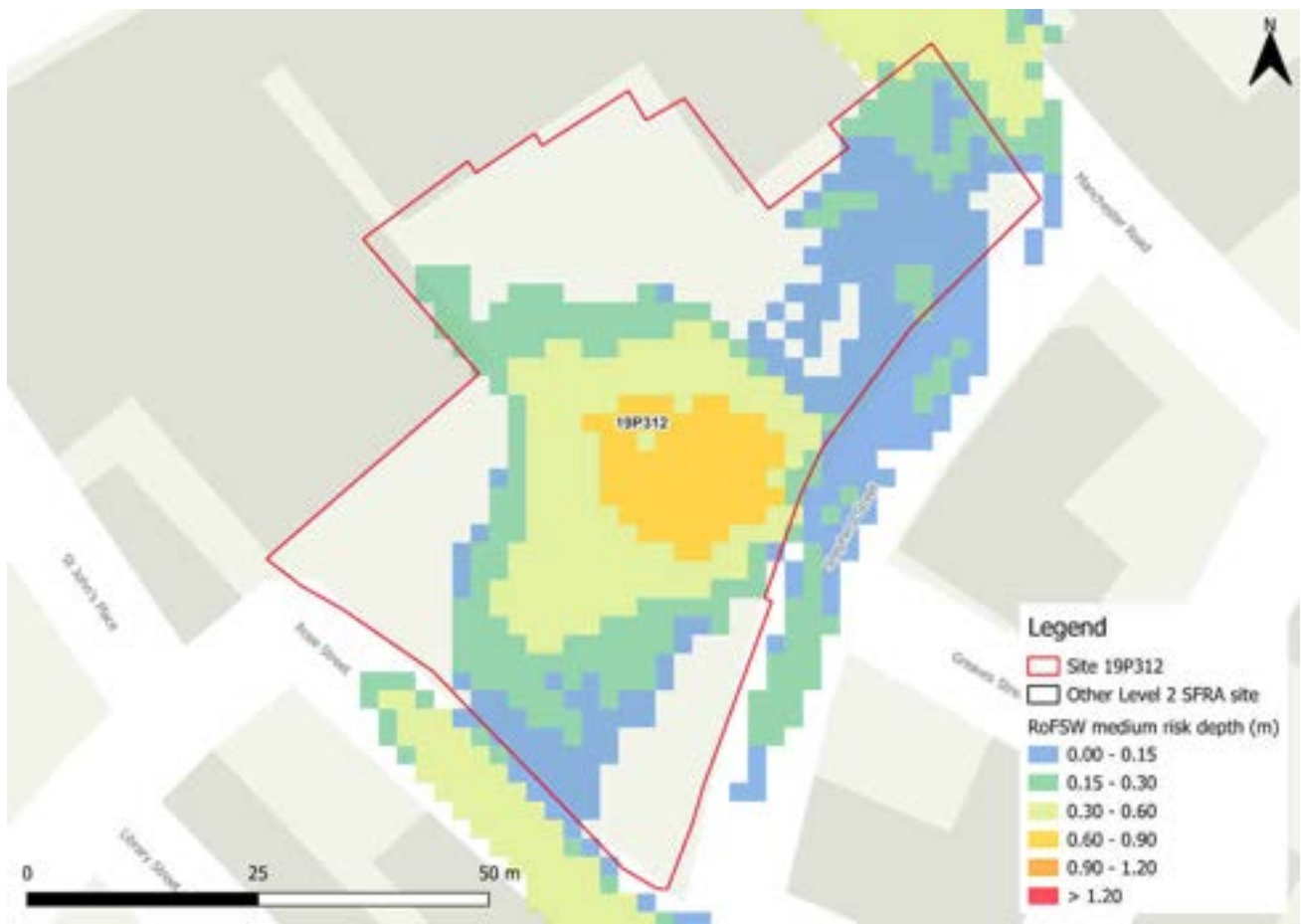


Figure 118-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

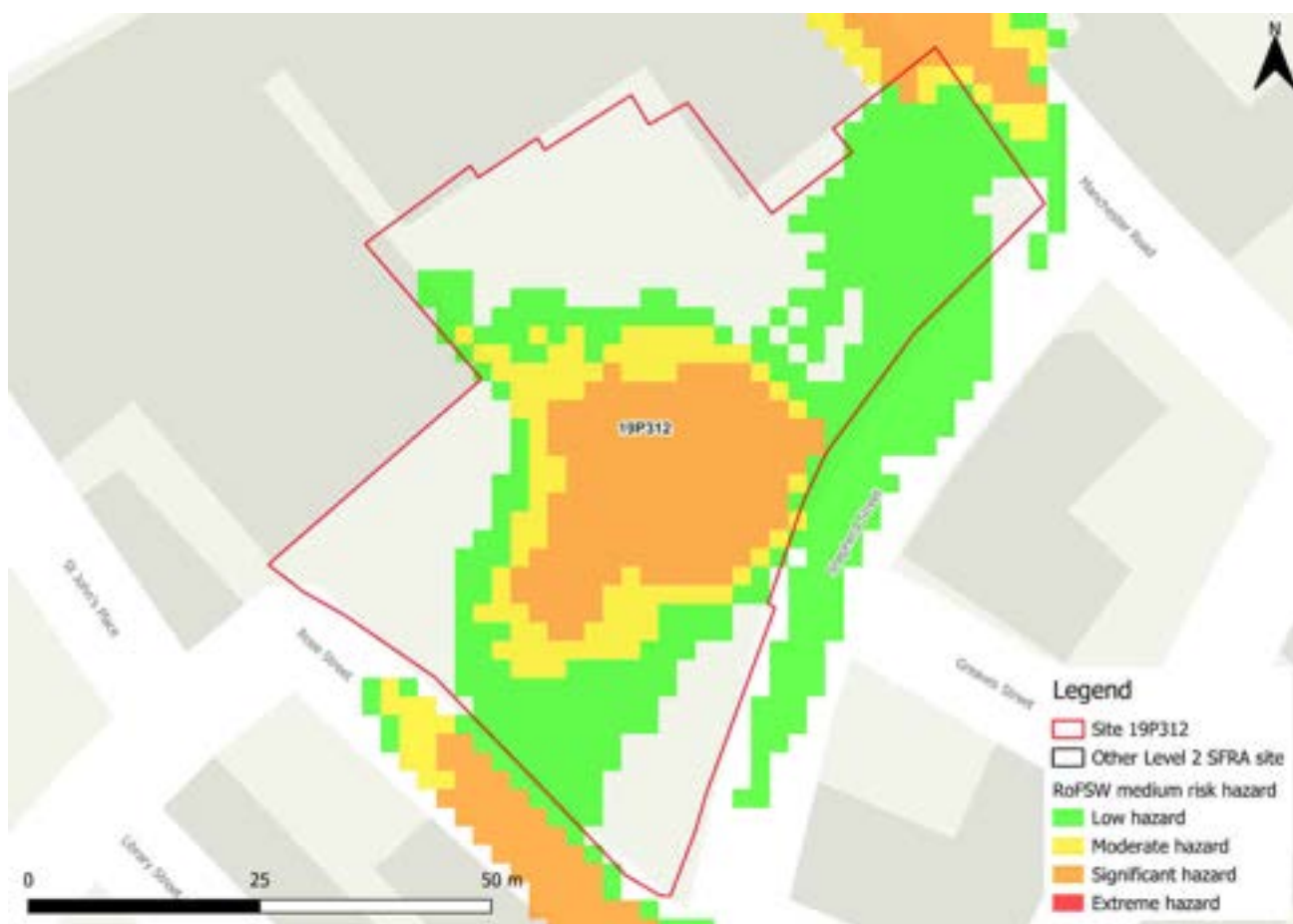


Figure 118-2: Medium risk event surface water flood hazard⁷⁰ (Risk of Flooding from Surface Water map)

118.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 118-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water depths for the medium risk event +50% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium risk climate change event being similar in extent to the present day low

⁷⁰ 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

risk event, covering the majority of the site. Maximum flood depths are modelled to be > 1.2m (Figure 3-3) with some large areas of significant hazard (Figure 3-4). Safe access and escape routes may be challenging to achieve during this event. There may be some opportunity via Rose Street to the west of the site, however this should be confirmed through detailed surface water modelling of the site and surrounding areas. However, it is recommended that this site is not developed for more vulnerable uses.

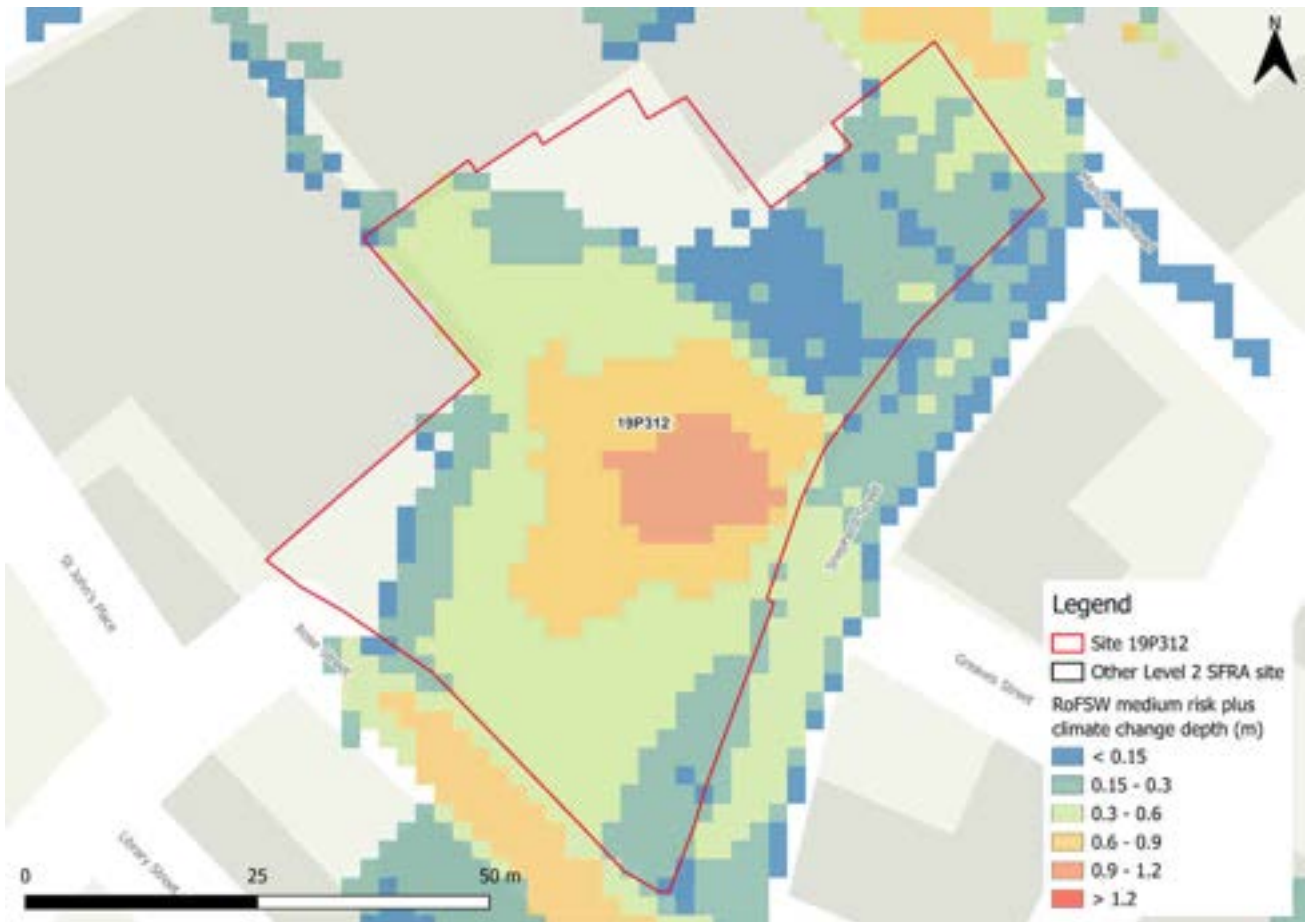


Figure 118-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

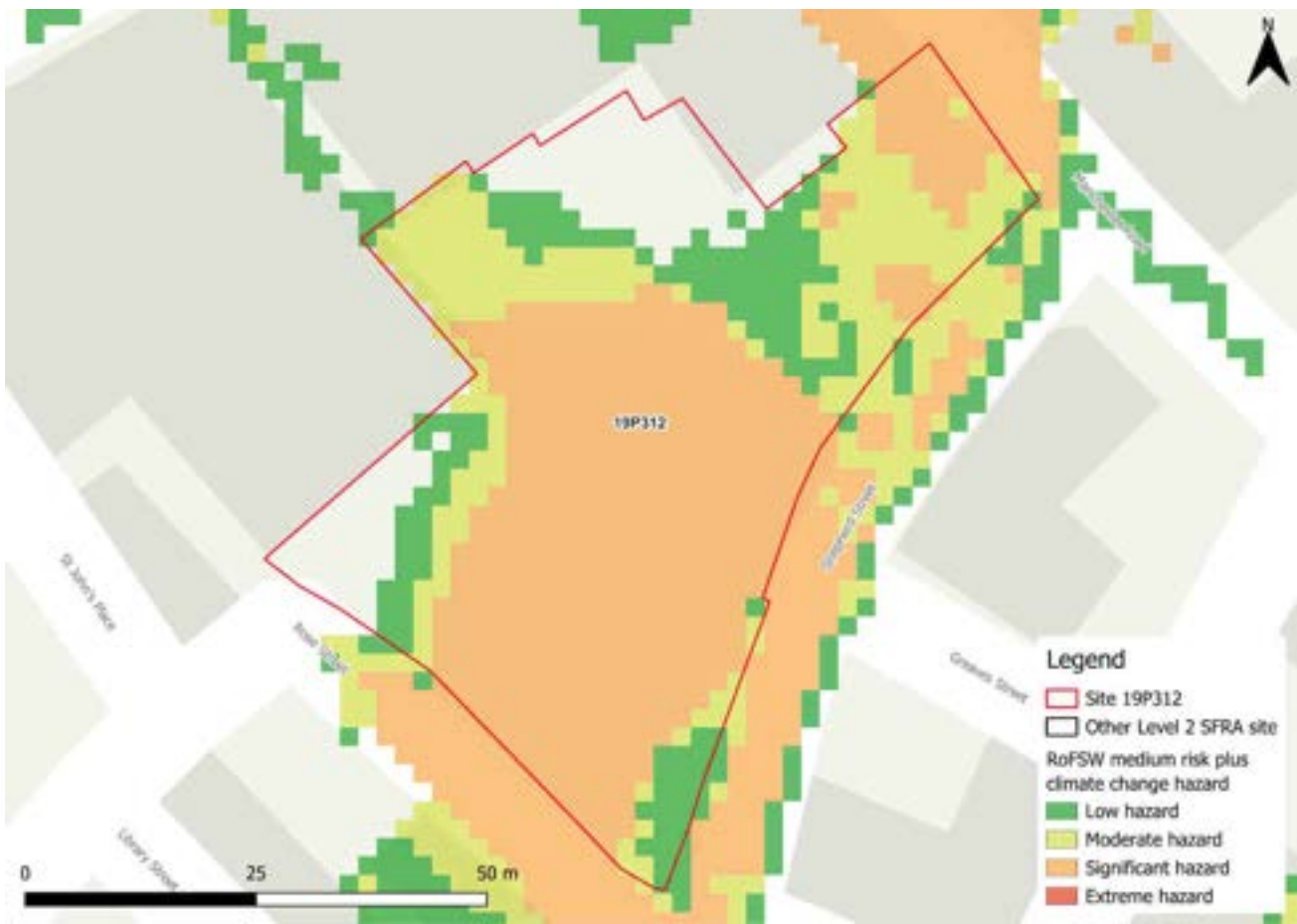


Figure 118-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

118.3 Observations, mitigation options and site suitability - surface water

- Present day surface water risk to the site is significant. Over a third of the site is modelled to be at risk from surface water flooding in the high risk event, covering a large area within the centre of the site. Almost the entire site is inundated in the low risk surface water event.
- The medium risk modelled climate change outputs indicate a similar extent of risk to the present day low risk event, with almost the entire site modelled to be at risk.
- Safe access and escape routes may be challenging to achieve during a surface water flood event. There may be some opportunity via Rose Street to the west of the site, however this should be confirmed as part of a drainage strategy through detailed surface water modelling of the site and surrounding areas.
- It is recommended that this site not be developed for more vulnerable uses.
- Note, 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 or evidence.

119 Risk from groundwater

Risk from groundwater sources 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 Guide⁷¹. Figure 4-1 shows the map for the site and the surrounding areas and Table 119-1 explains the risk classifications.

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



Figure 119-1: JBA 5m Groundwater Emergence Map

⁷¹ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 119-1: Groundwater Flood 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.	

120 Overall site assessment

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

This site is not required to pass part b) of the exception test⁷², 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.

120.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, and the significant level of surface water risk, this site would ideally be left free of development and left for car parking or ideally converted to open greenspace enabling storage of surface water and would provide amenity benefits.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁷² Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P313

Final

February 2025

Prepared for:



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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll of JBA Consulting carried out this work.

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JBA disclaims any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to JBA's attention after the date of the Report.

Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based

on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JBA specifically does not guarantee or warrant any estimates or projections contained in this Report.

Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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122 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P313. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

122.1 Site 19P313

- Location: Arkwright House, Midgery Lane, Preston, PR1 3XT
- Existing site use: Commercial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.05 hectares
- Proposed development impermeable area: 0.04 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 122-1: Existing site location boundary

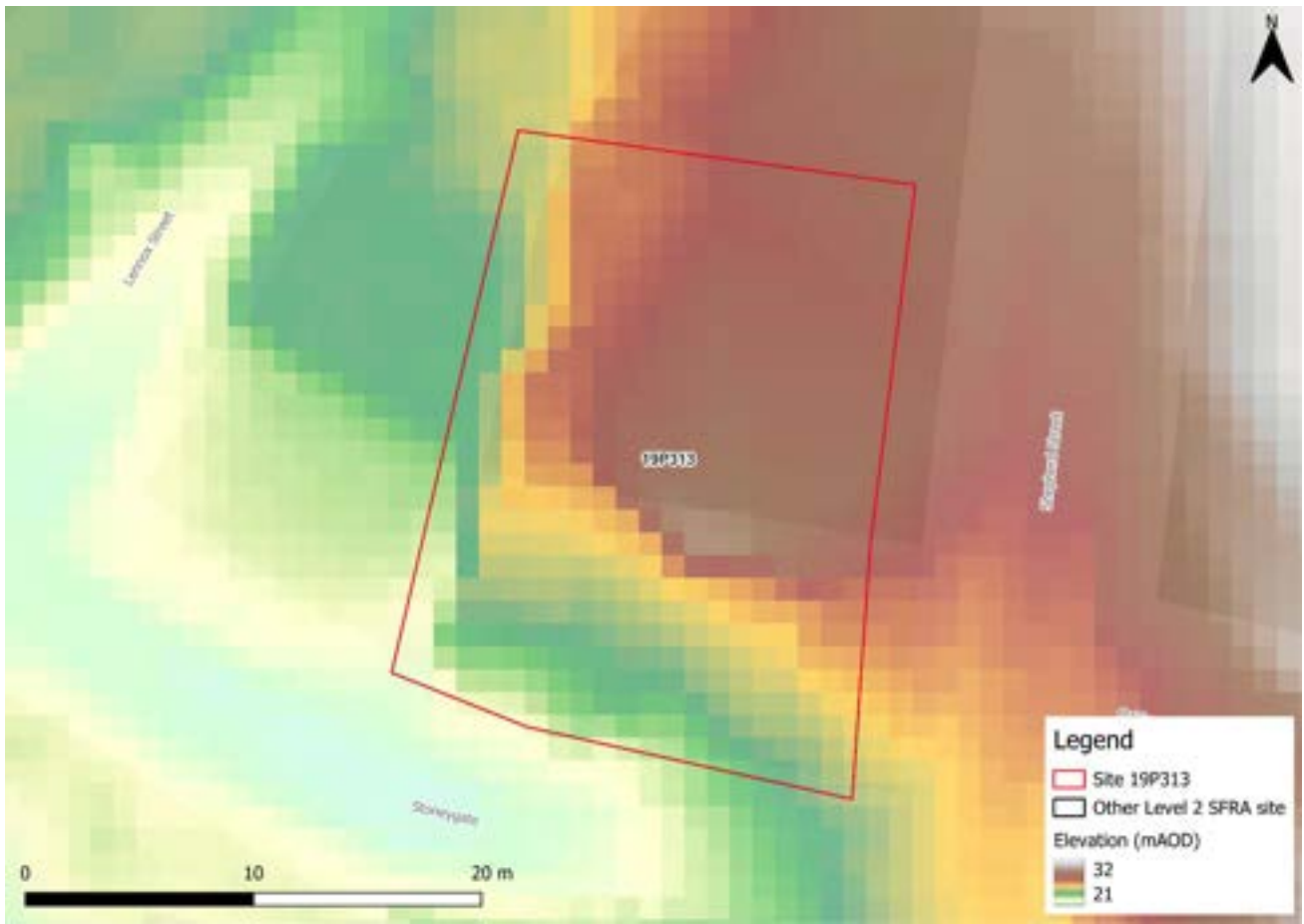


Figure 122-2: Topography

123 Flood risk from rivers

123.1 Existing risk

123.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating it is at low risk from flooding from rivers.

Table 123-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 123-1: Existing risk from rivers to the site

123.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

123.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P313 is located within one catchment, namely; Coastal Catchment 176. This is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

123.2.2 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. There are no applicable areas that could benefit the site.

123.3 Residual risk

123.3.1 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. The '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 not modelled to be at risk from reservoir flooding.

123.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

123.5 Flood warning and access and escape routes

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. Site 19P313 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 an FWA. The site is also not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Shepherd Street.

123.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in risk classification from less vulnerable to more vulnerable, according to NPFF.
- Given the change in use and therefore vulnerability to 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 FRC-PPG).
- The site is located wholly within Flood Zone 1.

124 Flood risk from surface water

124.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is within the high risk surface water flood zone. A further 2% is at medium risk and a further 12% is at low risk, as shown in Table 124-1.

In the high and medium risk events, surface water risk is confined to a small area within the north of the site. In the low risk event, there is a greater area of risk within the north of the site, and there is some additional risk along the southern boundary of the site.

Greatest flood depths within the medium risk event are between 0.15 and 0.3 m (Figure 3-1), with areas of hazard categorised as moderate (Figure 3-2). Safe access and escape routes should be possible via Shepherd Street in the high and medium risk events. Safe access and escape routes may be challenging to achieve in the low risk event, given depths of up to 0.3 m along this route.

Table 124-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
84	12	2	2

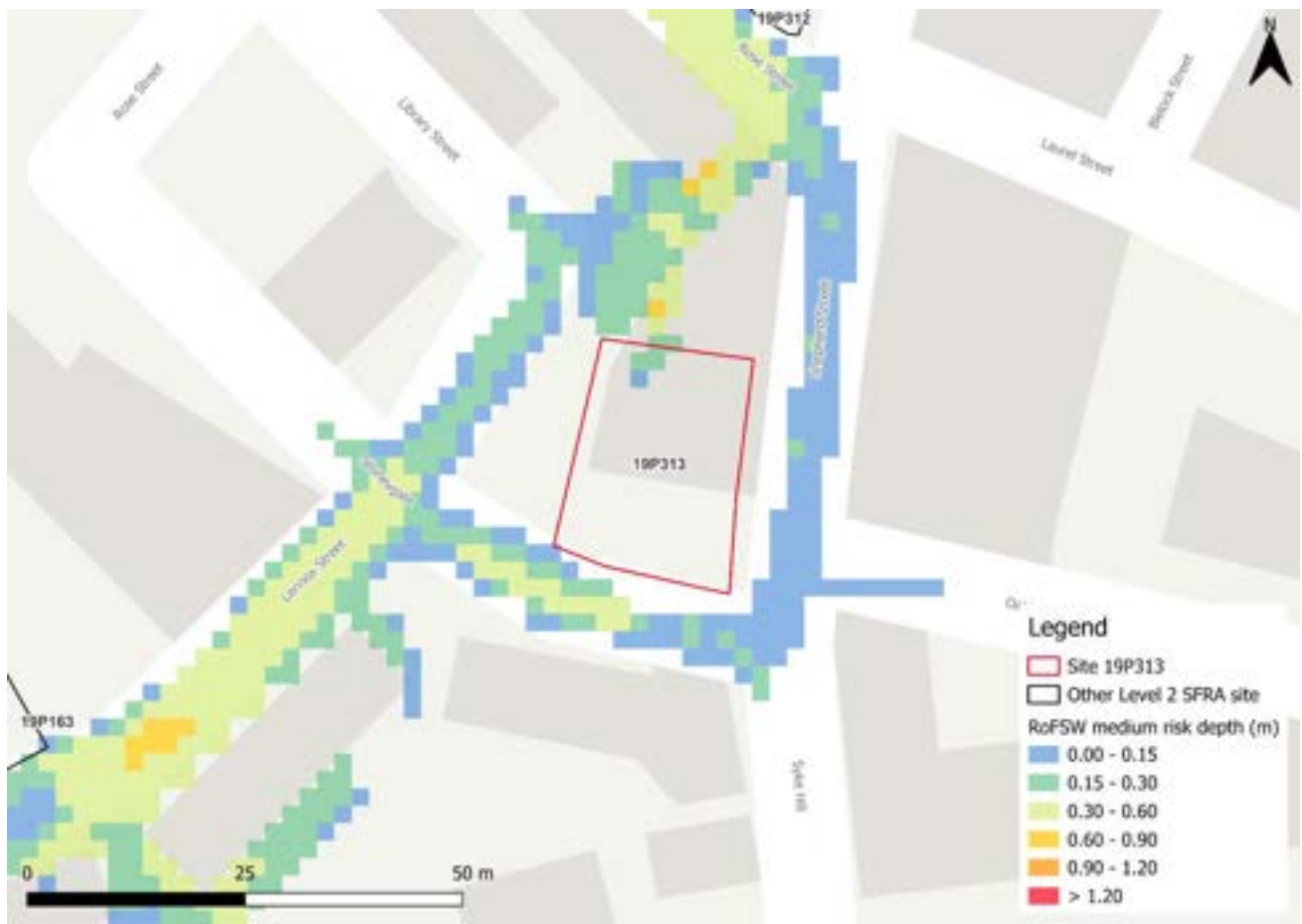


Figure 124-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 124-2: Medium risk event surface water flood hazard⁷³ (Risk of Flooding from Surface Water map)

124.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 124-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water flood depths for the medium risk event +50% climate change. Risk is modelled to be significantly greater in extent than the present day medium risk event, similar in extent to the low risk event. Greatest flood depths are

⁷³ 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

modelled to be between 0.3 and 0.6 m, with some areas of significant hazard (Figure 3-4). Safe access and escape routes may be challenging to achieve in this event.

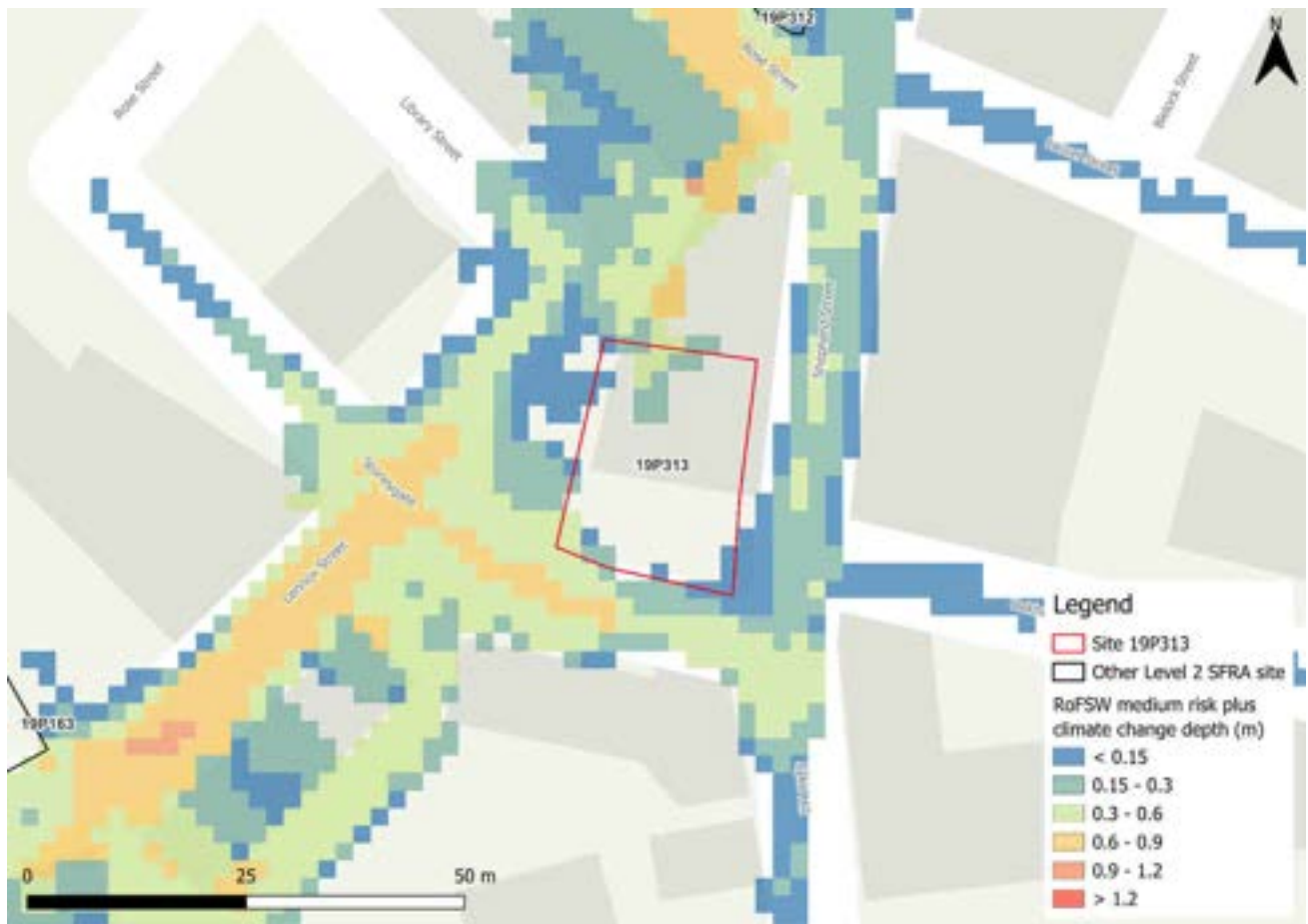


Figure 124-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 124-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

124.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 84% of the site being at very low risk. Surface water risk in the medium risk event is confined to a small area of ponding within the north of the site.
- The medium risk modelled climate change outputs indicate a greater risk to the site than the present day surface water flood events, similar in extent to the present day low risk event.
- Safe access and escape routes may be challenging to achieve in the present day low risk event and medium risk surface water event plus climate change. Consideration should be given to the safe access and escape of site users in this event, including for appropriate evacuation procedures and flood response infrastructure are in place to manage the risk associated with the climate change enhanced flood event.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS across the eastern site parcel. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.

- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed residential development or whether further capacity will be required.
- Were development plans to proceed, a full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.

125 Risk from groundwater

Flood risk from groundwater sources 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 Guide⁷⁴. Figure 4-1 show the map for Site 19P313 and the surrounding areas and Table 125-1 explains the risk classifications.

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



Figure 125-1: JBA 5m Groundwater Emergence Map

⁷⁴ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 125-1: Groundwater Flood 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.	

126 Overall site assessment

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

This site is not required to pass part b) of the exception test⁷⁵ 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.

126.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Were this site to be developed, appropriate emergency and evacuation plans must be in place for the site to deal with the future surface water flood risk.
- Any FRA must consider the inclusion of detailed emergency plans and the provision of safe access and escape routes in the future surface water flood event, based on detailed climate change modelling.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁷⁵ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P325

Final

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Acknowledgements

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128 Background

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128.1 Site 19P325

- Location: Balderstone Farm, Bartle Lane, Lower Bartle, Preston, PR4 0RU (Parcel 1)
- Existing site use: Agricultural land
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 6.8 hectares
- Proposed development impermeable area: 5.8 hectares (assumed 85% impermeable area)
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk



Figure 128-1: Existing site location boundary

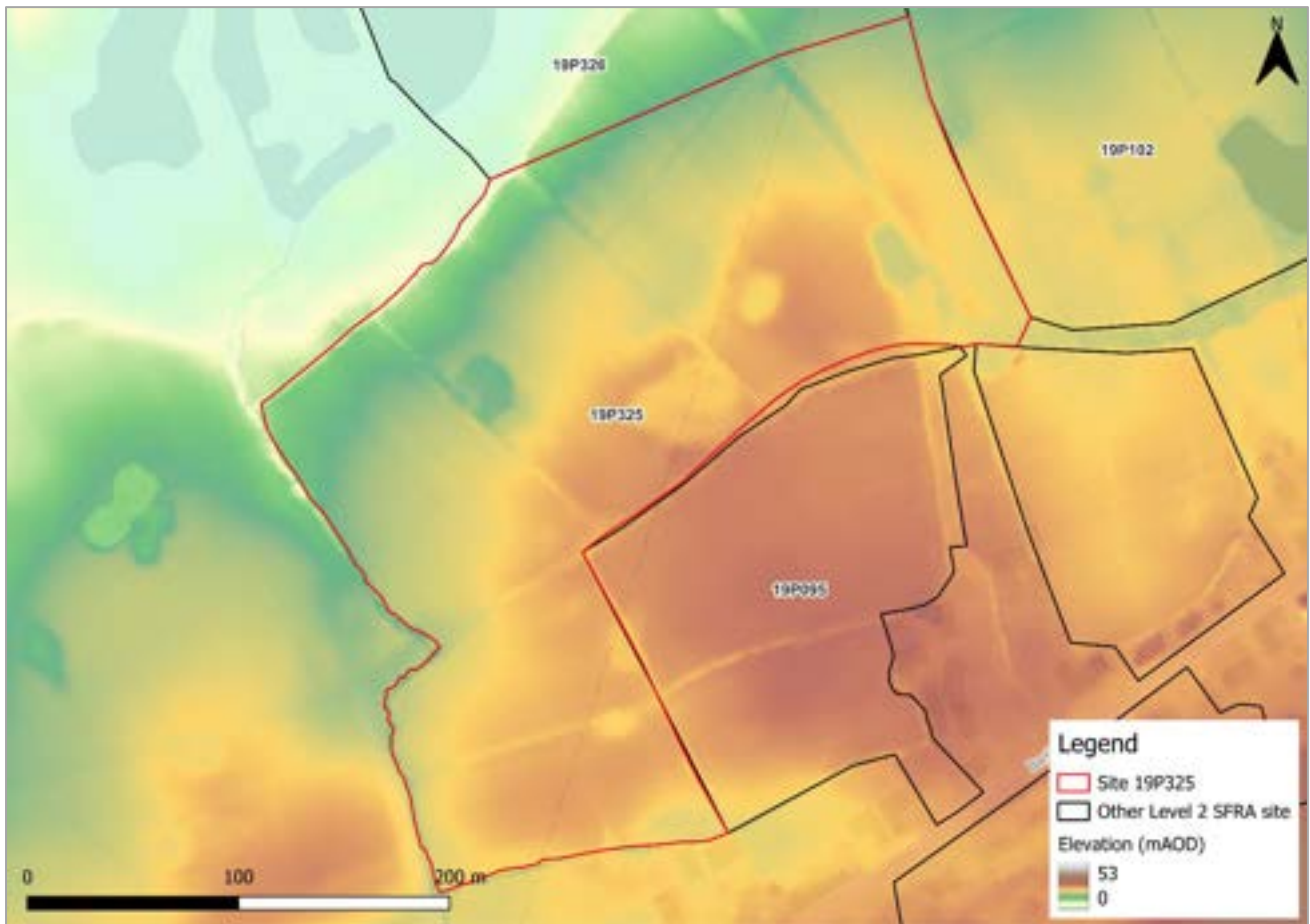


Figure 128-2: Topography

129 Flood risk from rivers

129.1 Existing risk

129.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0).

The site is located entirely within Flood Zone 1, indicating it is at low risk of flooding from rivers. However, there appears to be a ditch within the south site, as identified in the OS mapping and picked up in LiDAR imagery (Figure 128-2). This ditch should be investigated further at the Flood Risk Assessment (FRA) stage.

Table 129-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 129-1: Existing risk from rivers to the site

129.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

129.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P325 is located within one catchment, namely; Woodplumpton Brook. Woodplumpton Brook is ranked as a high sensitivity catchment. Planning policy considerations for sites at higher sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

129.2.2 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. Within the site, there are significant opportunities for wider catchment and riparian tree planting which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. The small topographic depressions, represent opportunities for runoff attenuation in both the 3.3% and 1% AEP events. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 129-2.

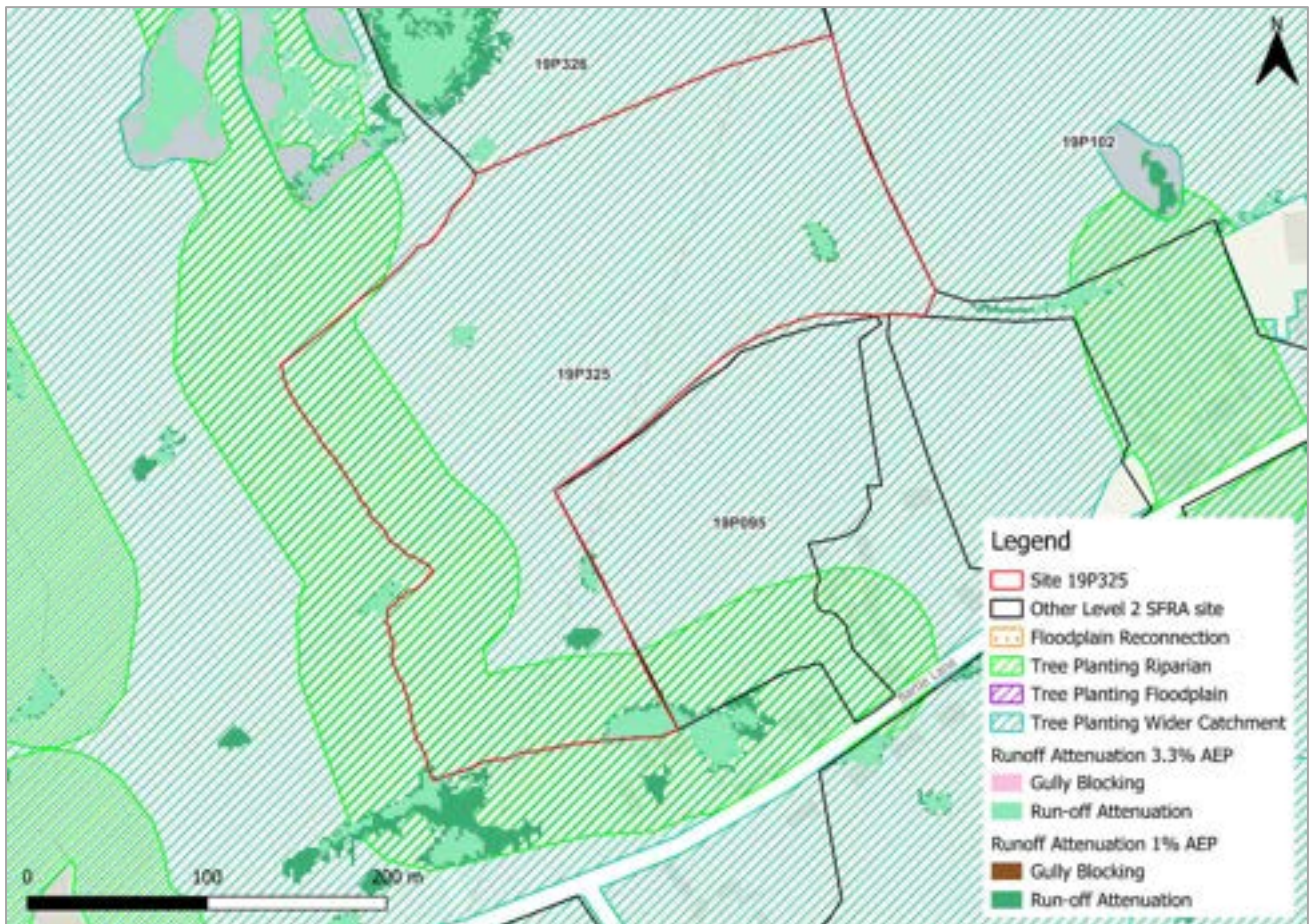


Figure 129-2: Natural Flood Management (NFM) potential mapping

129.3 Residual risk

129.3.1 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. 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 not modelled to be at risk from reservoir flooding.

129.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

129.5 Flood warning and access and escape routes

There are no Flood Warning Areas (FWA) or Flood Alert Areas (FAA) within the vicinity of the site.

Safe access and escape routes should be achievable via the unnamed road / track off Bartle Lane to the south of the site.

129.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is wholly within Flood Zone 1.
- Further investigation is required to quantify flood risk from the onsite drainage ditch.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P326, 19P095 and 19P102, 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.

130 Flood risk from surface water

130.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is within the high risk surface water zone. A further 1% is at medium surface water risk and a further 2% is at low surface water risk as shown in Table 130-1.

In the high risk event, surface water risk is largely confined to the southern site boundary. with some scattered areas of surface water ponding within topographic low spots across the site. In the medium and low risk event, ponding within the site expands slightly. In the low risk event a flow path also forms along the western site boundary. Greatest flood depths in the medium risk event are between 0.6 and 0.9 m (Figure 3-1) with some areas of significant hazard at the southern corner (Figure 3-2). Safe access and escape may be unachievable via the unnamed track leading to Bartle Road south of the site due to a surface water flow path across the track with a significant flood hazard rating.

Table 130-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
95%	2%	1%	2%

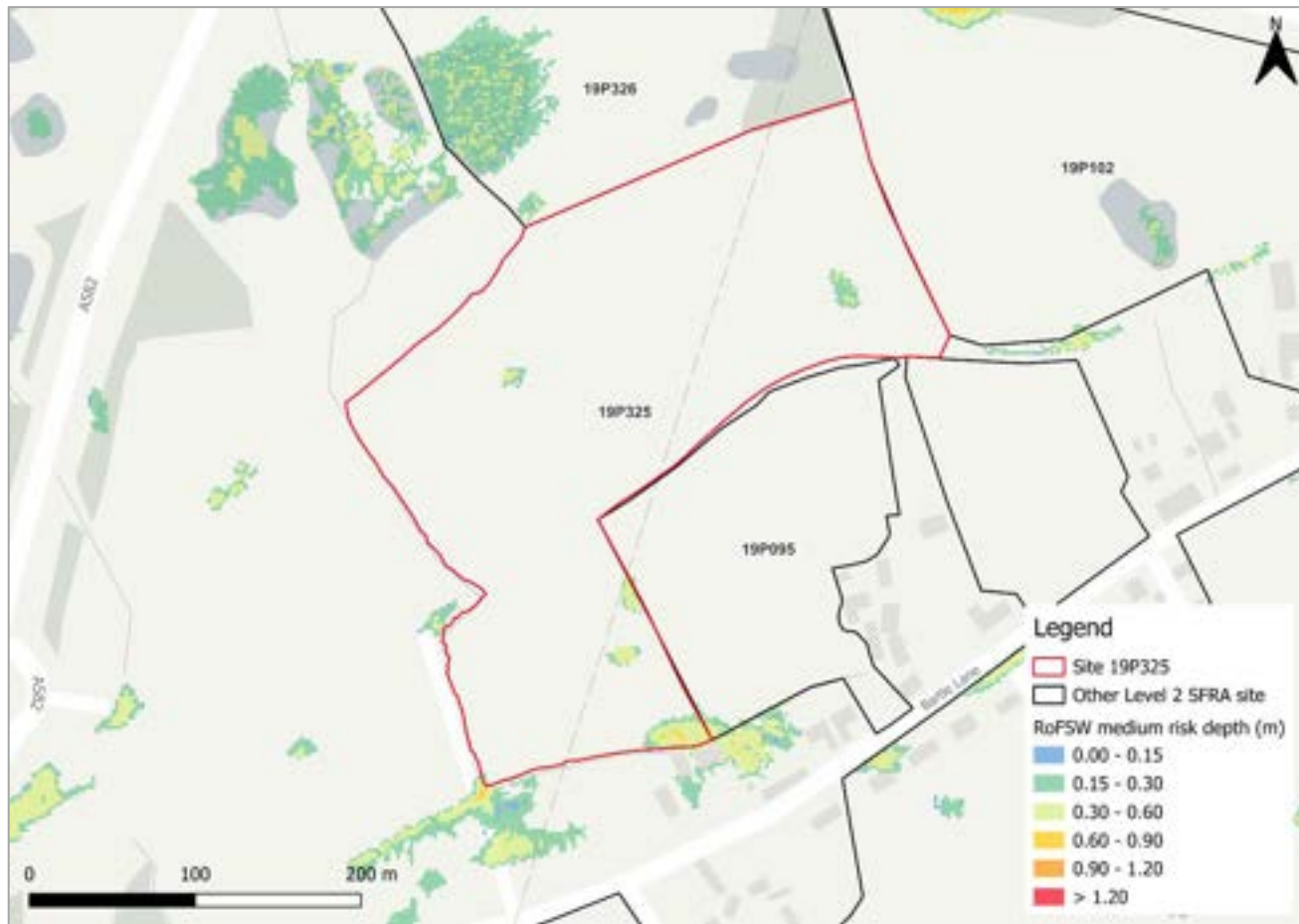


Figure 130-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

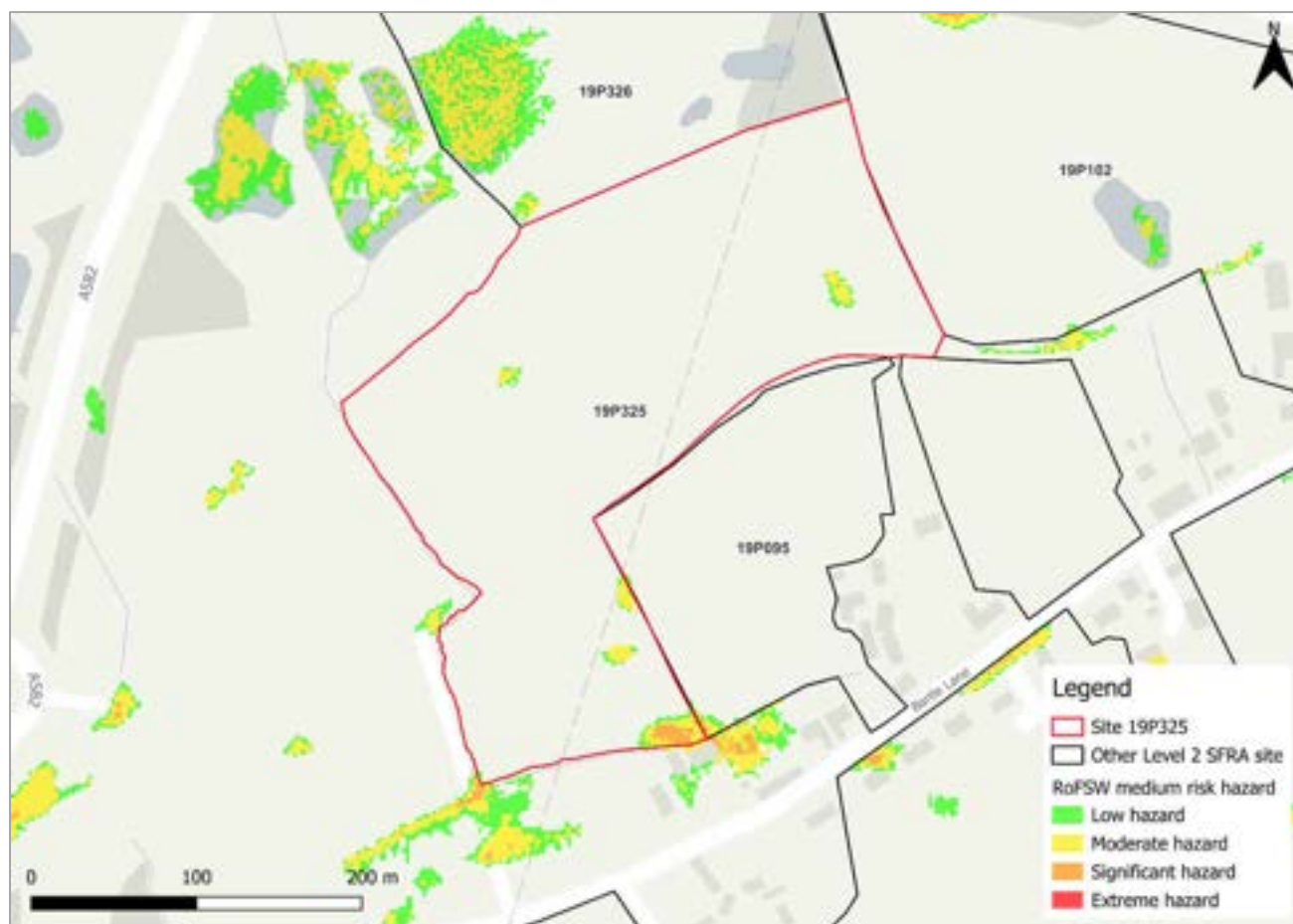


Figure 130-2: Medium risk event surface water flood hazard⁷⁶ (Risk of Flooding from Surface Water map)

130.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 130-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	45%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water flood event plus an allowance for climate change. The areas of ponding across the site expand in area (size) and depth. The larger area of ponding at the southern corner of the site is modelled to be

⁷⁶ 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

similar in size to the present day, low risk event though flood depths are modelled to increase. There is also a new area of ponding within the northeast of the site. Maximum flood depths are modelled to remain between 0.6 and 0.9 m, with some areas of significant hazard (Figure 3-4). The surface water flow path across the track leading to Bartle Lane also increases in size and flood depth, flood hazard remains significant.

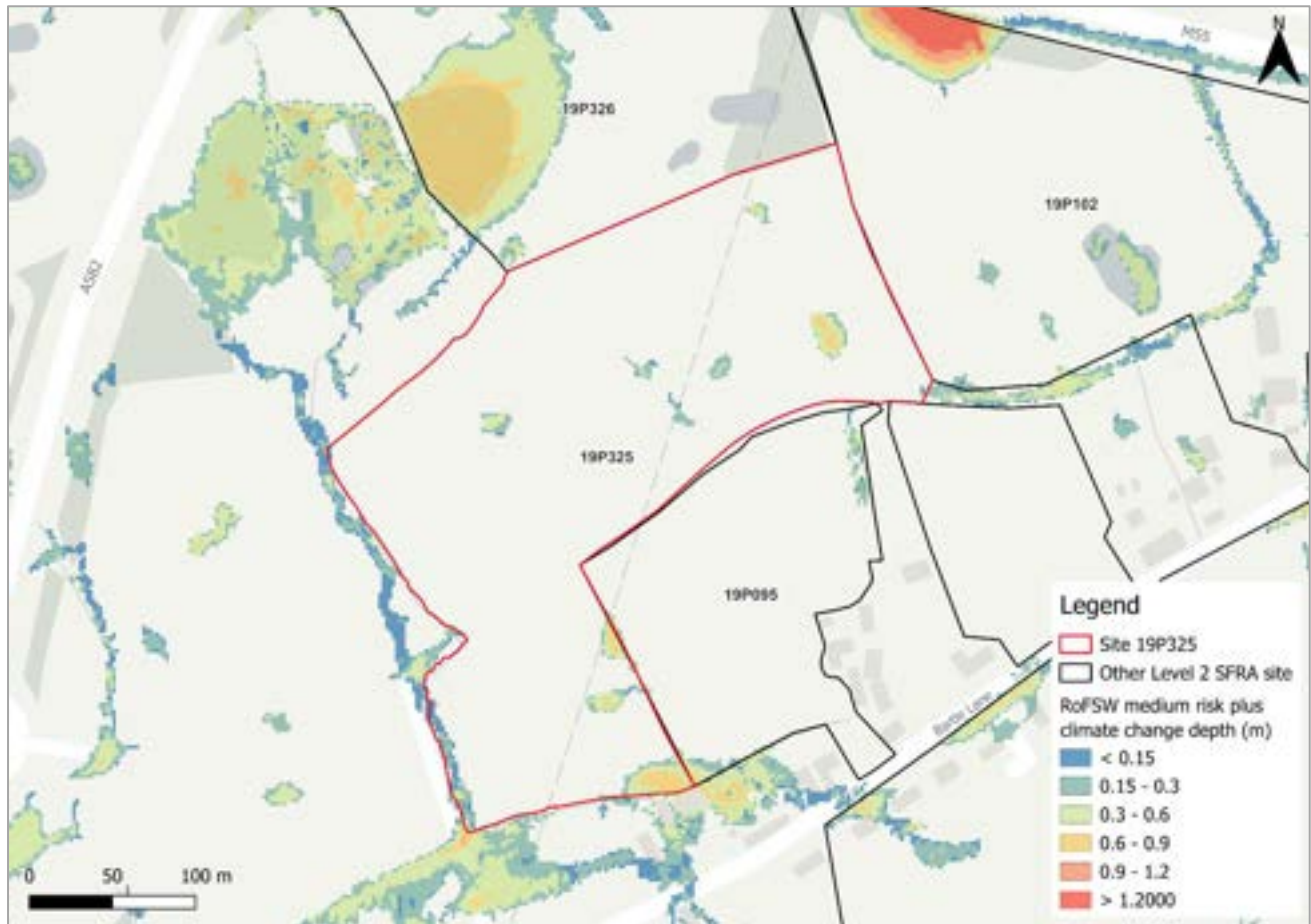


Figure 130-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

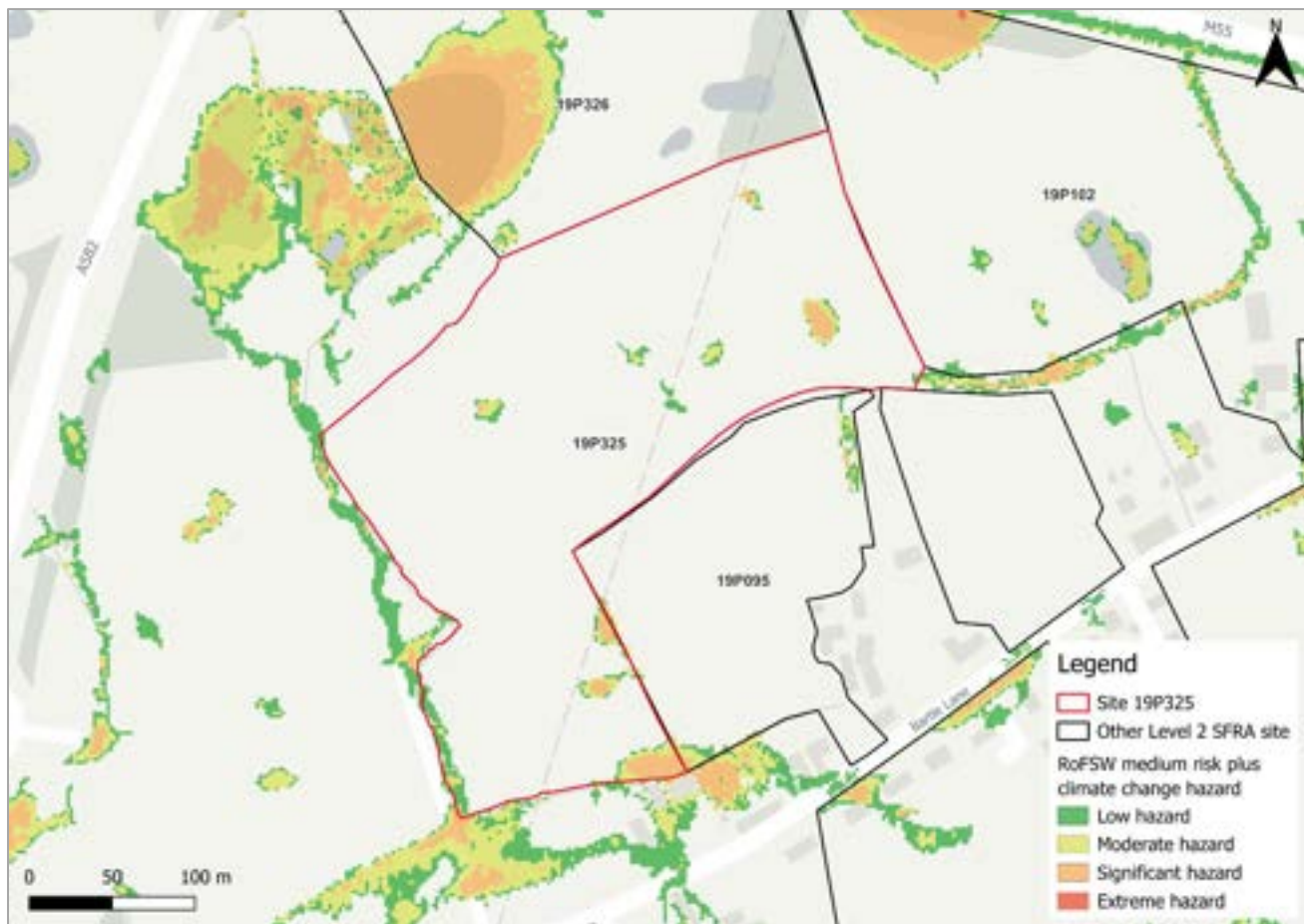


Figure 130-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

130.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 2% of the site being at high, 1% at medium and 2% at low surface water flood risk. Surface water risk in the high risk event is spread across the site with the deepest area of ponding within the southern corner. In the medium and low risk events ponding expands with a flow path along the western site boundary in the low risk event.
- The medium risk event plus climate change modelling shows risk is greater in extent to the present day medium risk event, greater flood depths at the southern corner and a new area of ponding in the north eastern side of the site.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current rates (likely to be greenfield) and, where possible, betterment should be achieved.
- The Groundwater Flood Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.

- Note, 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 or evidence.

131 Risk from groundwater

Risk from groundwater sources 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 Guide⁷⁷. Figure 4-1 show the map for Site 19P325 and the surrounding areas and Table 131-1 explains the risk classifications.

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.

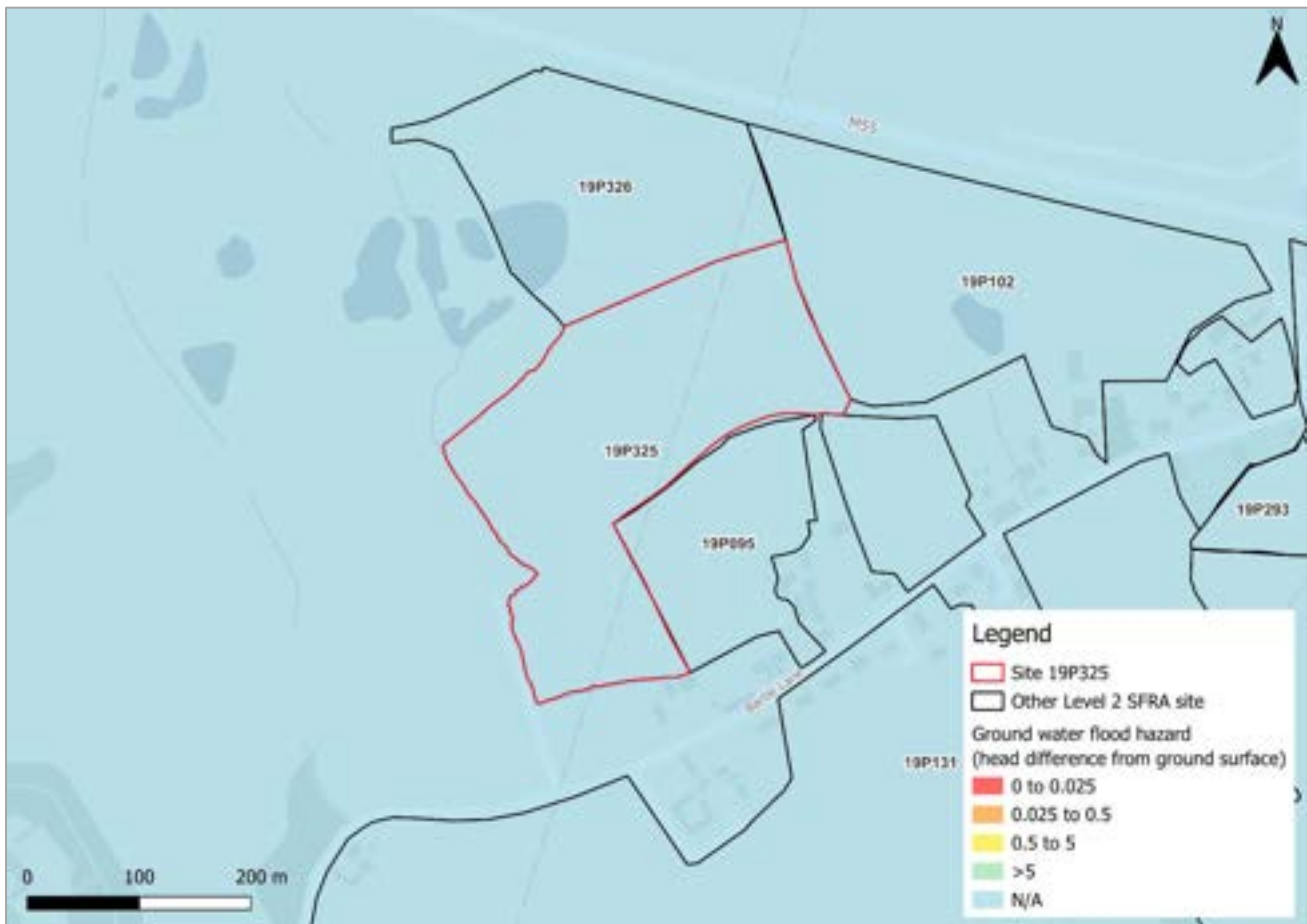


Figure 131-1: JBA 5m Groundwater Flood Map

⁷⁷ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 131-1: Groundwater Flood 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.	

132 Overall site assessment

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

To pass part b) of the exception test⁷⁸, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

132.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate for this site to be allocated, given the low fluvial and predominantly very low surface water flood risk to the site.
- A drainage strategy will be required for any new development. The use of infiltration SuDS should be investigated.
- Opportunities for NFM features to reduce flood risk to the site and surrounding areas should be explored at the site-specific FRA stage.
- Any FRA must further consider surface water flood risk, including a drainage strategy with runoff restricted to greenfield rates at least.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁷⁸ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P051

Final

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Freya Nation of JBA Consulting carried out this work.

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134 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P051. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

134.1 Site 19P051

- Location: Land off Ribbleton Hall Drive, Preston
- Existing site use: School fields (greenfield)
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 5.7 hectares
- Proposed development impermeable area: 4.8 hectares (assumed 85% impermeable area)
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk



Figure 134-1: Existing site location boundary

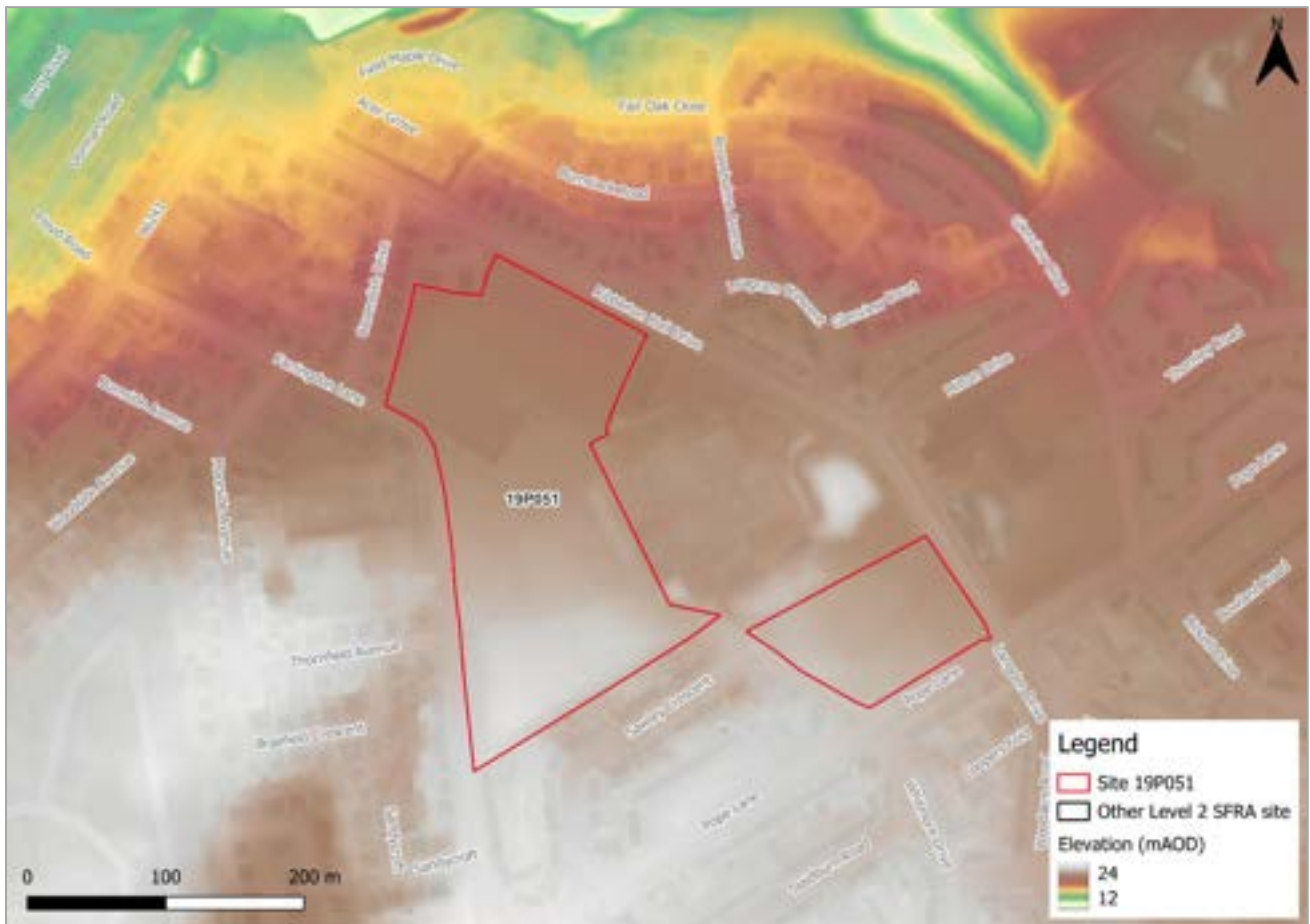


Figure 134-2: Topography

135 Flood risk from rivers

135.1 Existing risk

135.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 135-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 135.2) or the impacts of climate change.

This site is located fully within Flood Zone 1, indicating it is at low risk of flooding from rivers.

Table 135-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

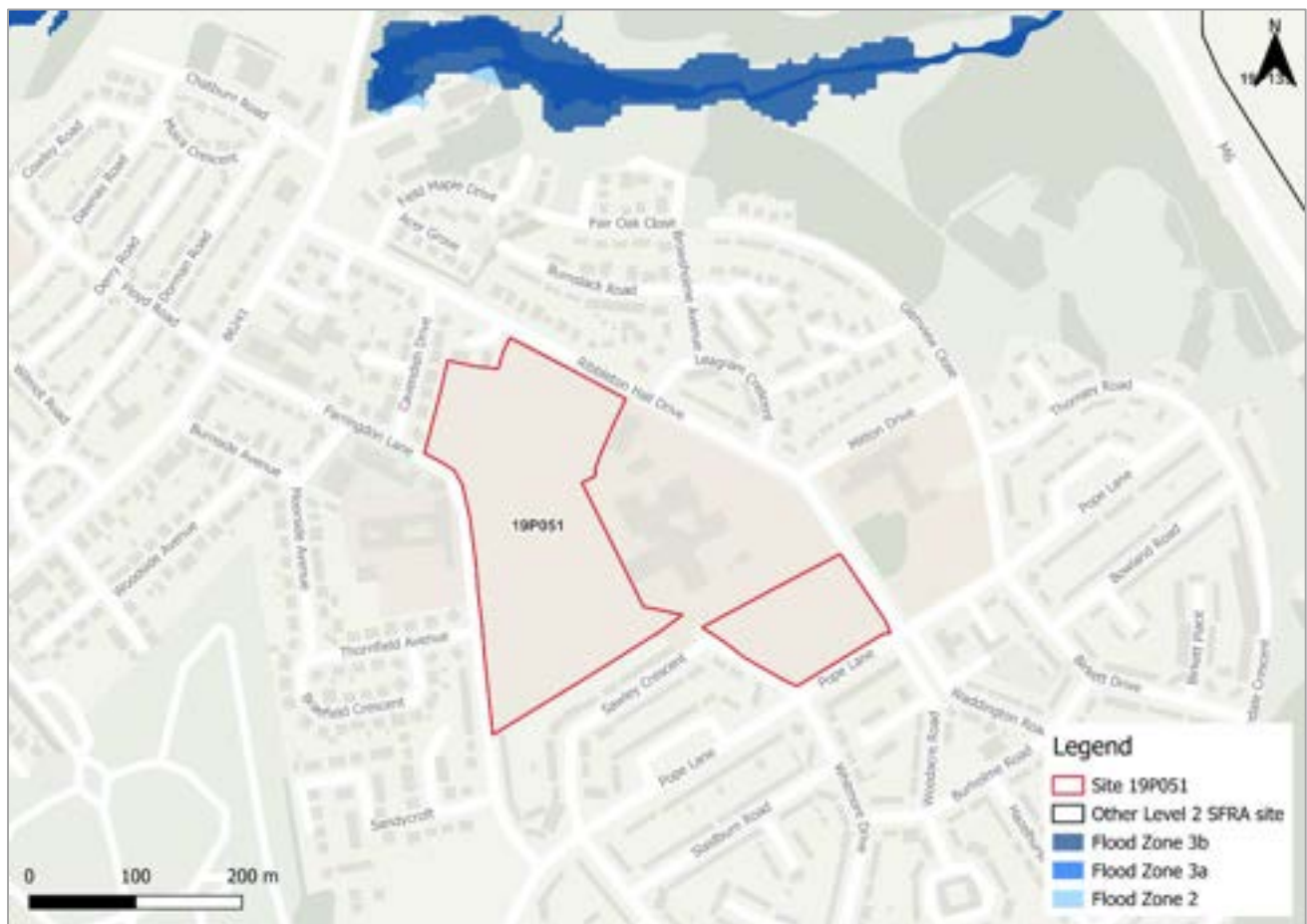


Figure 135-1: Existing risk from rivers to the site

135.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

135.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P051 is located within two catchment, namely Savick Brook and Ribble - conf Calder to tidal. Savick Brook is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁷⁹.
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

135.2.2 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. There are no applicable areas within or in vicinity of the site.

135.3 Residual risk

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

135.3.1 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. 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 not modelled to be at risk of flooding from reservoirs.

⁷⁹ [Lancashire SuDS Guidance](#)

135.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

135.5 Flood warning and access and escape routes

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. Site 19P051 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. The site is also not located within a FAA.

Safe access and escape routes could likely be achieved during a flood event via the B6241 or via Fulwood Hall Lane.

135.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is located wholly within Flood Zone 1.

136 Flood risk from surface water

136.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low. Approximately 2% of the site is within low surface water risk zone as shown in Table 3-1.

In the low risk event, surface water risk is mostly confined to the western half of the site parcel. There are two short flow paths within the northern half of the site. There are also flow paths along Ribbleton Hall Drive and Farrington Lane west of the site and along Pope Lane east of the site. Greatest flood depths in the low risk event are 0.15 to 0.3 m (Figure 3-1) with low flood hazard ratings (Figure 3-2). Safe access and escape should be achievable via Ribbleton Hall Drive in all events, given the shallow depths of flooding on these roads.

Table 136-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
98%	2%	0%	0%

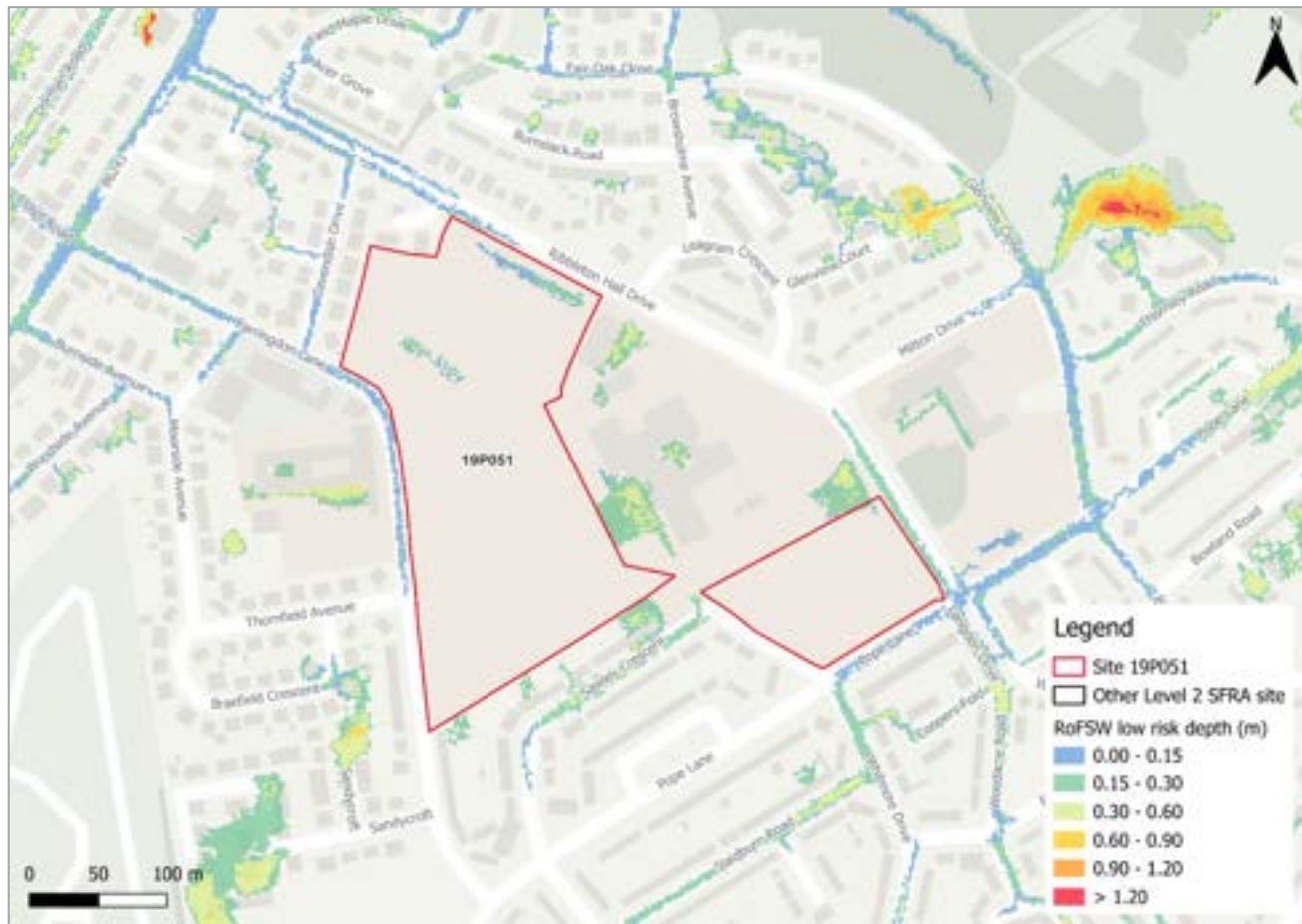


Figure 136-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)

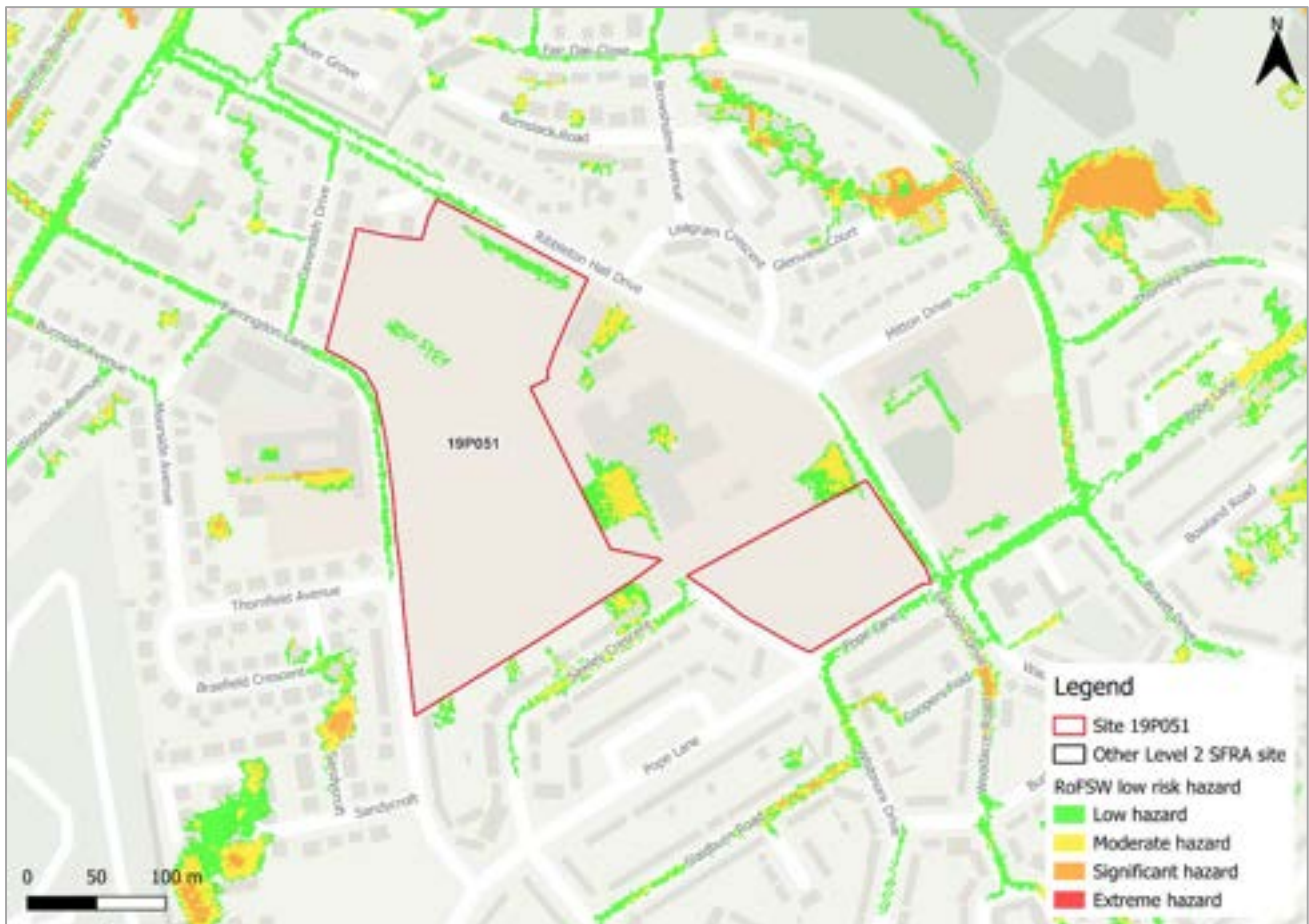


Figure 136-2: Low risk event surface water flood hazard⁸⁰ (Risk of Flooding from Surface Water map)

136.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 136-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the flood depths during the medium risk surface water event plus an allowance for climate change. Flooding is modelled to be slightly greater than the present day low risk event. Ponding within the western half of the site parcel increases slightly in

⁸⁰ 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

size. Ponding along the northern site boundary of the eastern half of the site parcel encroaches slightly into the site. Maximum flood depths remain 0.15 to 0.3 m (Figure 3-3) with a low flood hazard rating (Figure 3-4). Safe access and escape may remain achievable via Ribbleton Hall Drive, given the low depths of flooding on the road.

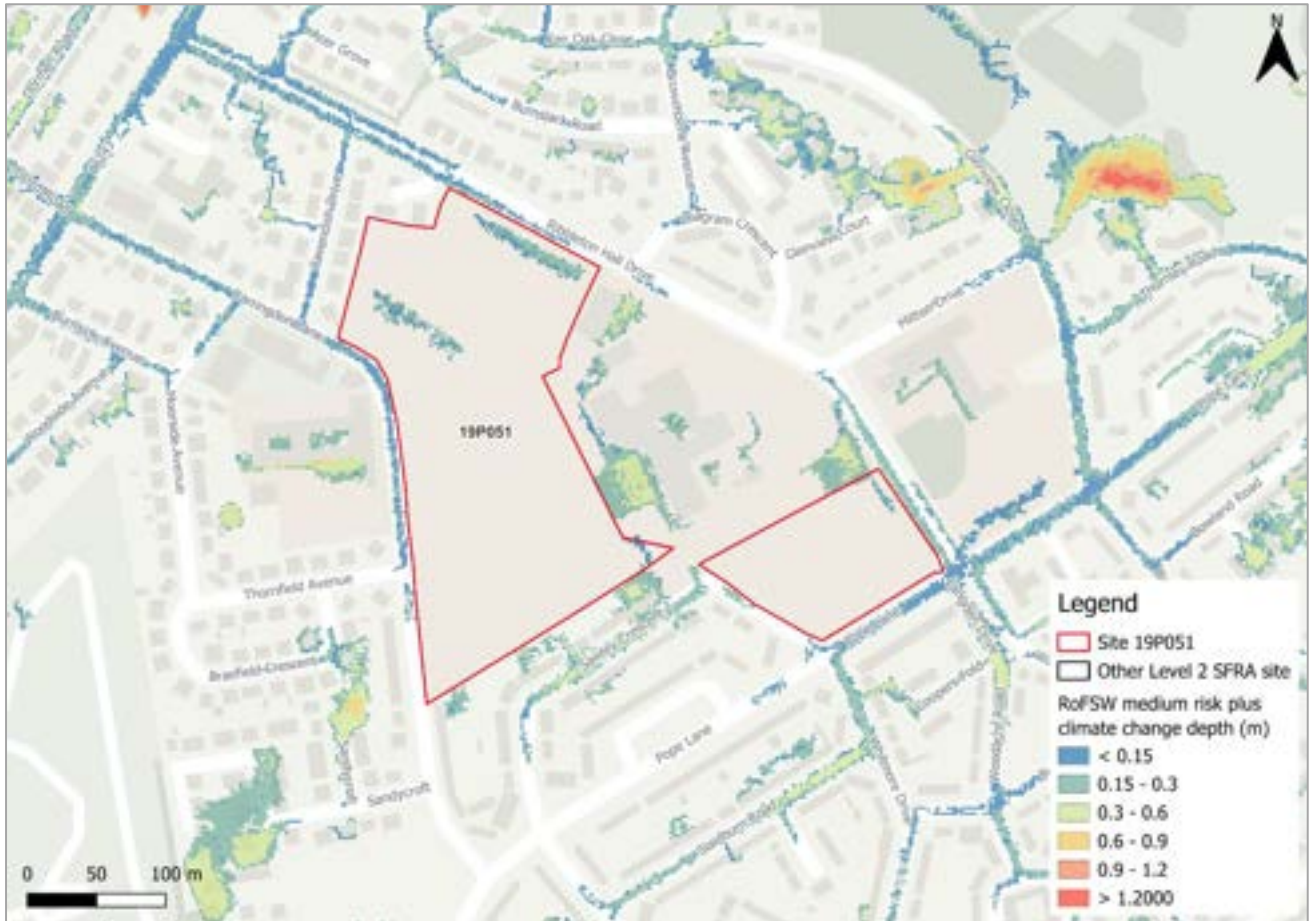


Figure 136-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

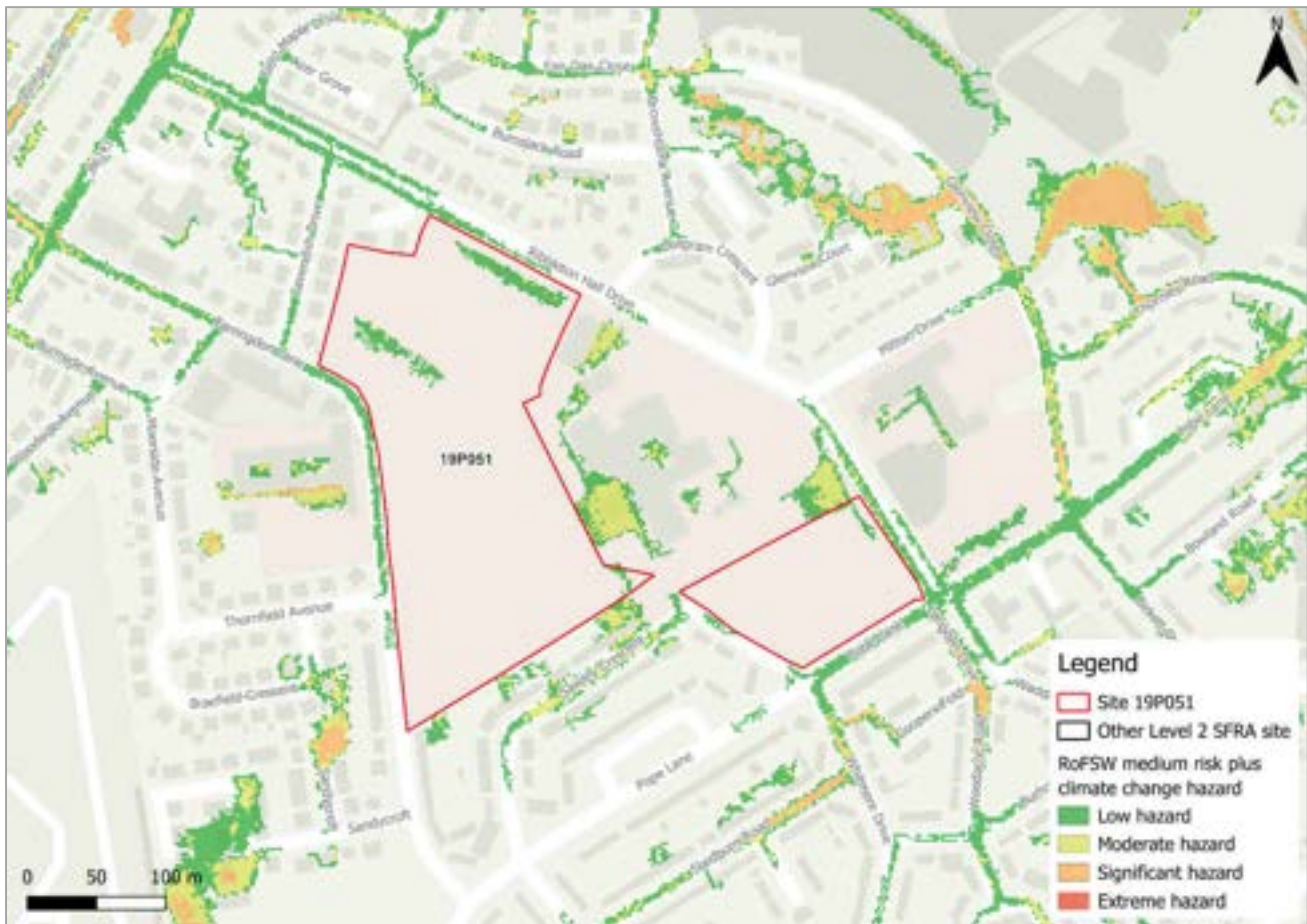


Figure 136-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

136.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with only 2% of the site being at low surface water flood risk. In the low risk event flow paths form along roads and within the north of the western half of the site parcel.
- The effects of climate change on surface water have been modelled for this SFRA using medium risk flood depths plus 50% climate change. Surface water risk slightly increases in flood extent in comparison to the present day low risk event.
- A drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current greenfield rates and, where possible, betterment should be achieved.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS across the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.

- Note, 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 or evidence.

137 Risk from groundwater

Risk from groundwater sources 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 Guide⁸¹. Figure 4-1 shows the map for Site 19P051 and the surrounding areas and Table 4-1 explains the risk classifications.

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.



Figure 137-1: JBA 5m Groundwater Flood Map

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

Table 137-1: Groundwater Flood 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.	

138 Overall site assessment

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

To pass part b) of the exception test⁸², it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

138.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be possible to allocate this site if development avoids areas at risk of surface water ponding and maintains existing flow paths.
- A drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current rates (likely to be greenfield) and, where possible, betterment should be achieved.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁸² Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P200

Final

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll of JBA Consulting carried out this work.

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140 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P200. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

140.1 Site 19P200

- Location: Sharoe Green Hospital, Sharoe Green Lane, PR2 9HT
- Existing site use: Brownfield; derelict land
- Existing site use vulnerability: Water compatible
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 2.54 hectares
- Proposed development impermeable area: 2.16 hectares (assumed 85% impermeable area)
- Watercourse: Savick Brook
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 140-1: Existing site location boundary



Figure 140-2: Topography

141 Flood risk from rivers

141.1 Existing risk

141.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is wholly located within Flood Zone 1 indicating it is at low risk from flooding from rivers.

Table 141-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 141-1: Existing risk from rivers to the site

141.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

141.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P200 is located within one catchment, namely, Savick Brook. This is ranked as a high sensitivity catchment. Planning considerations for sites at high risk to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

141.2.2 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. There are no applicable areas that could benefit the site.

141.3 Residual risk

141.3.1 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. 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 not modelled to be at risk from reservoir flooding.

141.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

141.5 Flood warning and access and escape routes

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 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 an FWA. The site is also not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Bhailok Square and Sharoe Green Lane.

141.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in the risk classification from water compatible to more vulnerable, according to NPFF.
- 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 FRC-PPG).
- The site is located wholly within Flood Zone 1.
-

142 Flood risk from surface water

142.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is very low. Approximately 1% of the site is within the low risk surface water flood zone, as shown in Table 142-1.

In the low risk event, surface water risk is confined to a very small area along the southern boundary of the site.

Greatest flood depths in the low risk event are between 0.15 and 0.3 m (Figure 3-1) with areas of low hazard (Figure 3-2). Safe access and escape routes should be achievable via Bhailok Square and Sharoe Green Lane in all events.

Table 142-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
99	1	0	0

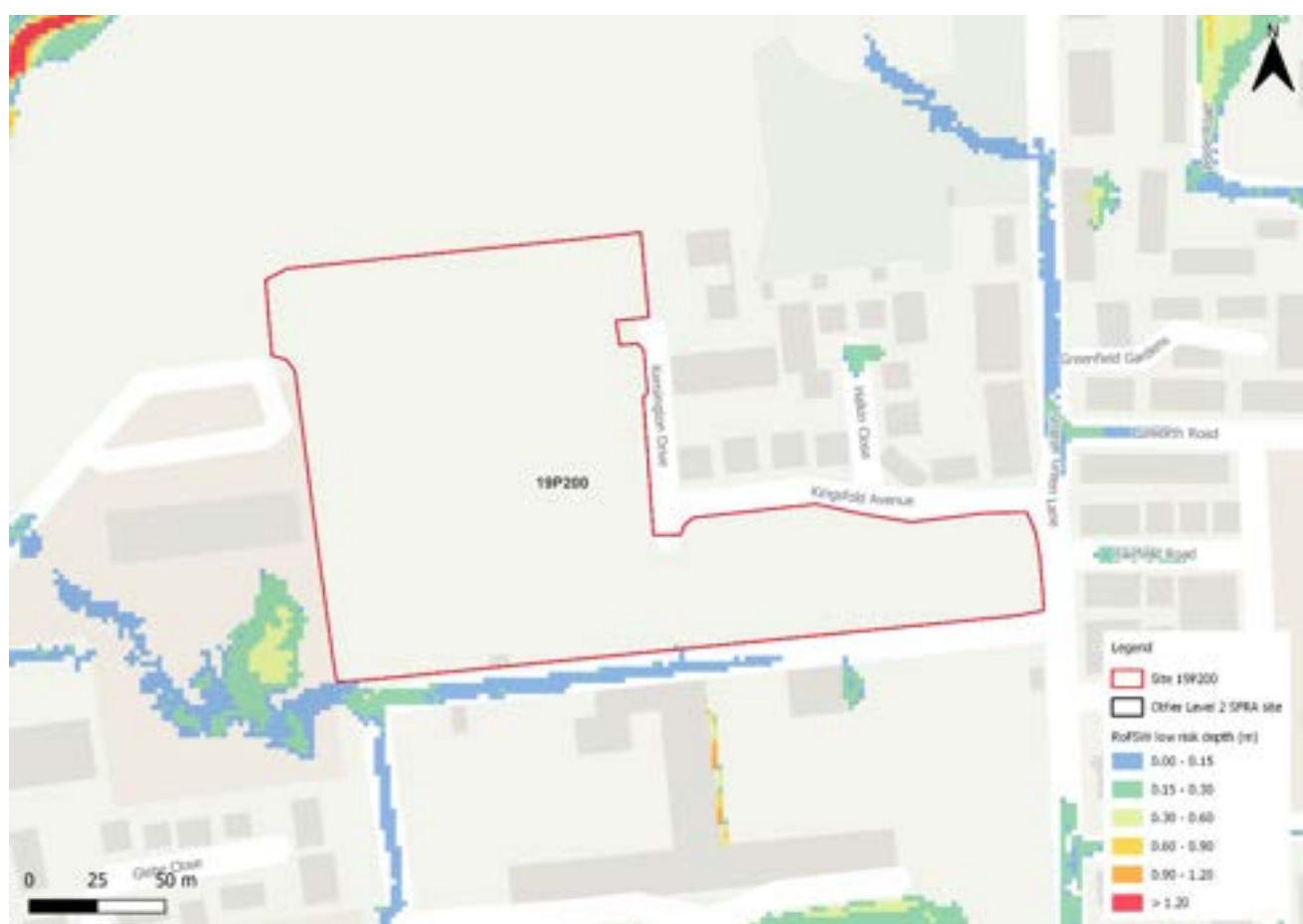


Figure 142-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 142-2: Low risk event surface water flood hazard⁸³ (Risk of Flooding from Surface Water map)

142.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 142-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be greater in extent than the present day low risk surface water event, with an additional short flow path within the north of the site. Greatest flood depths are

⁸³ 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

modelled to be between 0.15 and 0.3m, (Figure 3-3), with areas of low hazard (Figure 3-4). Safe access and escape routes should remain achievable via Bhailok Square and Sharoe Green Lane.

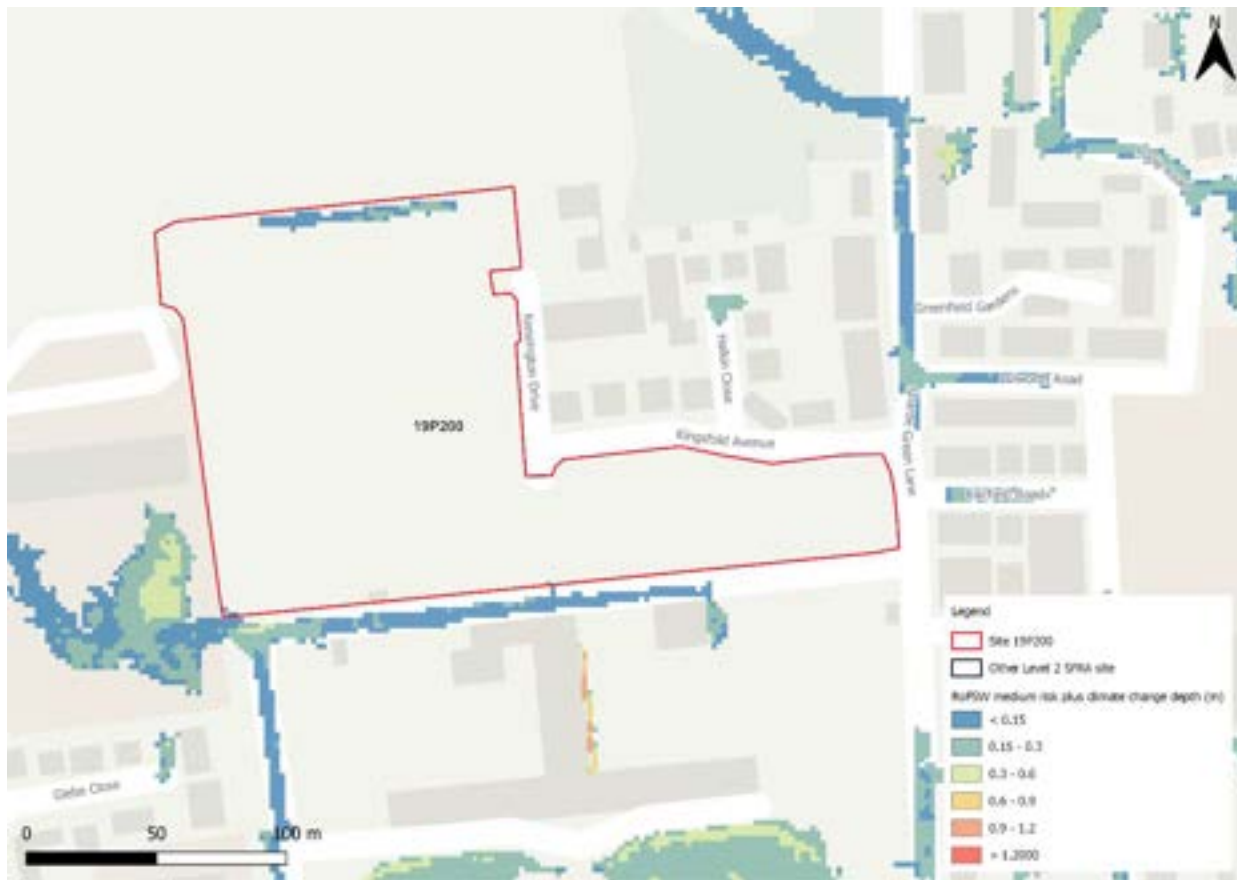


Figure 142-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 142-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

142.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is very low, with 99% of the site being at very low surface water risk. Surface water risk in the low risk event is confined to a very small area along the southern site boundary.
- The medium risk modelled climate change outputs indicate a greater risk to the site than the present day surface water flood events. There is an additional surface water flow path within the north of the site.
- Where development plans to proceed, a full detailed drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere because of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Note, 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 or evidence.

143 Risk from groundwater

Risk from groundwater sources 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 Guide⁸⁴. Figure 4-1 show the map for Site 19P200 and the surrounding areas and Table 143-1 explains the risk classifications.

The risk of groundwater emergence varies across the site. The majority of the site is in an area of where there is no risk of groundwater emergence. The northern boundary of the site is in an area where there is a risk of flooding to subsurface assets, but surface manifestation of groundwater is unlikely. Groundwater conditions may therefore be suited to infiltration SuDS across the majority of the site.



Figure 143-1: JBA 5m Groundwater Emergence Map

⁸⁴ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 143-1: Groundwater Flood 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.	

144 Overall site assessment

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

This site is not required to pass part b) of the exception test⁸⁵ 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.

144.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁸⁵ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P012

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146 Background

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146.1 Site 19P012

- Location: Alstoms, Strand Road
- Existing site use: Brownfield; industrial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Employment
- Proposed site use vulnerability: Less vulnerable
- Site area: 6.4 hectares
- Proposed development impermeable area: 5.4 hectares (assumed 85% impermeable area)
- EA model: Ribble-Douglas 2010
- Watercourse: River Ribble
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of modelled fluvial flood depths and hazards
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk



Figure 146-1: Existing site location boundary



Figure 146-2: Topography

147 Flood risk from rivers

147.1 Existing risk

147.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The site is almost entirely located within Flood Zone 2 indicating it is at medium risk of flooding from rivers. Fluvial risk originates from the River Ribble to the south of the site.

Table 147-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
1	99	0	0

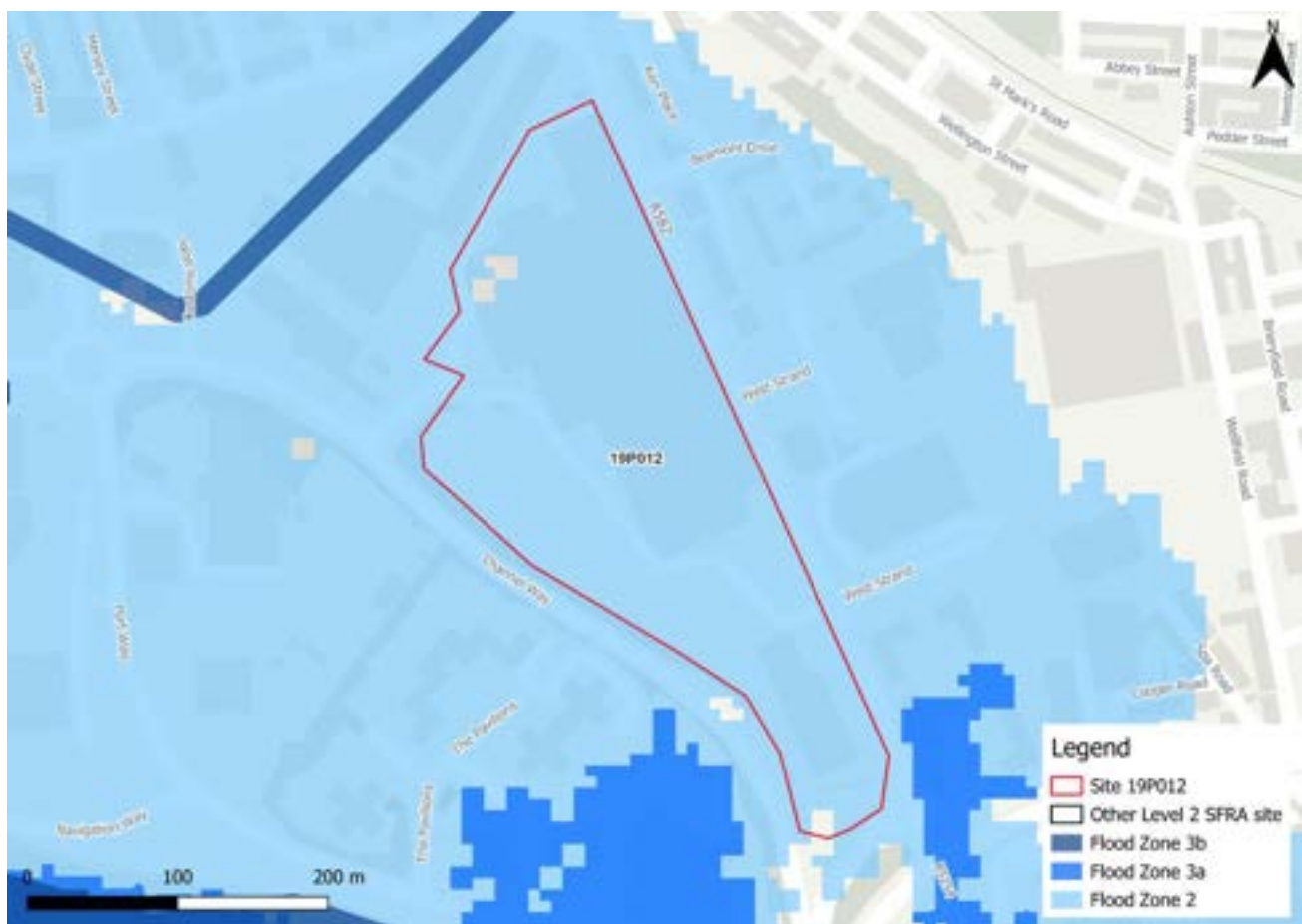


Figure 147-1: Existing risk from rivers to the site

147.1.2 Ribble-Douglas 2010 undefended model outputs

Figure 147-2 shows the modelled flood depths for the 0.1% AEP undefended event which is the event Flood Zone 2 of the Flood Map for Planning is based on. Modelled risk is similar to Flood Zone 2 across the site. However, as the Ribble-Douglas 2010 outputs are slightly different to the Flood Map for Planning in this location it will therefore mean recommendations on development will also be different when accounting for the Flood Map for Planning or the Ribble-Douglas 2010 model. The Environment Agency have confirmed that the defended scenario informs the flood zones in this area as flooding is modelled to be greater in extent than the undefended.

Maximum flood depths within the site are between 0.9 and 1.2 m with areas of hazard categorised as 'Danger for some' (Figure 147-2).



Figure 147-2: Flood depths for 0.1% AEP undefended flood event

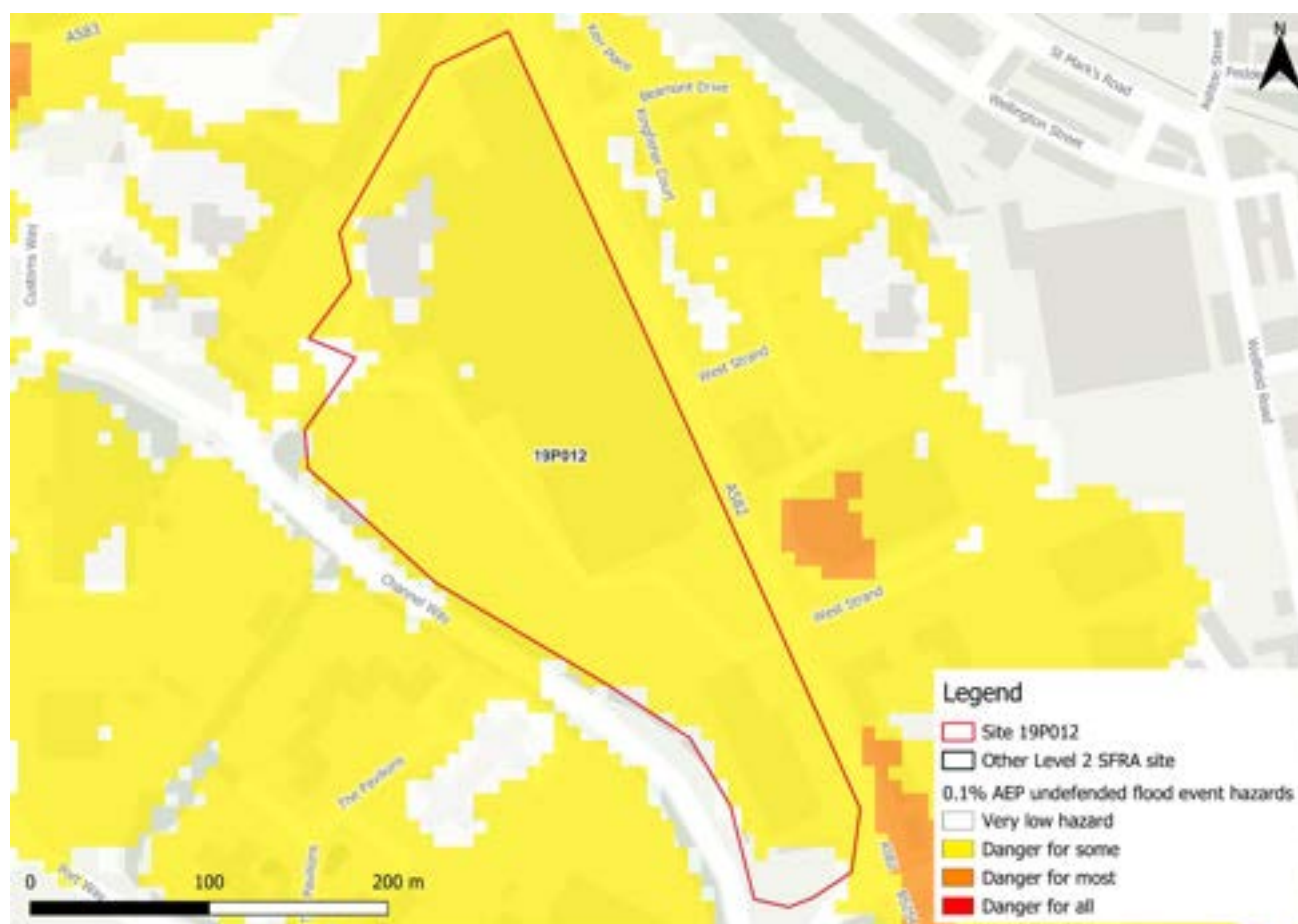


Figure 147-3: Flood hazard⁸⁶ for 0.1% AEP undefended flood event

147.2 Impacts from climate change

The impacts of climate change on flood risk from the River Ribble have been modelled without flood defence infrastructure in place. This allows for direct comparison with the existing risk of the Flood Map for Planning.

With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 147-2.

Table 147-2: Modelled climate change allowances for peak river flows for the Ribble Management Catchment

Return period	Central allowance 2080s	Higher central allowance 2080s
3.3% (functional floodplain)	36%	46%
1%	36%	46%

⁸⁶ 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 147-4 shows the modelled onsite flood depths for the 1% AEP undefended event plus central climate change allowance. Risk is modelled to be much greater than for present day conditions with almost the entire site at risk, similar to Flood Zone 2. Maximum flood depths are modelled to be between 0.6 and 0.9 m. The functional floodplain is not modelled to increase in extent and remains in channel.

Figure 147-5 shows the modelled flood hazard ratings for the 1% AEP undefended event plus central climate change allowance. Flood hazard within the site is largely categorised as 'Danger for some', with some areas of very low hazard.

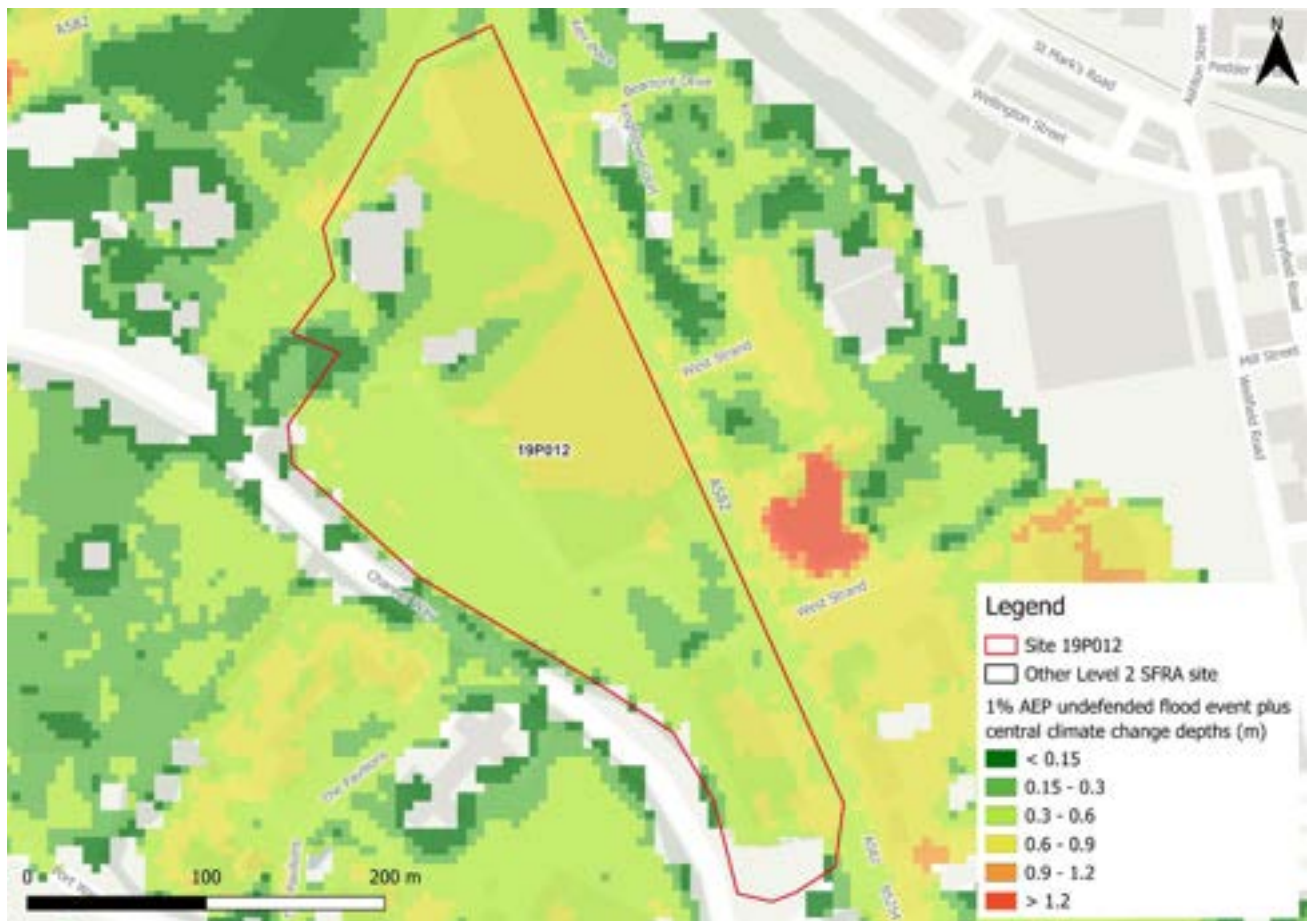


Figure 147-4: Flood depths for 1% AEP undefended flood event central climate change allowance

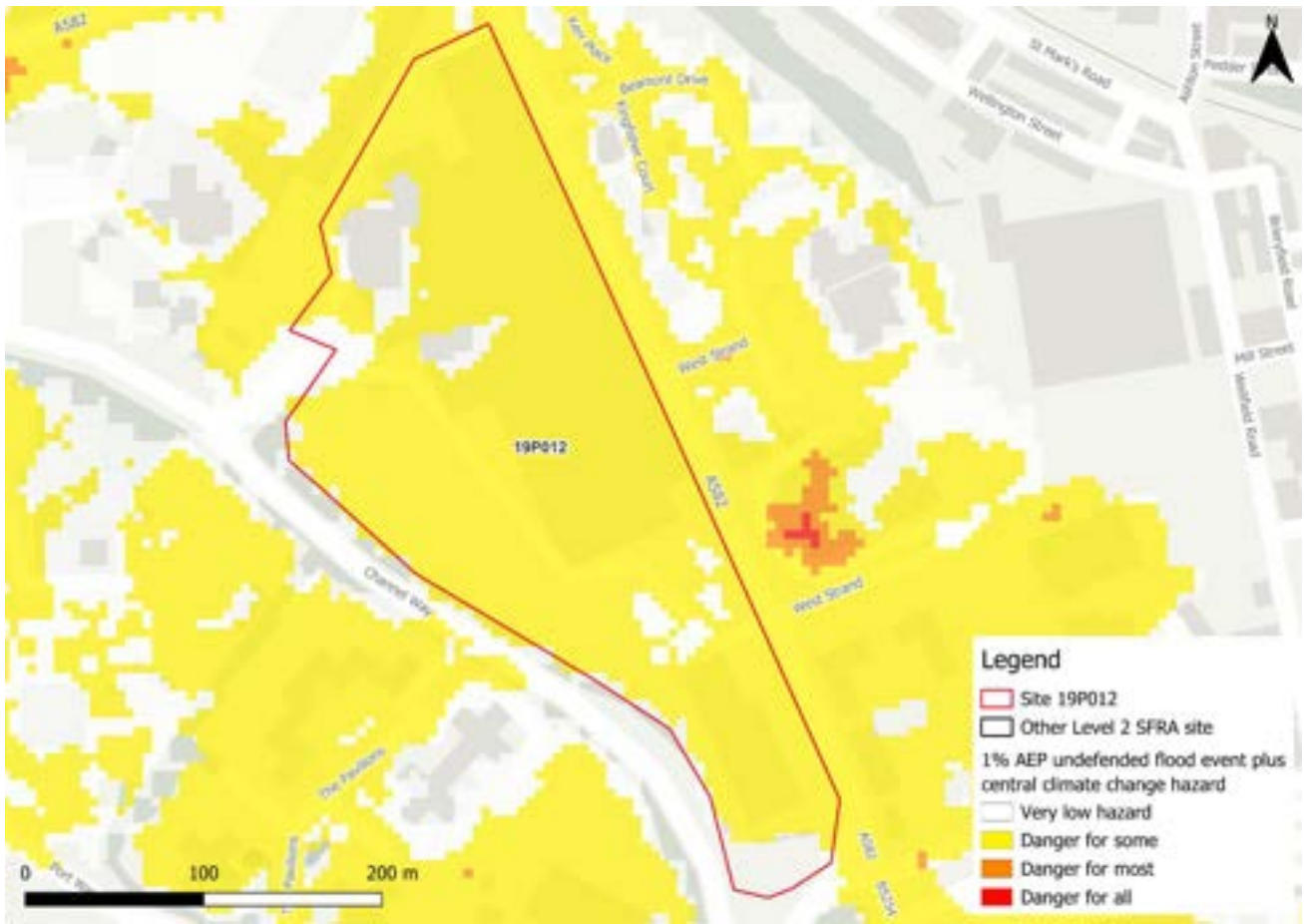


Figure 147-5: Flood hazard for 1% AEP undefended flood event central climate change allowance

147.3 Flood risk management

Flood defences are in place along the right bank of the River Ribble, as shown on Figure 147-6. Information provided in the EA's 'Spatial Flood Defences' dataset states that these defences are raised embankments with a design Standard of Protection (SoP) of 100 years. Actual SoP is unknown. Current condition is also unknown. The owner and maintainer of these defences is unknown.



Figure 147-6: EA Spatial Flood Defences dataset

147.3.1 Ribble-Douglas 2010 defended model outputs

Figure 147-7 shows the effect of the River Ribble flood defences on flood risk from the 0.1% AEP event. There is a significantly greater modelled flood depths across the site in the defended event in comparison to the undefended event. This is because the in-channel water levels are consistently higher in the defended scenario throughout Preston, and removing the defences allows for water to flood the area to the south of the River Ribble, rather than the north. Access and escape routes are likely to be challenging to achieve in this event.

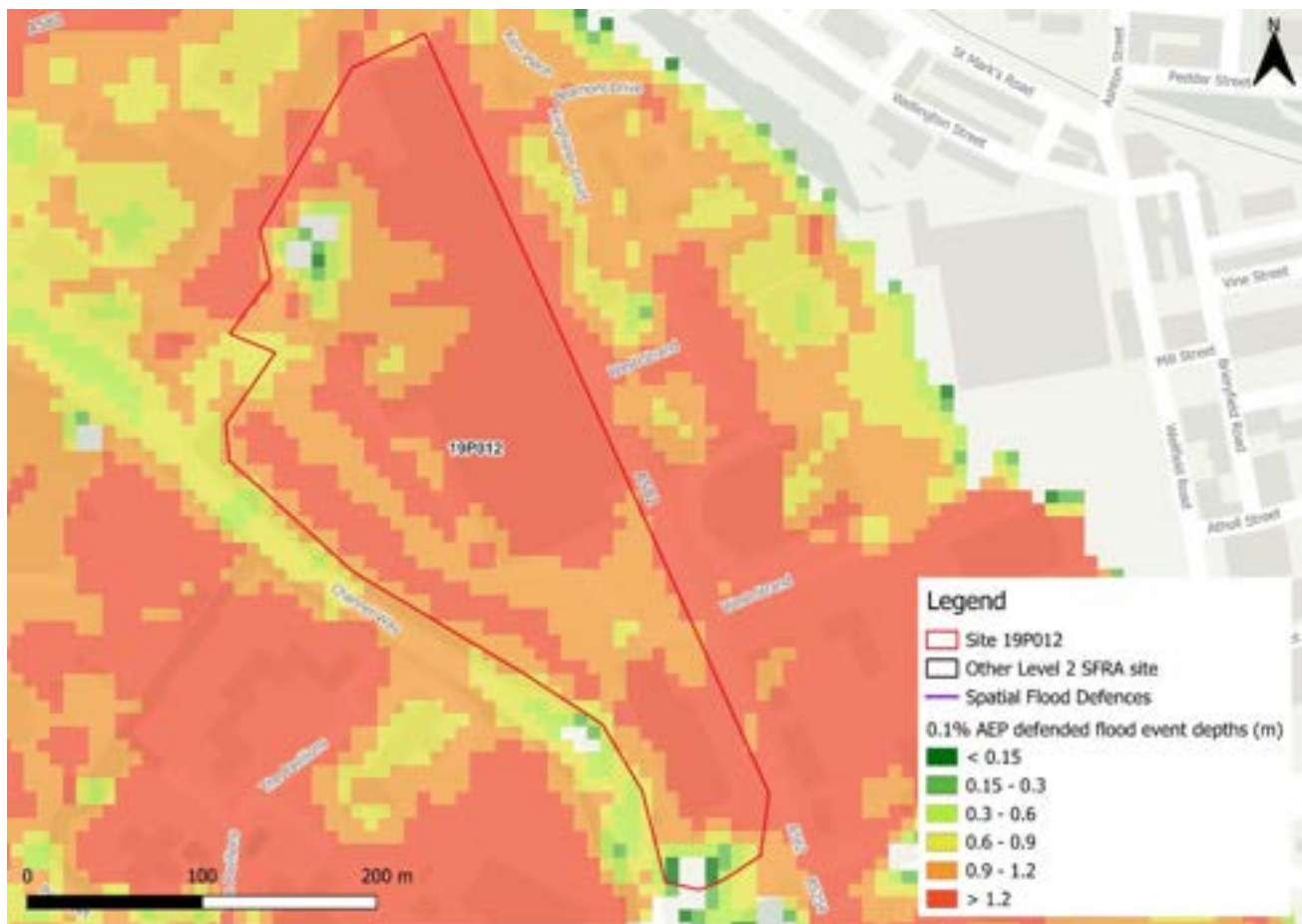


Figure 147-7: Modelled 0.1% AEP defended flood event depths (m) (Ribble-Douglas 2010)

147.3.2 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P012 is located within one catchment, namely; Coastal Catchment 176. This is ranked as a medium sensitivity catchment. Planning considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁸⁷.
- Developments should be incentivised to provide wider betterment by demonstrating in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments should achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

⁸⁷ [Lancashire SuDS Guidance](#)

147.3.3 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. Upstream of the site adjacent to the River Ribble, there is potential for tree planting to slow floodwaters, reduce flood peak height and reduce sediment delivery to the watercourse. There is also the potential for floodplain reconnection to connect the floodplain to the channel and allow floodwater to be stored. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown on Figure 147-8.



Figure 147-8: Natural Flood Management (NFM) potential mapping

147.4 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 bridge openings.

Though the defences along the right bank of the River Ribble do not protect the site in the 0.1% AEP event, there is potential residual risk to the site in the event of a breach during the 1% AEP event. A breach of the defences in this location should be modelled at the site-specific FRA stage.

147.4.1 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 26-4 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 eight reservoirs, five of which are located within Lancashire, however outside of the Central Lancashire authority boundary, and three located within Blackburn with Darwen. All reservoirs with the potential to impact the site are operated by United Utilities.

The EA's SFRA guidance states that where a proposed development site is at flood risk from a reservoir, 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 United Utilities 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 147-9: Flood risk from reservoirs

147.5 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

147.6 Flood warning and access and escape routes

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 site is located within one FWA, namely 012FWBL34A - Ribble estuary at Riversway Docklands.

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 site is also located within a FAA, namely 012WAFLR - Lower River Ribble and Darwen.

Based on the FMfP and modelled outputs, safe access and escape routes may be challenging to achieve in the extreme 0.1% AEP event and when accounting for climate change during the 1% AEP undefended event.

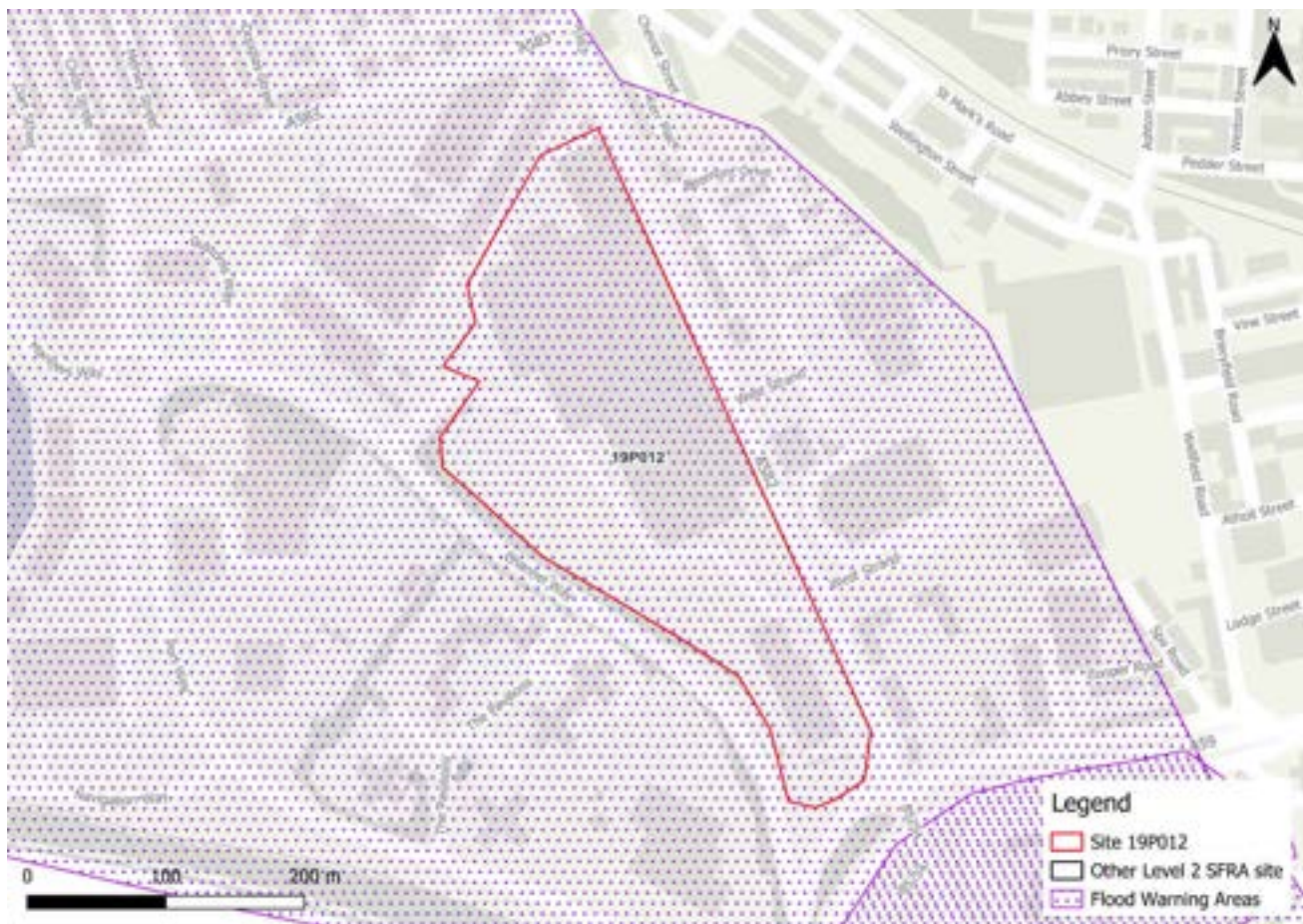


Figure 147-10: EA Flood Warning Areas

147.7 Observations, mitigation options and site suitability - fluvial

- The site is modelled to be at significant risk from fluvial sources (according to the Ribble-Douglas 2010 model) in the extreme 0.1% AEP undefended and defended scenarios, which impacts almost the entirety of the site. Any development within the 0.1% AEP event flood outline must consider property flood resilience measures and emergency planning procedures.
- Any development within the extreme flood event outline must account for the safety of people within a building if it floods and also the safety of people around a building and in adjacent areas, including people who are less mobile or who have a physical impairment. This includes the ability of users to evacuate before the extreme flood event occurs including for an allowance for climate change. The 0.1% AEP event plus climate change has not been modelled as part of this SFRA.
- Though the defences along the right bank of the River Ribble do not protect the site in the 0.1% AEP event, there is potential residual risk to the site in the event of a breach during the 1% AEP event. A breach of the defences in this location should be modelled at the site-specific FRA stage.
- The EA flood warnings and alerts should continue to be in place to ensure early evacuation of site users before an extreme flood event occurs.

- Safe access and escape routes may be challenging to achieve in the extreme event and when accounting for climate change during the 1% AEP undefended event. Safe access and escape routes should be possible via the A582 to the east of the site during the 1% AEP undefended event.
- The FRA must show that development will be safe for its lifetime taking account of the vulnerability of its users, including for appropriate evacuation procedures and flood response infrastructure are in place to manage the risk associated with the extreme flood event.
- Given the potential reservoir risk to the site, developers should consider⁸⁸:
 - Whether additional modelling is required to understand the flood risk from the reservoir, referring to the specification for the reservoir flood maps as a starting point
 - Whether the development may have an impact on the reservoir or reservoir owner
 - Referring to the Central Lancashire Level 1 SFRA for information on reservoir risk and recommendations for how to address it
 - Contacting the LPA for pre-application advice
 - Contacting the LPA to understand the need to consult with their emergency planning team and with the reservoir owner

88 [Reservoir flood maps: when and how to use them | Environment Agency | 2021](#)

148 Flood risk from surface water

148.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 1% of the site is within the high risk surface water flood zone. A further 1% is at medium surface water risk, and a further 6% is at low surface water risk, as shown in Table 148-1.

In the high risk event, surface water risk is confined to a small area of shallow ponding within a topographic low spot in the centre of the site. There are a number of additional scattered areas of ponding across the site in the medium and low risk events. Surface water risk is constrained by the existing development within the site in all events.

Greatest flood depths in the medium risk event are between 0.15 and 0.3 m (Figure 3-1) with some areas of moderate hazard (Figure 3-2). Safe access and escape routes should be achievable via Channel Way to the south of the site in all events.

Table 148-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
92	6	1	1



Figure 148-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 148-2: Medium risk event surface water flood hazard⁸⁹ (Risk of Flooding from Surface Water map)

148.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 148-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water depths for the medium risk event +50% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium risk climate change event being similar in extent to the present day low

⁸⁹ 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

risk event. Maximum depths are between 0.3 and 0.6 m with areas of moderate hazard (Figure 3-4). Risk is clearly constrained by the current building onsite.



Figure 148-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 148-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

148.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is very low, with approximately 92% of the site being at very low risk. Surface water risk in the medium risk event is confined to small areas of shallow ponding within topographic low spots across the site. Surface water risk is constrained by the existing development within the site. Safe access and escape routes should be achievable via Channel Way to the south of the site in all events.
- The medium risk modelled climate change outputs indicate a similar extent risk to the present day low risk event, with a number of flow paths emerging through the site.
- Topographic flow routes and depressions should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.

- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed employment development or whether further capacity will be required.
- It is assumed the existing onsite development will be demolished for new employment units. A drainage strategy would therefore be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.

149 Risk from groundwater

Risk from groundwater sources 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 Guide⁹⁰. Figure 4-1 show the map for Site 19P012 and the surrounding areas and

⁹⁰ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 149-1 explains the risk classifications.

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



Figure 149-1: JBA 5m Groundwater Emergence Map

Table 149-1: Groundwater Flood 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.	

150 Overall site assessment

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

This site is not required to pass part b) of the exception test⁹¹ 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.

150.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, it should be possible to allocate this site given it is proposed for less vulnerable uses, assuming appropriate mitigation measures and emergency plans are in place.
- Alternative access and escape route arrangements may need to be developed for the site during the extreme 0.1% AEP undefended event with an allowance for climate change.
- The potential residual risk to the site in the 1% AEP event should be investigated further at the site-specific FRA stage, as there may be more significant hazards associated with a breach in comparison to the 0.1% AEP undefended event.
- Current flood warnings should remain in place.
- Property flood resilience measures will be required for any development within a flood risk area.
- A detailed drainage strategy will be required including investigation into the use of infiltration SuDS.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

91 Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P031

Final

February 2025

Prepared for:



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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Freya Nation of JBA Consulting carried out this work.

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152 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P031. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

152.1 Site 19P031

- Location: Land West of Cottam and East of Preston Western Distributor A.
- Existing site use: Mixed use; agricultural land, residential, leisure, education
- Existing site use vulnerability: More vulnerable
- Proposed site use: Mixed use
- Proposed site use vulnerability: More vulnerable
- Site area: 155.9 hectares
- Proposed development impermeable area: 132.5 hectares (assumed 85% impermeable area)
- EA model: N/A
- Watercourse: Savick Brook along the southern site boundary as well as three tributaries of Savick Brook; Lady Head Runnel and two unnamed watercourses.
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of modelled fluvial flood depths and hazards
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk

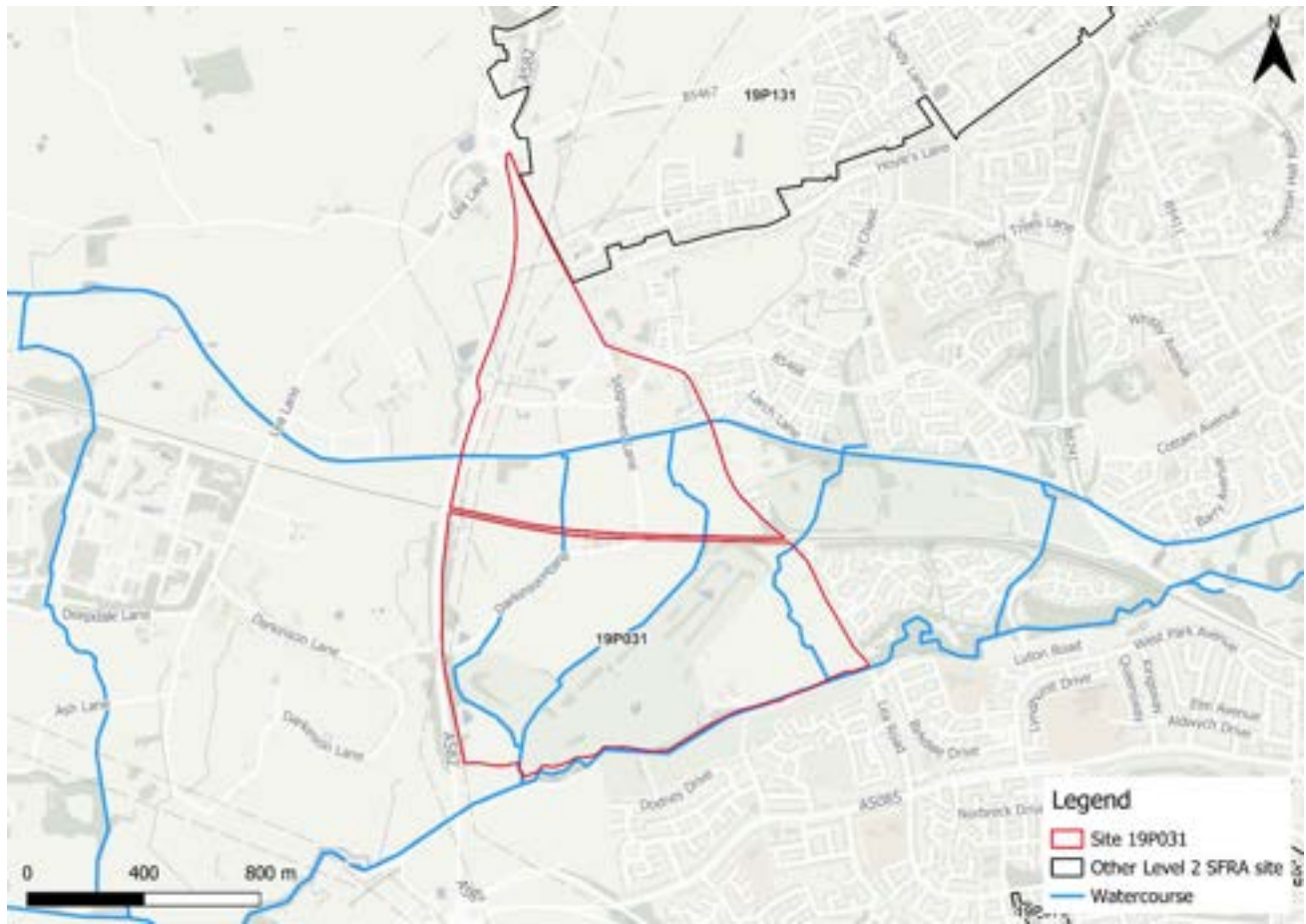


Figure 152-1: Existing site location boundary

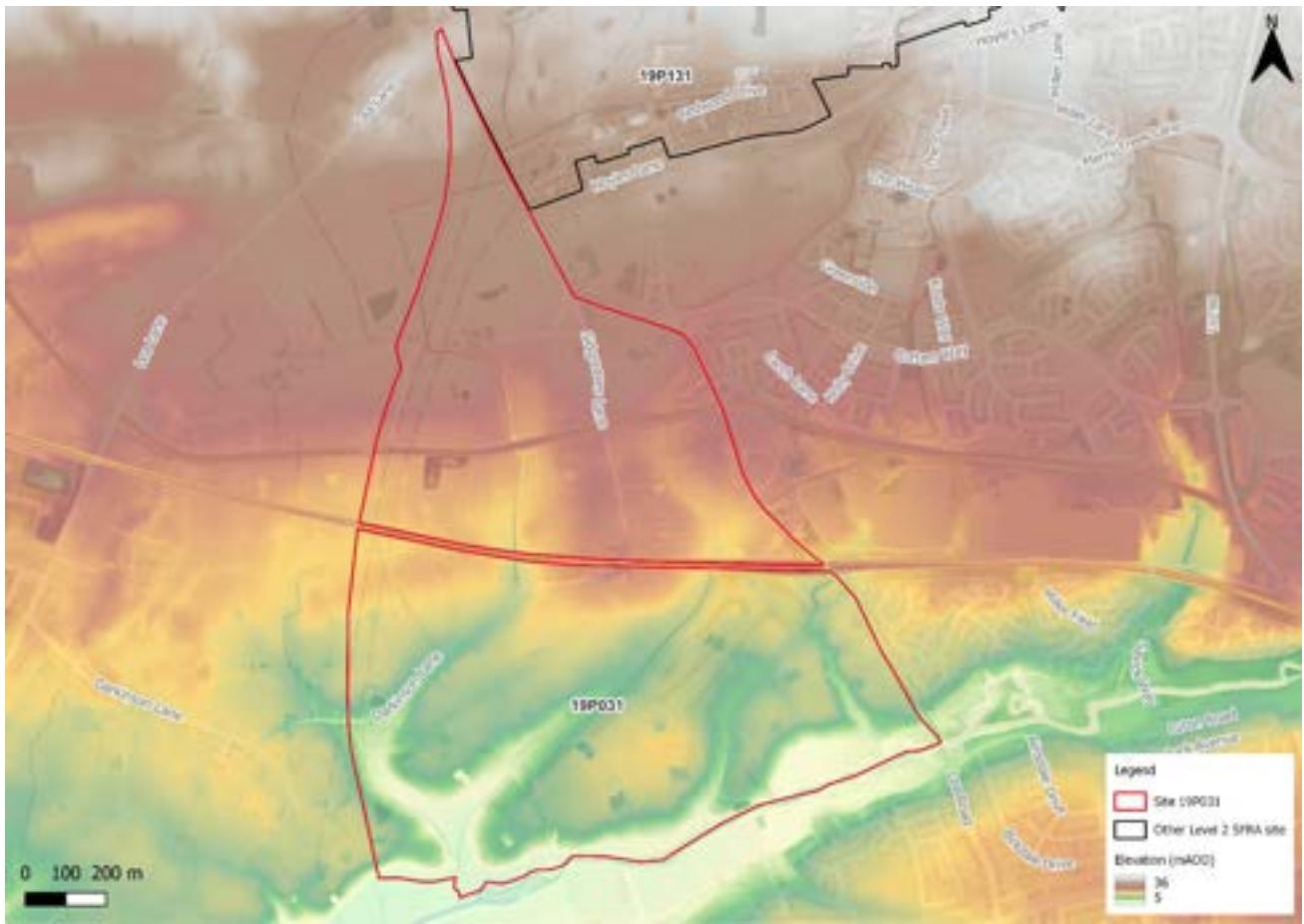


Figure 152-2: Topography

153 Flood risk from rivers

153.1 Existing risk

153.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 153.3) or the impacts of climate change (Section 32.2).

Approximately 6% of the site is modelled to be within Flood Zone 3b. The majority of the remaining area of the site is within Flood Zone 1. The area along the southern boundary of the site is located within Flood Zone 3b of Savick Brook. There should be no development within the functional floodplain. The functional floodplain in this location is conservatively based on the EA's Flood Map for Planning Flood Zone 3 (1% AEP undefended event) in the absence of suitable modelled data.

The section of Savick Brook which borders the site is also known as the Millenium Ribble Link, a canalised reach of Savick Brook linking the Lancaster Canal to the River Ribble.

The Lancaster Canal bisects the site and there are three tributaries of Savick Brook (Lady Head Runnel and two unnamed watercourses) which flow through the site and into the brook, at the southern site boundary. The functional floodplain along the Lancaster Canal and tributaries of Savick Brook is based on an 8m buffer either side of the OS Open Rivers Watercourse link dataset. It is recognised that this is an approximation.

Any flood risk assessment (FRA) should produce a detailed model of Savick Brook and its tributaries to understand modelled flood depths and hazards within the site.

Table 153-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
92	2	0	6

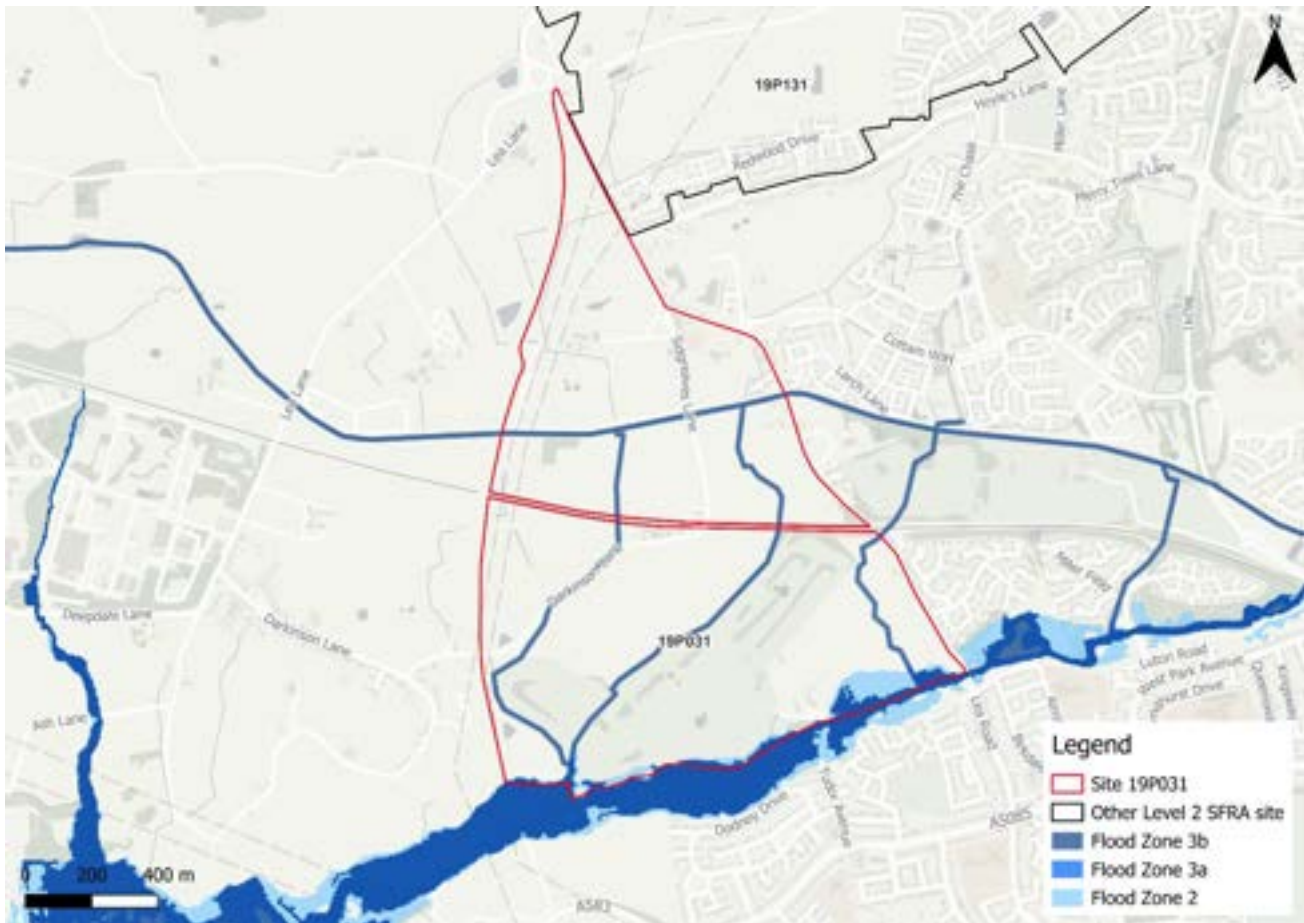


Figure 153-1: Existing risk from rivers to the site

153.2 Impacts from climate change

The impacts of climate change on flood risk from Savick Brook have not been modelled for this SFRA, due to the absence of a detailed flood model. Therefore, in the absence of modelled climate change information, Flood Zone 2 of the Flood Map for Planning (based on the modelled 0.1% AEP undefended event) can be used as a conservative proxy for Flood Zone 3 plus climate change. Based on this approach, with the exception of the southeastern corner of the site, fluvial risk is modelled to remain largely similar in extent to the present day Flood Zone 3 (Figure 8-1).

The impacts of climate change must be modelled using the EA's latest allowances for peak river flows to robustly inform on flood risk to the site. Therefore, any updates to this Level 2 SFRA and/or any FRA should produce a detailed model of Savick Brook and its tributaries and include for the most up to date climate change allowances.

153.3 Flood risk management

The site doesn't benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

153.3.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P031 is located within one catchment, namely; Savick Brook. This is ranked as a medium sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance⁹².
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments are to aim to achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

153.3.2 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. Within the site, there are significant opportunities for floodplain and riparian tree planting, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. The majority of the site is also identified to have potential for wider catchment tree planting, which can intercept, slow, store and filter water. There are also opportunities for reconnecting the floodplain to Savick Brook, however, since this section of the brook is a canalised navigation, it is unlikely that floodplain reconnection could be achieved. Additionally, there are areas of potential surface water runoff attenuation across the site. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 153-2.

⁹² [Lancashire SuDS Guidance](#)

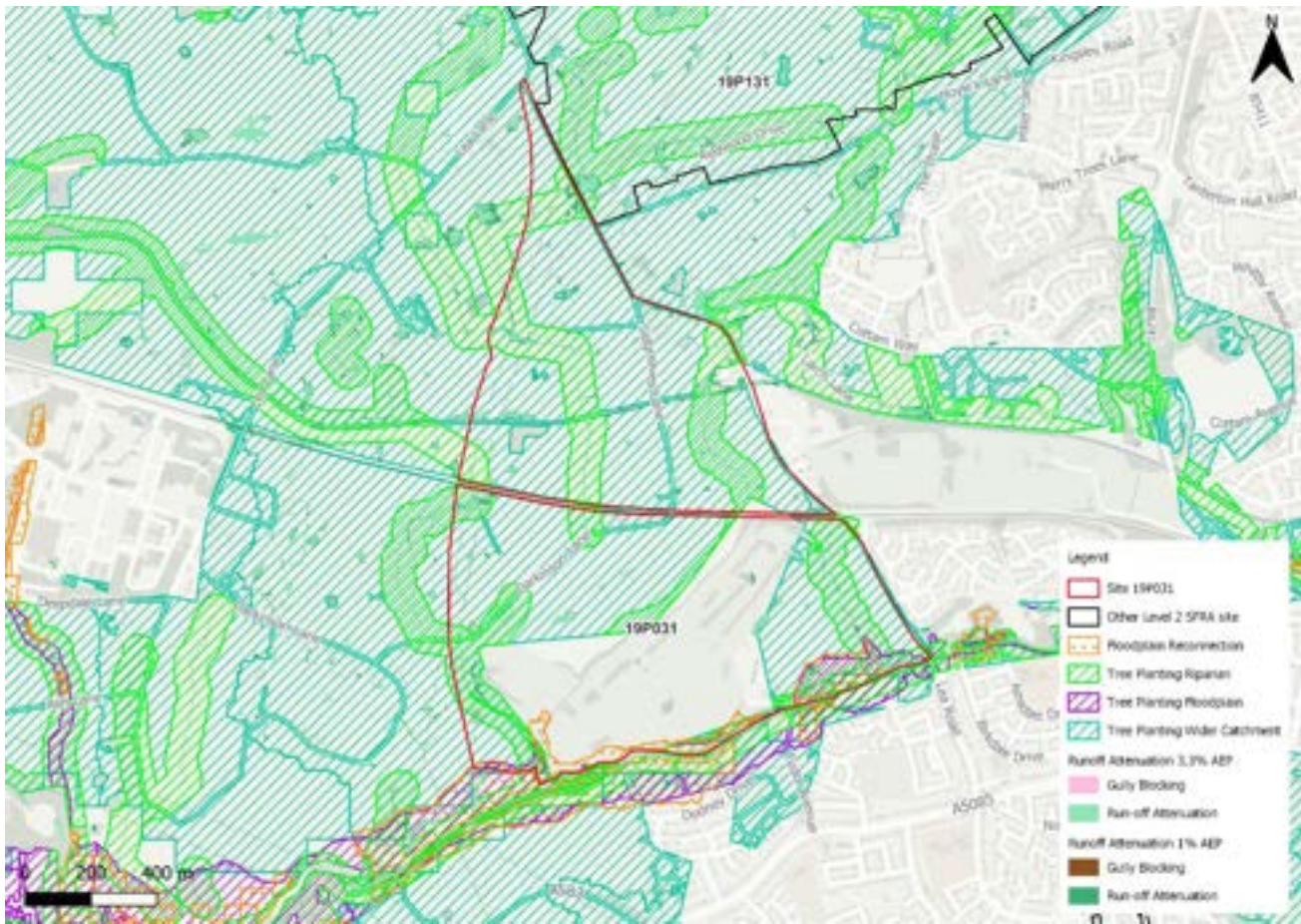


Figure 153-2: Natural Flood Management (NFM) potential mapping

153.4 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 bridge openings.

There are potential residual risks to the site from possible blockages of the tributaries of Savick Brook which are culverted beneath roads, farm tracks, Lancaster Canal and the railway line within the site (Figure 153-3). The impacts of culvert blockages have not been modelled as part of this Level 2 SFRA, as there are no available flood models for the watercourses. It is recommended that the site-specific FRA should consider the impact of a blockage of these culverts on residual flood risk to the site. Options for culvert removal should be assessed and inclusion of open watercourses in site design. There should be no development over existing culverts or watercourses.



Figure 153-3: Potential culvert blockage locations

153.4.1 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 26-4 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 four reservoirs. Alston No. 1, Alston No.2 and Stocks reservoir, located in Ribble Valley Borough, owned and operated by United Utilities; and Highgate Park FSR in Preston, owned and operated by the Environment Agency. All are located within the Lancashire LLFA area.

The EA's SFRA guidance states that where a proposed development site is at flood risk from a reservoir, 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. At the FRA stage, United Utilities and the Environment Agency, should be contacted 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 153-4: Flood risk from reservoirs

153.4.2 Flood risk from canals

Canal & River Trust historic overtopping incidents data indicates that there have been some recorded incidents of the Lancaster Canal overtopping within the vicinity of the site, occurring in 2011 and 2014.

153.5 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

153.6 Flood warning and access and escape routes

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. Site 19P021 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. The site is located within a FAA, namely; 012WAFLR - Lower River Ribble and Darwen.

Based on available information, safe access and escape routes are available from multiple locations around the site.

153.7 Observations, mitigation options and site suitability - fluvial

- The site is modelled to be within the functional floodplain along the southern boundary of the site, adjacent to Savick Brook, as well as through the site along the Lancaster Canal, Lady Head Runnel and two unnamed tributaries of Savick Brook. Development is not permitted within the functional floodplain. However, the functional floodplain in this area is conservatively based on the EA's FMfP Flood Zone 3 for Savick Brook and an 8m buffer either side of the OS Open Rivers Watercourse link dataset for the other watercourses.
- A flood risk activity permit may be required if development is planned within 8m of Savick Brook. The EA can advise on whether a permit will be required. If feasible, this area would be used as a green / blue corridor which can provide ecological, social and amenity value.
- Flood Zone 2 has been used as a proxy to provide a conservative estimate of Flood Zone 3 plus climate change. Flood depths and hazards were not available at the time of writing, therefore a fully robust assessment of fluvial flood risk to this site cannot be carried out. Any update to the Level 2 SFRA and/or any FRA should include for detailed modelling of Savick Brook including for climate change. At this stage, it cannot be proven that this site can be safe for its lifetime.
- Risk from the smaller unmodelled watercourses must be quantified through appropriate modelling. These watercourses should be allowed to flow unobstructed and could be included in site design through a blue / green corridor.
- The site is potentially at residual risk from the possible blockage of the onsite culverts. It is recommended that the site-specific FRA considers the impacts of blockages of these culverts on residual flood risk to the site.
- Safe access and escape routes are available via all roads to and from the site based on available information.
- Given the potential reservoir risk to the site, developers should consider⁹³:
 - Whether additional modelling is required to understand the flood risk from the reservoir, referring to the specification for the reservoir flood maps as a starting point
 - Whether the development may have an impact on the reservoir or reservoir owner

⁹³ [Reservoir flood maps: when and how to use them | Environment Agency | 2021](#)

- Referring to the Central Lancashire Level 1 SFRA for information on reservoir risk and recommendations for how to address it
- Contacting the LPA for pre-application advice
- Contacting the LPA to understand the need to consult with their emergency planning team and with the reservoir owner
- Site 19P031 is located adjacent to the Sandpiper Grange development (planning reference 06/2019/0114). The FRA submitted with the Sandpiper Grange planning application states the site is located within Flood Zone 1 and hydraulic modelling of the watercourse crossing the site is not required by the EA. Flood risk to site 19P031 is greater due to its location within Flood Zone 3b.

154 Flood risk from surface water

154.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map flood risk within the site is predominantly very low. Approximately 2% of the site is within the high risk surface water zone. A further 2% is at medium risk and 5% is at low surface water flood risk, as shown in Table 154-1.

In the high risk event, surface water risk is scattered across the site. Ponding is shown within topographic low spots, with some additional flow paths coincident with the ordinary watercourses within the site. In the medium risk event, there is a greater extent of surface water ponding and flood depths increase. A flow path emerges within the southwestern corner of the site. In the low risk event, flooding significantly increases with additional flow paths and areas of ponding forming throughout the site. Greatest flood depths in the high risk event are > 1.2 m (Figure 3-1), however these depths are located within the ordinary watercourse channel, with some areas of significant hazard (Figure 3-2). Safe access and escape routes should be available via all roads to and from the site based on current information.

Table 154-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
91	5	2	2

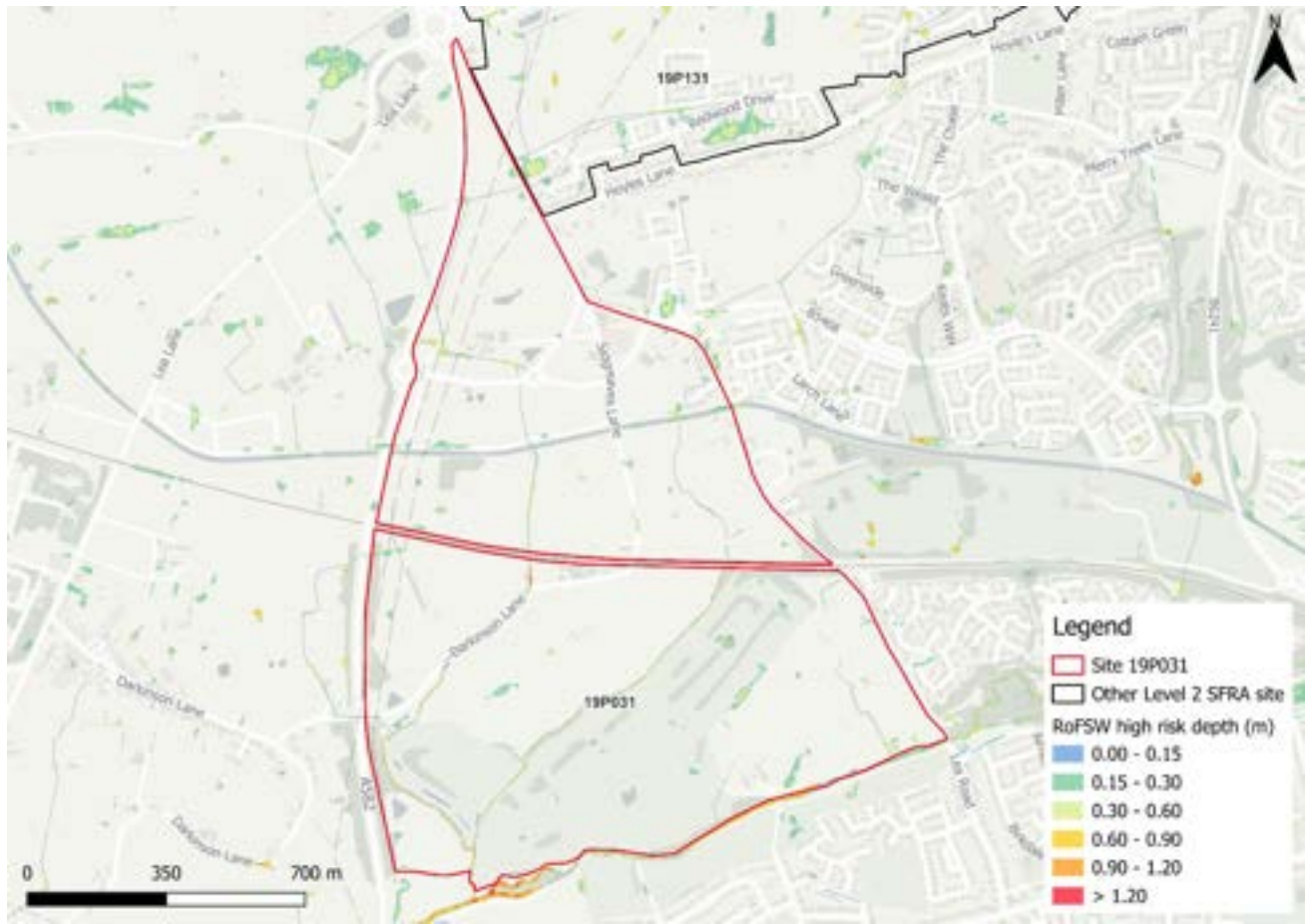


Figure 154-1: High risk event surface water flood depths (Risk of Flooding from Surface Water map)

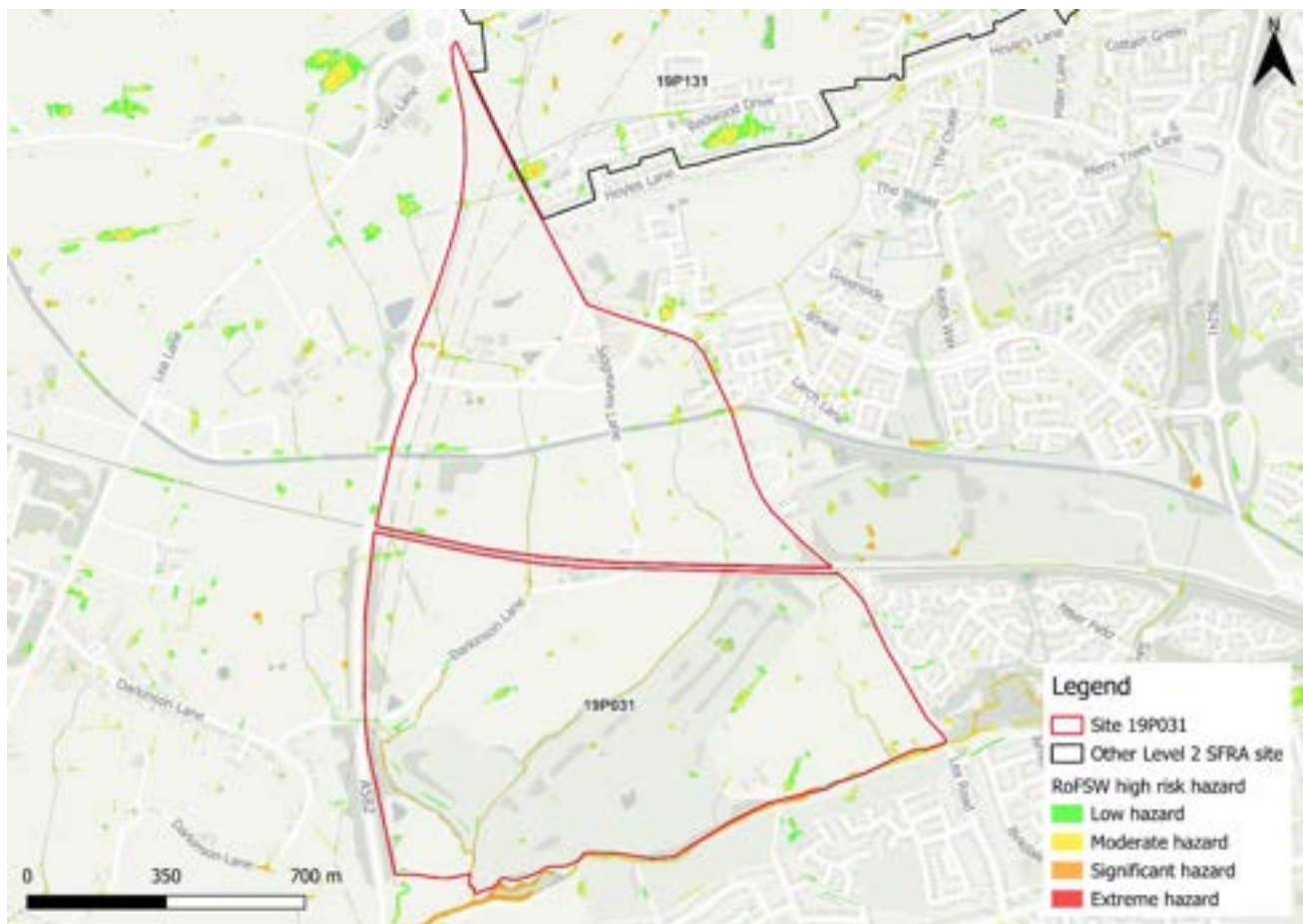


Figure 154-2: High risk event surface water flood hazard⁹⁴ (Risk of Flooding from Surface Water map)

154.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 154-2: Modelled climate change allowances for rainfall for the Douglas management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	45%

Figure 3-3 shows the flood depths during the high risk surface water event plus a 40% allowance for climate change. Risk is modelled to be greater than for present day conditions, with the high risk climate change event showing a similar level of risk to the

⁹⁴ 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

medium risk present day event. Maximum depths are > 1.2 m, however these are located within the channel of the ordinary watercourses within the site, with areas of hazard categorised as significant (Figure 3-4).

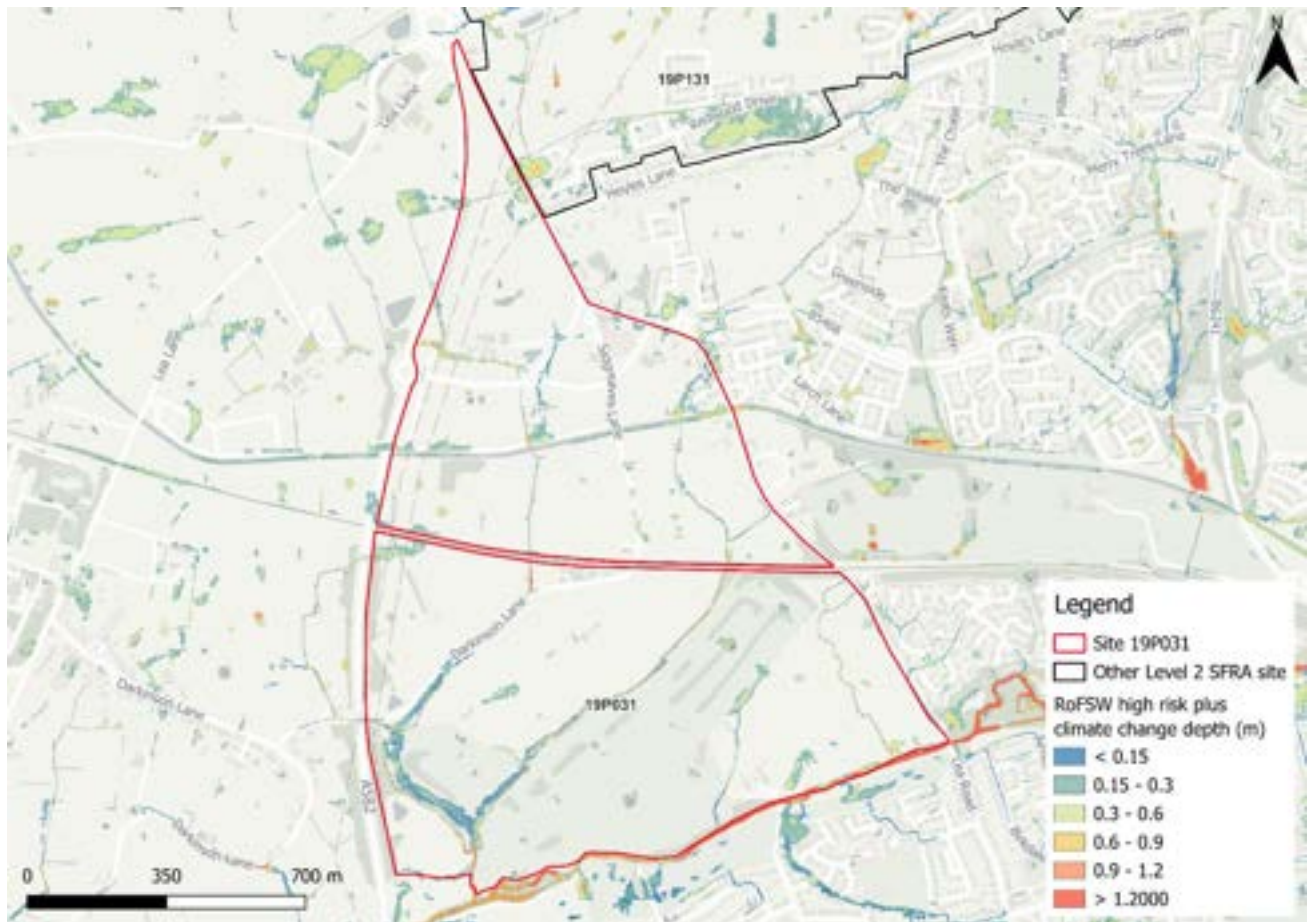


Figure 154-3: High risk event surface water flood depths plus 40% climate change (based on Risk of Flooding from Surface Water map)

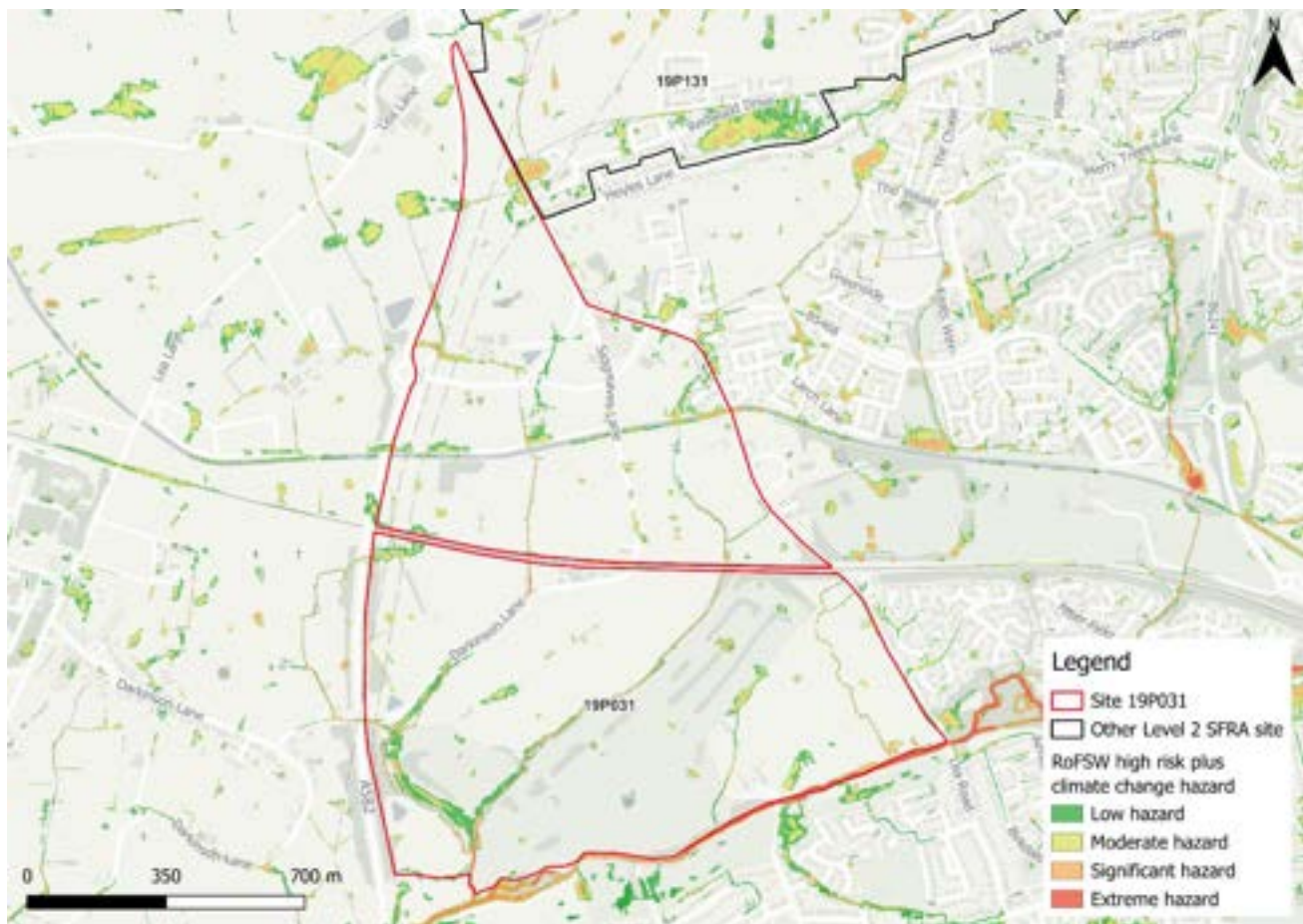


Figure 154-4: High risk event surface water flood hazards plus 40% climate change (based on Risk of Flooding from Surface Water map)

154.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 91% of the site being at very low risk. There are scattered areas of surface water ponding within topographic low spots across the site, with some additional surface water flow paths through the site. Any existing topographic depressions and flow paths should be maintained in site design.
- Safe access and escape routes are available at multiple locations.
- The high risk event plus climate change modelling shows significantly increased depths and areas of ponding in comparison to the present day high risk event, similar to the present day medium risk event.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Site runoff should be maintained at current rates and, where possible, betterment should be achieved.
- 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 or evidence.
- The site is located adjacent to the Sandpiper Grange development (planning reference 06/2019/0114). The FRA submitted with this planning application states that the surface water drainage strategy for Sandpiper Grange will use an existing surface water sewer pipe adjacent to Cottam Way which connects to a larger public surface water sewer that outfalls to Savick Brook. A detailed investigation carried out for the Sandpiper Grange site indicates ground conditions and are not suitable for SuDS due to the impermeability of the clayey soils underlying the site. It is recommended similar detailed investigations are carried out for site 19P031 to determine the surface water management options.

155 Risk from groundwater

Risk from groundwater sources 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 Guide⁹⁵. Figure 4-1 shows the map for Site 19P031 and the surrounding areas and Table 155-1 explains the risk classifications.

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

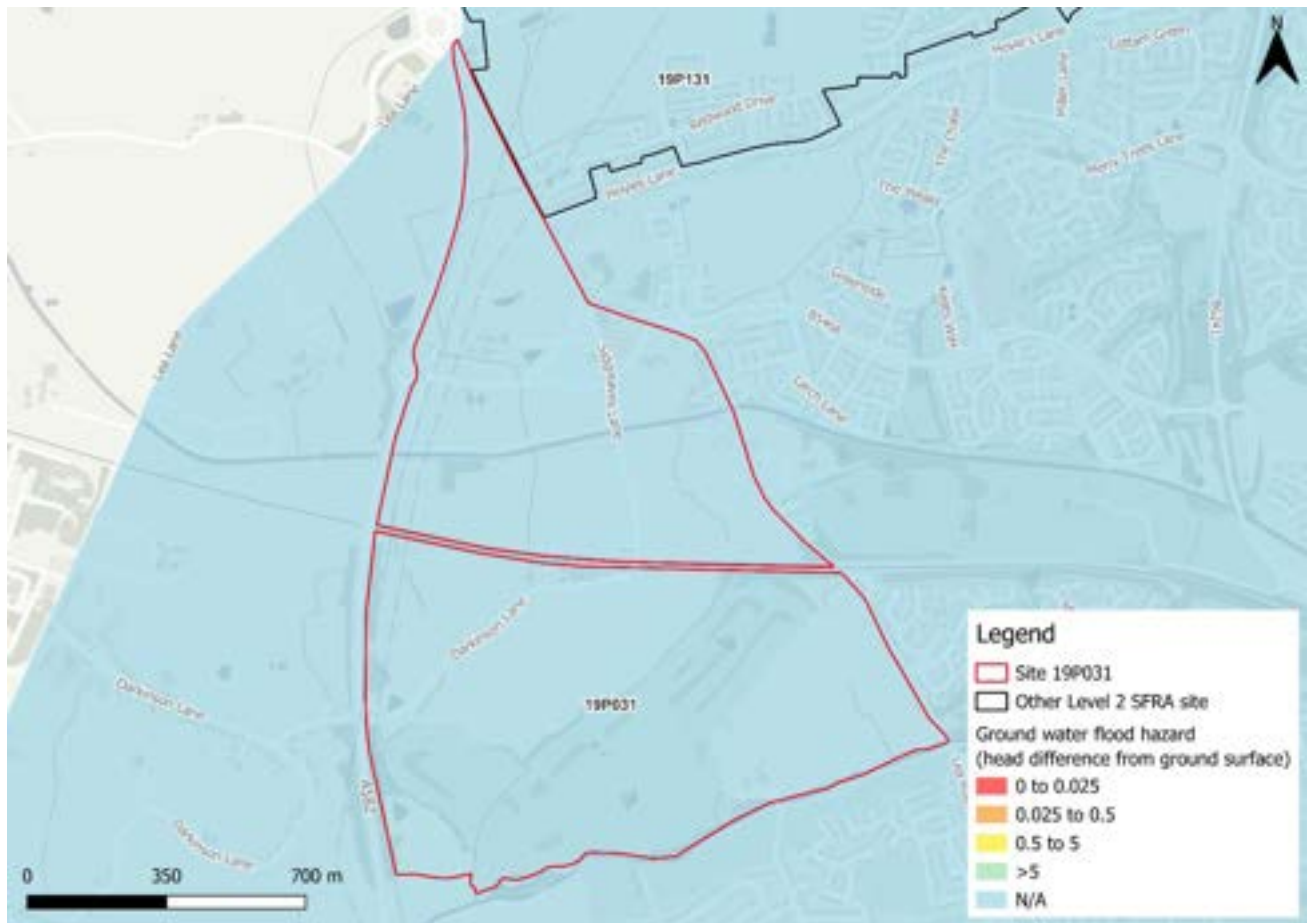


Figure 155-1: JBA 5m Groundwater Emergence Map

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

Table 155-1: Groundwater Flood 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.	

156 Overall site assessment

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

To pass part b) of the exception test⁹⁶, it must be proven that the development can be safe for its lifetime, which is 75 years for non-residential development and 100 years for residential development. Given the absence of modelled climate change data and the use of proxies to inform future fluvial flood risk to the site, it cannot be proven that this site can remain safe for its lifetime and therefore the exception test cannot be passed.

The areas of flood risk within this site cannot be developed until the required information detailed in this SFRA on existing and future flood risk from Savick Brook and its tributaries is fully ascertained. This is because, at this stage, it cannot be proven that the site can remain safe for its lifetime. The site can only be allocated if all development can be directed to areas of low flood risk.

Were additional, more detailed modelled information on flood risk become available through an update to the SFRA or through a site-specific FRA, that show the risk area to be lower than currently shown, more of the site could then be developed. Conversely, were the risk to be greater, any development must account for this. Flood risk elsewhere should not be increased as a result of development.

156.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Updated present day and climate change modelling of Savick Brook and its tributaries should be used to update this Level 2 SFRA at the earliest opportunity to provide a robust strategic assessment of flood risk to this site and surrounding areas. Risk from the ordinary watercourses should be investigated.
- It would be acceptable to use updated modelling to suitably assess risk through a site-specific FRA, as well as/instead of a Level 2 SFRA update.
- There should be no development within the functional floodplain. There should also be no development within 8m of Savick Brook. The EA recommend for an 8m no development buffer for all main rivers to enable access for maintenance activities. This should be converted to a blue / green corridor to provide ecological, amenity and social value.
- A detailed drainage strategy will be required given the large area of this site. The use of infiltration SuDS should be investigated.
- The site is at potential residual risk from possible blockages of the culverts within the site, which should be considered at the FRA stage.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.

⁹⁶ Para 178 National Planning Policy Framework 2024

- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P039

Final

February 2025

Prepared for:



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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll 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 19 August 2024 and 14 February 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.

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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158 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P039. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

158.1 Site 19P039

- Location: Land off Green Nook Lane
- Existing site use: Agriculture
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.94 hectares
- Proposed development impermeable area: 0.80 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-



Figure 158-1: Existing site location boundary

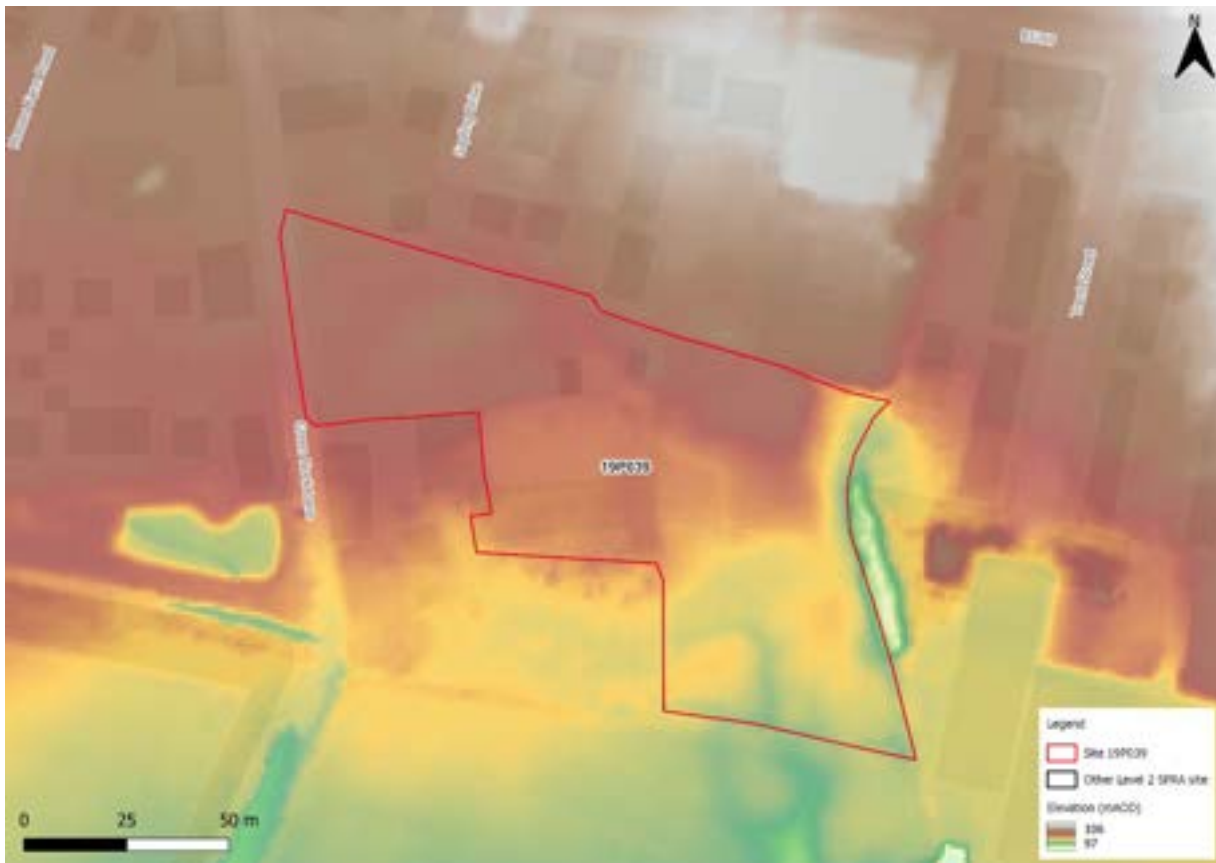


Figure 158-2: Topography

159 Flood risk from rivers

159.1 Existing risk

159.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating the site is at low risk of flooding from rivers.

Table 159-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

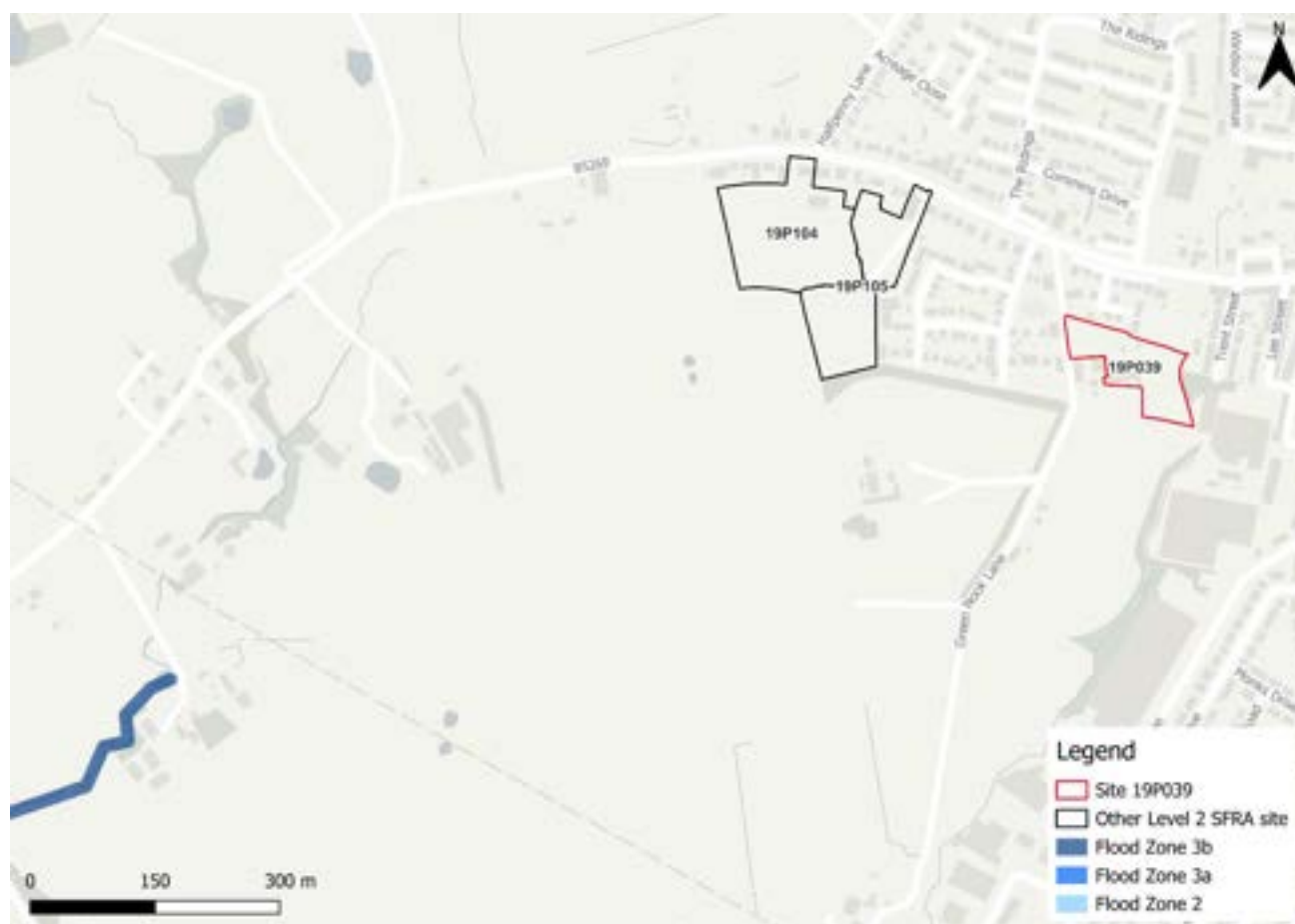


Figure 159-1: Existing risk from rivers to the site

159.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

159.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P039 is located within one catchment, namely Savick Brook. This is ranked as a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

159.2.2 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. Both within and upstream of the site there is potential for both riparian and wider catchment woodland planting to attenuate flows and reduce the volume of runoff downstream. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 159-2.



Figure 159-2: Natural Flood Management (NFM) potential mapping

159.2.3 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. 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 likely not modelled to be at risk from reservoir flooding.

159.3 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

159.4 Flood warning and access and escape routes

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 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 an FWA. The site is not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Green Nook Lane to the west of the site.

159.5 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is wholly located within Flood Zone 1.

160 Flood risk from surface water

160.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 3% of the site is within the high risk surface water flood zone. A further 1% is at medium surface water risk and a further 7% of the site is at low surface water risk.

In the high risk event, surface water risk is confined to a short flow path along the eastern boundary of the site. There is an additional area of shallow ponding along the southern boundary. In the medium risk event, the areas of surface water risk along the eastern and southern boundaries increase in extent, with the flow path in the east extending towards both the north and south. In the low risk event, there are some additional areas of ponding within the centre and north of the site.

Greatest flood depths within the medium risk event are between 0.6 and 0.9 m (Figure 3-1) with some areas of significant hazard (Figure 3-2). Safe access and escape routes should be possible via Green Nook Lane to the west of the site during all events.

Table 160-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
89	7	1	3



Figure 160-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)

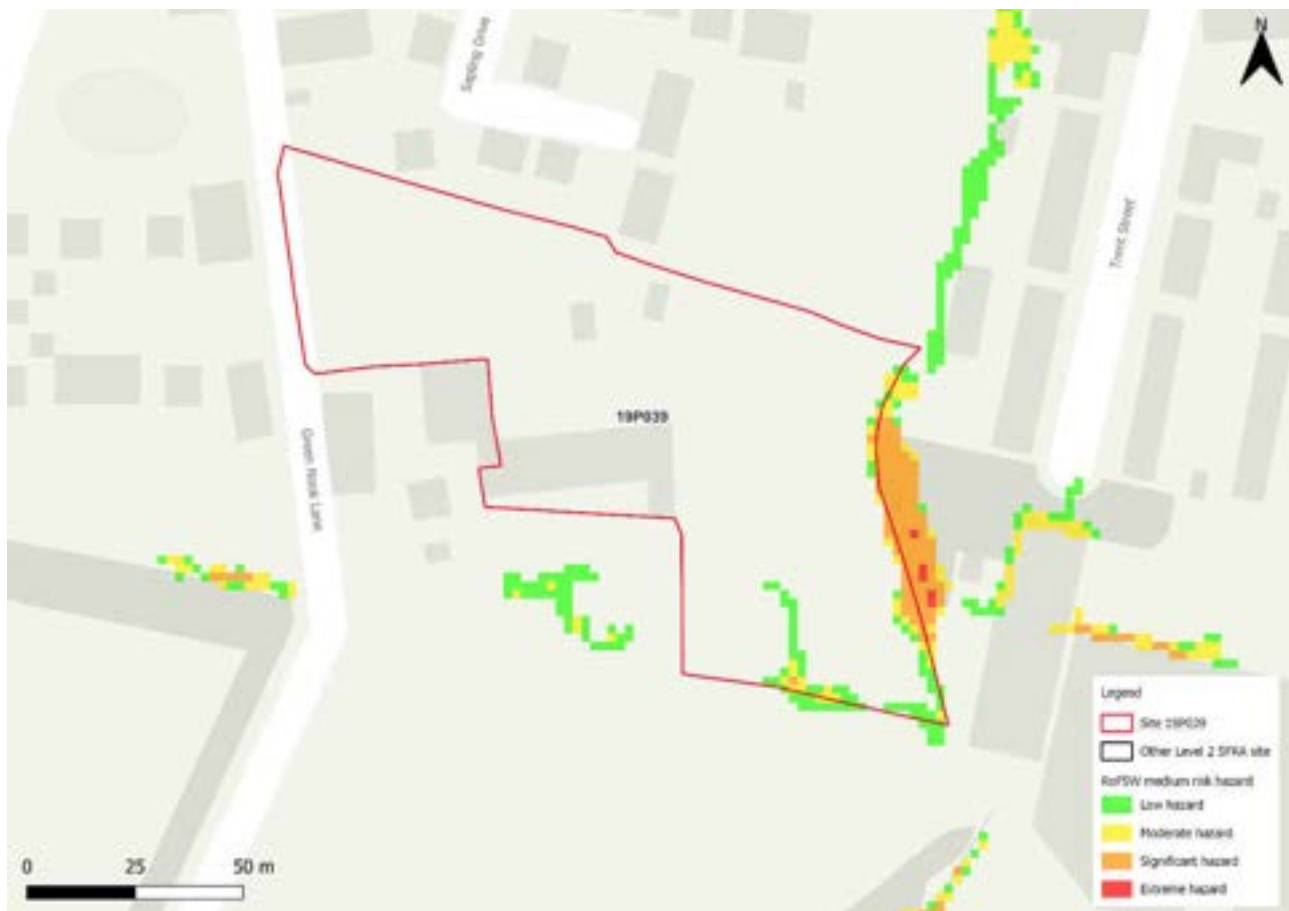


Figure 160-2: Medium risk event surface water flood hazard⁹⁷ (Risk of Flooding from Surface Water map)

160.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 160-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium risk climate change event being slightly greater in extent than the present day low risk event. Maximum flood depths are modelled to be between 0.9 and 1.2 m (Figure 3-3), with

⁹⁷ 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

some areas of significant hazard (Figure 3-4). There are a number of flow paths on and around the site that will require investigation through a drainage strategy. Onsite runoff should be retained onsite.

Safe access and escape routes should remain achievable via Green Nook Lane to the west of the site.

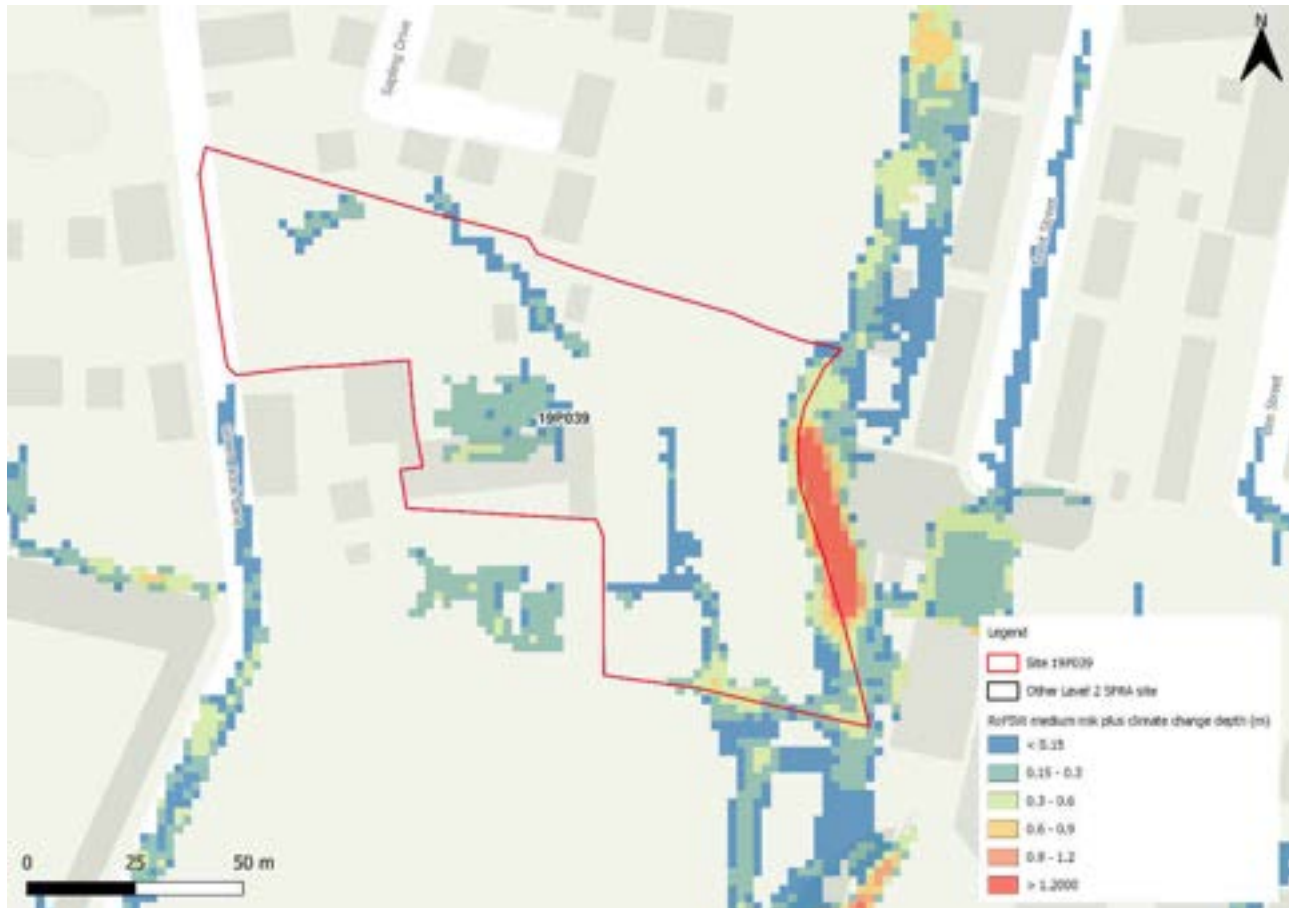


Figure 160-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 160-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

160.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with approximately 89% of the site being at very low risk. Surface water risk in the high and medium risk events is largely confined to the eastern and western boundaries.
- The modelled medium risk climate change outputs indicate a slightly greater extent of risk than the present day low risk event, with additional areas of ponding and flow routes emerging through the site.
- Safe access and escape routes should be achievable via Green Nook Lane to the west of the site in all events.
- Topographic depressions and flow routes should be considered and included in site design and ideally left in place to flood naturally when required. Any regrading of land must include for like for like volumes to ensure risk is contained safely onsite for the lifetime of development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- A full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will

require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Note, 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 or evidence.
-

161 Risk from groundwater

Risk from groundwater sources is assessed in this SFRA using JBA's 5m Groundwater Flood Map. This dataset is recommended for use by the EA in the SFRA Good Practice Guide⁹⁸. Figure 4-1 show the map for the site and the surrounding areas and explains the risk classifications.

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



Figure 161-1: JBA 5m Groundwater Emergence Map

⁹⁸ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 161-1: Groundwater Flood 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.	

162 Overall site assessment

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

This site is not required to pass part b) of the exception test⁹⁹ 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.

162.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on the evidence in this SFRA, it should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Surface water should be retained onsite which may reduce units. This will require detailed surface water modelling based on layout plans and detailed design and full consultation with the LLFA on required runoff rates, likely to be greenfield or betterment. The use of infiltration SuDS should be investigated.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

⁹⁹ Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P086

Final

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Dominic Richardson of JBA Consulting carried out this work.

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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. Information obtained by JBA has not been independently verified by JBA, unless otherwise stated in the Report.

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Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the Report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. JBA specifically does not guarantee or warrant any estimates or projections contained in this Report.

Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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164 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P086. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

164.1 Site 19P086

- Location: Former Fishwick Hall Golf Course, Glenluce Drive
- Existing site use: Brownfield, Disused Carpark
- Existing site use vulnerability: Less Vulnerable
- Proposed site use: Mixed Use
- Proposed site use vulnerability: More Vulnerable
- Site area: 0.21 hectares
- Proposed development impermeable area: 0.179 hectares (assumed 85% impermeable area)
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Modelling of latest Environment Agency (EA) climate change allowances for peak river flows and peak rainfall intensities



Figure 164-1: Existing site location boundary

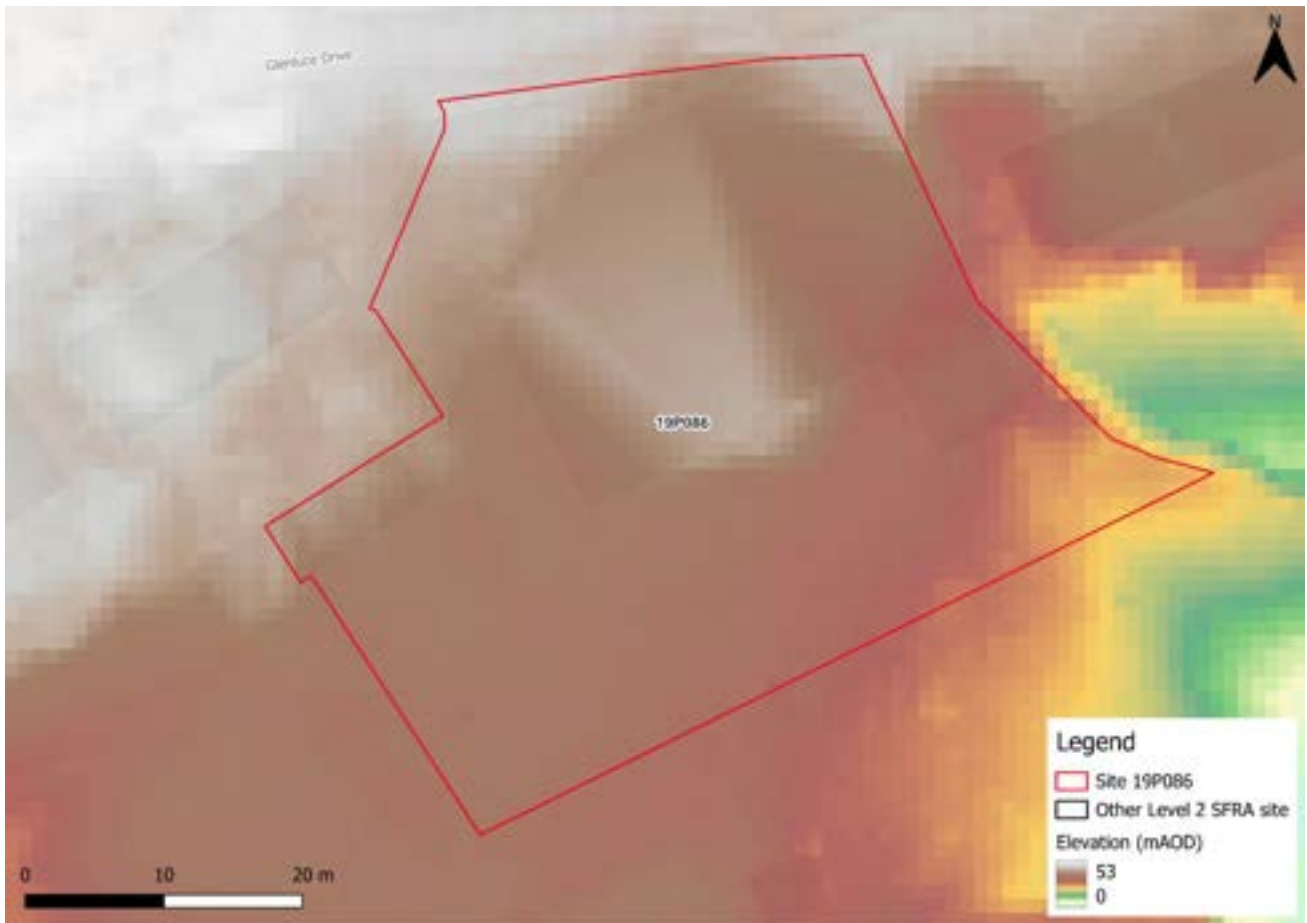


Figure 164-2: Topography

165 Flood risk from rivers

165.1 Existing risk

165.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The entire the site is located within Flood Zone 1, indicating low risk from rivers.

Table 165-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 165-1: Existing risk from rivers to the site

165.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

165.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P086 is located within two catchments, namely; Ribble - conf Calder to tidal and Coastal Catchment 176. The majority of the site is located within a high sensitivity catchment. Planning policy considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
- The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
- The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
- A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

165.2.2 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. There are no opportunities for Natural Flood Management indicated to be present at the site.

165.3 Residual risk

165.3.1 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. 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 not modelled to be at risk from reservoir flooding.

165.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

165.5 Flood warning and access and escape routes

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. Site 19C277x 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. The site is not located within a FAA.

Based on available information, Safe access and escape routes would be achieved via Glenluce Drive in all events.

165.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The entire site is located within Flood Zone 1 indicating that it is at low risk of flooding from rivers. There are therefore no constraints to development at the site with respect to flood risk from rivers.
- The site is not located within a flood warning zone and Safe access and escape routes could likely be achieved via multiple routes surrounding the site, based on available information.
-

166 Flood risk from surface water

166.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water flood risk to the site is predominantly very low, with the entire site shown to be at very low flood risk from surface water.

In all events, surface water is confined to outside of the site boundary.

Based on available information, safe access and escape routes are anticipated to be viable in all events via Glenluce Drive and Butterlands. Whilst Glenluce Drive is shown to be partially inundated with surface water to the east of the site, hazard levels are indicated as low to moderate and the west of the drive as well as Butterlands are indicated to be flood free, therefore access and escape routes are anticipated to remain viable.

Table 166-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
100	0	0	0



Figure 166-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 166-2: Low risk event surface water flood hazard¹⁰⁰ (Risk of Flooding from Surface Water map)

166.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 166-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3%	30%	40%
1%	35%	50%

Figure 3-3 shows the modelled surface water depths for the medium risk event +50% climate change. Risk is modelled to be comparable to present day conditions, although

¹⁰⁰ 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

extents and depths of nearby areas of surface water are marginally greater. As in the present-day low risk event, flood extents do not enter the site area. The site is therefore indicated to remain at a very low risk of flooding from surface water in the climate change events as well as the present-day events.

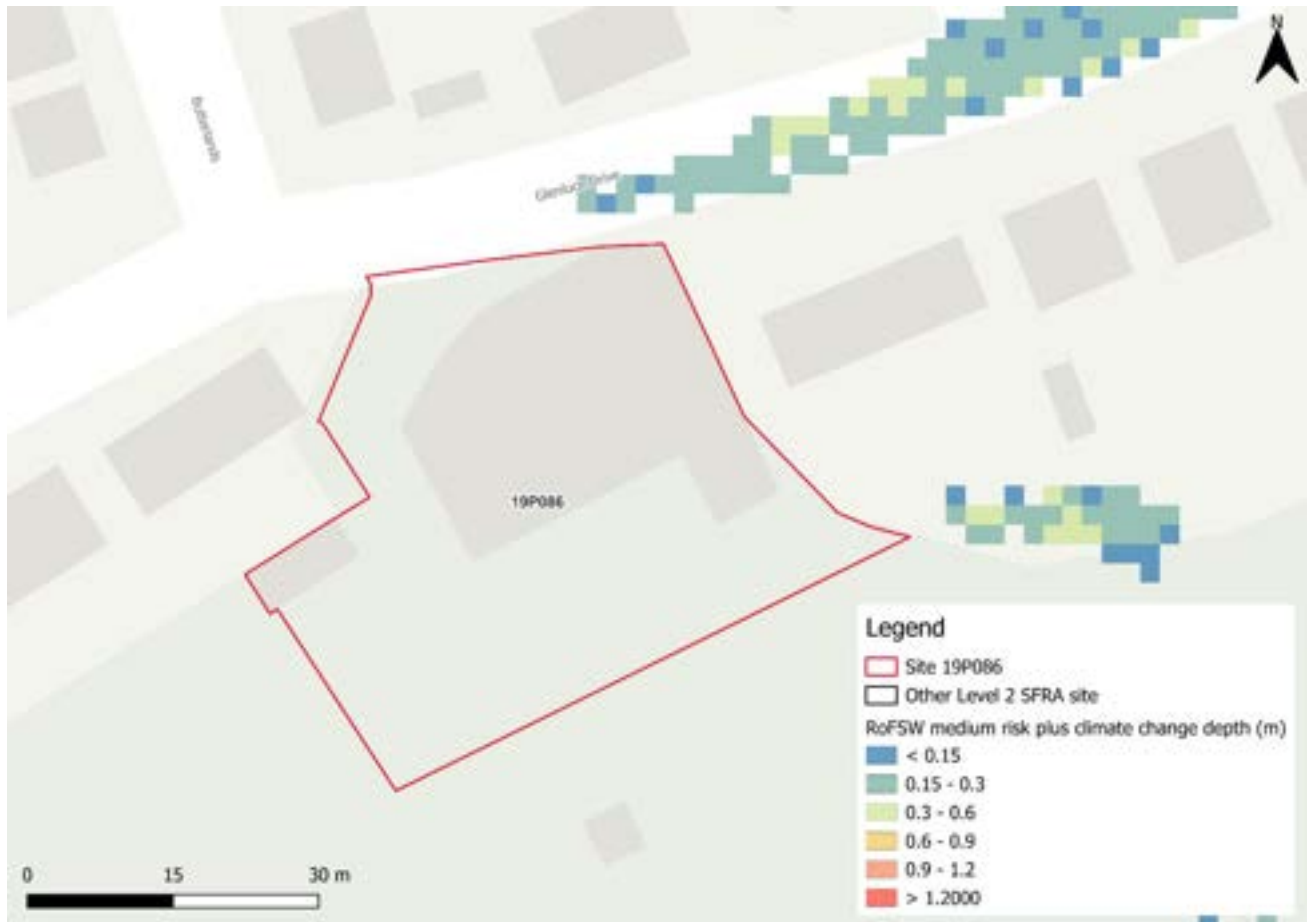


Figure 166-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 166-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

166.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is very low, with the entire site being at very low surface water flood risk. Surface water flood extents are not shown to enter the site area in any modelled event, including for climate change.
- Safe access and escape routes are anticipated to be present at Glenluce Drive and Butterlands in all events.
- The Groundwater Emergence Map (Figure 4-1) indicates that the site is at no risk from groundwater emergence.

167 Flood risk from groundwater

Flood risk from groundwater sources is assessed in this SFRA using JBA's 5m Groundwater Flood Map. This dataset is recommended for use by the EA in the SFRA Good Practice Guide¹⁰¹. Figure 4-1 show the map for Site 19P086 and the surrounding areas and Table 167-1 explains the risk classifications.

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



Figure 167-1: JBA 5m Groundwater Emergence Map

¹⁰¹ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 167-1: Groundwater Flood 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.	

168 Overall site assessment

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

The site is not required to pass part b) of the exception test¹⁰² as it is located within Flood Zone 1. However, it must still be proven to be safe for its lifetime, which is 100-years for residential development and 75-years for non-residential development.

168.2 Recommendation summary, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

102 Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P131

Final

November 2024

Prepared for:



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170 Background

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170.1 Site 19P131

- Location: North West Preston, PR4 0LH-PR4 0RU (PLP MD2: North West Preston allocation / strategic location)
- Existing site use: Mixed use (housing and agricultural)
- Existing site use vulnerability: More vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 319.2 hectares
- Proposed development impermeable area: 271.3 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk

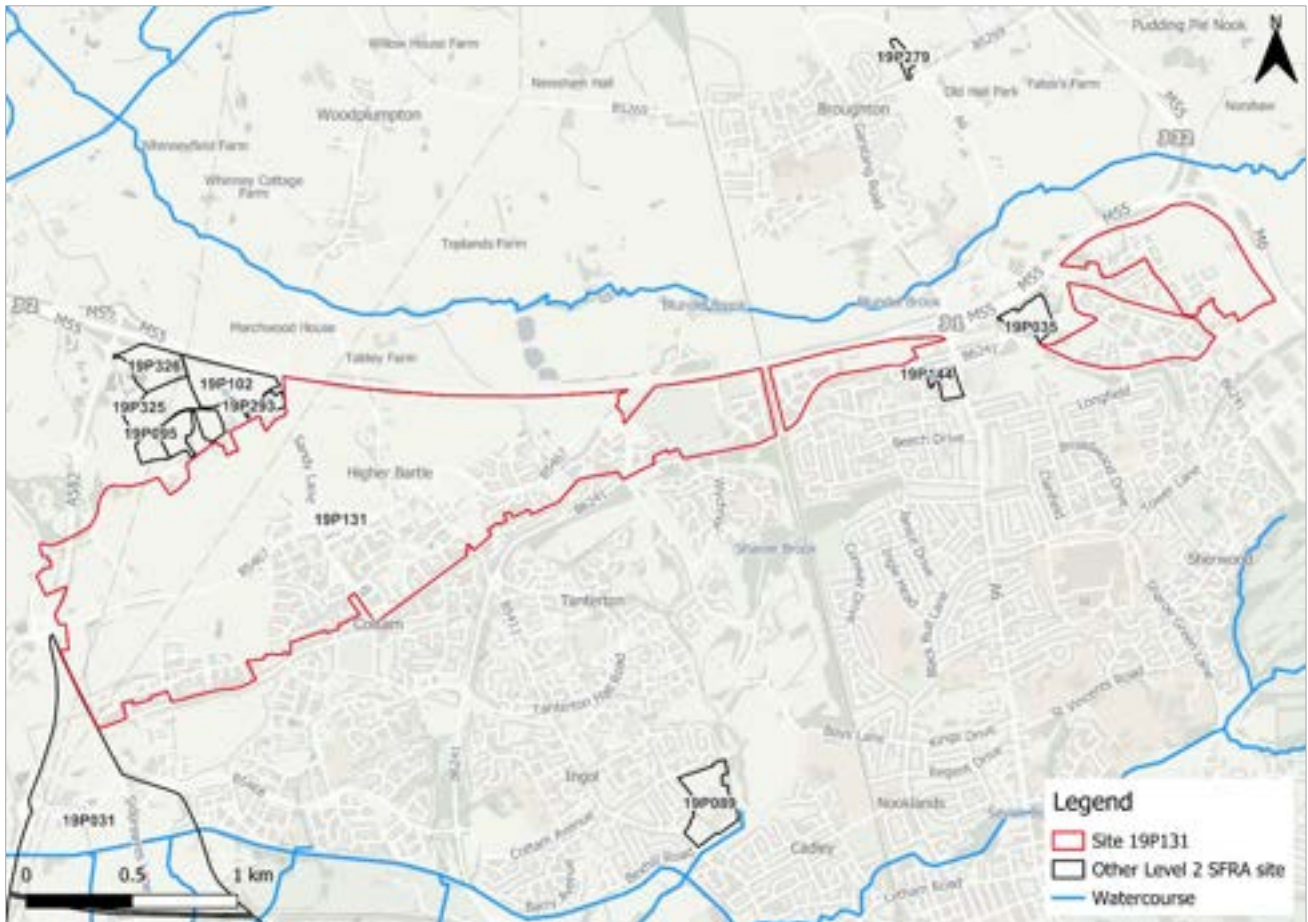


Figure 170-1: Existing site location boundary

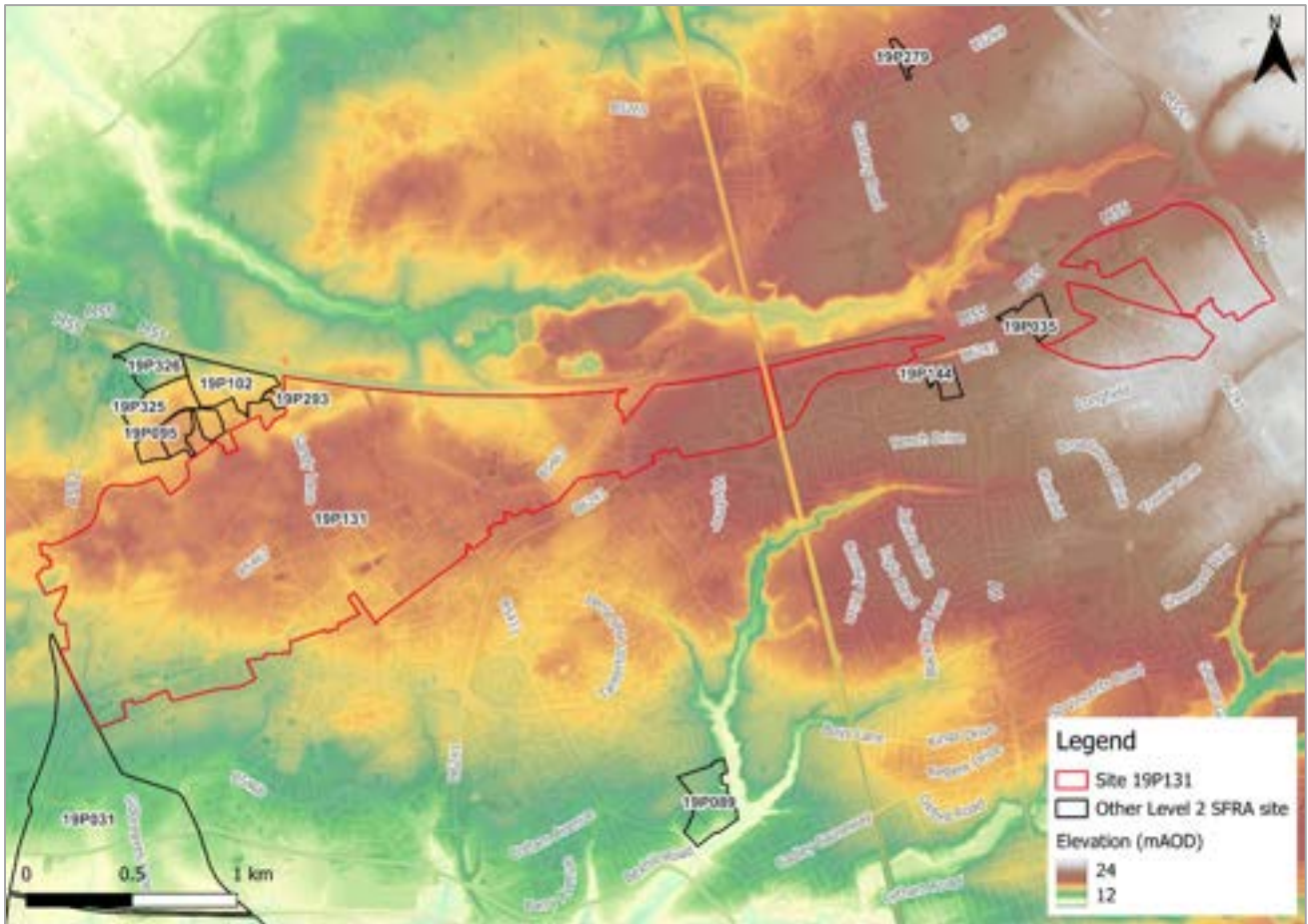


Figure 170-2: Topography

171 Flood risk from rivers

171.1 Existing risk

171.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 171-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The site is located fully within Flood Zone 1, indicating it is at low risk of flooding from rivers.

Table 171-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

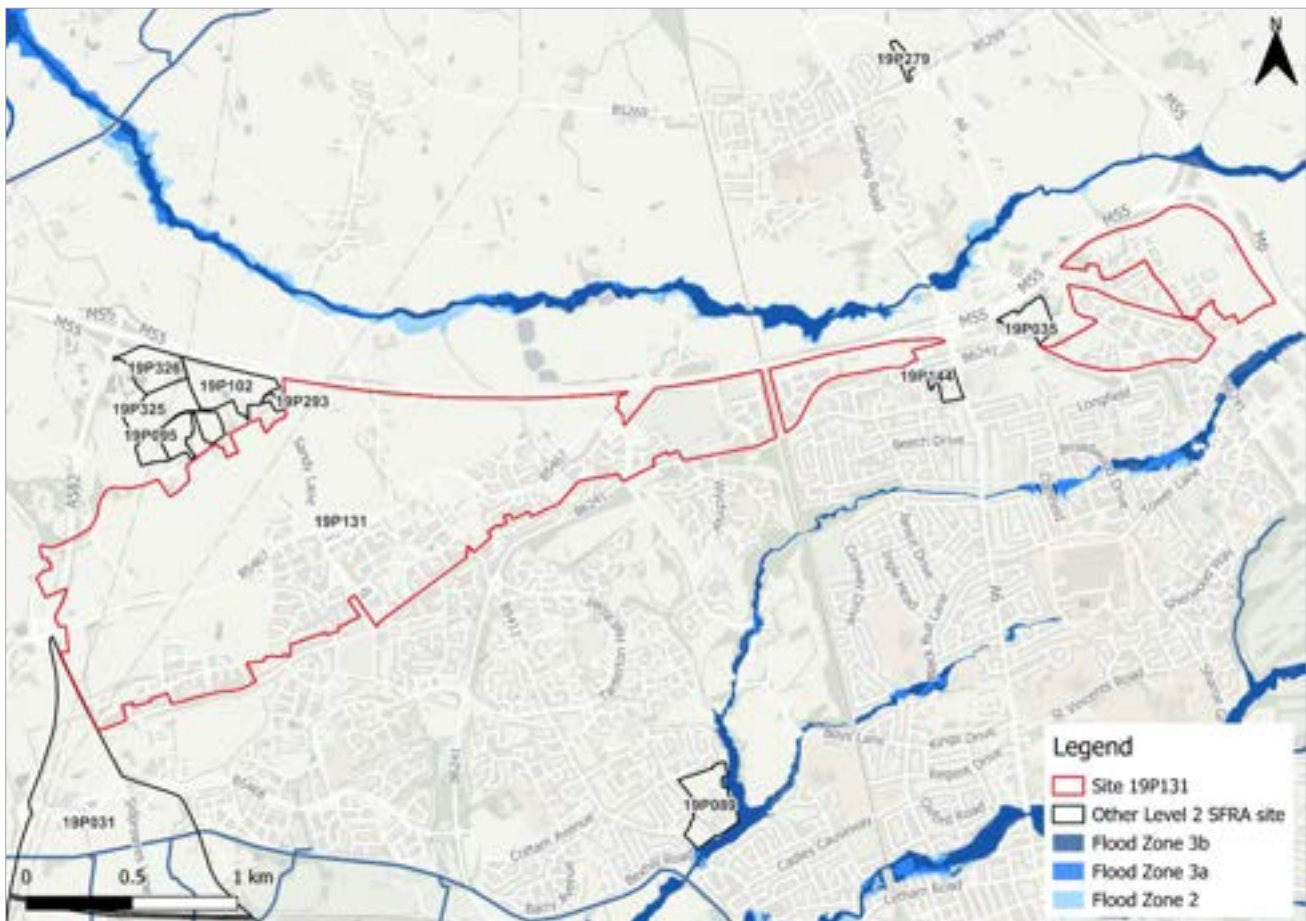


Figure 171-1: Existing risk from rivers to the site

171.2 Flood risk management

There are no engineered flood defences within the vicinity of the site, according to the EA's spatial flood defences dataset.

171.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P131 is located within two catchments, namely; Woodplumpton Brook and Savick Brook. Woodplumpton Brook is ranked as a high sensitivity catchment, while Savick Brook is ranked medium sensitivity. Planning policy considerations for sites at high sensitivity to cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions for sites at high and medium sensitivity can be found in Appendix G of the Level 1 SFRA.

171.2.2 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. Across the majority of the site there are significant opportunities for wider catchment tree planting to reduce runoff downstream. There is also potential for riparian tree planting in parts of the site, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 171-2.

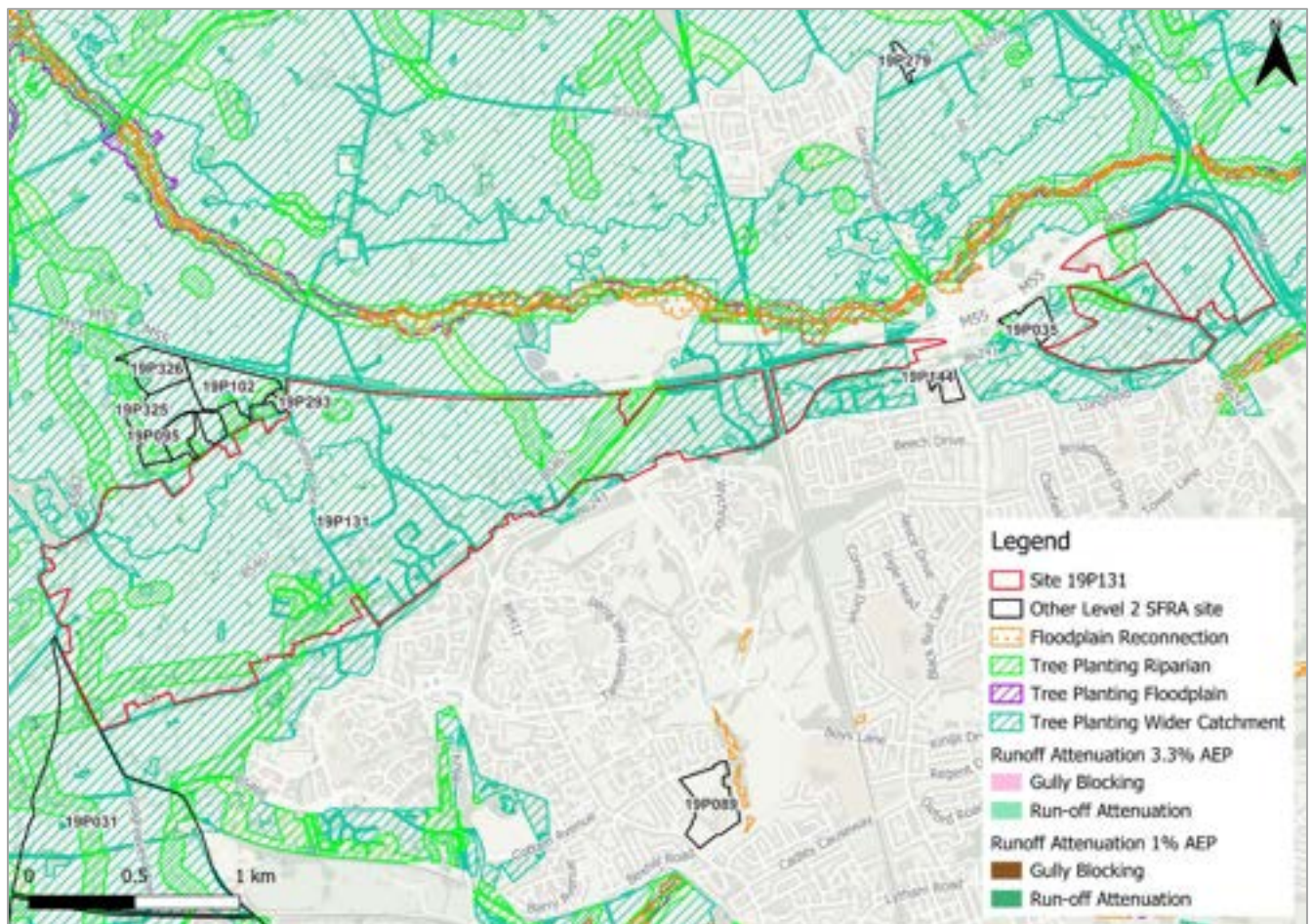


Figure 171-2: Natural Flood Management (NFM) potential mapping

171.2.3 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. 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 not modelled to be at risk of reservoir flooding.

171.3 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

171.4 Flood warning and access and escape routes

There are no Flood Warning Areas (FWA) or Flood Alert Areas (FAA) within the vicinity of the site.

Based on the FMfP, safe access and escape routes should be achievable via the M55, B5467 and B6241 during all events.

171.5 Observations, mitigation options and site suitability - fluvial

- The site is modelled to be fully within Flood Zone 1.

172 Flood risk from surface water

172.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 3% of the site is within the high risk surface water flood zone. 2% of the site is in the medium risk zone and a further 5% is at low surface water risk as shown in Table 172-1.

In the high risk event, surface water risk is widespread across all four site parcels. Water ponds in areas of low topography and there are small flow paths on the site parcel west of the railway, the parcel east of the railway and the parcel south of D'Urton Lane.

Greatest surface water flood depths in the high risk event are >1.2 m with areas of significant hazard. In the medium risk event, areas of ponding and flow paths expand in size and depth (Figure 3-1). Maximum hazard in the medium event remains significant (Figure 3-2). In the low risk event, large areas of ponding are modelled with additional flow paths forming within all four site parcels. Safe access and escape routes may be possible via the B6421 and Hoyle's Lane, though in the extreme event there are areas of ponding with a significant flood hazard on parts of these roads.

Table 172-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
90%	5%	2%	3%

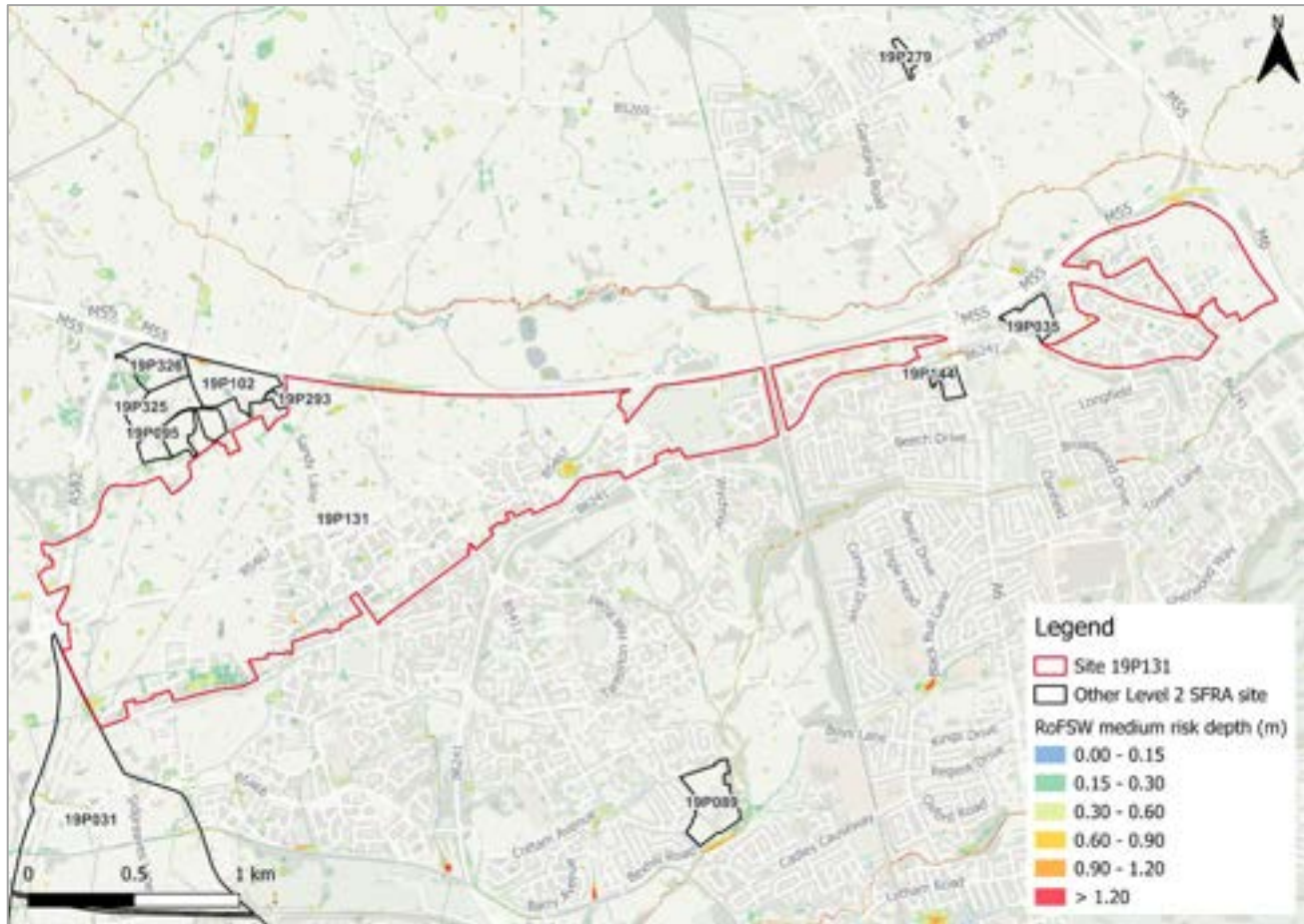


Figure 172-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 172-2: Medium risk event surface water flood hazard¹⁰³ (Risk of Flooding from Surface Water map)

172.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. The site lies within both the Wyre and Ribble management catchments. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 172-2: Modelled climate change allowances for rainfall for the Wyre and Ribble management catchments

Management catchment	Return period	Central allowance 2070s	Upper end allowance 2070s
Wyre	3.3% (high risk)	30%	45%
	1% (medium risk)	35%	50%
Ribble	3.3% (high risk)	30%	40%
	1% (medium risk)	35%	50%

¹⁰³ 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

Figure 3-3 shows the medium risk surface water flood depths plus the upper end climate change allowance. Risk is modelled to be significantly greater than the present day medium surface water risk flood event with flooding modelled to be similar to the present day low risk event. Maximum flood depths are modelled to be >1.2 m, with many areas of significant hazard (Figure 3-4). Safe access and escape routes may remain achievable via the B6421 and Hoyle's Lane, though there are some areas of ponding with a significant flood hazard on parts of these roads.

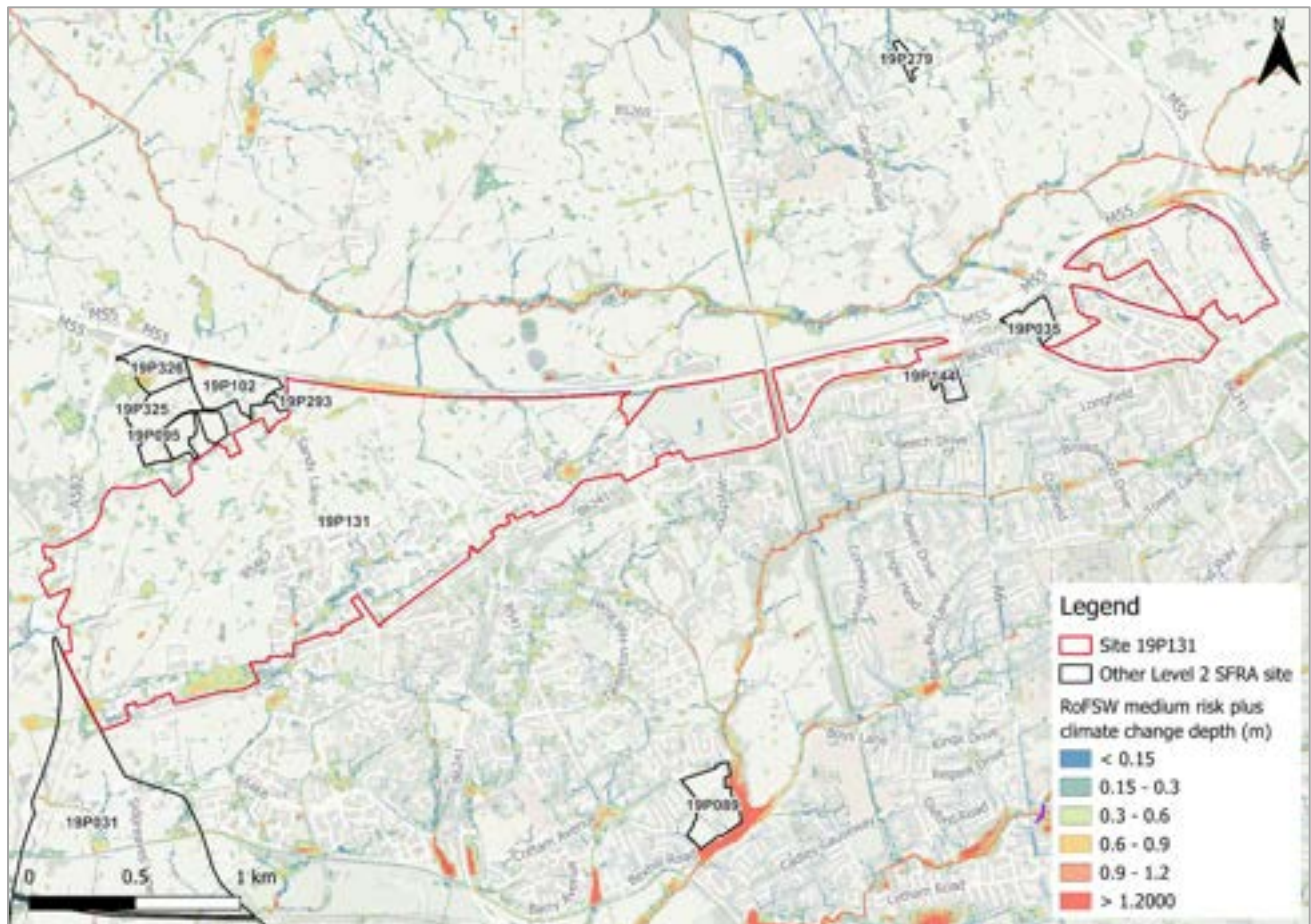


Figure 172-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)

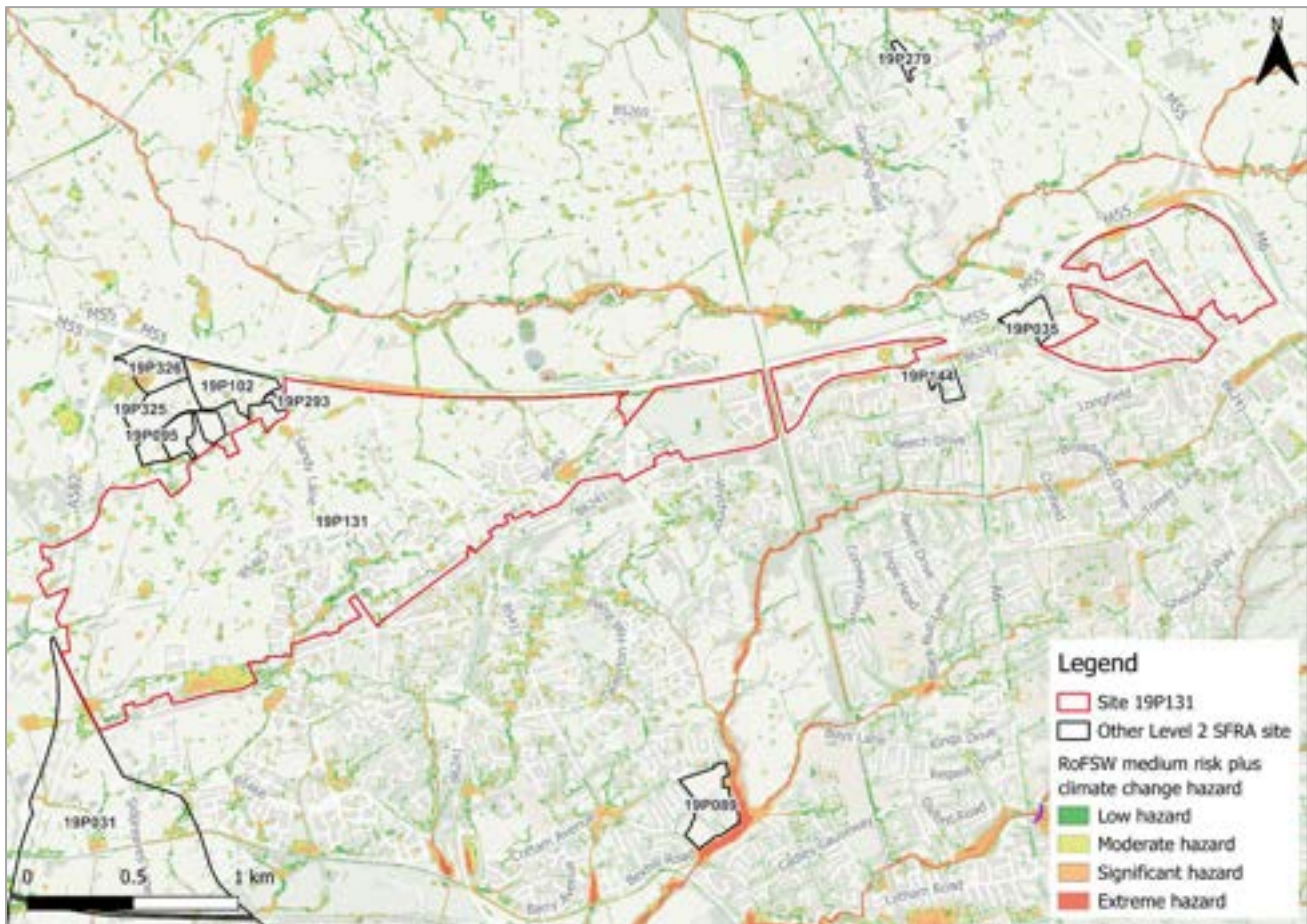


Figure 172-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

172.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 90% of the site being at very low surface water flood risk. Surface water risk in the high event consists of ponding within topographic low spots and small flow paths. Flooding in the low risk event is significantly greater with further flow paths forming across all site parcels. Safe access and escape may be achievable via the B6421 and Hoyle's Lane in all events.
- The effects of climate change on surface water have been modelled for this SFRA using the medium risk surface water flood depths plus climate change. Surface water risk is significantly greater than in the present day event, flooding is similar to the modelled present day low risk event. Any existing flow paths should be maintained in site design.
- The Groundwater Flood Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could

accommodate the proposed residential development or whether further capacity will be required.

- Given the large size of the site, a detailed drainage strategy will be required.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P095, 19P102, 19P293, 19P325 and 19P326, 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.
- Note, 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 or evidence.

173 Risk from groundwater

Risk from groundwater sources 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 Guide¹⁰⁴. Figure 4-1 show the map for Site 19P131 and the surrounding areas and Table 173-1 explains the risk classifications.

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.

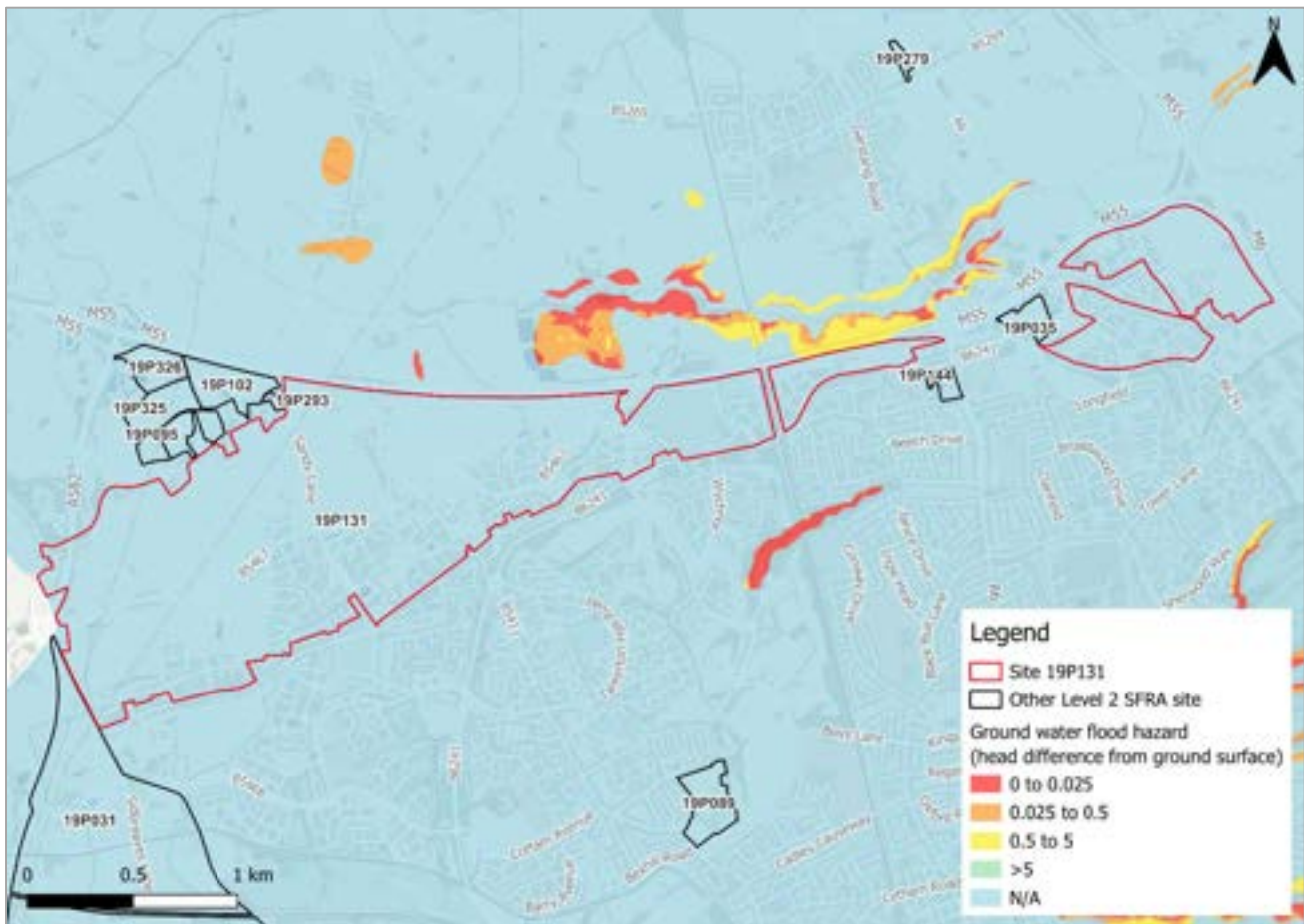


Figure 173-1: JBA 5m Groundwater Flood Map

¹⁰⁴ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 173-1: Groundwater Flood 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.	

174 Overall site assessment

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

To pass part b) of the exception test¹⁰⁵, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

174.2 Recommendation summary, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, it should be possible to allocate this site if development avoids areas at risk of surface water ponding and maintains existing flow paths.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could accommodate the proposed development or whether further capacity will be required.
- A detailed drainage strategy will be required for any new development including investigation into the use of infiltration SuDS.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P095, 19P102, 19P293, 19P325 and 19P326, 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.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

105 Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P133

Final

February 2025

Prepared for:



www.jbaconsulting.com

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll of JBA Consulting carried out this work.

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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176 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P133. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

176.1 Site 19P133

- Location: Red Scar Site H / Red Scar, Whittingham Lane, Broughton
- Existing site use: Greenfield
- Existing site use vulnerability: Water compatible
- Proposed site use: Employment
- Proposed site use vulnerability: Less vulnerable
- Site area: 3.08 hectares
- Proposed development impermeable area: 2.62 hectares (assumed 85% impermeable area)
- Watercourse: River Ribble
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-
-



Figure 176-1: Existing site location boundary

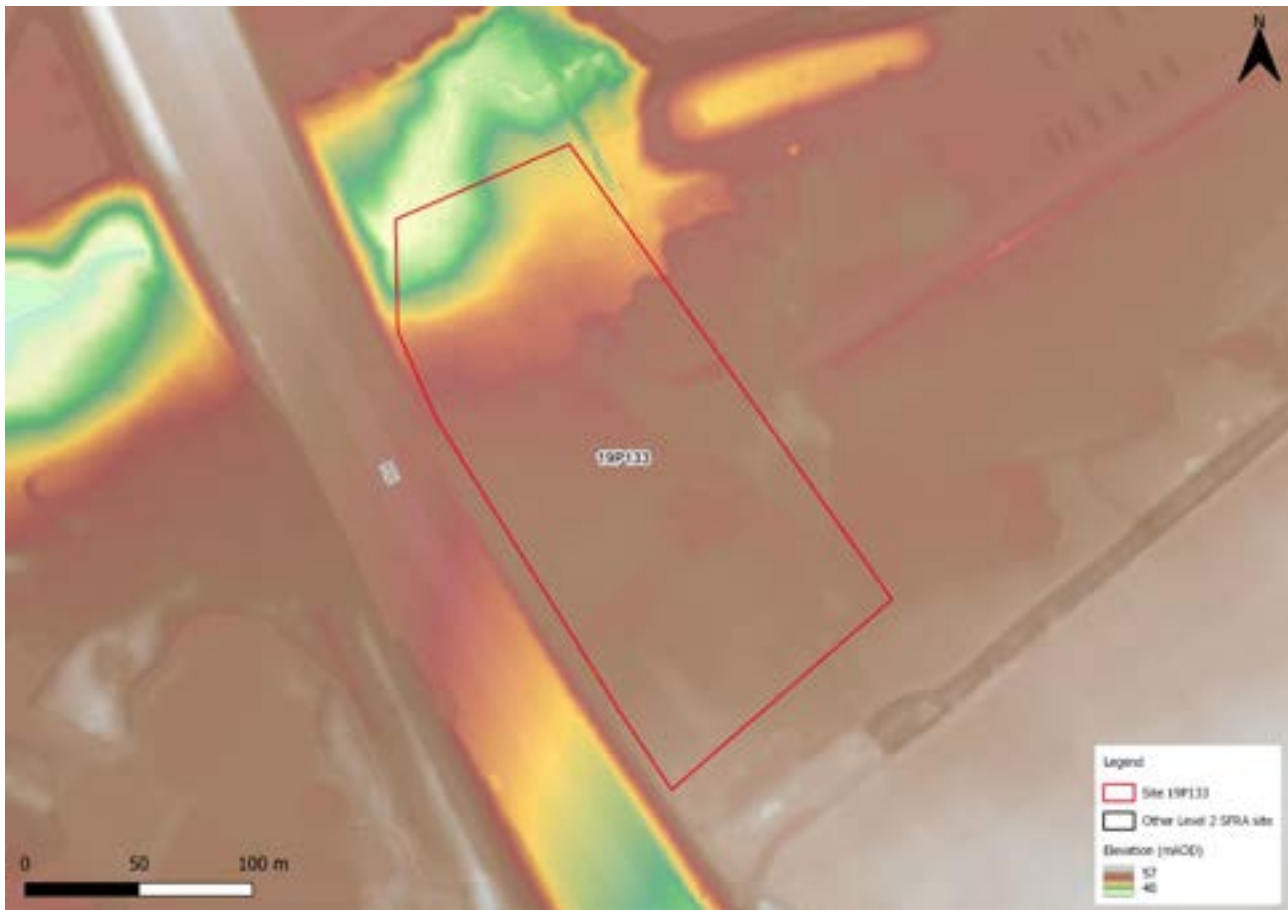


Figure 176-2: Topography

177 Flood risk from rivers

177.1 Existing risk

177.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating the site is at low risk of flooding from rivers.

Table 177-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 177-1: Existing risk from rivers to the site

177.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

177.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P133 is located within two catchments, namely, Savick Brook and Ribble - Calder to tidal. The majority of the site is located within a high sensitivity catchment. Planning considerations for sites at high sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- For larger sites and strategic developments (e.g. new settlements and urban extensions):
 - The LLFA, Environment Agency, and LPA should be consulted at pre-application stage.
 - The FRA should examine the cumulative impacts of proposed peak surface water runoff rates and volumes from across the site on the peak flows, duration of flooding and timing of flood peaks in receiving watercourses. This should include the impact of other developments within the WFD catchment, if appropriate, as advised by the LPA/LLFA.
 - A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

177.2.2 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. The majority of the site has the potential for wider catchment tree planting and the north of the site has potential for riparian tree planting, which will aid in reducing the rate of runoff downstream. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 177-2.

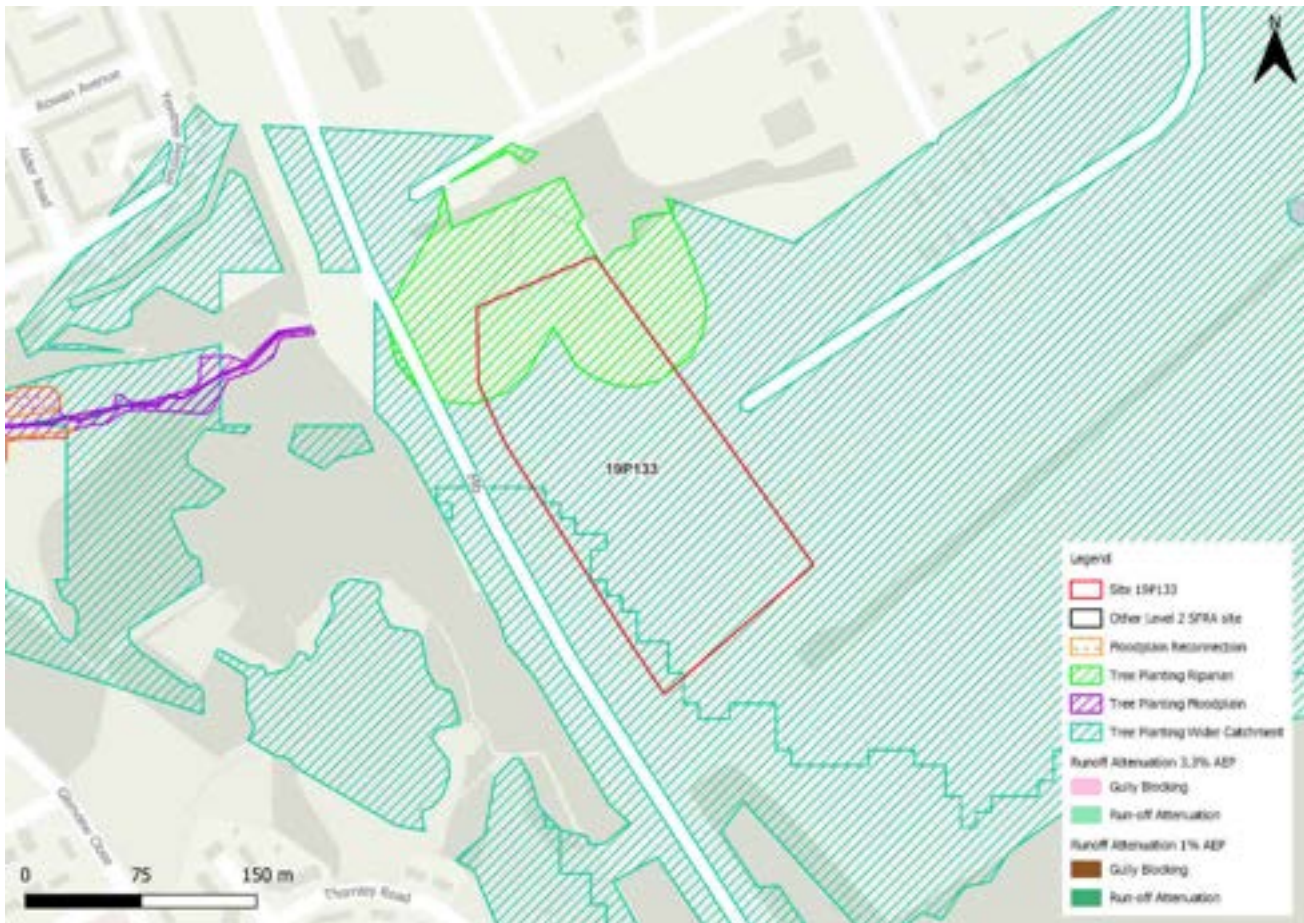


Figure 177-2: Natural Flood Management (NFM) potential mapping

177.3 Residual risk

177.3.1 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. 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 not modelled to be at risk from reservoir flooding.

177.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events within the vicinity of the site.

177.5 Flood warning and access and escape routes

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 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. The site is also not located within a FAA.

Based on available information, safe access and escape routes could likely be achieved during a flood event via the access road to the east of the site.

177.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in the risk classification from water compatible to less vulnerable, according to NPFF.
- 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 FRC-PPG).
- The site is located wholly within Flood Zone 1.
-

178 Flood risk from surface water

178.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water to the site is predominantly very low, with 95% of the site at very low surface water risk, with a further 3% at low risk and 2% at medium risk. This is shown in Table 178-1.

In the medium risk event, surface water risk is confined to a flow path within the north of the site and two areas of ponding in topographic low spots towards the south of the site. In the low risk event, these areas increase in both depth and extent.

Greatest surface water flood depths in the low risk event are between 0.3 and 0.6 m (Figure 3-1), with some areas of moderate hazard (Figure 3-2). Safe access and escape routes should be possible via the access road to the east of the site. This route may need to be raised above the existing area of surface water risk.

Table 178-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
95	3	2	0



Figure 178-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 178-2: Medium risk event surface water flood hazard¹⁰⁶ (Risk of Flooding from Surface Water map)

178.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 178-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the medium risk surface water flood depths plus 50% climate change. Risk is modelled to be greater in extent than the present day medium risk event but similar in extent to the present low risk surface water event. Greatest flood depths are modelled to

¹⁰⁶ 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

be between 0.6 and 0.9 m (Figure 3-3), with some areas of significant hazard (Figure 3-4). Safe access and escape routes should remain possible via the existing access road, however may need to be raised above the modelled area of risk.



Figure 178-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 178-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

178.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is predominantly very low, with 95% of the site being at very low surface water risk. Surface water risk in the medium risk event is confined to a flow path within the north of the site and topographic low spots within the south.
- The medium risk modelled climate change outputs indicate a greater risk to the site than the present day event, similar to the present day low risk event.
- Safe access and escape routes should be possible via the access road to the east of the site. However, this route may need to be raised above the existing area of surface water risk.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS across the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Were development plans to proceed, a full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- Note, 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 or evidence.
-

179 Risk from groundwater

Risk from groundwater sources 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 Guide¹⁰⁷. Figure 4-1 show the map for Site 19P133 and the surrounding areas and Table 179-1 explains the risk classifications.

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.



Figure 179-1: JBA 5m Groundwater Emergence Map

¹⁰⁷ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 179-1: Groundwater Flood 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.	

180 Overall site assessment

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

This site is not required to pass part b) of the exception test¹⁰⁸ 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.

180.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Were this site to be developed, appropriate access and escape routes must be considered further.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

108 Para 178 National Planning Policy Framework 2024

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P178

Final

February 2025

Prepared for:



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Contract

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JBA Project Code	2023s1344

This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Laura Thompson of JBA Consulting carried out this work.

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Unless otherwise stated in this Report, the assessments made assume that the sites and facilities will continue to be used for their current purpose without significant changes.

Acknowledgements

We would like to thank the Environment Agency for their assistance with this work

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182 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P178. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

182.1 Site 19P178

- Location: Riversway Phase B Site Specific Policy, Maritime Way, Preston, PR2 2HT
- Existing site use: Greenfield
- Existing site use vulnerability: Water compatible
- Proposed site use: Employment
- Proposed site use vulnerability: Less vulnerable
- Site area: 16.6 hectares
- Proposed development impermeable area: 14.1 hectares (assumed 85% impermeable area)
- EA model: Ribble Estuary 2014 / Ribble-Douglas 2010
- Watercourse: River Ribble. Drainage ditch through the centre of the site.
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of modelled fluvial flood depths and hazards
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk

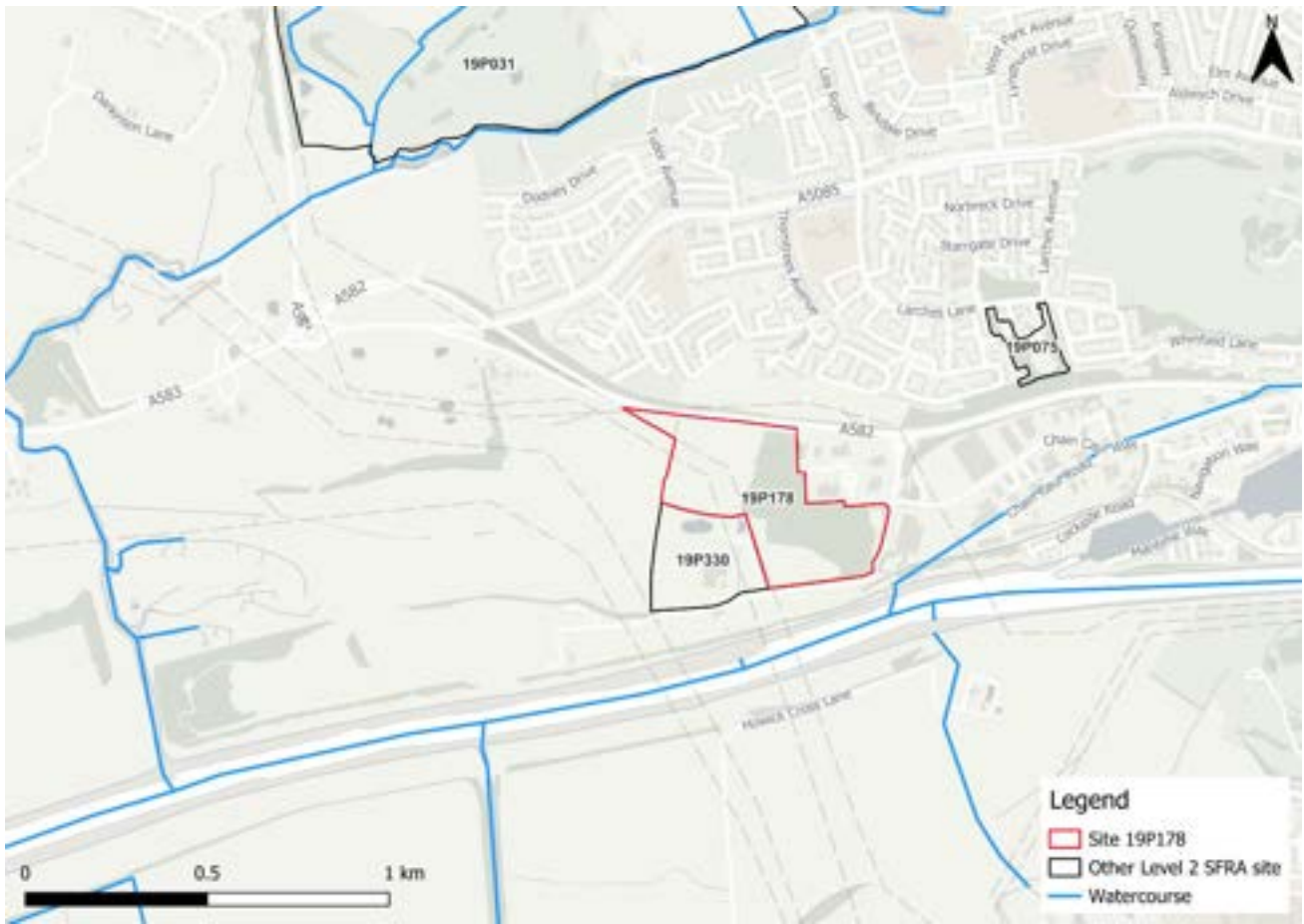


Figure 182-1: Existing site location boundary

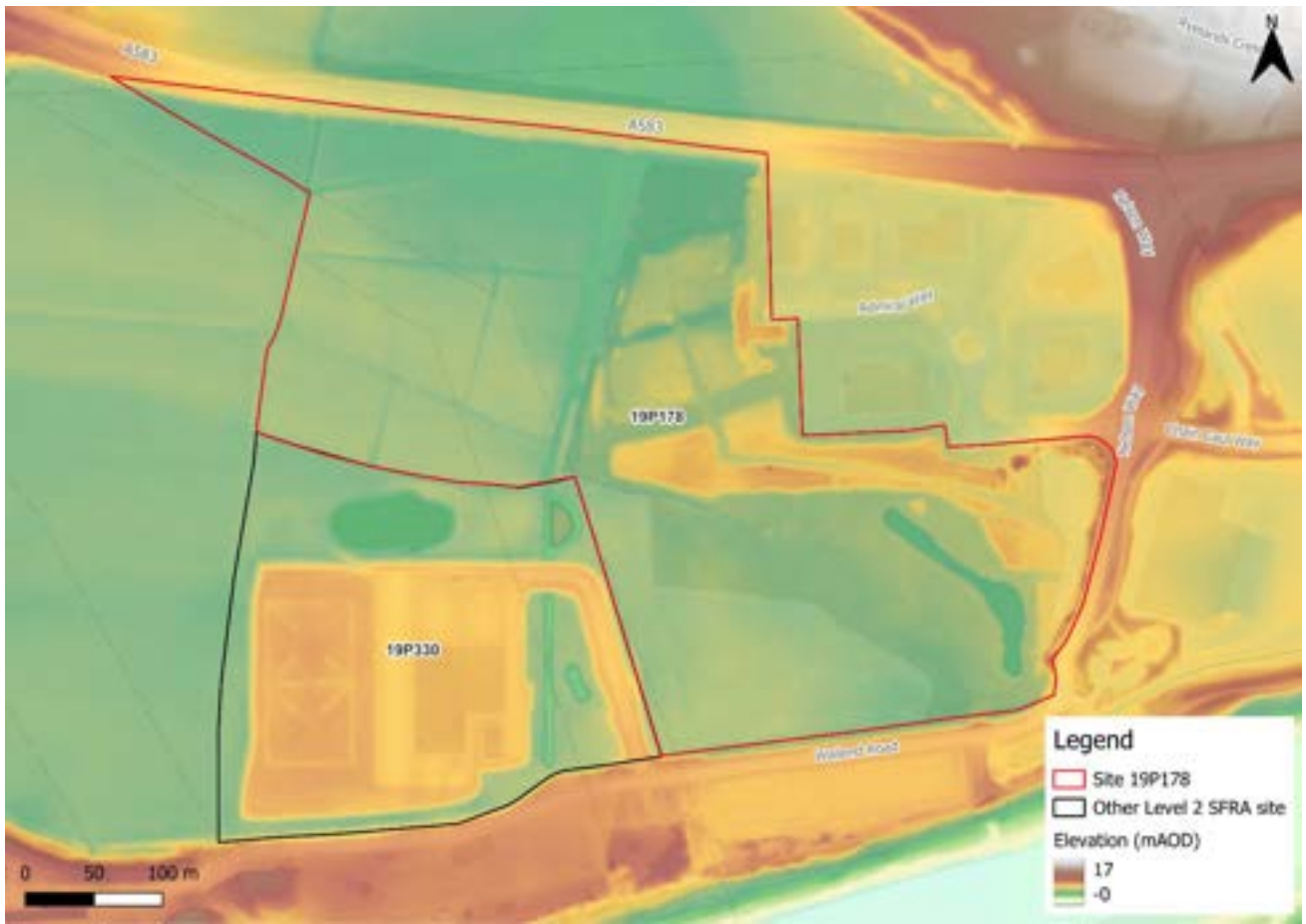


Figure 182-2: Topography

183 Flood risk from rivers and the sea

183.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each tidal flood zone are stated in Table 183-1 and can be viewed on Figure 183-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 183.3) or the impacts of climate change (Section 183.2).

Almost the entire site is located within Flood Zone 2 indicating it is at medium risk of flooding from rivers and the sea.

Table 183-1: Existing tidal flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
1	99	0	0



Figure 183-1: Existing risk from rivers and the sea to the site

183.1.1 Ribble-Douglas 2010 undefended model outputs

The Ribble-Douglas model outputs are different to the Flood Map for Planning and will therefore mean recommendations on development will also be different when accounting for the Flood Map for Planning or the outputs from the Ribble-Douglas model. The Environment Agency have confirmed that the defended scenario informs the flood zones in this area as flooding is modelled to be greater in extent than the undefended.

There is no modelled present day undefended risk to the site from the Ribble-Douglas 2010 combined fluvial and tidal model (Figure 183-2).

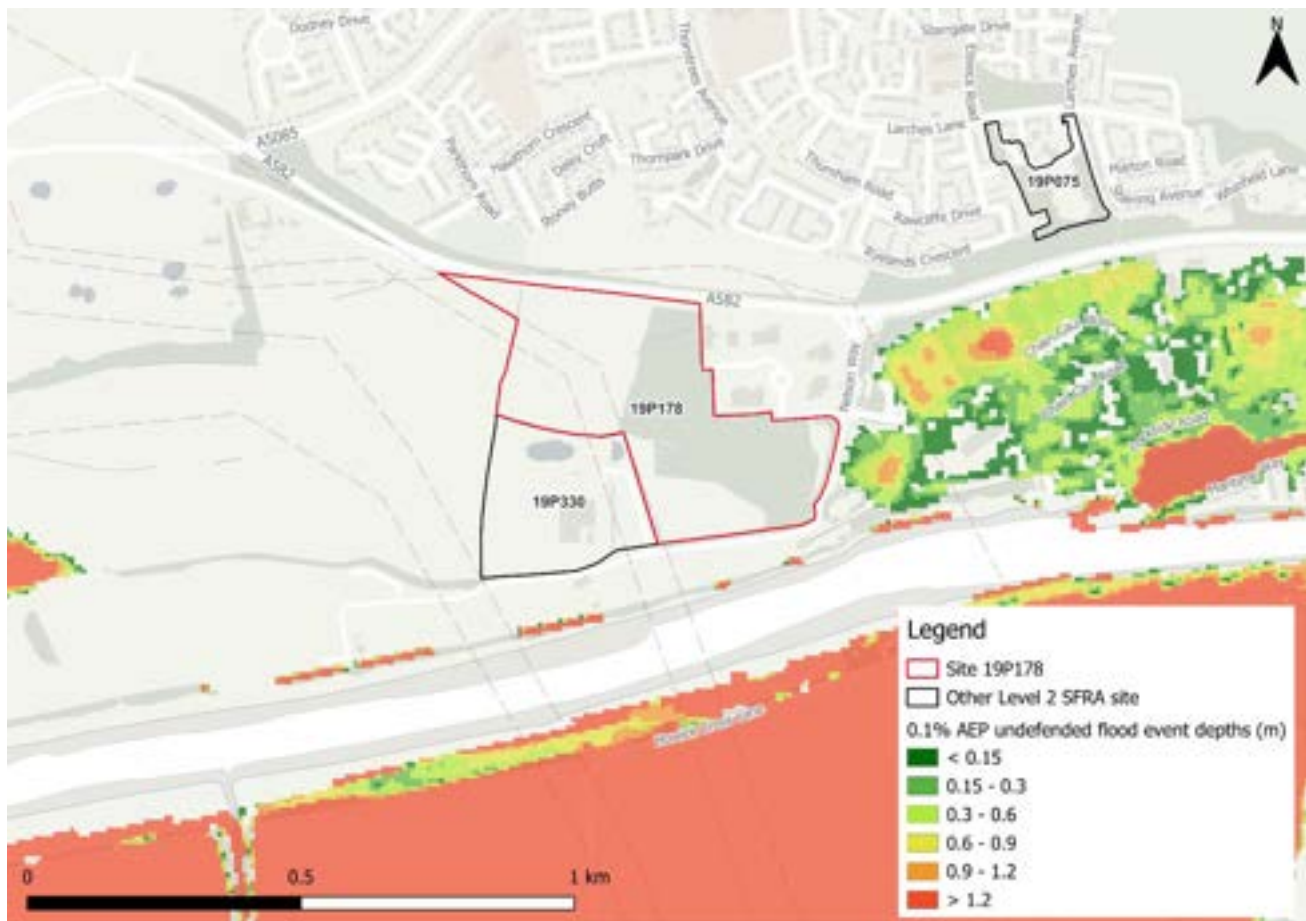


Figure 183-2: Flood depths (m) for 0.1% AEP undefended flood event (Ribble-Douglas 2010)

183.1.2 Ribble Estuary 2014 undefended model outputs

The Ribble Estuary model outputs are different to the Flood Map for Planning and will therefore mean recommendations on development will also be different when accounting for the Flood Map for Planning or the outputs from the Ribble Estuary model.

Figure 183-3 shows the modelled flood depths for the 0.1% AEP undefended event. There is modelled risk to through the centre of the site, along the existing drainage ditch. There is no modelled risk to the rest of the site in this event based on the Ribble Estuary 2014 undefended model.

Figure 183-4 shows the modelled flood hazard ratings for the 0.1% AEP undefended event. Flood hazard within the site is largely categorised as 'very low hazard', with a small area of 'Danger for some' located within the drainage ditch in the centre of the site.

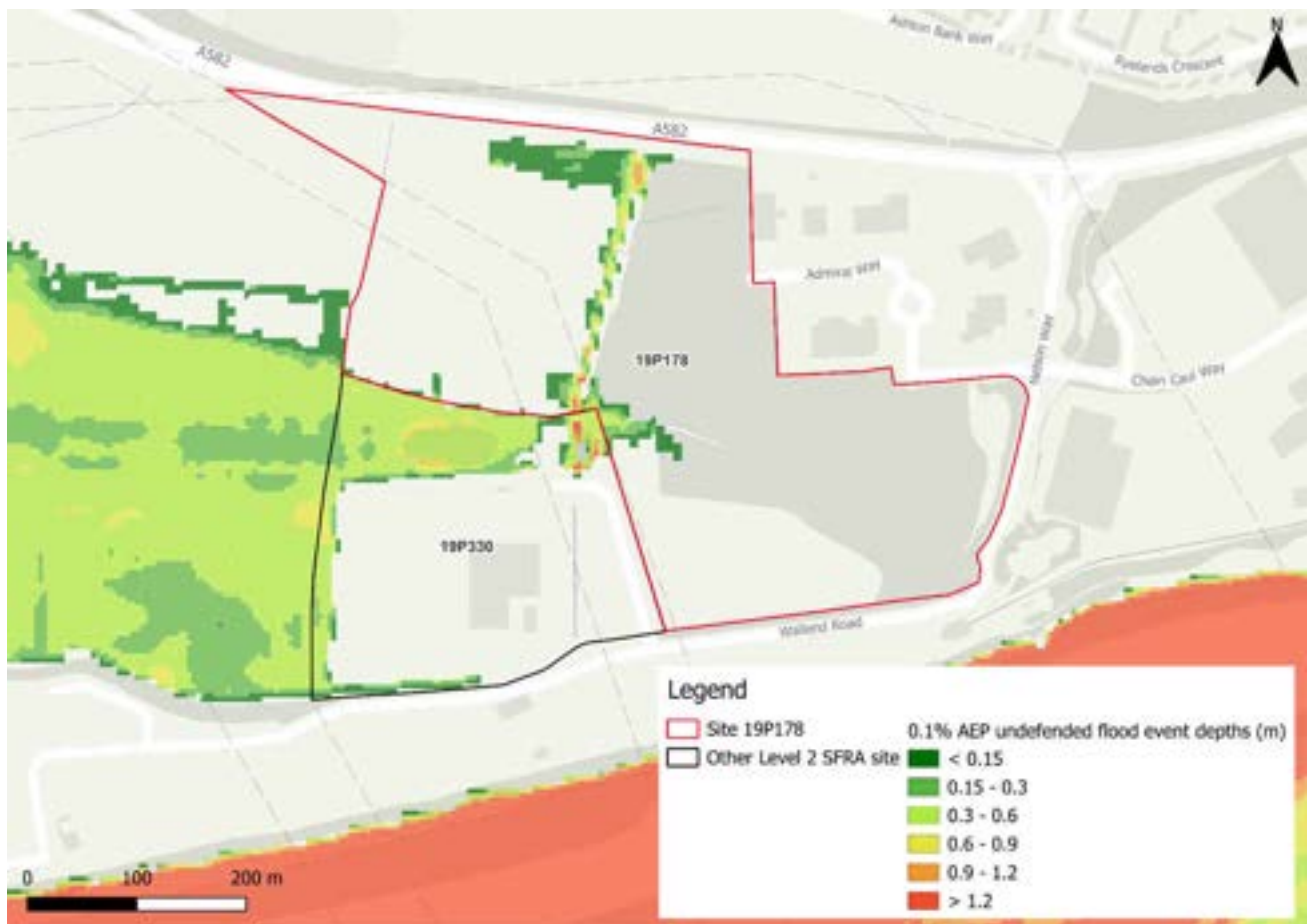


Figure 183-3: Flood depths (m) for 0.1% AEP undefended flood event (Ribble Estuary 2014)

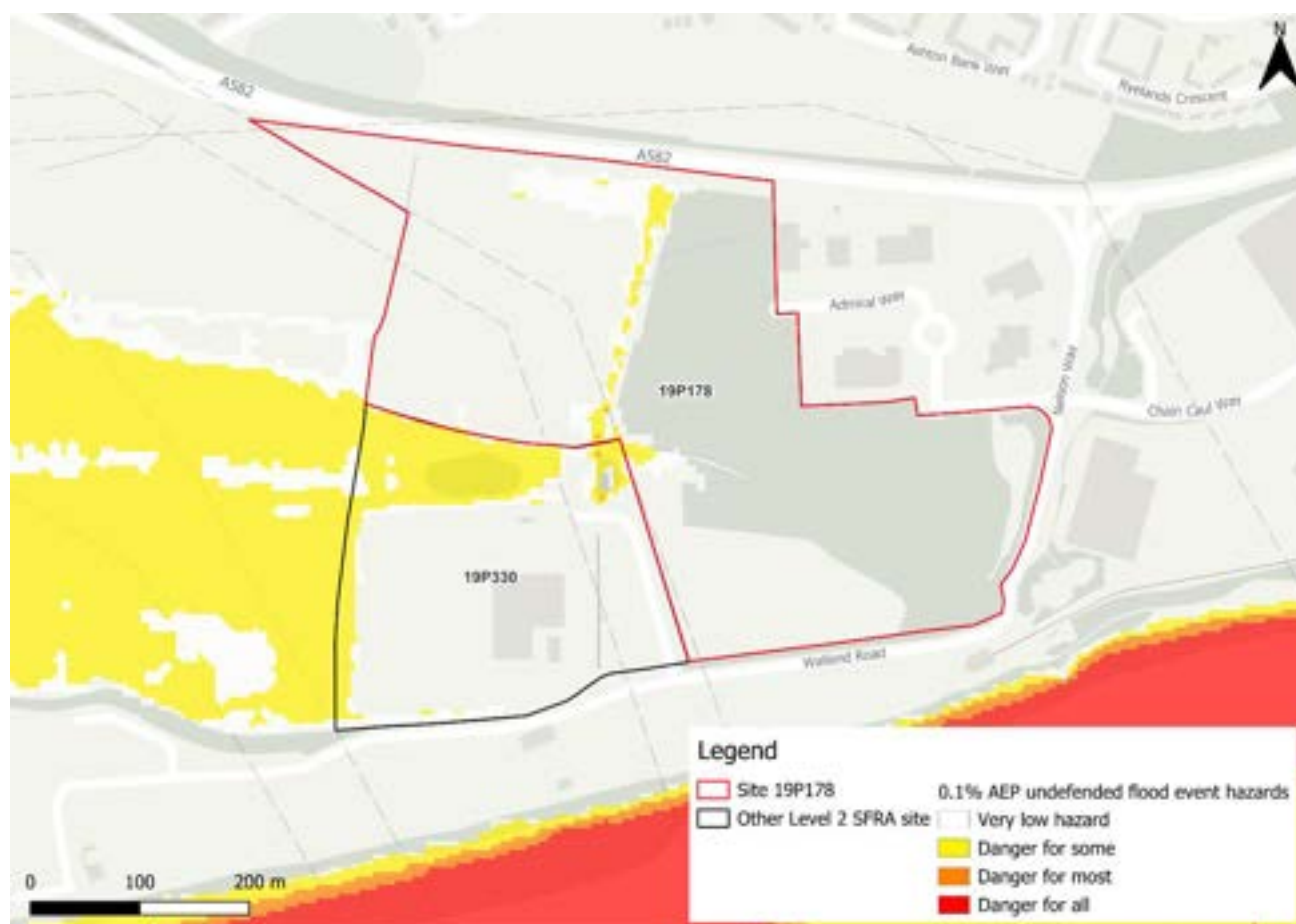


Figure 183-4: Flood hazard for 0.1% AEP undefended flood event (Ribble Estuary 2014)

183.2 Impacts from climate change

The impacts of climate change on flood risk from the Ribble-Douglas 2010 and Ribble Estuary 2014 models have been modelled without flood defence infrastructure in place. This allows for direct comparison with the existing risk of the Flood Map for Planning. However, as discussed, both the Ribble-Douglas 2010 and Ribble Estuary 2014 undefended model outputs do not reflect the Flood Map for Planning.

With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 147-2 and Table 183-3.

Table 183-2: Modelled climate change allowances for peak river flows for the Ribble Management Catchment (Ribble-Douglas 2010 model)

Return period	Central allowance 2080s	Higher central allowance 2080s
3.3% (functional floodplain)	36%	46%
1%	36%	46%

Table 183-3: Modelled climate change allowances for sea level rise for the North West river basin district (Ribble Estuary 2014 model)

Allowance category	2000-2035 (mm)	2036-2065 (mm)	2066-2095 (mm)	2096-2125 (mm)	Cumulative rise 2000-2125 (m)
Upper end	5.7 (200)	9.9 (297)	14.2 (426)	16.3 (489)	1.41
Higher central	4.5 (158)	7.3 (219)	10 (300)	11.2 (336)	1.01

183.2.1 Ribble-Douglas 2010 climate change model outputs

Although there is no modelled impact to the site in the present day 1% AEP event in the fluvial and tidal combined Ribble-Douglas 2010 model, there is a significant impact to the site when accounting for climate change. Figure 183-5 shows the onsite modelled flood depths for the 1% AEP undefended event plus higher central sea level rise allowance. Risk is modelled to be much greater than for present day conditions within this model, with a flow path extending through the centre of the site. Maximum flood depths are modelled to be significant at > 1.2 m.



Figure 183-5: Flood depths (m) for 1% AEP undefended flood event plus higher central climate change allowance (Ribble-Douglas 2010)

Figure 183-6 shows the modelled flood hazard ratings for the 1% AEP undefended event plus higher central sea level rise allowance. Flood hazard within the site is largely categorised as 'Danger for some', with a small area of 'Danger for most' located within the drainage ditch in the centre of the site.

There is no modelled risk to the site in the 1% AEP undefended event plus central sea level rise allowance.

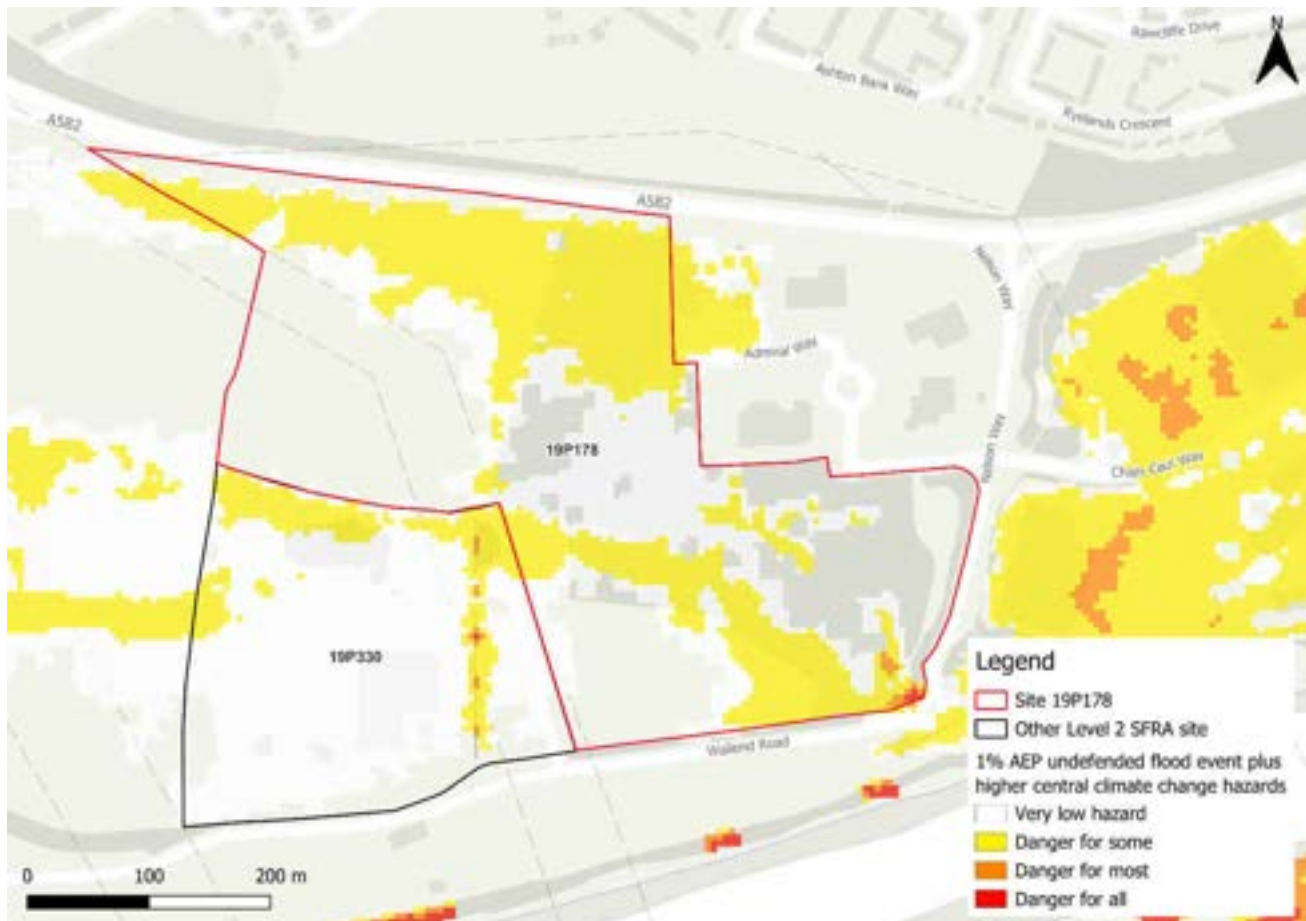


Figure 183-6: Flood hazard¹⁰⁹ for 1% AEP undefended flood event plus higher central climate change allowance (Ribble-Douglas 2010)

183.2.2 Ribble Estuary 2014 climate change model outputs

Figure 183-7 shows the onsite modelled flood depths for the 0.1% AEP undefended event plus higher central sea level rise allowance. Risk is modelled to be much greater than for present day conditions within this model, with almost the entire site modelled to be at risk, similar to Flood Zone 2. Maximum flood depths are modelled to be significant at > 1.2 m. The functional floodplain is not modelled to increase in extent and remains in channel. There is no modelled risk to the site

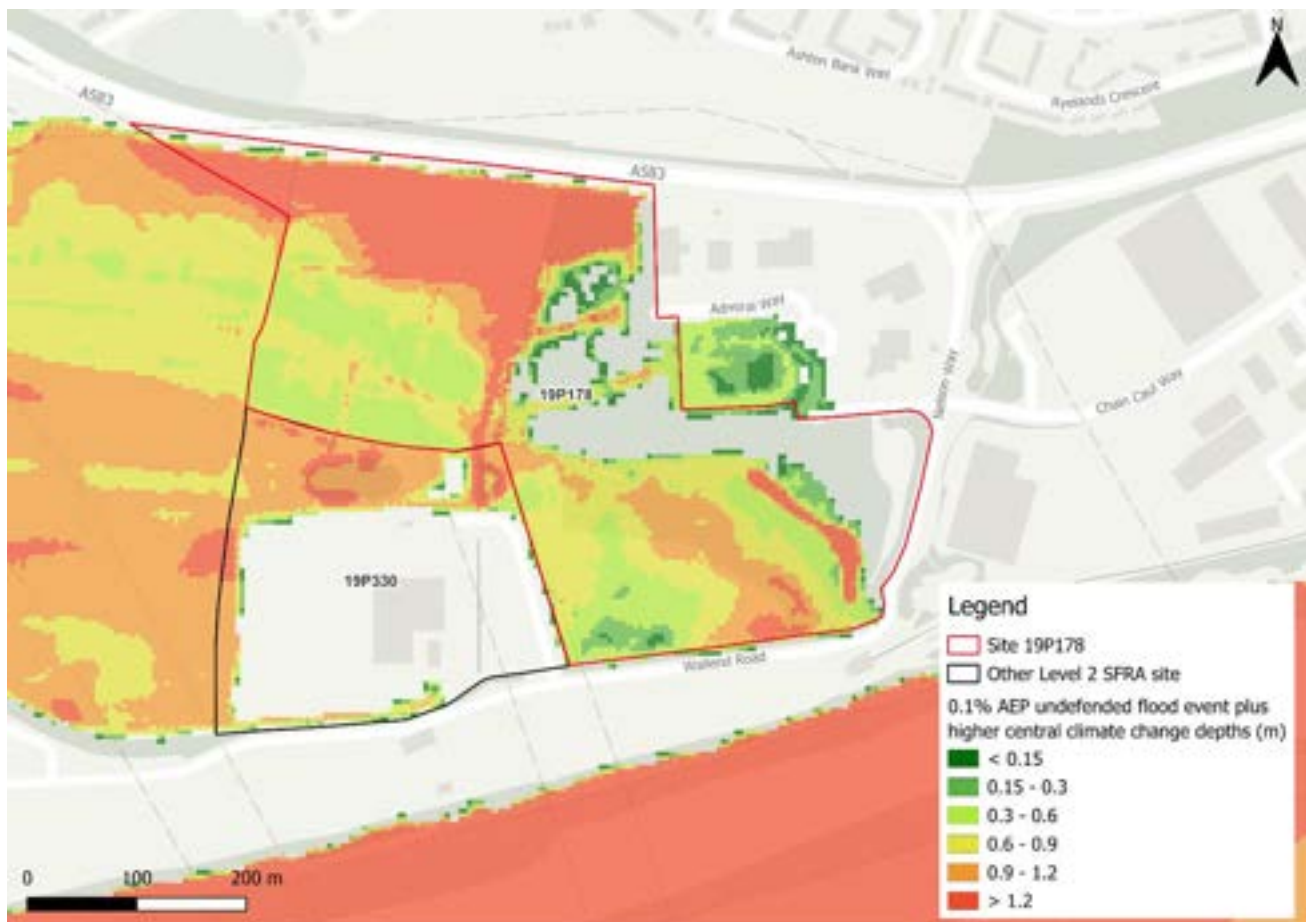


Figure 183-7: Flood depths (m) for 0.1% AEP undefended flood event plus higher central climate change allowance (Ribble Estuary 2014)

Figure 183-8 shows the modelled flood hazard ratings for the 0.1% AEP undefended event plus higher central sea level rise allowance. Flood hazard within the site is largely categorised as 'Danger for some', with a small area of 'Danger for most' located within the drainage ditch in the centre of the site.



Figure 183-8: Flood hazard¹⁰⁹ for 0.1% AEP undefended flood event plus higher central climate change allowance (Ribble Estuary 2014)

183.3 Flood risk management

Flood defences are in place along the right (northern) bank of the tidally influenced River Ribble, as shown on Figure 183-9. Information provided in the EA's 'Spatial Flood Defences' dataset states that this defence is a raised embankment with a design Standard of Protection (SoP) of 100 years. Actual SoP is unknown. Current condition is also unknown. The dataset states that a private individual, company or charity owns and maintains this defence.

There is also an embankment located to the west of the site which is modelled to provide some level of protection to the site. Design SoP, actual SoP and current condition are all unknown. The dataset states that the local authority owns and maintains this defence. The embankment is situated approximately 2.5 m above the floodplain, as measured from the LIDAR. The measured level from the LIDAR aligns with the embankment crest level within

¹⁰⁹ 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. Environment Agency.

the EA's Spatial Flood Defences dataset. The Environment Agency have confirmed that inspections of this asset is completed every 24 months.

There is residual risk of defence failure or overtopping. Section 183.4.1 discusses the breach modelling carried out for this SFRA and the impacts to the site and surrounding areas.



Figure 183-9: EA Spatial Flood Defences dataset

183.3.1 Ribble-Douglas 2010 defended model outputs

Figure 183-10 shows the effect of the River Ribble flood defences on flood risk from the 0.1% AEP event. There is a significantly greater risk to the site in the defended event in comparison to the undefended event. This is because the in-channel water levels are consistently higher in the defended scenario throughout Preston, and removing the defences allows for water to flood the area to the south of the River Ribble, rather than the north. The model outputs indicate that flooding overtops the area of natural high ground (NGR 350526, 429357 - green point on Figure 183-10) and subsequently impacts the site. The defended event is also modelled to overtop the marshland defence to the west of the site. From observing the depths either side of this defence it appears this is overtopping from east (upstream) to west (downstream), rather than a failure of this defence to protect the site from flooding from the west. Access and escape routes are likely to be challenging to achieve in this event.

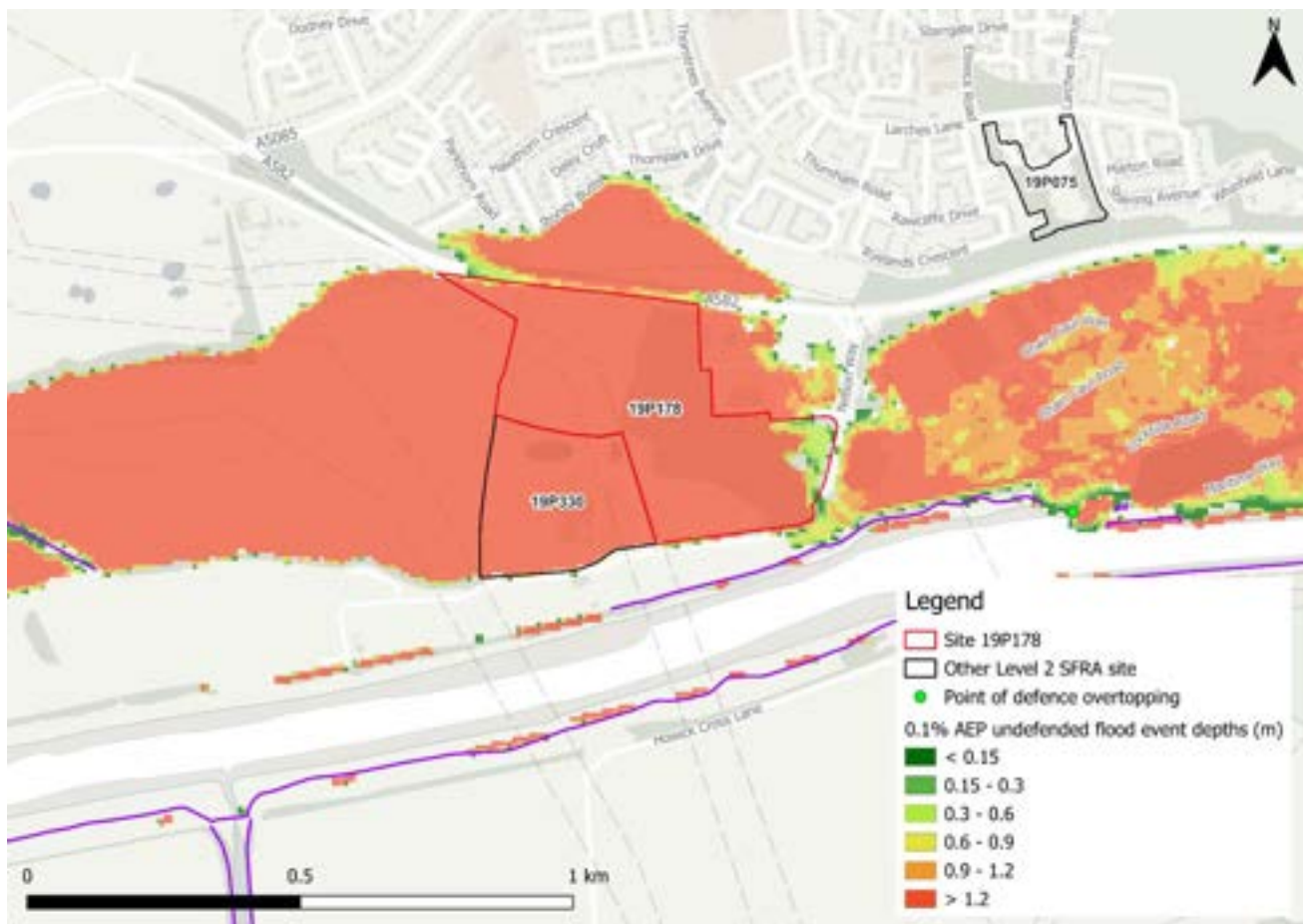


Figure 183-10: Modelled 0.1% AEP defended flood event depths (m) (Ribble-Douglas 2010)

183.3.2 Ribble Estuary 2014 defended model outputs

Figure 183-11 shows the effect of the Ribble Estuary flood defences on flood risk from the 0.1% AEP event. The raised embankments along the River Ribble do not protect the site given their standard of protection of 100 years. The embankment to the west of the site protects the site in the defended event, holding floodwaters in the marshland area. Maximum depths behind the embankment are modelled to be approximately 1.5 m. The modelled impacts of climate change for the 0.1% AEP defended event are also constrained by this embankment. Access and escape routes are not affected in this event.

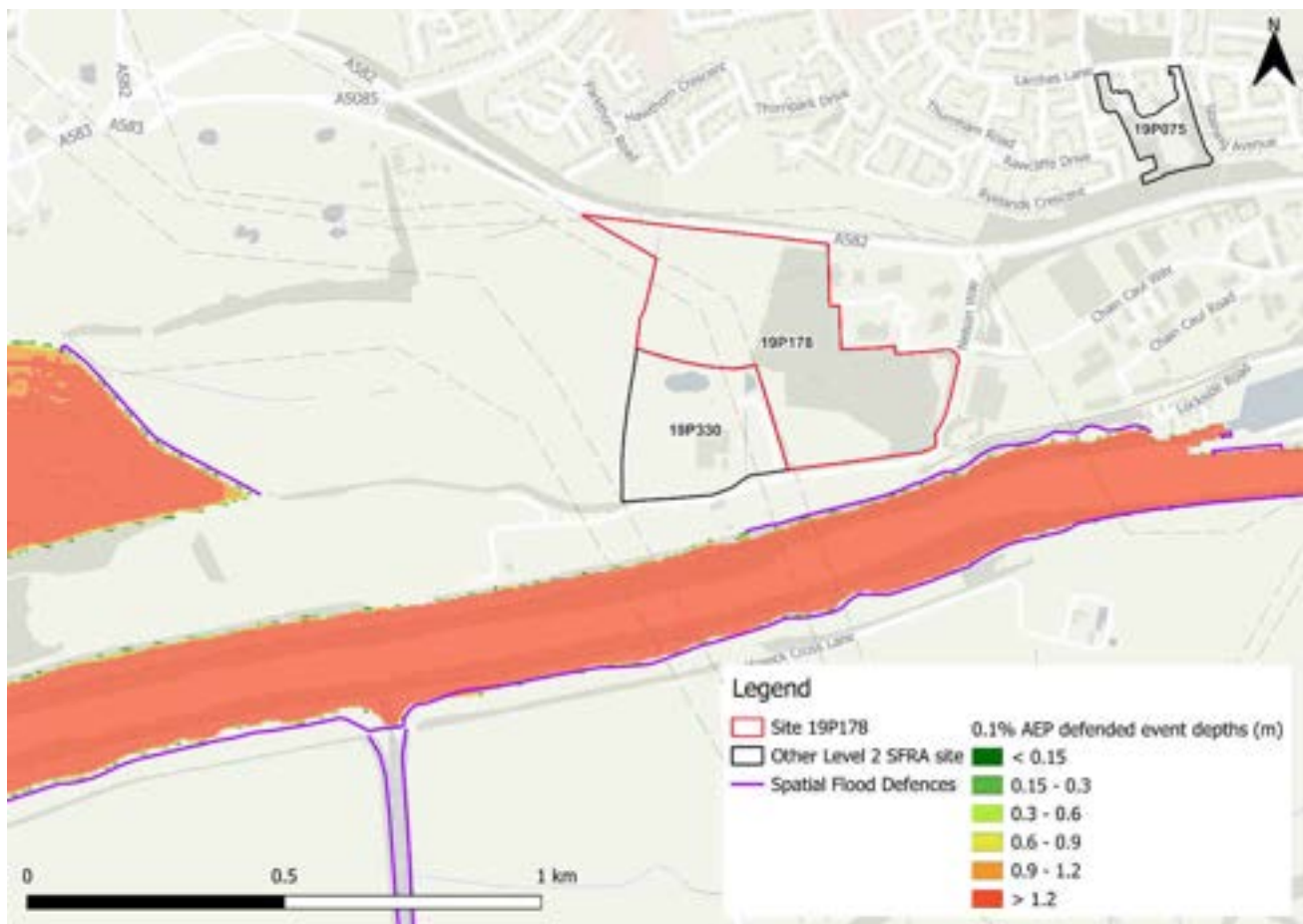


Figure 183-11: Modelled 0.1% AEP defended flood event depths (m) (Ribble Estuary 2014)

183.3.3 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P178 is located within one catchment, namely; Coastal Catchment 176. This is ranked as a medium sensitivity catchment. Planning considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance¹¹⁰.
- Developments should be incentivised to provide wider betterment by demonstrating in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments should achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

¹¹⁰ [Lancashire SuDS Guidance](#)

183.3.4 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. Both within and upstream of the site, there is potential for tree planting to slow floodwaters, reduce flood peak height and reduce sediment delivery to the watercourse. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown on Figure 183-12. Further investigation into using this site for tree planting should be undertaken. This could provide multiple benefits as well as flood risk mitigation, including biodiversity net gains, social and amenity value.

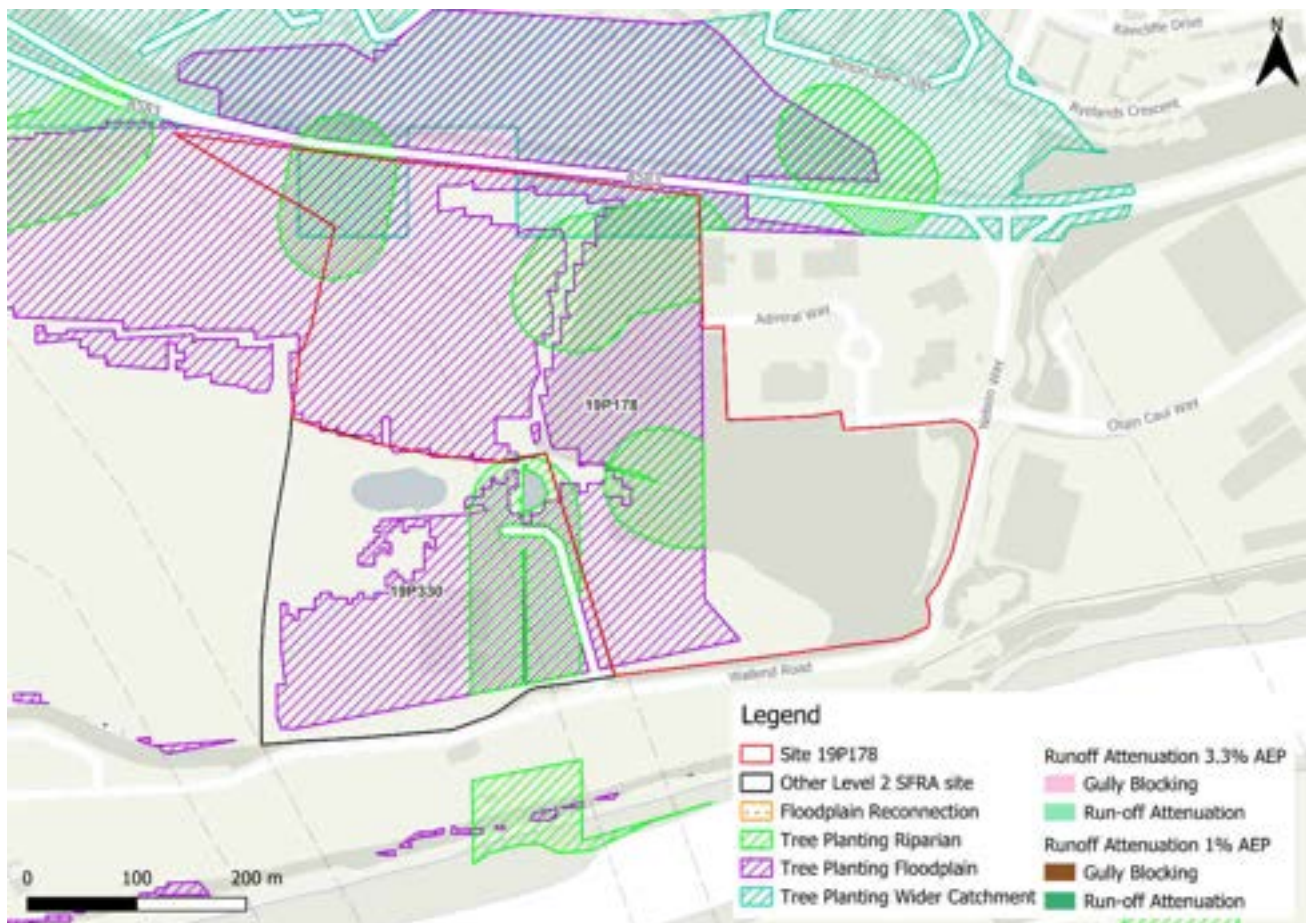


Figure 183-12: Natural Flood Management (NFM) potential mapping

183.4 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 bridge openings.

Residual risk at this site comes from possible breaching / overtopping of the flood defences to the west of the site (Figure 183-9). Section 183.4.1 presents the breach modelling outputs. There may also be additional residual risks of defence breaching to this site that have not been explored in this Level 2 SFRA.

183.4.1 Marsh defence breach

Figure 183-13 shows the modelled flood depths in the event of a breach of the marsh embankment adjacent to Savick Brook at NGR 348423, 429502 (green point on Figure 183-13), based on the Ribble Estuary 2014 model. The modelled event represents the 0.5% AEP event plus higher central sea level rise allowance. The modelled breach outputs show a significantly greater risk to the site than the 0.5% AEP defended event plus higher central sea level rise allowance. Maximum depths within the site are significant at > 1.2 m with some areas of hazard categorised as 'Danger for most' (Figure 183-14).

Based on the Ribble Estuary 2014 breach modelling outputs, this site is at significant residual risk of flooding.

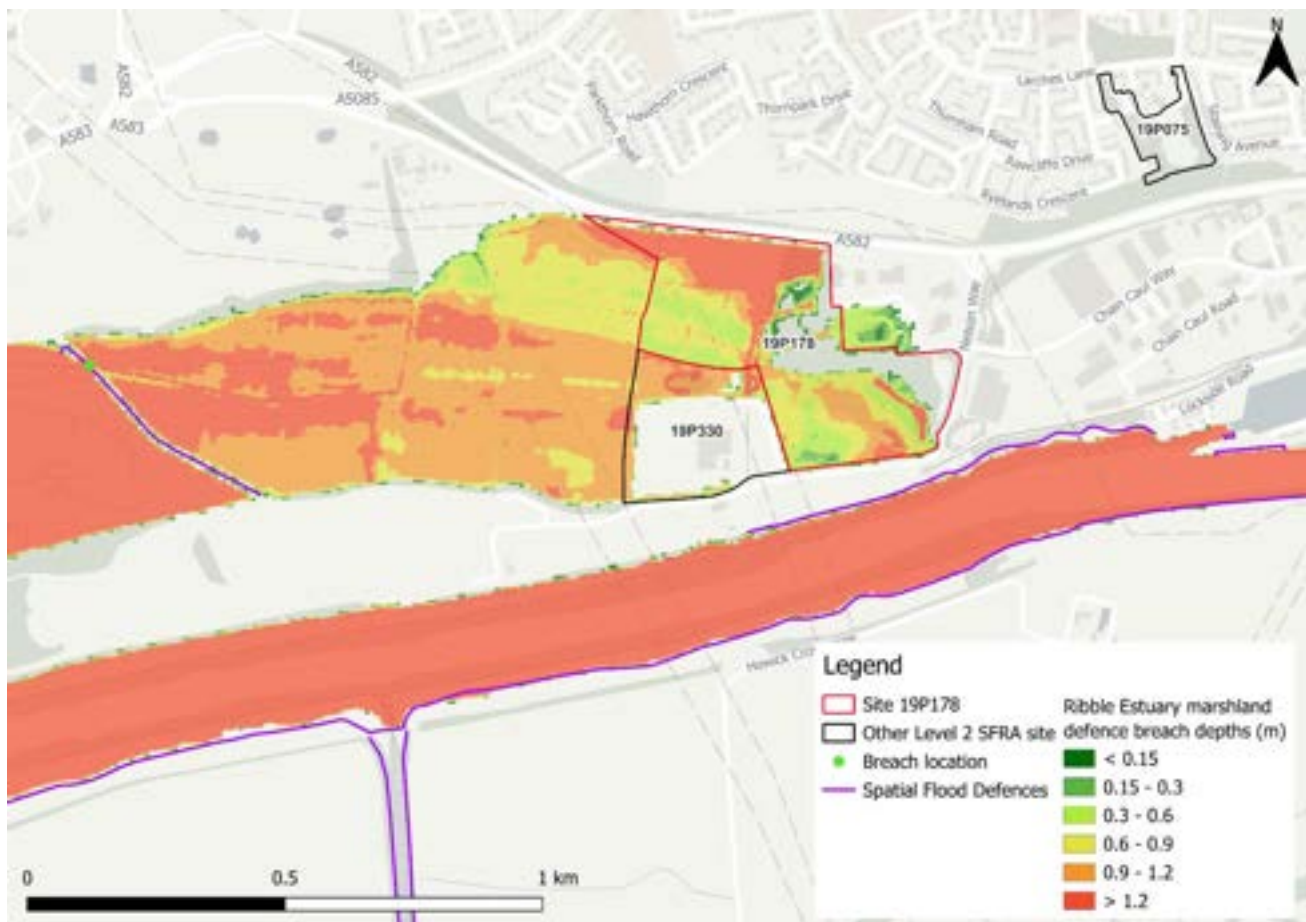


Figure 183-13: Flood depths (m) based on a breach of the marshland defence during a 0.5% AEP defended flood event plus higher central sea level rise allowance

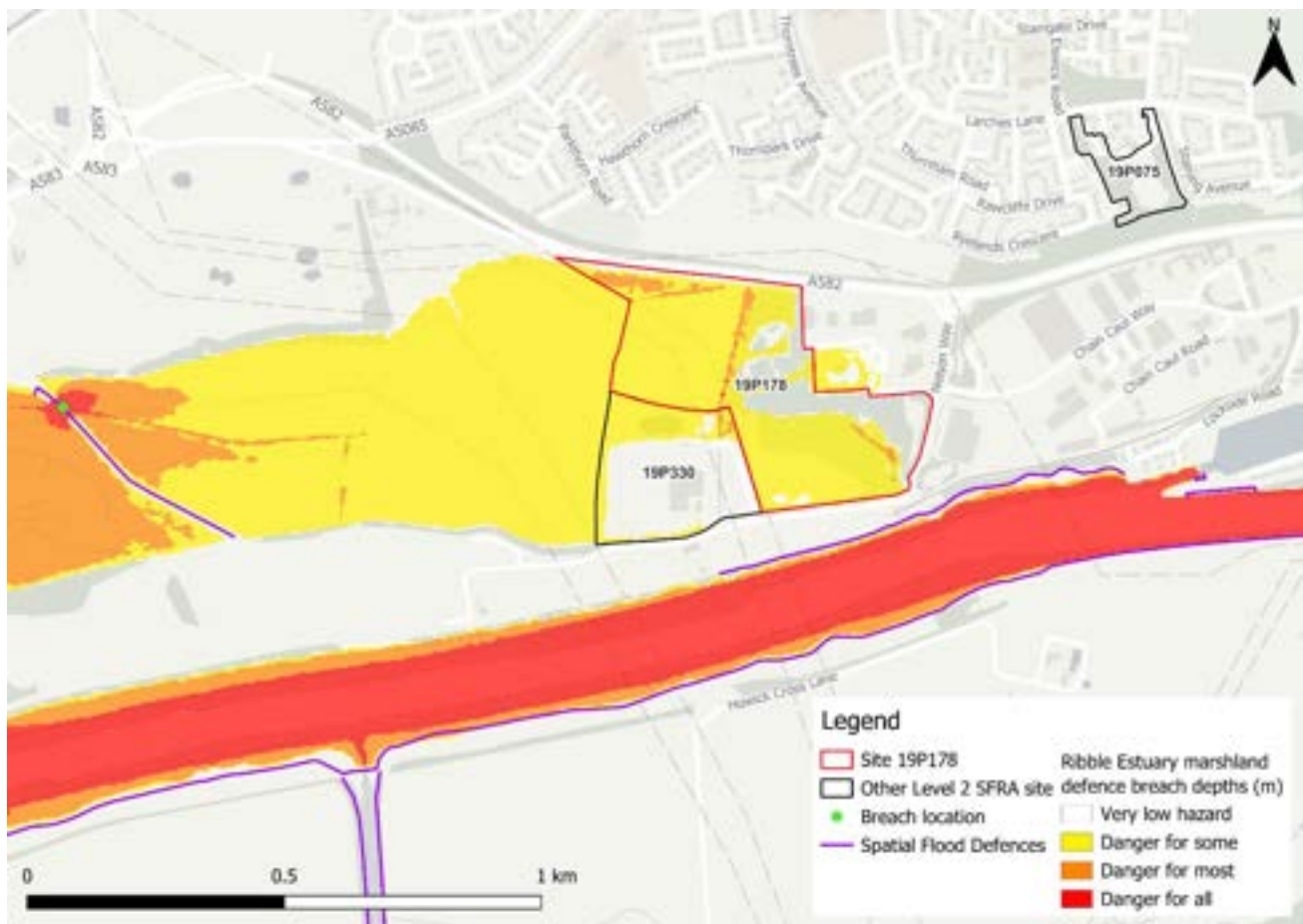


Figure 183-14: Marshland defence breach hazards

183.4.2 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 183-15 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 eight reservoirs, five of which are located within the Lancashire County Council administrative area, however outside of the Central Lancashire authority area, and three located within Blackburn with Darwen. All reservoirs with the potential to impact the site are operated by United Utilities.

The EA's SFRA guidance states that where a proposed development site is at flood risk from a reservoir, 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 United Utilities to ascertain whether the proposed development could affect the reservoirs 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.

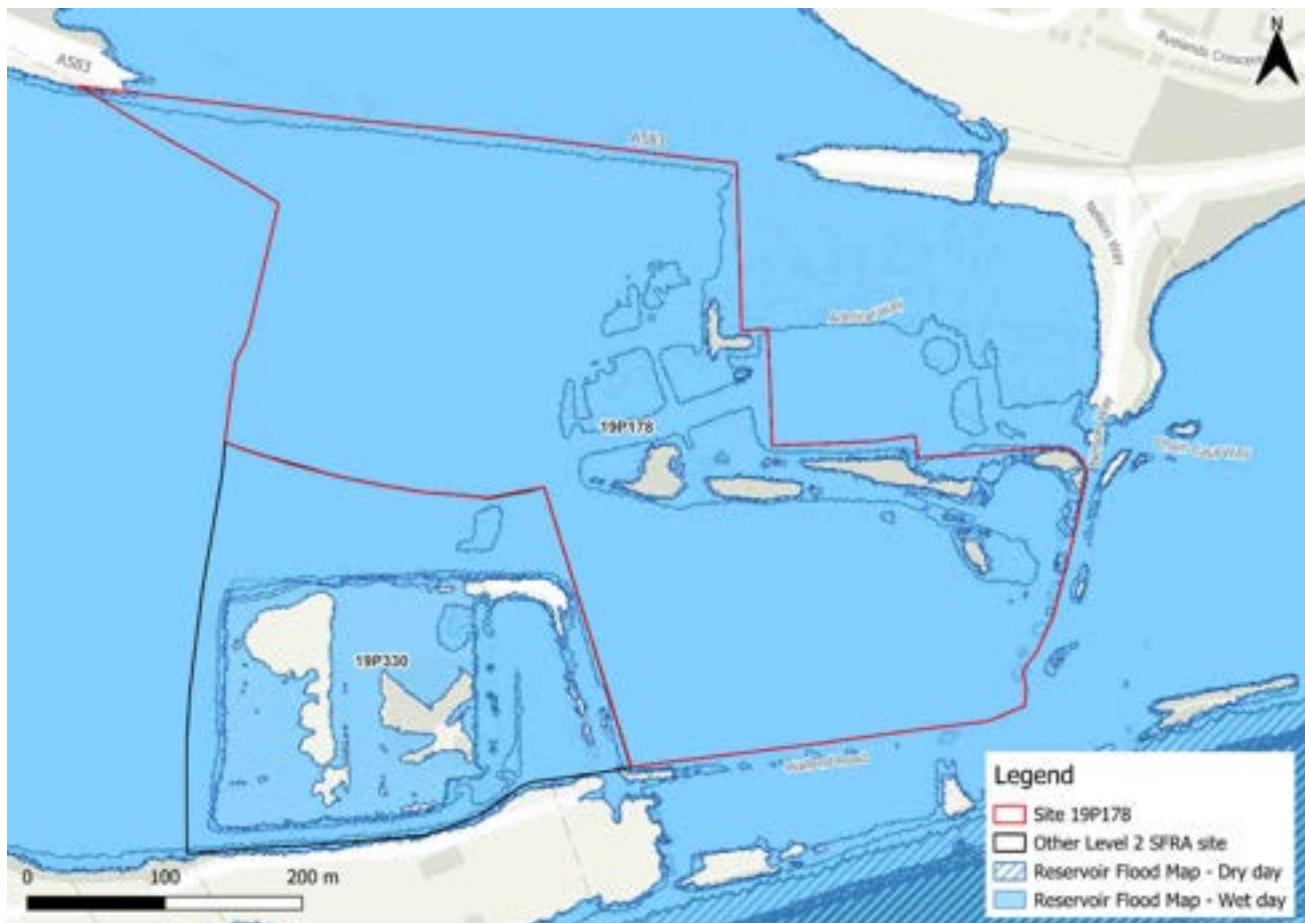


Figure 183-15: Flood risk from reservoirs

183.5 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

183.6 Flood warning and access and escape routes

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 site is partially located within one FWA, namely; 012FWBL34A - Ribble estuary at Riversway Docklands.

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 site is also almost entirely located within two FAA's, namely 012WATRE - Ribble estuary west of Preston and 012WAFLR - Lower River Ribble and Darwen.

Based on the Flood Map for Planning and modelled flood outputs, safe access and escape routes could likely be achieved during a flood event via Nelson Way to the east of the site.



Figure 183-16: EA Flood Warning Areas

183.7 Observations, mitigation options and site suitability - rivers and sea

- The site is modelled to be at risk from tidal sources (according to the Ribble Estuary 2014 model) in the 0.1% AEP event undefended scenario though to a lesser degree than shown by Flood Zone 2.
- There is no present day modelled undefended risk to the site from fluvial sources (according to the Ribble-Douglas 2010 model). Flood Zone 2 at the site is based on the defended 0.1% AEP event as flood risk in this area is modelled to be greater in the defended event.
- Modelled risk from climate change increases the undefended risk to the site in both the Ribble-Douglas 2010 and Ribble Estuary 2014 models.
- When accounting for defences, the present day Ribble Estuary 2014 0.1% AEP event outputs are constrained by the embankment to the west of the site, leaving the site at low risk in the future. However, it is not appropriate to consider the site flood free as residual flood risk remains from possible defence breaches.
- Areas behind flood defences are at particular risk from the rapid onset of fast flowing and deep flooding, with little or no warning if defences are breached.

Emergency plans must be in place for such areas and safe access and escape routes must be in place for the lifetime of the development. Resistance and resilience measures may also be put in place to manage residual flood risk when avoidance measures have been exhausted.

- The LPA should use the information on residual risk in this Level 2 SFRA to state in the local plan strategic policies a preferred mitigation strategy for ensuring development will be safe throughout its lifetime in relation to urban form, risk management and where flood mitigation measures are likely to have wider sustainable design implications (para 042, FRCC-PPG).
- When considering whether defended sites could be appropriate for development, the FRCC-PPG states that the likelihood of defences keeping pace with climate change should be considered, i.e. available funding streams and funding options such as Community Infrastructure Levy, planning obligations / S106 agreements, or Partnership Funding.
- The local authority maintains the flood defence to the west of the site. The local authority should therefore be in a position to advise on funding and maintenance arrangements for these defences into the future. Consultation with the EA will also be required on whether this site is suitable for development.
- Given the residual risk to this site, the following should be considered:
 - Use of flood resistance and resilience measures
 - Adequate flood warning and alerts should remain in place, in consultation with the EA,
 - Provision of emergency escape routes including for vehicular access for emergency services. Judgements on whether the site can be regarded as safe will need to consider the feasibility and provision of evacuation from the site during a flood,
 - Provision of detailed emergency plans and signage for users.
- Given the site is proposed for less vulnerable uses, it should be appropriate for the site to be developed if appropriate resilience measures are put in place. The area at risk could be converted to open space and used as a multifunctional greenspace for flood storage, amenity use and to provide environmental / ecological benefits. Safe access and escape routes must be available at times of flood.
- The site-specific FRA must show that development will be safe for its lifetime, taking into account the vulnerability of its users, including for appropriate evacuation procedures and flood response infrastructure are in place to manage the residual risk associated with the extreme flood event.
- Given the potential reservoir risk to the site, developers should consider¹¹¹:
 - Whether additional modelling is required to understand the flood risk from the reservoir, referring to the specification for the reservoir flood maps as a starting point

111 [Reservoir flood maps: when and how to use them | Environment Agency | 2021](#)

- Whether the development may have an impact on the reservoir or reservoir owner
- Referring to the Central Lancashire Level 1 SFRA for information on reservoir risk and recommendations for how to address it
- Contacting the LPA for pre-application advice
- Contacting the LPA to understand the need to consult with their emergency planning team and with the reservoir owner
- Were development of this site to proceed, given the proximity of this site to neighbouring site 19P330, 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.

184 Flood risk from surface water

184.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is within the high risk surface water flood zone. A further 2% is at medium surface water risk, and a further 13% is at low surface water risk, as shown in Table 184-1.

In the high and medium risk events, surface water risk is largely confined to the drainage ditch within the centre of the site, with some small areas of ponding within topographic low spots across the site. In the low risk event, there is a significant area of ponding behind the raised A582 within the north of the site.

Greatest flood depths in the medium risk event are > 1.2 m however these are located within the drainage ditch present within the site boundary (Figure 3-1). Greatest flood depths outside of the ditch are between 0.6 and 0.9 m, with areas of hazard categorised as significant (Figure 3-2). Safe access and escape routes should be possible via Nelson Way to the east of the site in all events.

Table 184-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
83	13	2	2



Figure 184-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 184-2: Medium risk event surface water flood hazard¹¹² (Risk of Flooding from Surface Water map)

184.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 184-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water depths for the medium risk event +50% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium risk climate change event being similar in extent to the present day low

¹¹² 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

risk event. Maximum depths are between 0.9 and 1.2 m with some areas of significant hazard (Figure 3-4). There are several flow paths through the site and a large area of significant ponding in the north, kept within the site by the A582 road which is clearly raised above the levels of the site. There appears to be a culvert beneath the road flowing from upstream of the A582 towards the south, draining the land to the north of the road into the site.

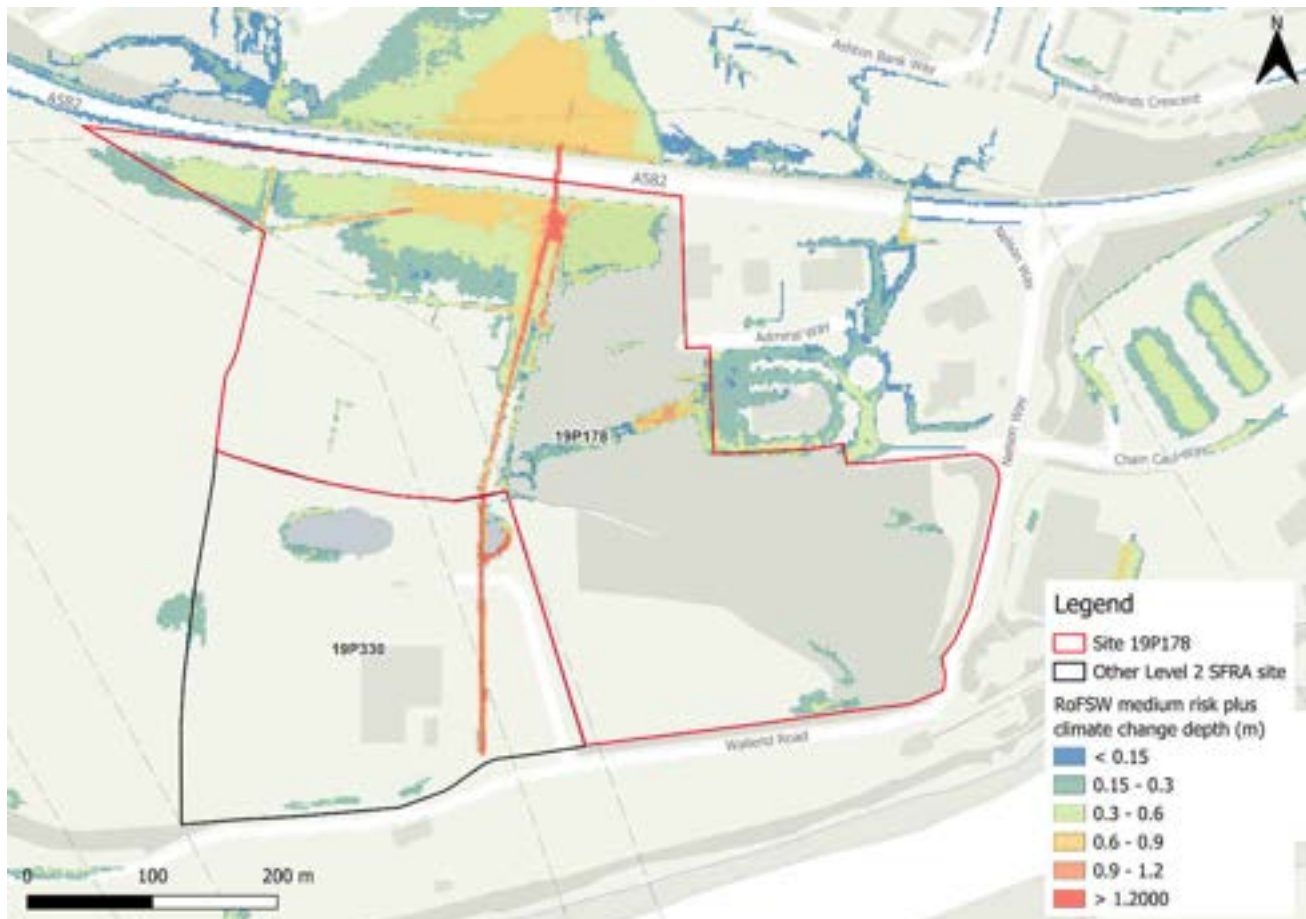


Figure 184-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 184-4: Medium risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

184.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is very low, with approximately 83% of the site being at very low risk. Surface water risk in the high and medium risk events is present within the drainage ditch in the centre of the site, with some areas of scattered surface water ponding.
- There is a large area of ponding behind the A583 embankment within the north of the site in the low risk event.
- The medium risk modelled climate change outputs indicate a similar extent risk to the present day low risk event. Safe access and escape routes should be achievable via Nelson Way to the east of the site in all events.
- The drainage ditch should be kept in place and remain unobstructed. The ditch should be maintained and included within the landscaping design of the development.
- There appears to be an existing culvert beneath the A582 which drains the upstream land into the site. The culvert should be kept in place and remain unobstructed to prevent surface water flood risk increasing upstream of the site.
- The use of appropriate SuDS should be investigated. The groundwater table is likely to be low across the site judging from the Groundwater Emergence Map in

Figure 4-1 therefore infiltration SuDS may be an option. This will require appropriate ground and infiltration survey, and surface water modelling based on layout plans and detailed design and full consultation with the LLFA.

- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Note, 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 or evidence.

185 Risk from groundwater

Risk from groundwater sources 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 Guide¹¹³. Figure 4-1 shows the map for Site 19P178 and the surrounding areas and Table 185-1 explains the risk classifications.

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



Figure 185-1: JBA 5m Groundwater Emergence Map

¹¹³ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 185-1: Groundwater Flood 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.	

186 Overall site assessment

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

This site is not required to pass part b) of the of the exception test¹¹⁴ 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.

186.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- There is residual risk to the site from a breach of the embankment to the west of the site. Depths and hazards in the area at risk are significant. Were this site to be developed, appropriate emergency and evacuation plans must be in place to deal with potential residual risk of infrastructure blockage and failure.
- Early discussions should take place between the local authority and the EA with regards to the defence infrastructure and subsequent options for site development.
- The defences are owned and maintained by the local authority. The local authority should therefore be in a position to advise on funding and maintenance arrangements for these defences into the future.
- The drainage ditch within the centre of the site should be kept in place and remain unobstructed. The ditch should be maintained and included within the landscaping design of the development. This should be reviewed as part of a detailed drainage strategy for the site.
- Based on the evidence within this SFRA, it should be appropriate to develop this site for less vulnerable uses if appropriate resilience measures are put in place. The area at risk could be converted to open space and used as a multifunctional greenspace for flood storage, amenity use and to provide environmental / ecological benefits. Safe access and escape routes must be available at times of flood.
- Any FRA must further consider residual risk and the inclusion of detailed emergency plans and the provision of safe access and escape routes in the extreme low risk event.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P279

Final

February 2025

Prepared for:



www.jbaconsulting.com

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Contract

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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Kaylyn Carroll of JBA Consulting carried out this work.

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188 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P279. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

188.1 Site 19P279

- Location: 25 & 27 Whittingham Lane and land to rear of 25-31 Whittingham Lane
- Existing site use: Greenfield
- Existing site use vulnerability: Water compatible
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 0.82 hectares
- Proposed development impermeable area: 0.69 hectares (assumed 85% impermeable area)
- Watercourse: N/A
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of surface water flood depths and hazards
 - Assessment of all other sources of flood risk
-



Figure 188-1: Existing site location boundary

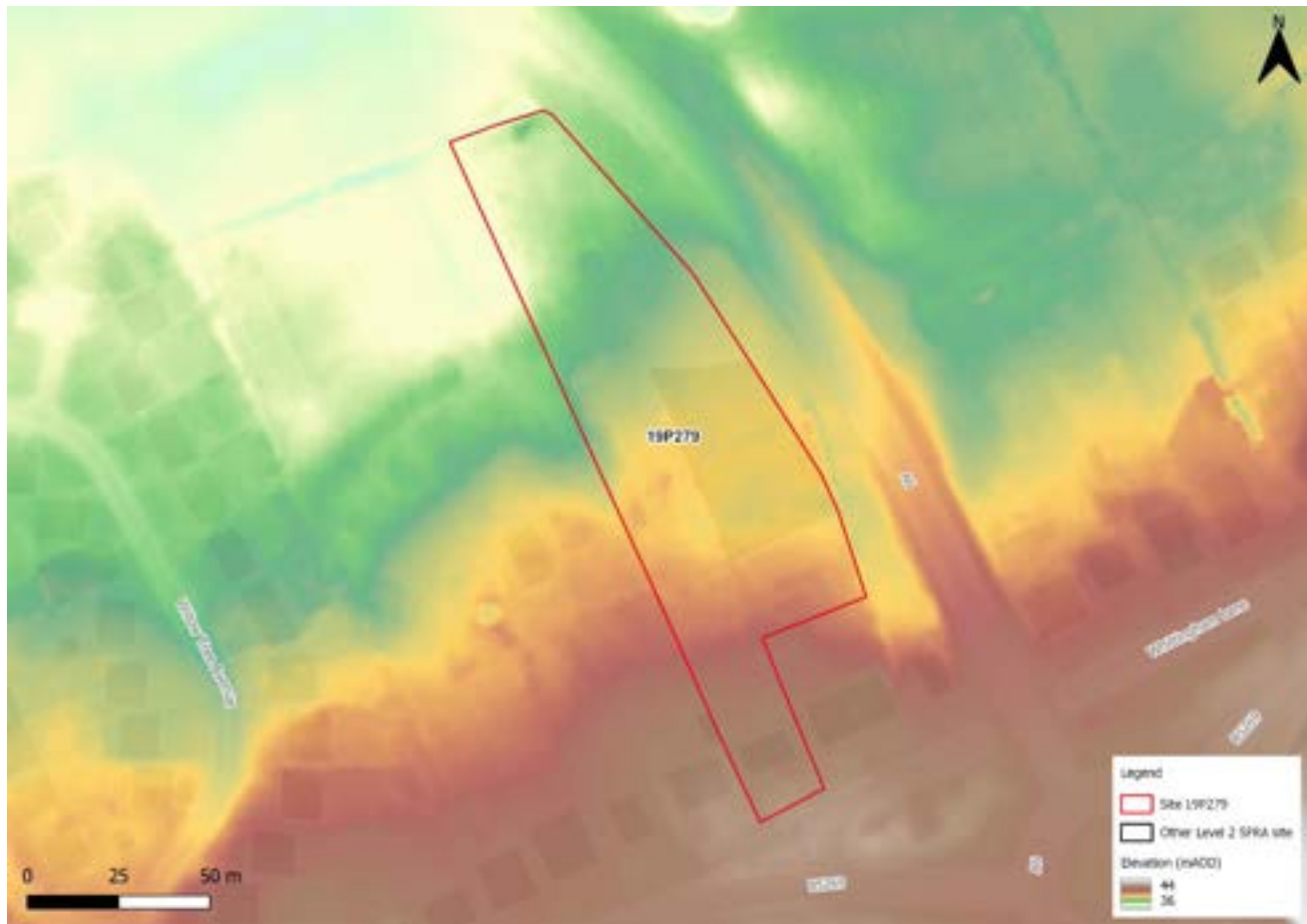


Figure 188-2: Topography

189 Flood risk from rivers

189.1 Existing risk

189.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change.

The site is located wholly within Flood Zone 1 indicating the site is at low risk of flooding from rivers.

Table 189-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0



Figure 189-1: Existing risk from rivers to the site

189.2 Flood risk management

The site does not benefit from any formal engineered flood defences, according to the EA's spatial flood defences dataset.

189.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P279 is located within one catchment, namely, Barton (Westfield) Brook. This is ranked as a low sensitivity catchment.

189.2.2 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. The majority of the site has potential for wider catchment tree planting, this is shown in Figure 189-2. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required.



Figure 189-2: Natural Flood Management (NFM) potential mapping

189.3 Residual risk

189.3.1 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. 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 not modelled to be at risk from reservoir breach.

189.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood events at this site.

189.5 Flood warning and access and escape routes

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 site is not located within a flood warning area.

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 site is also not located within a flood alert area.

Safe access and escape routes could likely be achieved during a flood event via BS269.

189.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site would see a change in the risk classification from water compatible to more vulnerable, according to NPFF.
- 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 FRC-PPG).
- The site is located wholly within Flood Zone 1 indicating that the site is at low risk of flooding from rivers.

190 Flood risk from surface water

190.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is very low, with almost 100% of the site being at very low surface water risk, as shown in Table 190-1.

In the low risk event, surface water risk is present in a small area of ponding on the eastern site boundary.

Greatest surface water flood depths in the low risk event are between 0.15 and 0.3 m (Figure 3-1) with areas of low hazard (Figure 3-2). Safe access and escape routes should be possible via the B5269 in all events.

Table 190-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
99	1	0	0



Figure 190-1: Low risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 190-2: Low risk event surface water flood hazard¹¹⁵ (Risk of Flooding from Surface Water map)

190.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 190-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water depths for the medium risk event plus 45% climate change. Risk is modelled to be significantly greater than present day conditions, with the medium risk plus climate change event being greater in both extent and depth than

¹¹⁵ 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 present day medium risk event. Maximum flood depths are modelled to be between 0.15 and 0.3 m with some areas of moderate hazard (Figure 3-4).

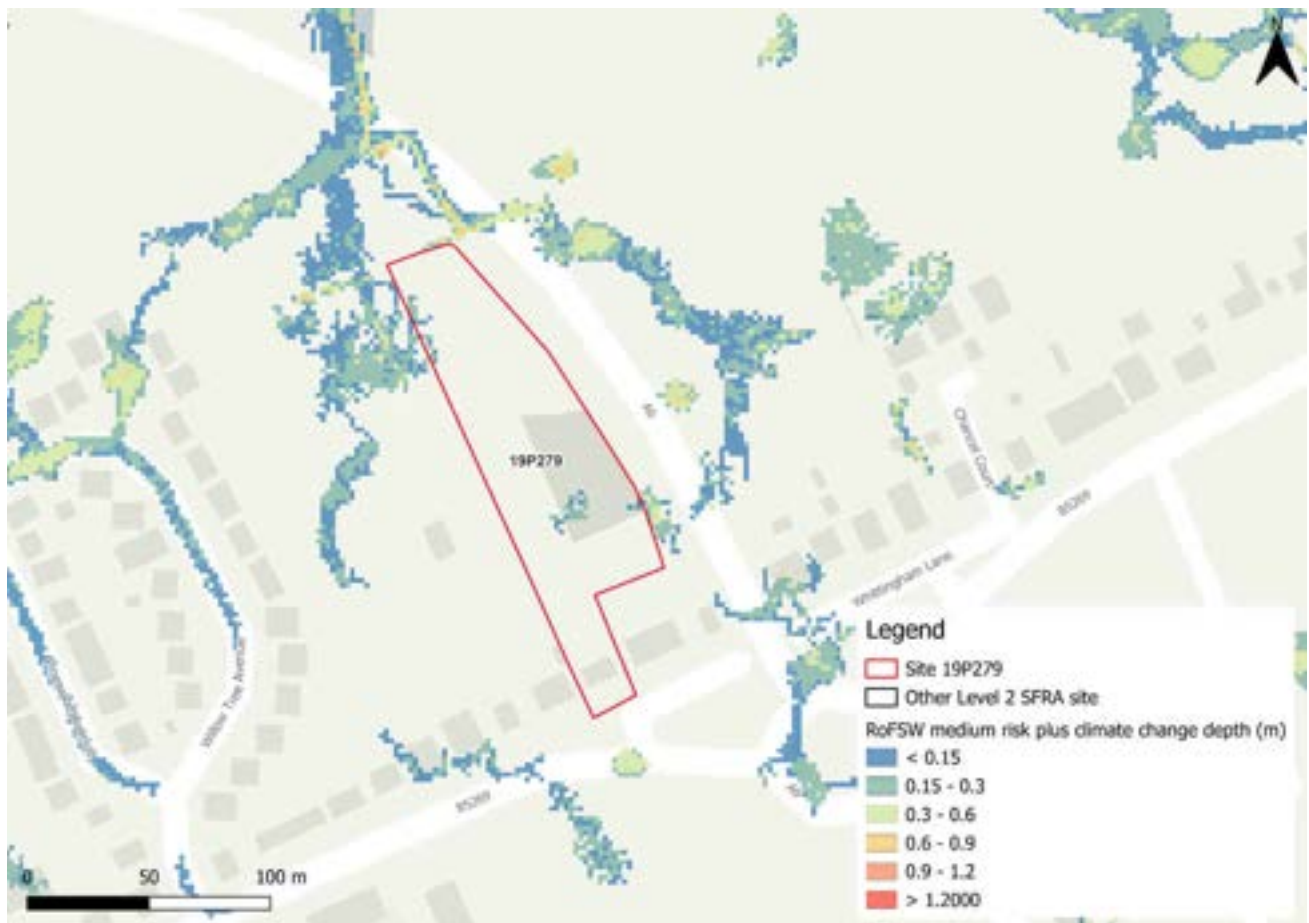


Figure 190-3: Medium risk event surface water flood depths plus 45% climate change (based on Risk of Flooding from Surface Water map)



Figure 190-4: Medium risk event surface water flood hazards plus 45% climate change (based on Risk of Flooding from Surface Water map)

190.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is very low, with 99% of the site being at very low surface water risk. Surface water risk in the low risk event is confined to an area of ponding along the eastern boundary of the site.
- The medium risk modelled climate change outputs indicate a greater risk to the site than the present day event, similar to the present day low risk event.
- Safe access and escape routes should be possible via B5269 in all events.
- The Groundwater Emergence Map (Figure 191-1: JBA 5m Groundwater Emergence Map) indicates that ground conditions may be suitable for infiltration SuDS in the majority of the site. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Were development to proceed, a full drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at greenfield rates and, where possible, betterment should be achieved.

- Note, 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 or evidence.

191 Flood risk from groundwater

Flood risk from groundwater sources 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 Guide¹¹⁶. Figure 4-1 show the map for the site and the surrounding areas and Table 191-1 explains the risk classifications.

The entire site is in an area where there is no risk of groundwater emergence. Groundwater conditions may be suitable to infiltration SuDS across the site.



Figure 191-1: JBA 5m Groundwater Emergence Map

¹¹⁶ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 191-1: Groundwater Flood 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.	

192 Overall site assessment

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

This site is not required to pass part b) of the exception test¹¹⁷ 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.

192.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- It should be appropriate to develop this site for more vulnerable purposes given its location in Flood Zone 1 and the majority of the site being at very low surface water flood risk.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P326

Final

February 2025

Prepared for:



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This report describes work commissioned by Preston City Council, on behalf of the Central Lancashire Local Plan Team, by an instruction dated 19 August 2024. The Client's representative for the contract was Carolyn Williams of Preston City Council. Freya Nation of JBA Consulting carried out this work.

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Certain statements made in the Report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based

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194 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for the Central Lancashire Local Plan Site 19P326. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the 'Central Lancashire Level 1 SFRA' (2025) and read the 'Central Lancashire Level 2 SFRA Main Report' (2025) and is therefore familiar with the terminology used in this report.

194.1 Site 19P326

- Location: Balderstone Farm, Bartle Lane, Lower Bartle, Preston, PR4 0RU (Parcel 2)
- Existing site use: Greenfield, agriculture
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Housing
- Proposed site use vulnerability: More vulnerable
- Site area: 4.56 hectares
- Proposed development impermeable area: 3.88 hectares (assumed 85% impermeable area)
- Watercourse: unnamed watercourse
- Summary of requirements from scoping stage:
- Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
- Assessment of surface water flood depths and hazards
- Assessment of all other sources of flood risk



Figure 194-1: Existing site location boundary

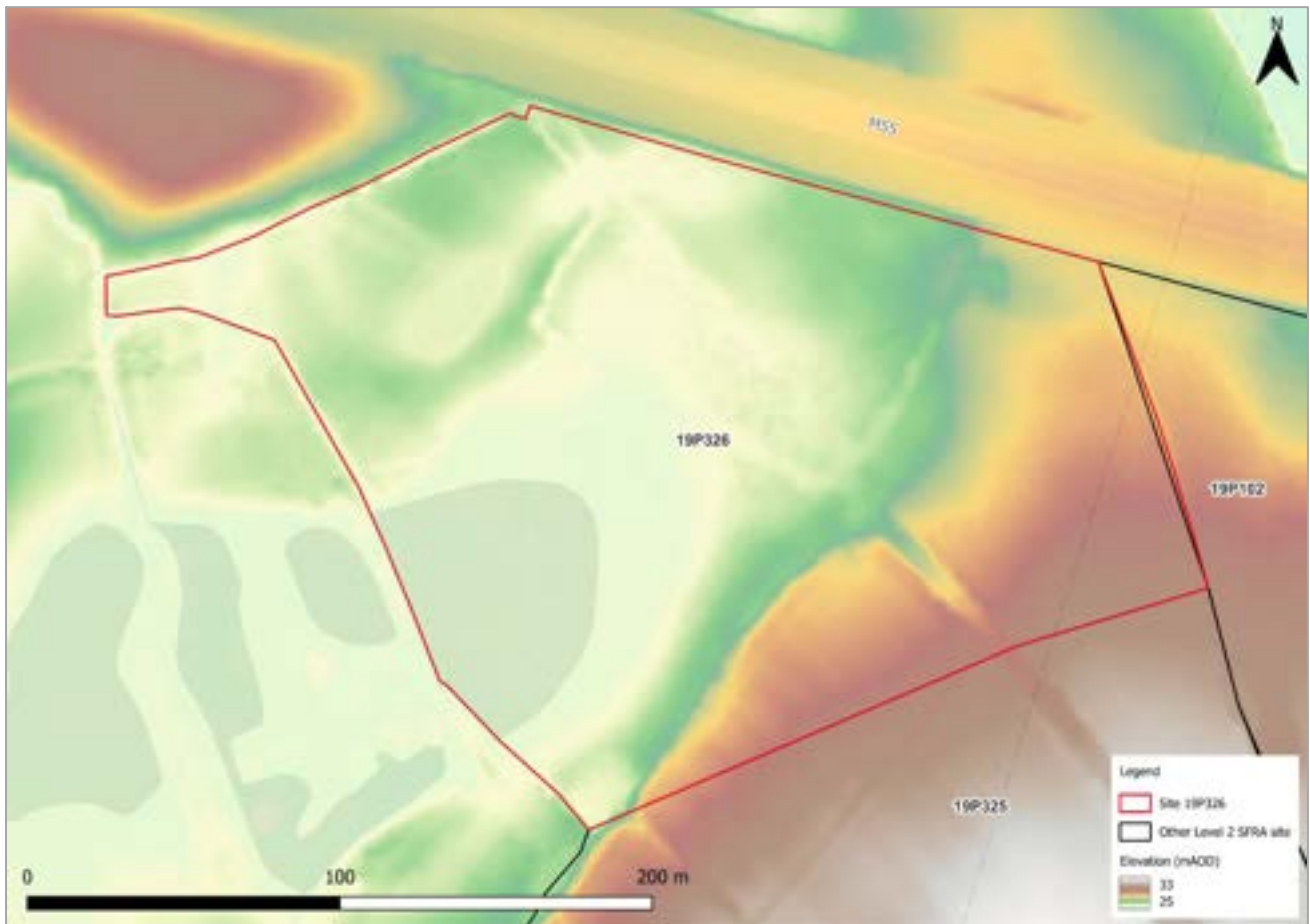


Figure 194-2: Topography

195 Flood risk from rivers

195.1 Existing risk

195.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA (2025), the percentage areas of the site within each fluvial flood zone are stated in Table 2-1 and can be viewed on Figure 8-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 0) or the impacts of climate change (Section 32.2).

The site is located wholly within Flood Zone 1 indicating it is at low risk of flooding from rivers.

Table 195-1: Existing fluvial flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

195.2 Flood risk management

195.2.1 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P326 is located within one catchment, namely; Woodplumpton Brook. Woodplumpton Brook is ranked as a high sensitivity catchment. Planning policy considerations for sites at higher sensitivity to the cumulative impacts of development that apply to this site include:

- National and local flood risk planning policy must be stringently applied within these areas, with flood risk from all sources given the appropriate priority, particularly when applying the Sequential and Exception Tests.
- Both greenfield and brownfield developments to achieve 20% betterment over pre-development greenfield runoff peak flows and volumes in their post development state.
- A Surface Water Drainage Masterplan should be developed and implement appropriate drainage sub-catchments for the management of surface water, with specific runoff rate and volume requirements set for each sub-catchment, in line with the SuDS management train.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

195.2.2 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. Across the majority of the site there are significant opportunities for wider catchment tree planting to reduce runoff downstream. There is also potential for riparian tree planting in the northwestern corner of the site, which can slow flows, reduce sediment delivery to the watercourse and reduce bankside erosion. The pond within the site, along with three smaller topographic depressions, represent opportunities for runoff attenuation in both the 3.3% and 1% AEP events. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown in Figure 171-2.

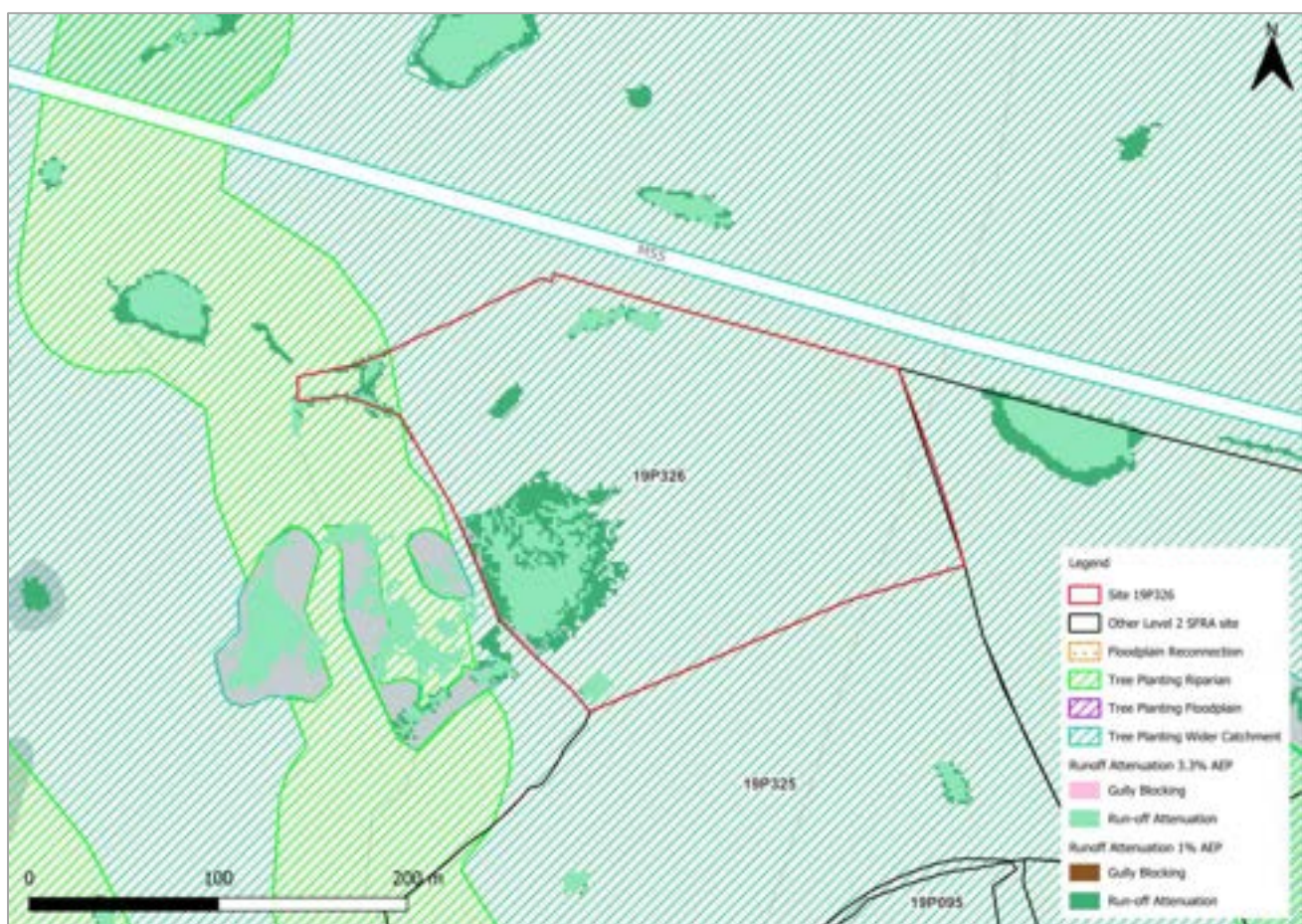


Figure 195-1: Natural Flood Management (NFM) potential mapping

195.3 Residual risk

195.3.1 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. 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 not modelled to be at risk of reservoir flooding.

195.4 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

195.5 Flood warning and access and escape routes

There are no Flood Warning Areas (FWA) or Flood Alert Areas (FAA) within the vicinity of the site.

195.6 Observations, mitigation options and site suitability - fluvial

- The proposed development of the site is anticipated to 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).
- The site is located wholly within Flood Zone 1.

196 Flood risk from surface water

196.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 7% of the site is within the high risk surface water flood zone. 6% of the site is in the medium risk zone and a further 18% is at low surface water risk as shown in Table 196-1.

In the high risk event, surface water risk is largely confined to the pond along the western border of the site. There are also areas of ponding in the northwestern corner, southwestern corner and north of the site. In the medium risk event, ponding expands in area (size) and in the low risk event, ponding expands again and flow paths form between areas of ponding within and adjacent to the site.

Greatest surface water flood depths in the medium risk event are between 0.3 and 0.6 m (Figure 3-1) with small areas of significant hazard at the northwestern corner (Figure 3-2). Safe access and escape routes may be possible via the A582, though in the extreme event there are areas of ponding with a significant flood hazard on parts of this road.

Table 196-1: Existing surface water flood risk based on the RoFSW map

Very low risk (%)	Low risk (%)	Medium risk (%)	High risk (%)
69%	18%	6%	7%



Figure 196-1: Medium risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 196-2: Medium risk event surface water flood hazard¹¹⁸ (Risk of Flooding from Surface Water map)

196.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 196-2: Modelled climate change allowances for rainfall for the Wyre management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	45%
1% (medium risk)	35%	50%

Figure 3-3 shows the surface water flood depths for the medium risk plus 50% climate change allowance event. Risk is modelled to be greater than the present day medium surface water risk flood event with flooding modelled to be similar to the present day

¹¹⁸ 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

medium risk event. Maximum flood depths are modelled to be between 0.6 and 0.9 m, with hazard rating increasing to significant within the large area of ponding in the western half of the site. Flood hazard at the northwestern site corner also increases to significant (Figure 3-4).



Figure 196-3: Medium risk event surface water flood depths plus 50% climate change (based on Risk of Flooding from Surface Water map)



Figure 196-4: High risk event surface water flood hazards plus 50% climate change (based on Risk of Flooding from Surface Water map)

196.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is largely very low, with 69% of the site being at very low surface water flood risk. Surface water risk in the high risk event consists of ponding within topographic low spots, particularly the pond within the site. Flooding in the low risk event is significantly greater with flow paths forming across the site. Safe access and escape may be achievable via the A582 in all events.
- The effects of climate change on surface water have been modelled for this SFRA using the medium risk surface water flood depths plus 50% climate change. Surface water risk is greater than in the present day event, flooding increases in depth and hazard rating. Any existing flow paths should be maintained in site design.
- The large area of ponding in the west of the site should be left free of development and included in site layout as a feature.
- The Groundwater Flood Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.

- A drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current rates (likely to be greenfield) and, where possible, betterment should be achieved.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P095, 19P102, 19P293, 19P325 and 19P131, 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.
- Note, 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 or evidence.

197 Risk from groundwater

Risk from groundwater sources 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 Guide¹¹⁹. Figure 4-1 show the map for Site 19P326 and the surrounding areas and Table 197-1 explains the risk classifications.

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.



Figure 197-1: JBA 5m Groundwater Flood Map

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

Table 197-1: Groundwater Flood 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.	

198 Overall site assessment

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

To pass part b) of the exception test¹²⁰, it must be proven that the development can be safe for its lifetime, which is 100 years for residential development, taking account of the vulnerability of its users, without increasing risk elsewhere, and, where possible, will reduce flood risk overall.

- The site is not required to pass the exception test as it is located wholly within Flood Zone 1.

198.2 Recommendations, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- Based on current information, it should be possible to allocate this site if development avoids areas at risk of surface water ponding and maintains existing flow paths.
- A drainage strategy would be required to ensure there is no increase in surface water flood risk elsewhere as a result of new development. This will require surface water modelling based on layout plans and detailed design and full consultation with the LLFA.
- Site runoff should be maintained at current rates (likely to be greenfield) and, where possible, betterment should be achieved.
- Were development of this site to proceed, given the proximity of this site to neighbouring sites 19P095, 19P102, 19P293, 19P325 and 19P131, 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.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.
- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

120 Para 178 National Planning Policy Framework 2024

199 Licencing

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Central Lancashire Level 2 Strategic Flood Risk Assessment - Site 19P330

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200 Background

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200.1 Site 19P330

- Location: Preston Waste Transfer Station, Wallend Road, Aston-on-Ribble, Preston, PR2 2HW
- Existing site use: Brownfield; industrial
- Existing site use vulnerability: Less vulnerable
- Proposed site use: Employment
- Proposed site use vulnerability: Less vulnerable
- Site area: 7.2 hectares
- Proposed development impermeable area: 6.1 hectares (assumed 85% impermeable area)
- EA model: Ribble Estuary 2014
- Watercourse: River Ribble. Drainage ditch through the centre of the site.
- Summary of requirements from scoping stage:
 - Level 1 SFRA recommendation was for withdrawal from allocation or more detailed assessment through Level 2 SFRA
 - Assessment of modelled fluvial flood depths and hazards
 - Assessment of surface water flood depths and hazards



Figure 200-1: Existing site location boundary



Figure 200-2: Topography

201 Flood risk from rivers and the sea

201.1.1 Flood Map for Planning and functional floodplain

Based on the EA's Flood Map for Planning and Flood Zone 3b (functional floodplain) as updated in the Central Lancashire Level 1 SFRA, the percentage areas of the site within each tidal flood zone are stated in Table 183-1 and can be viewed on Figure 183-1. The Flood Map for Planning does not consider flood defence infrastructure (Section 183.3) or the impacts of climate change (Section 183.2).

Flood Zone 3a is present within the site along the western boundary and in an area to the north. Flood Zone 2 covers the remaining area of the site.

Table 201-1: Existing tidal flood risk

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
0	77	23	0

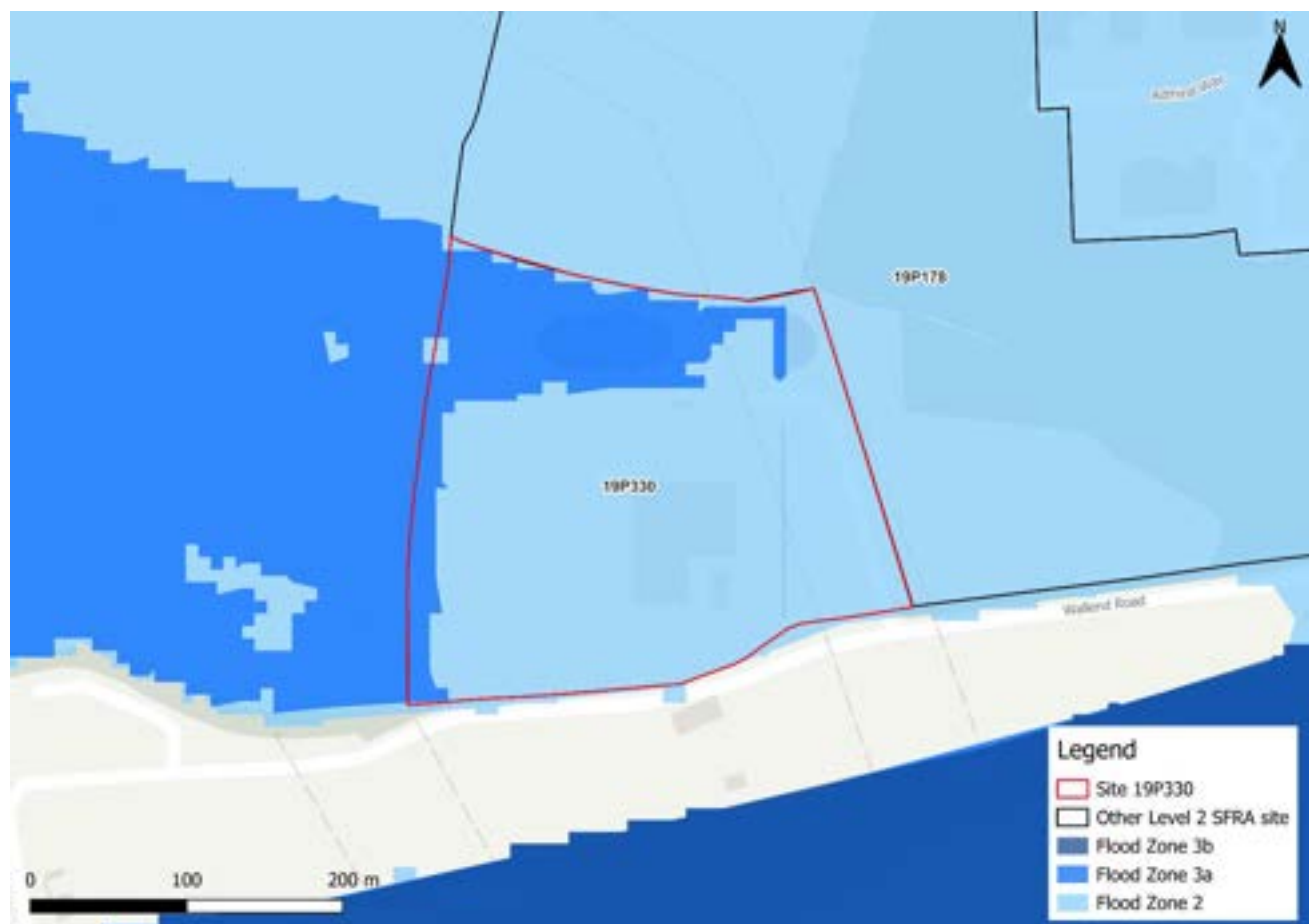


Figure 201-1: Existing risk from the sea to the site

201.1.2 Ribble-Douglas 2010 undefended model outputs

The Ribble-Douglas model outputs are different to the Flood Map for Planning and will therefore mean recommendations on development will also be different when accounting for the Flood Map for Planning or the outputs from the Ribble-Douglas model. The Environment Agency have confirmed that the defended scenario informs the flood zones in this area as flooding is modelled to be greater in extent than the undefended.

There is no modelled present day undefended risk to the site from the Ribble-Douglas 2010 combined fluvial and tidal model (Figure 201-2).

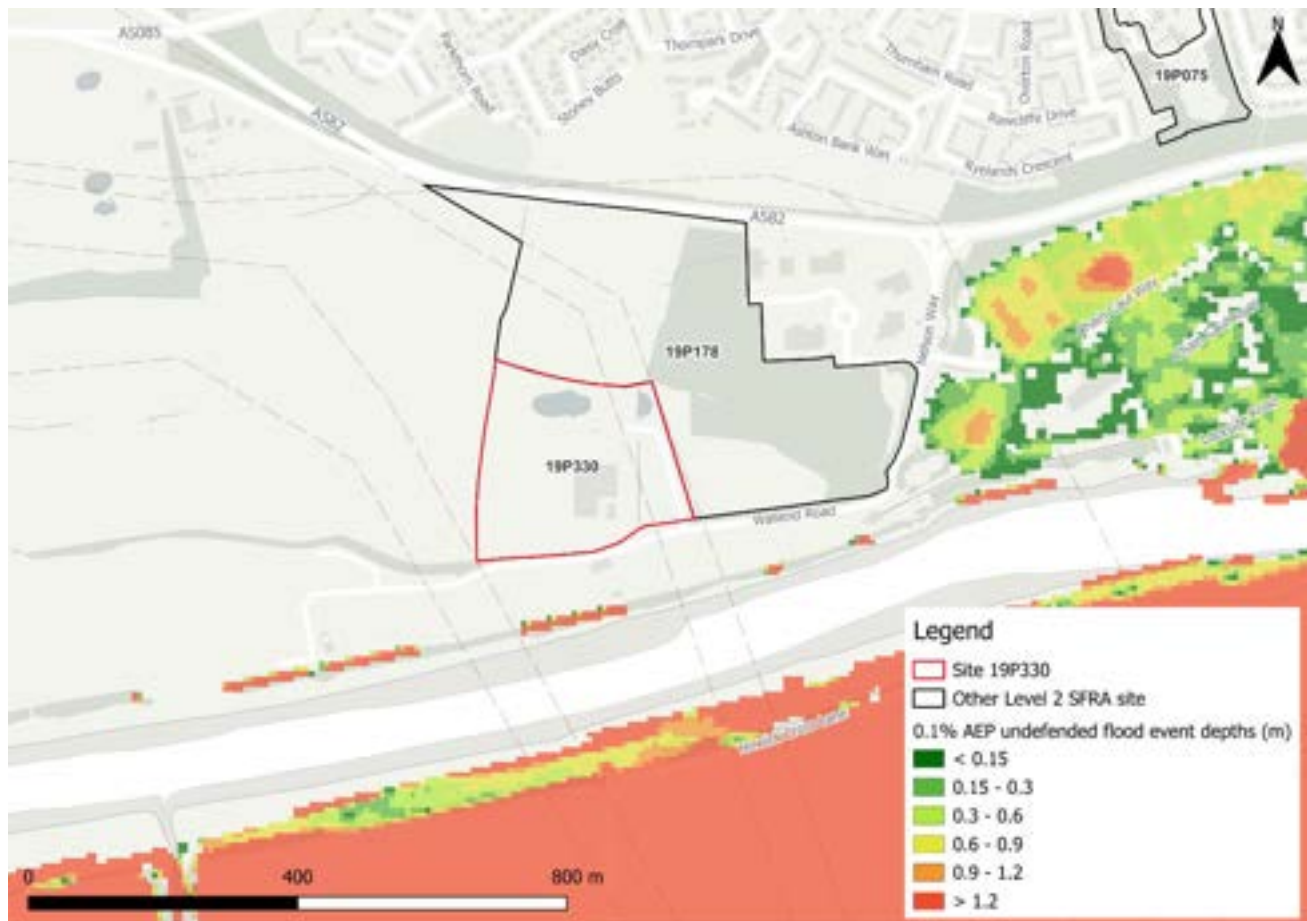


Figure 201-2: Flood depths (m) for 0.1% AEP undefended flood event (Ribble-Douglas 2010)

201.1.3 Ribble Estuary 2014 undefended model outputs

The Ribble Estuary outputs are different to the Flood Map for Planning and will therefore mean recommendations on development will also be different when accounting for the Flood Map for Planning or the Ribble Estuary model.

Figure 183-3 shows the modelled flood depths for the 0.5% AEP undefended event which is the event the Flood Zone 3 of the Flood Map for Planning is based on. Modelled risk to the site is less than that shown by Flood Zone 3. Flood depths within the site are largely shallow, with maximum depths being between 0.3 and 0.6 m. This is reflected in the

modelled flood hazard being mostly very low, with a small area categorised as 'Danger for some' (Figure 201-4).



Figure 201-3: Flood depths for 0.5% AEP undefended flood event



Figure 201-4: Flood hazard¹²¹ for 0.5% AEP undefended flood event

201.2 Impacts from climate change

The impacts of climate change on flood risk from the Ribble-Douglas 2010 and Ribble Estuary 2014 models have been modelled without flood defence infrastructure in place. This allows for direct comparison with the existing risk of the Flood Map for Planning. However, as discussed, both the Ribble-Douglas 2010 and Ribble Estuary 2014 undefended model outputs do not reflect the Flood Map for Planning.

With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 147-2 and Table 201-3.

¹²¹ 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. Environment Agency.

Table 201-2: Modelled climate change allowances for peak river flows for the Ribble Management Catchment (Ribble-Douglas 2010 model)

Return period	Central allowance 2080s	Higher central allowance 2080s
3.3% (functional floodplain)	36%	46%
1%	36%	46%

Table 201-3: Modelled climate change allowances for sea level rise for the North West river basin district

Allowance category	2000-2035 (mm)	2036-2065 (mm)	2066-2095 (mm)	2096-2125 (mm)	Cumulative rise 2000-2125 (m)
Upper end	5.7 (200)	9.9 (297)	14.2 (426)	16.3 (489)	1.41
Higher central	4.5 (158)	7.3 (219)	10 (300)	11.2 (336)	1.01

201.2.1 Ribble-Douglas 2010 climate change model outputs

Although there is no modelled impact to the site in the present day 1% AEP event in the fluvial and tidal combined Ribble-Douglas 2010 model, there is a significant impact to the site when accounting for climate change. Figure 201-5 shows the onsite modelled flood depths for the 1% AEP undefended event plus higher central sea level rise allowance. Risk is modelled to be much greater than for present day conditions within this model, with almost the entire site modelled to be at risk. Maximum flood depths are modelled to be significant at >1.2 m, located within the existing ditch present onsite.

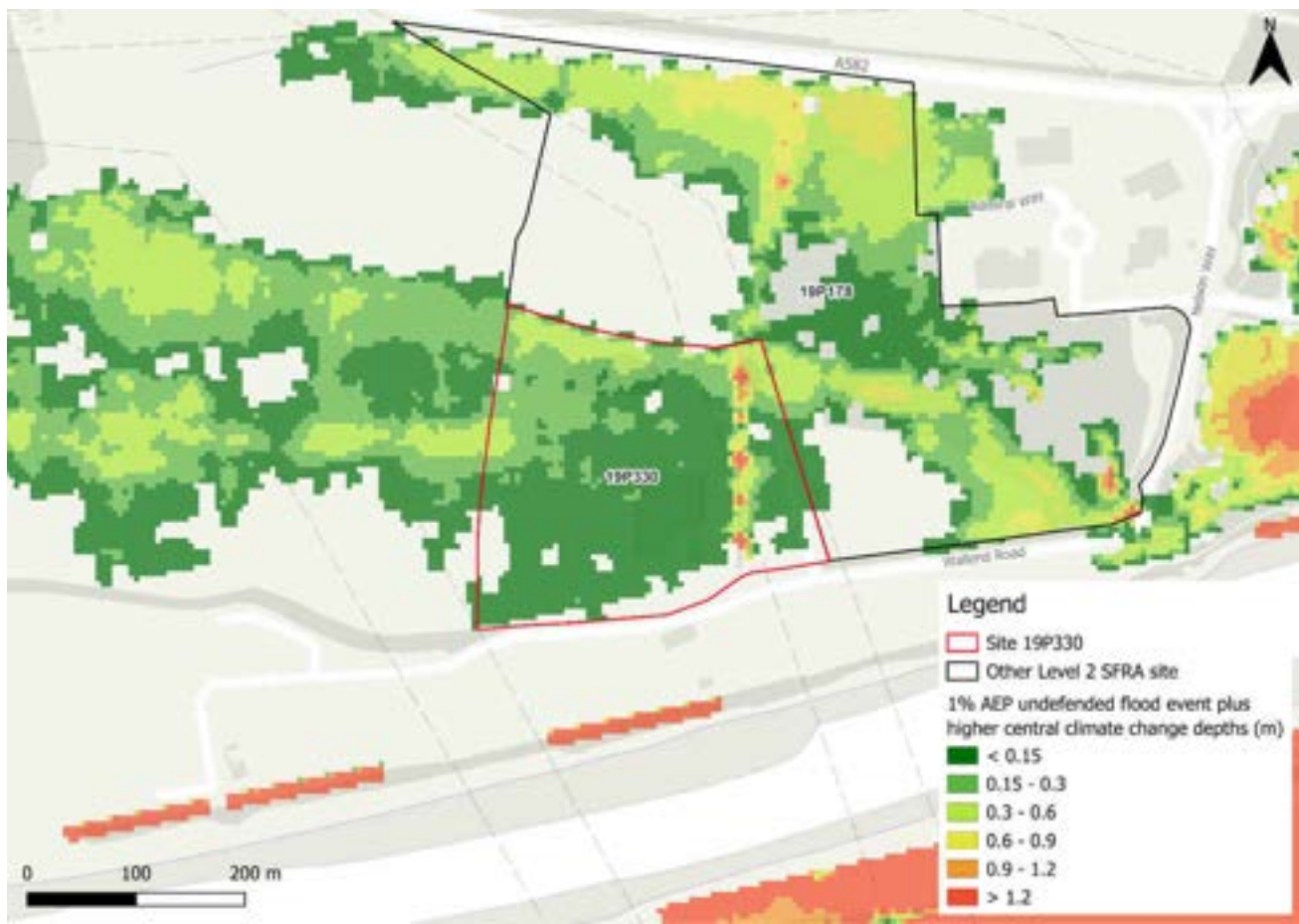


Figure 201-5: Flood depths (m) for 1% AEP undefended flood event plus higher central climate change allowance (Ribble-Douglas 2010)

Figure 201-6 shows the modelled flood hazard ratings for the 1% AEP undefended event plus higher central sea level rise allowance. Flood hazard within the site is largely categorised as 'very low hazard', with a small area of 'Danger for most' located within the drainage ditch in the onsite.

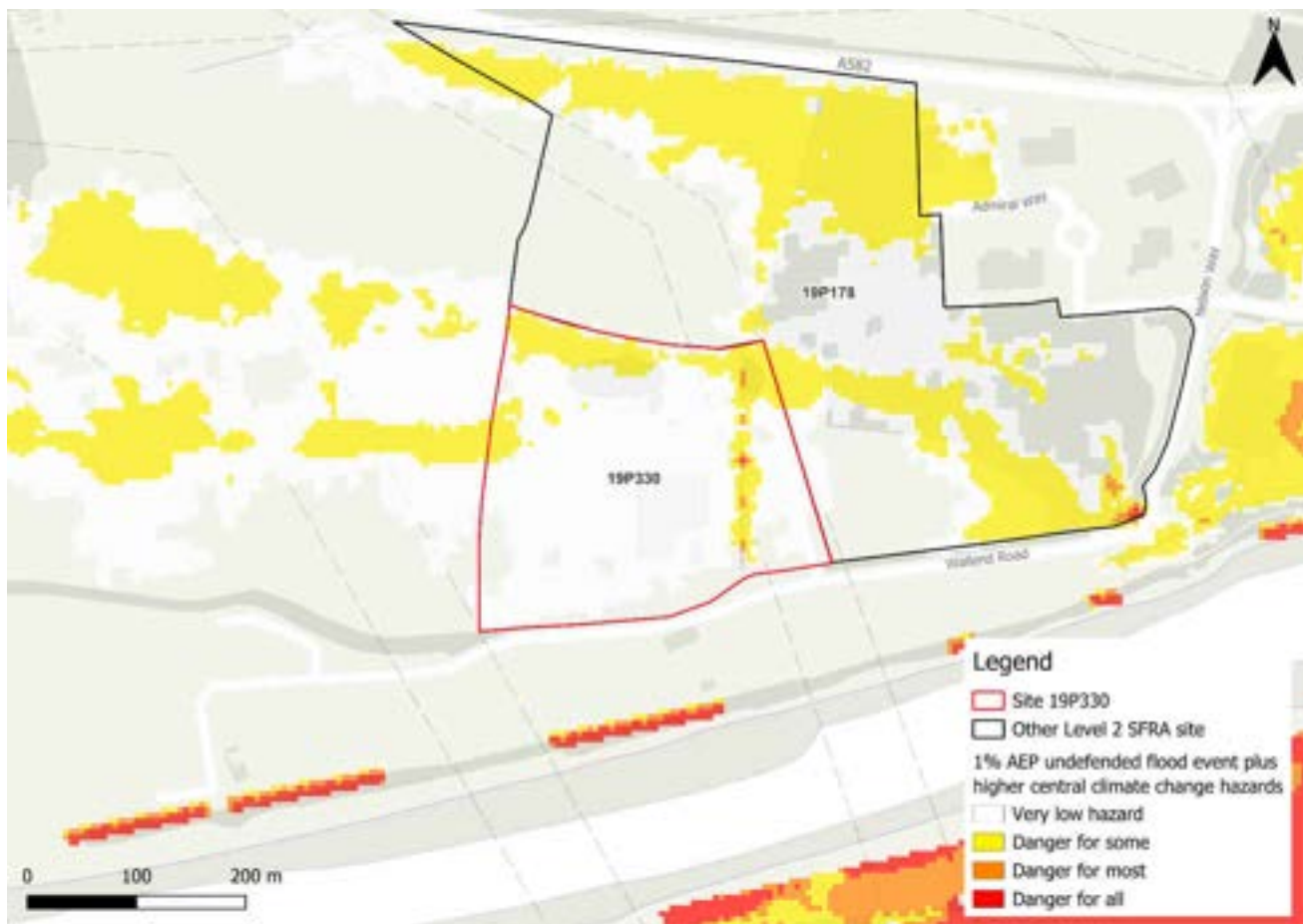


Figure 201-6: Flood hazard¹²¹ for 1% AEP undefended flood event plus higher central climate change allowance (Ribble-Douglas 2010)

201.2.2 Ribble Estuary 2014 climate change model outputs

Figure 183-7 shows the onsite modelled flood depths for the 0.5% AEP undefended event plus higher central sea level rise allowance. Risk is modelled to be much greater than for present day conditions with the western boundary and the north of the site modelled to be at risk, similar to Flood Zone 3a. Maximum flood depths are modelled to be > 1.2m. The functional floodplain is not modelled to increase in extent and remains in channel.

Figure 183-8 shows the modelled flood hazard ratings for the 0.5% AEP undefended event plus higher central sea level rise allowance. Flood hazard within the site is largely categorised as 'Danger for some', with a small area of 'Danger for most' located within the drainage ditch in the east of the site.

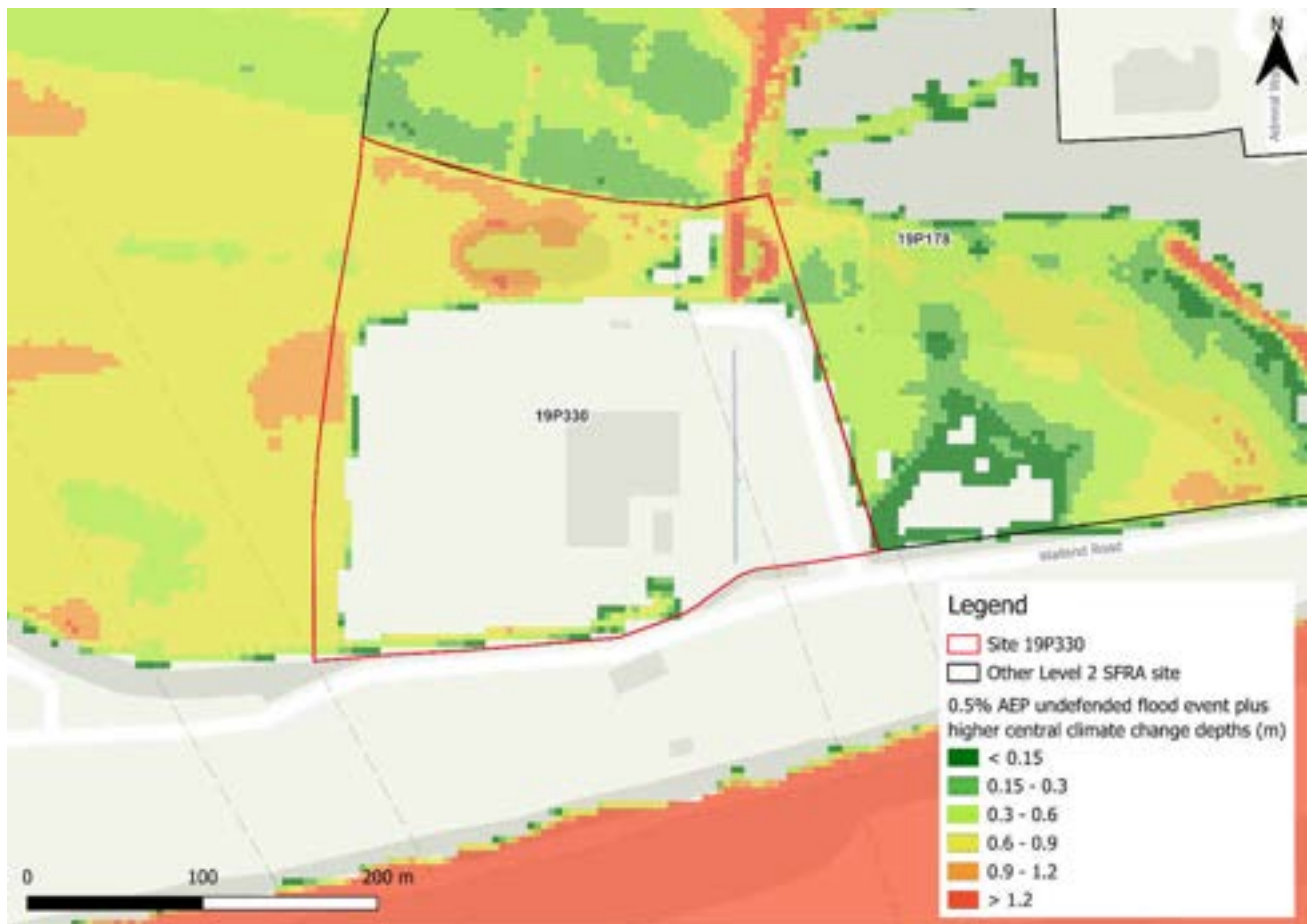


Figure 201-7: Flood depths for 0.5% AEP undefended flood event plus higher central climate change allowance



Figure 201-8: Flood hazard¹²¹ for 0.5% AEP undefended flood event plus higher central climate change allowance

201.3 Flood risk management

Flood defences are in place along the right bank of the River Ribble, as shown on Figure 183-9. Information provided in the EA's 'Spatial Flood Defences' dataset states that this defence is a raised embankment with a design Standard of Protection (SoP) of 100 years. Actual SoP is unknown. Current condition is also unknown. The dataset states that a private individual, company or charity owns and maintains this defence.

There is also an embankment located to the west of the site which is modelled to provide some level of protection to the site. Design SoP, actual SoP and current condition are all unknown. The dataset states that the local authority owns and maintains this defence. The embankment is situated approximately 2.5 m above the floodplain, as measured from the LIDAR. The measured level from the LIDAR aligns with the embankment crest level within the EA's Spatial Flood Defences dataset. The Environment Agency have confirmed that inspections of this asset is completed every 24 months.

There is residual risk of defence failure or overtopping. Section 201.4.1 discusses the breach modelling carried out for this SFRA and the impacts to the site and surrounding areas.



Figure 201-9: EA Spatial Flood Defences dataset

201.3.1 Ribble-Douglas 2010 defended model outputs

Figure 201-10 shows the effect of the River Ribble flood defences on flood risk from the 0.1% AEP event. There is a significantly greater risk to the site in the defended event in comparison to the undefended event. This is because the in-channel water levels are consistently higher in the defended scenario throughout Preston, and removing the defences allows for water to flood the area to the south of the River Ribble, rather than the north. The model outputs indicate that flooding overtops the area of natural high ground (NGR 350526, 429357 - green point on Figure 201-10) and subsequently impacts the site. The defended event is also modelled to overtop the marshland defence to the west of the site. From observing the depths either side of this defence it appears this is overtopping from east (upstream) to west (downstream), rather than a failure of this defence to protect the site from flooding from the west. Access and escape routes are likely to be challenging to achieve in this event.

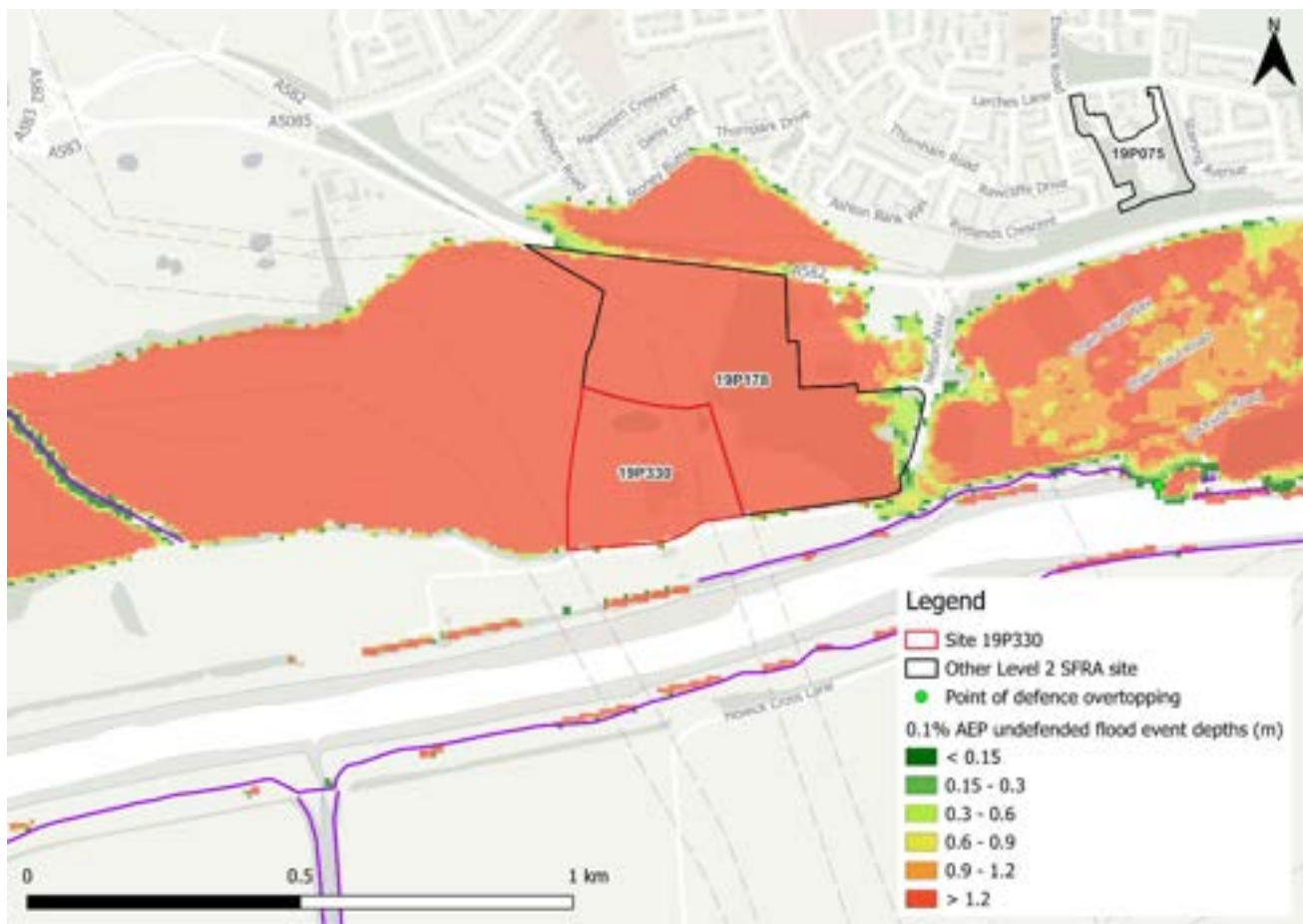


Figure 201-10: Modelled 0.1% AEP defended flood event depths (m) (Ribble-Douglas 2010)

201.3.2 Ribble Estuary 2014 defended model outputs

Figure 201-11 shows the effect of the Ribble Estuary flood defences on flood risk from the 0.1% AEP event. The raised embankments along the River Ribble do not protect the site given their standard of protection of 100 years. The embankment to the west of the site protects the site in the defended event, holding floodwaters in the marshland area. Maximum depths behind the embankment are modelled to be approximately 1.5 m. The modelled impacts of climate change for the 0.1% AEP defended event are also constrained by this embankment. Access and escape routes are not affected in this event.

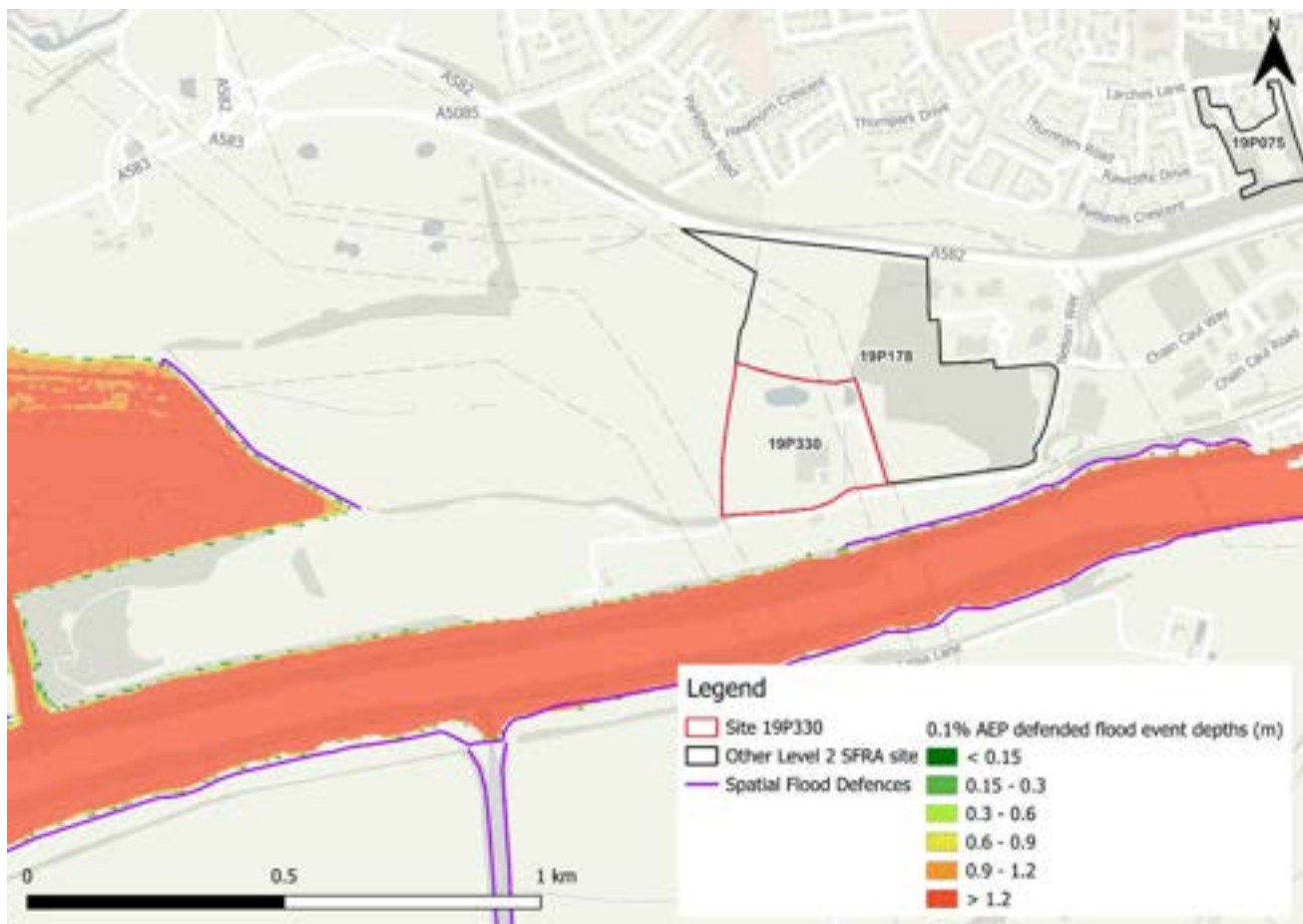


Figure 201-11: Modelled 0.1% AEP defended flood event depths (m) (Ribble Estuary 2014)

201.3.3 Cumulative impacts

A cumulative impact assessment was completed through the Central Lancashire Level 1 SFRA (2025), which aimed to identify catchments sensitive to the cumulative impact of development. Site 19P330 is located within one catchment, namely; Coastal Catchment 176. This is ranked as a medium sensitivity catchment. Planning considerations for sites at medium sensitivity to the cumulative impacts of development that apply to this site include:

- Incorporate SuDS and provide details of adoption, ongoing maintenance, and management, in line with the Lancashire SuDS Guidance¹²².
- Developments should be incentivised to provide wider betterment by being requested to demonstrate in site-specific FRAs and Surface Water Drainage Strategies what measures can be put in place to contribute to a reduction in flood risk downstream.
- Developments are to aim to achieve greenfield runoff rates and volumes in their post-development state.
- Surface Water Management Plans should be developed as required.

The full list of planning policy suggestions can be found in Appendix G of the Level 1 SFRA.

¹²² [Lancashire SuDS Guidance](#)

201.3.4 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. Both within and upstream of the site, there is potential for tree planting to slow floodwaters, reduce flood peak height and reduce sediment delivery to the watercourse. A Flood Risk Activity Permit (FRAP) may be required for NFM activities or works within the floodplain when planning permission is not required. These areas are shown on Figure 183-12. Further investigation into using this site for tree planting should be undertaken. This could provide multiple benefits as well as flood risk mitigation, including biodiversity net gains, social and amenity value.

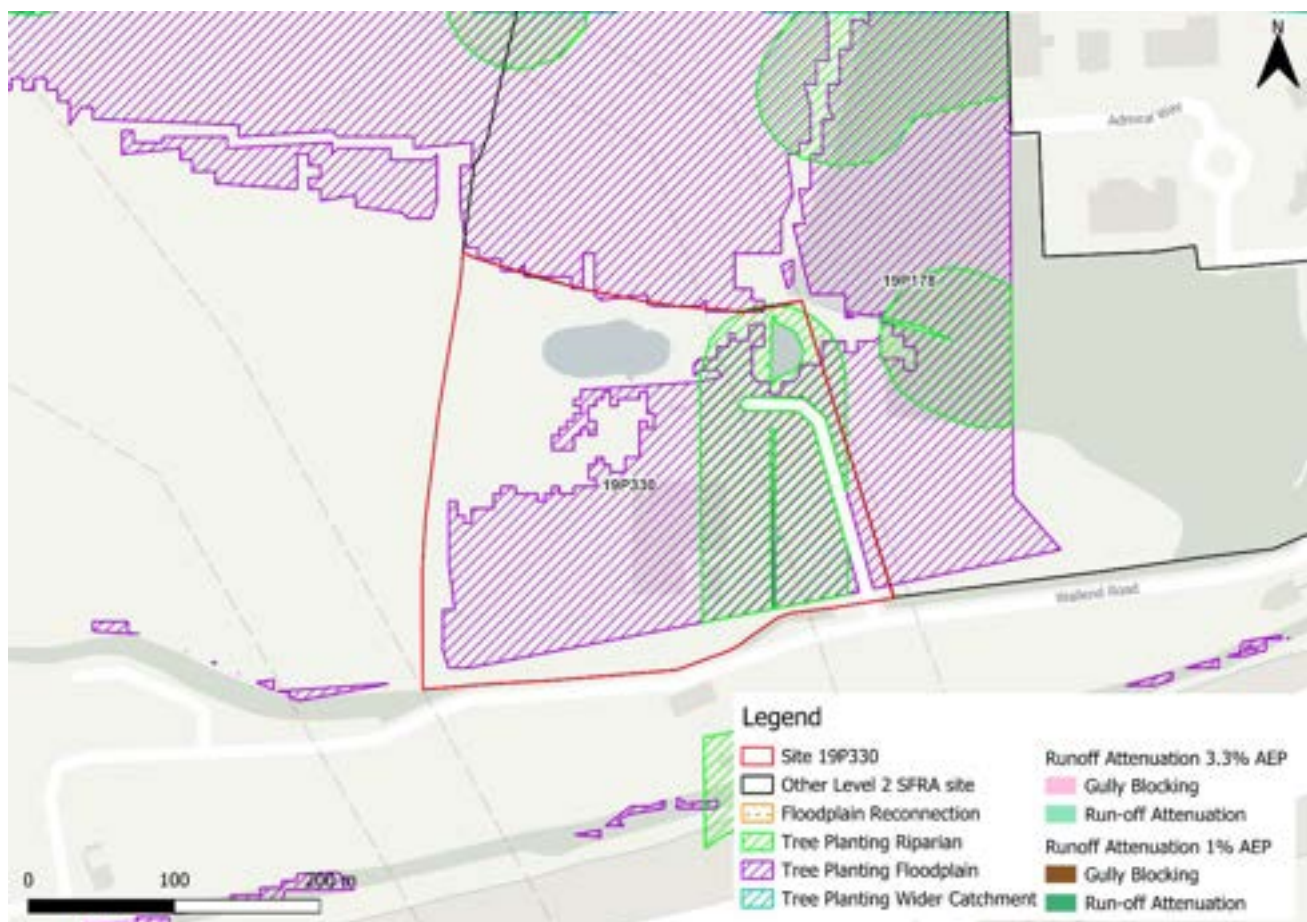


Figure 201-12: Natural Flood Management (NFM) potential mapping

201.4 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 bridge openings.

Residual risk at this site comes from possible breaching / overtopping of the flood defences to the west of the site (Figure 183-9). Section 201.4.1 presents the breach modelling outputs. There may also be additional residual risks of defence breaching to this site that have not been explored in this Level 2 SFRA.

201.4.1 Marsh defence breach

Figure 201-13 shows the modelled flood depths in the event of a breach of the marsh embankment adjacent to Savick Brook at NGR 348423, 429502 (green point on Figure 201-13), based on the Ribble Estuary 2014 model. The modelled event represents the 0.5% AEP event plus higher central sea level rise allowance. The modelled breach outputs show a significantly greater risk to the site than the 0.5% AEP defended event plus higher central sea level rise allowance. Maximum depths within the site are significant at > 1.2 m with some areas of hazard categorised as 'Danger for most' (Figure 201-14).



Figure 201-13: Flood depths (m) based on a breach of the marshland defence during a 0.5% AEP defended flood event plus higher central sea level rise allowance

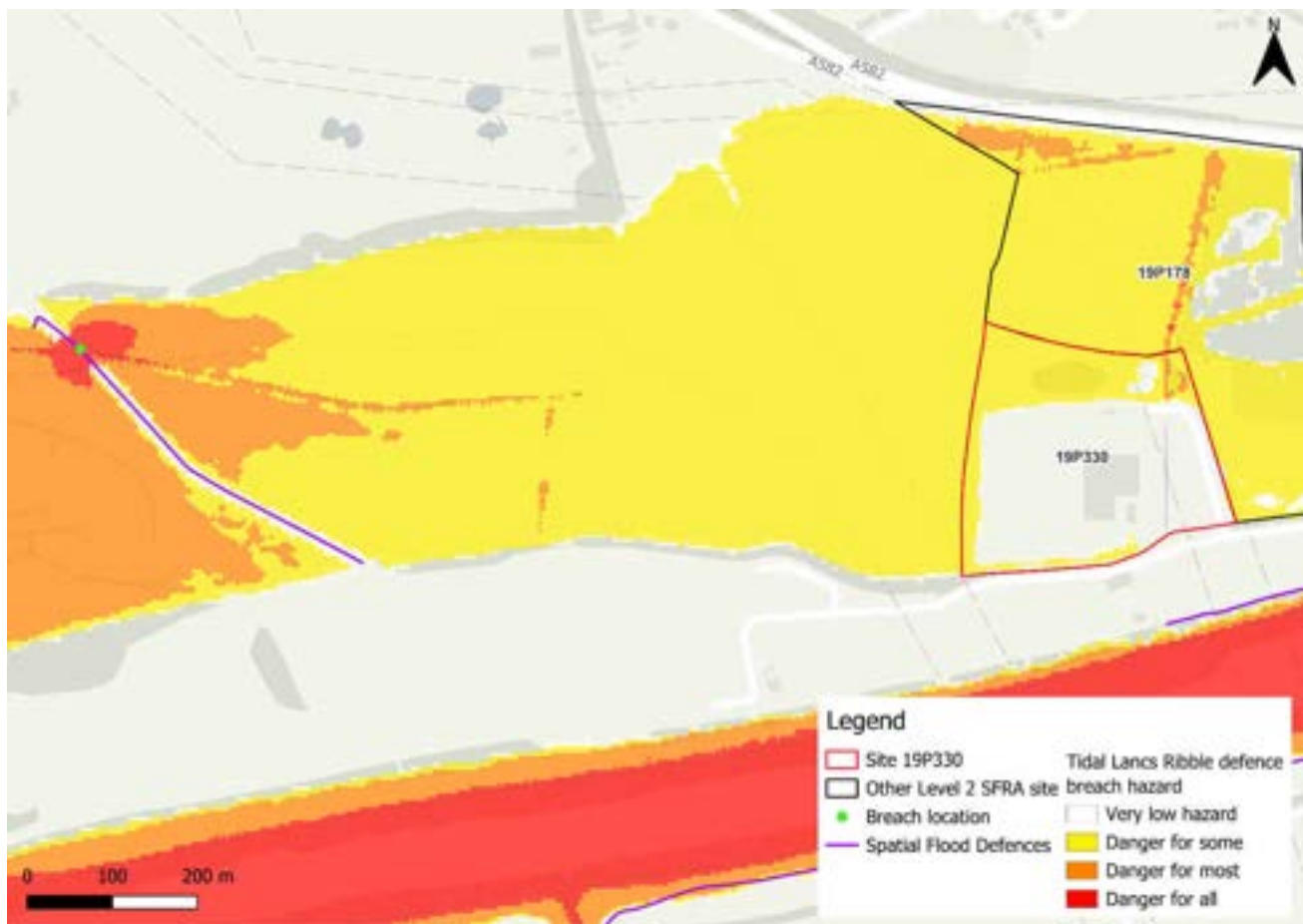


Figure 201-14: Flood hazard based on a breach of the marshland defence during a 0.5% AEP defended flood event plus higher central sea level rise allowance

201.4.2 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 183-15 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 eight reservoirs, five of which are located within Lancashire and three located within Blackburn with Darwen. All reservoirs with the potential to impact the site are operated by United Utilities.

The EA's SFRA guidance states that where a proposed development site is at flood risk from a reservoir, 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. At the FRA stage, United Utilities should be contacted to ascertain whether the proposed development could affect the reservoirs 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.

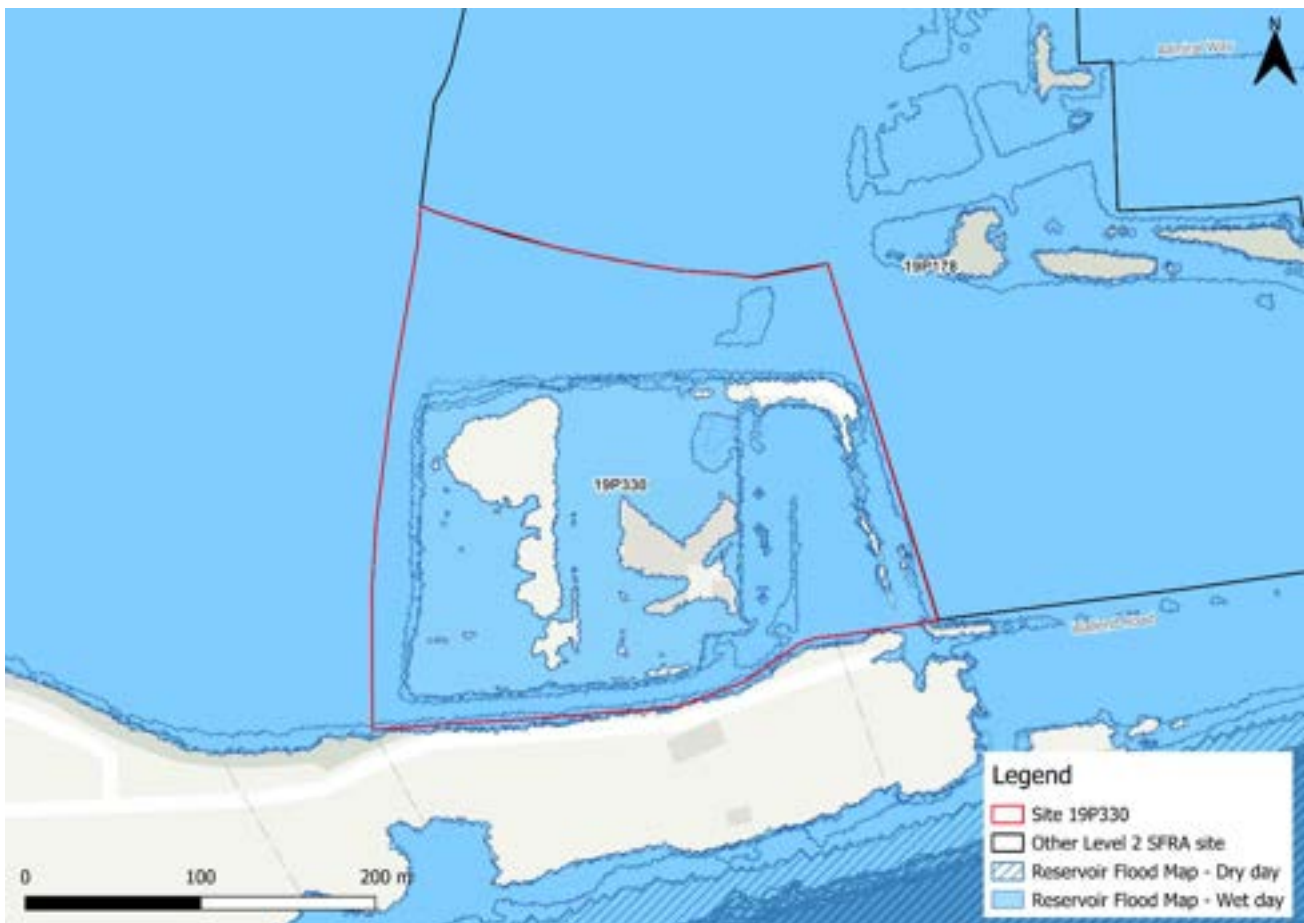


Figure 201-15: Flood risk from reservoirs

201.5 Historic flood incidents

The EA's Historic Flood Map (HFM) and Recorded Flood Outlines (RFO) datasets have been considered. There are no recorded historic flood incidents within the vicinity of the site.

201.6 Flood warning and access and escape routes

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. Site 19C330 is partially located within one FWA, namely; 012FWBL34A - Ribble estuary at Riversway Docklands.

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 site is also almost entirely located within two FAA's, namely; 012WATRE - Ribble estuary west of Preston and 012WAFLR - Lower River Ribble and Darwen.

Based on available information, safe access and escape routes could likely be achieved during a flood event via Wallend Road to the south of the site. Safe access and escape routes may be challenging to achieve in the extreme low risk event.

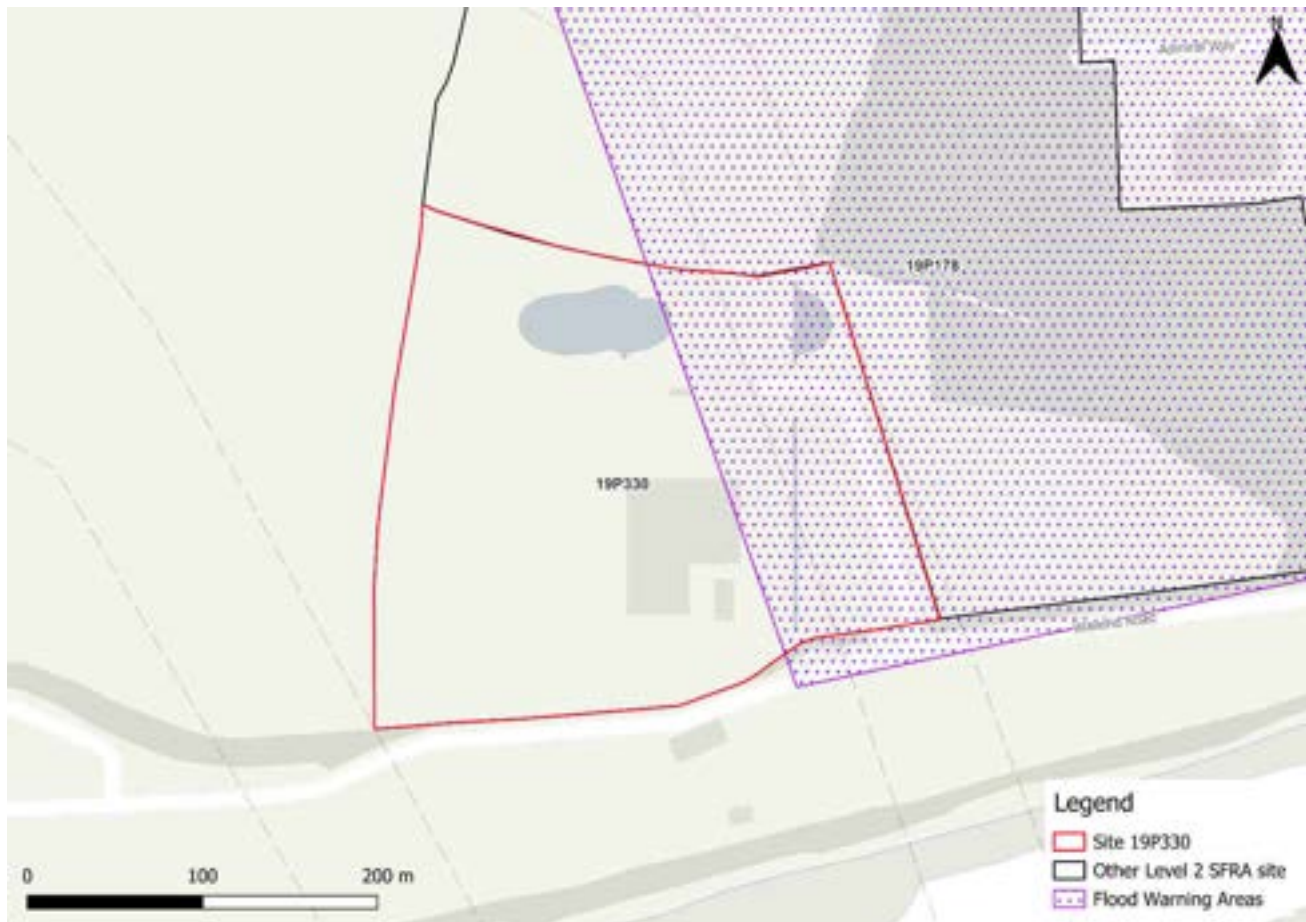


Figure 201-16: EA Flood Warning Areas

201.7 Observations, mitigation options and site suitability - tidal

- The site is modelled to be at risk from tidal sources (according to the Ribble Estuary 2014 model) in the 0.5% undefended scenario though to a lesser degree than shown by Flood Zone 3.
- There is no present day modelled undefended risk to the site from fluvial sources (according to the Ribble-Douglas 2010 model). Flood Zone 2 at the site is based on the defended 0.1% AEP event as flood risk in this area is modelled to be greater in the defended event.
- Modelled risk from climate change increases the undefended risk to the site in both the Ribble-Douglas 2010 and Ribble Estuary 2014 models.
- When accounting for defences, Ribble Estuary 2014 0.1% AEP event outputs are constrained by the embankment to the west of the site, leaving the site at low risk in the future. However, it is not appropriate to consider the site flood free as residual flood risk remains from possible defence breaches.

- Areas behind flood defences are at particular risk from the rapid onset of fast flowing and deep flooding, with little or no warning if defences are breached. Emergency plans must be in place for such areas and safe access and escape routes must be in place for the lifetime of the development. Resistance and resilience measures may also be put in place to manage residual flood risk when avoidance measures have been exhausted.
- The LPA should use the information on residual risk in this Level 2 SFRA to state in the local plan strategic policies a preferred mitigation strategy for ensuring development will be safe throughout its lifetime in relation to urban form, risk management and where flood mitigation measures are likely to have wider sustainable design implications (para 042, FRCC-PPG).
- When considering whether defended sites could be appropriate for development, the FRCC-PPG states that the likelihood of defences keeping pace with climate change should be considered, i.e. available funding streams and funding options such as Community Infrastructure Levy, planning obligations / S106 agreements, or Partnership Funding.
- The local authority maintains the flood defence to the west of the site. The local authority should therefore be in a position to advise on funding and maintenance arrangements for these defences into the future. Consultation with the EA will also be required on whether this site is suitable for development.
- Given the residual risk to this site, the following should be considered:
 - Use of flood resistance and resilience measures
 - Adequate flood warning and alerts should remain in place, in consultation with the EA,
 - Provision of emergency escape routes including for vehicular access for emergency services. Judgements on whether the site can be regarded as safe will need to consider the feasibility and provision of evacuation from the site during a flood,
 - Provision of detailed emergency plans and signage for users.
- Given the site is proposed for less vulnerable uses, it should be appropriate for the site to be developed if appropriate resilience measures are put in place. The area at risk could be converted to open space and used as a multifunctional greenspace for flood storage, amenity use and to provide environmental / ecological benefits. Safe access and escape routes must be available at times of flood.
- Consideration should also be given to the risk from the extreme 0.1% AEP flood event. The safety of people within a building if it floods and also the safety of people around a building and in adjacent areas, including people who are less mobile or who have a physical impairment must be considered. This includes the ability of residents and users to evacuate before the extreme event occurs.
- The site-specific FRA must show that development will be safe for its lifetime, taking into account the vulnerability of its users, including for appropriate

evacuation procedures and flood response infrastructure are in place to manage the residual risk associated with the extreme flood event.

- Given the potential reservoir risk to the site, developers should consider¹²³:
 - Whether additional modelling is required to understand the flood risk from the reservoir, referring to the specification for the reservoir flood maps as a starting point
 - Whether the development may have an impact on the reservoir or reservoir owner
 - Referring to the Central Lancashire Level 1 SFRA for information on reservoir risk and recommendations for how to address it
 - Contacting the LPA for pre-application advice
 - Contacting the LPA to understand the need to consult with their emergency planning team and with the reservoir owner
- Were development of this site to proceed, given the proximity of this site to neighbouring site 19P178, 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.

¹²³ [Reservoir flood maps: when and how to use them | Environment Agency | 2021](#)

202 Flood risk from surface water

202.1 Existing risk

Based on the EA's national scale Risk of Flooding from Surface Water (RoFSW) map, surface water risk to the site is predominantly very low. Approximately 2% of the site is within the high risk surface water flood zone. A further 1% is at medium surface water risk, and a further 3% is at low surface water risk, as shown in Table 184-1.

In the high and medium risk events, surface water risk is confined to the drainage ditch within the east of the site, with a small area of ponding within a topographic low spot within the south west of the site in the medium risk event. This is largely consistent with the low risk event, however there are some additional areas of shallow ponding scattered across the site.

Greatest flood depths in the high risk event are > 1.2 m however these are located within the drainage ditch present within the site boundary (Figure 3-1). Hazard is categorised as significant (Figure 3-2). Safe access and escape routes should be possible via Wallend Road to the south of the site in all events.

Table 202-1: Existing surface water flood risk based on the RoFSW map

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



Figure 202-1: High risk event surface water flood depths (Risk of Flooding from Surface Water map)



Figure 202-2: High risk event surface water flood hazard¹²⁴ (Risk of Flooding from Surface Water map)

202.2 Impacts from climate change

The impact of climate change on surface water flood risk has been modelled. This allows for direct comparison with the RoFSW map. With consideration of the EA's SFRA guidance, the latest climate change allowances have been modelled as shown in Table 3-2.

Table 202-2: Modelled climate change allowances for rainfall for the Ribble management catchment

Return period	Central allowance 2070s	Upper end allowance 2070s
3.3% (high risk)	30%	40%
1% (medium risk)	35%	50%

Figure 3-3 shows the modelled surface water depths for the high risk event +40% climate change. Risk is modelled to be similar to present day conditions, with the high risk climate

¹²⁴ 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

change event remaining within the drainage ditch in the east of the site. Maximum depths are > 1.2 m with some areas of extreme hazard (Figure 3-4).



Figure 202-3: High risk event surface water flood depths plus 40% climate change (based on Risk of Flooding from Surface Water map)



Figure 202-4: High risk event surface water flood hazards plus 40% climate change (based on Risk of Flooding from Surface Water map)

202.3 Observations, mitigation options and site suitability - surface water

- Current risk to the site is very low, with approximately 94% of the site being at very low risk. Surface water risk in the high risk event is present within the drainage ditch in the east of the site. There are some small areas of scattered surface water ponding across the site in the medium and low risk events.
- The modelled high risk surface water event plus climate change outputs indicate a similar risk to the present day medium risk event. Safe access and escape routes should site be achievable via Wallend Road to the south of the site in all events.
- The drainage ditch should be kept in place and remain unobstructed. The ditch should be maintained and included within the landscaping design of the development.
- The Groundwater Emergence Map (Figure 4-1) indicates that ground conditions may be suitable for infiltration SuDS. This should be further explored through appropriate ground survey as part of the FRA and drainage strategy.
- Assessment of the current drainage system in place should be carried out to ascertain any current capacity issues and whether the current system could

accommodate the proposed residential development or whether further capacity will be required.

- 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. This will require surface water modelling based on layout plans and detailed design and full consultation with 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 or evidence.

203 Risk from groundwater

Risk from groundwater sources 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 Guide¹²⁵. Figure 4-1 shows the map for Site 19P330 and the surrounding areas and Table 185-1 explains the risk classifications.

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



Figure 203-1: JBA 5m Groundwater Emergence Map

¹²⁵ [Strategic flood risk assessment good practice guide. ADEPT. December 2021.](#)

Table 203-1: Groundwater Flood 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.	

204 Overall site assessment

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

This site is not required to pass part b) of the of the exception test¹²⁶ 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.

204.2 Recommendation summary, FRA requirements and further work

Based on the evidence presented in the Level 1 SFRA (2025) and this Level 2 SFRA:

- There is residual risk to the site from a breach of the embankment to the west of the site. Depths and hazards in the area at risk are significant. Were this site to be developed, appropriate emergency and evacuation plans must be in place to deal with potential residual risk of infrastructure blockage and failure.
- Early discussions should take place between the local authority and the EA with regards to the defence infrastructure and subsequent options for site development.
- The defences are owned and maintained by the local authority. The local authority should therefore be in a position to advise on funding and maintenance arrangements for these defences into the future.
- The drainage ditch within the east of the site should be kept in place and remain unobstructed. The ditch should be maintained and included within the landscaping design of the development. This should be reviewed as part of a detailed drainage strategy for the site.
- The use of infiltration SuDS should be investigated.
- Based on the evidence within this SFRA, it should be appropriate to develop this site for less vulnerable uses if appropriate resilience measures are put in place. The area at risk could be converted to open space and used as a multifunctional greenspace for flood storage, amenity use and to provide environmental / ecological benefits. Safe access and escape routes must be available at times of flood.
- Any FRA must further consider surface water flood risk including a detailed drainage strategy which should include ground investigation for infiltration SuDS suitability.
- Any FRA should undertake a condition assessment of the embankment to the west of the site.
- Any FRA should be carried out in line with the NPPF; FRCC-PPG; EA guidance; Central Lancashire Local Plan and LLFA policies; and national and local SuDS policy and guidelines.

126 Para 178 National Planning Policy Framework 2024

- Throughout the FRA process, consultation should be carried out with the following, where applicable, the LPA; LLFA; emergency planning officers; EA; UU; the highways authorities; and the emergency services.

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