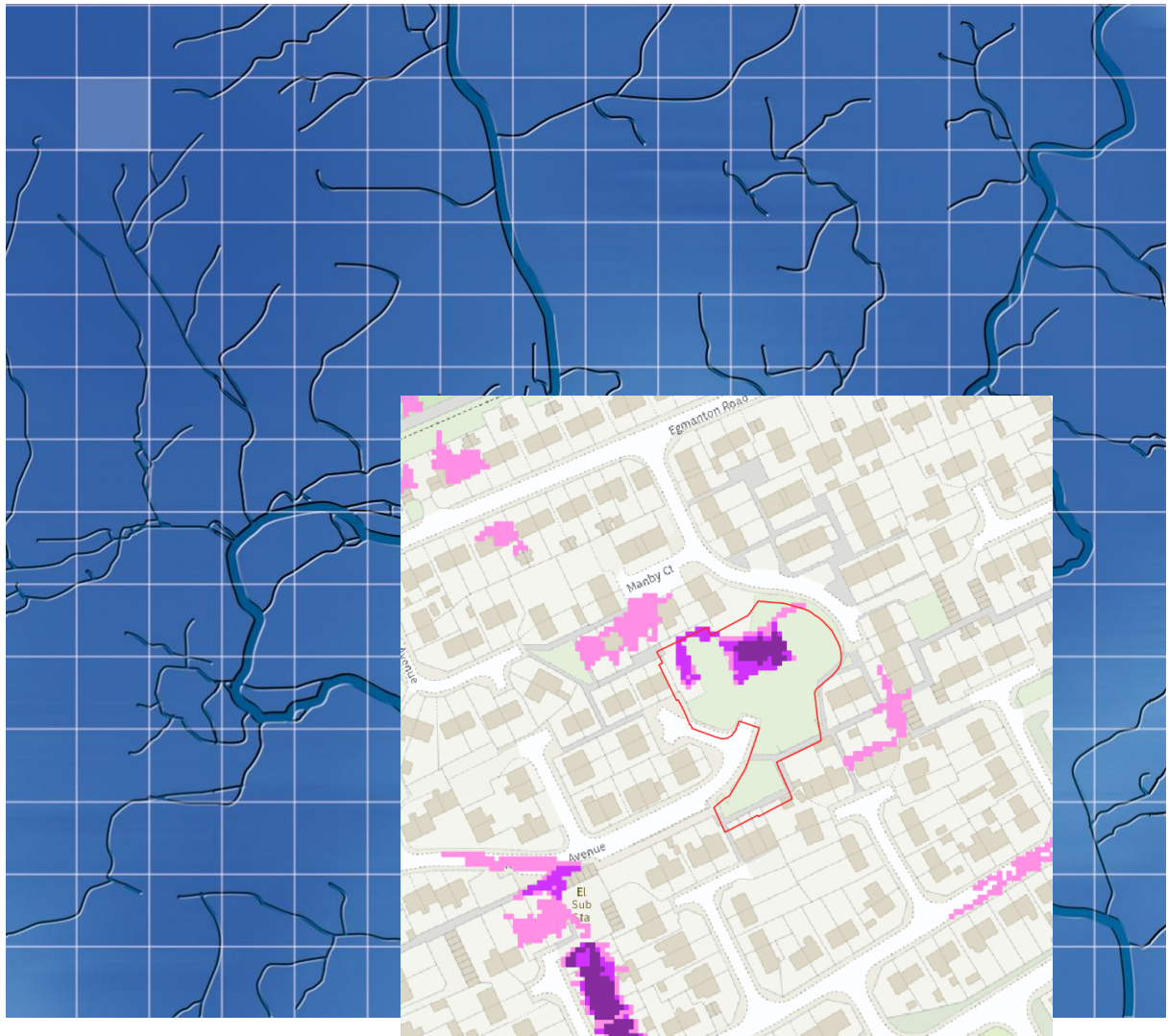


Mansfield District Council

August 2026

Appendix 1 Shirland Drive Boiler House Level 2 Strategic Flood Risk Assessment



Mansfield District Council

Shirland Drive Boiler House

Level 2 Strategic Flood Risk Assessment

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WHS10323

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For and on behalf of Wallingford HydroSolutions Ltd.

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Shirland Drive Boiler House Level 2 SFRA

Flood Risk Overview

Fluvial Flood Risk	L
Pluvial Flood Risk	L
Other Sources of Flood Risk	M
Confidence in Assessment	M

Flood Risk

The site is located within Flood Zone 1 and is at low risk of fluvial flooding. It is also located outside the pluvial flood extents; however, the main access/egress route is at significant risk during a design 1.0% AEP +CC pluvial event. This flood risk is primarily associated with surface runoff being channelled along Sawley Drive.

The Flood Map for Planning Surface Water Spatial Planning depth data shows depths range between < 150 mm and 600 mm along the main access route to the site.

The risk of fluvial flooding is considered to be low as entire site is within Flood Zone 1.

The risk from other sources of flooding is considered to be moderate due to the potential for groundwater flooding.

The overall confidence in the assessment is moderate. This is based on the fact that the EA's latest national scale modelling has informed the assessment of surface water flood risk. Detailed modelling may be required to better understand flood risk to the access routes to/from the site.

Conclusions and Recommendations

The development proposed is residential and categorised as *More Vulnerable Development*. All infrastructure at this site will be within Flood Zone 1 with low risk of fluvial flooding to people and property.

The site also lies outside the surface water flood extents; however, access routes to and from the site are at risk of surface water flooding. Development is already established in the area, and the overall flood hazard is expected to be manageable, given the limited flood depths across most locations and the low flow velocities anticipated. Nevertheless, a site-specific FRA will be required to assess the flood hazard, depth and speed of onset along the access routes in greater detail, and to demonstrate that safe access and egress can be maintained. This assessment may need to be supported by detailed pluvial flood modelling.

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1 Introduction

1.1 Background

Wallingford HydroSolutions Ltd has been commissioned by Mansfield District Council (MDC) to undertake a Level 2 Strategic Flood Risk Assessment (SFRA) at Shirland Drive Boiler House, in accordance with the National Planning Policy Framework (NPPF)¹, Planning Practice Guidance (PPG)² and associated guidance from the Environment Agency (EA)³.

Where there is a risk of flooding at the site, this risk has been quantified with the latest available datasets and any associated limitations with the assessment have been identified.

Where applicable, recommendations for improving our understanding of flood risk and/or mitigating the risk has also been included in this report.

1.2 Assessment of Flood Risk

For the site, a detailed assessment of the nature of flood hazard was undertaken. This included using the relevant fluvial modelling data to assess:

- The proportion of the site inundated for a range of return periods
- The speed of onset
- Flood depth
- Flood velocity
- Flood Hazard

The site is assessed against a range of return periods, however the design event, the 100-year (plus central climate change) event, was considered most important for planning purposes.

In addition to the analysis of modelling data, the location, standard and condition of existing flood defences was assessed. Other sources of flooding were also reviewed at the site. This included an assessment of surface water flooding and an assessment of groundwater flooding based on available hydrogeological information from BGS and SoilScapes. Potential access/egress routes were identified with respect to the risk posed from all sources of flooding.

Following a review of flood risk, flood defences and access/egress routes, an assessment was made on whether a future site-specific FRA would be able to show that the site can be allocated for development. The assessment takes into account the flood risk vulnerability of the development, the scale of development proposed along with any requirements for the Exception Test. In this context, any mitigative actions in the form of ground raising and compensatory storage are identified.

The site assessment also includes guidance for the preparation of FRAs, including information about the use of SuDS.

¹ Ministry of Housing Communities & Local government (2024) National Planning Policy Framework https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf

² UK Government (2025) Planning practice guidance- Flood risk and coastal change <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

³ Environment Agency (2026) <https://www.gov.uk/guidance/how-to-prepare-a-strategic-flood-risk-assessment>

1.3 Report Structure

This FRA follows the structure summarised below:

- 1 - Introduction (this section)
- 2 - Site Description
- 3 - Flood Risk
- 4 – Detailed Review of Primary Flood Risk
- 5 – Development Viability and FRA Recommendations

2 Site Description

2.1 General Location Plan

Shirland Drive Boiler House is a 0.20 ha brownfield site located within an established mixed use area northwest of Mansfield town centre, see Figure 1. The site is surrounded by hardstanding areas (tarmac/concrete access) and associated buildings.

The site is a proposed allocation for residential development in the emerging Local Plan review, with a capacity for 7 dwellings.

2.2 Topography

Based on 1m LiDAR data the site slopes south-easterly with ground levels ranging between 125.5 m AOD and 128.4 m AOD, see Figure 2. The average ground level is 127.2 m AOD.

2.3 Nearby Watercourses

The closest water features to site are a balancing pond approximately 70 m southwest and a settling pond approximately 300m east of the site. There are also ponds within the Ratcher Hill Quarry approximately 500 m east of the site. The closest main watercourse is the River Maun approximately 3 km northwest of the site.

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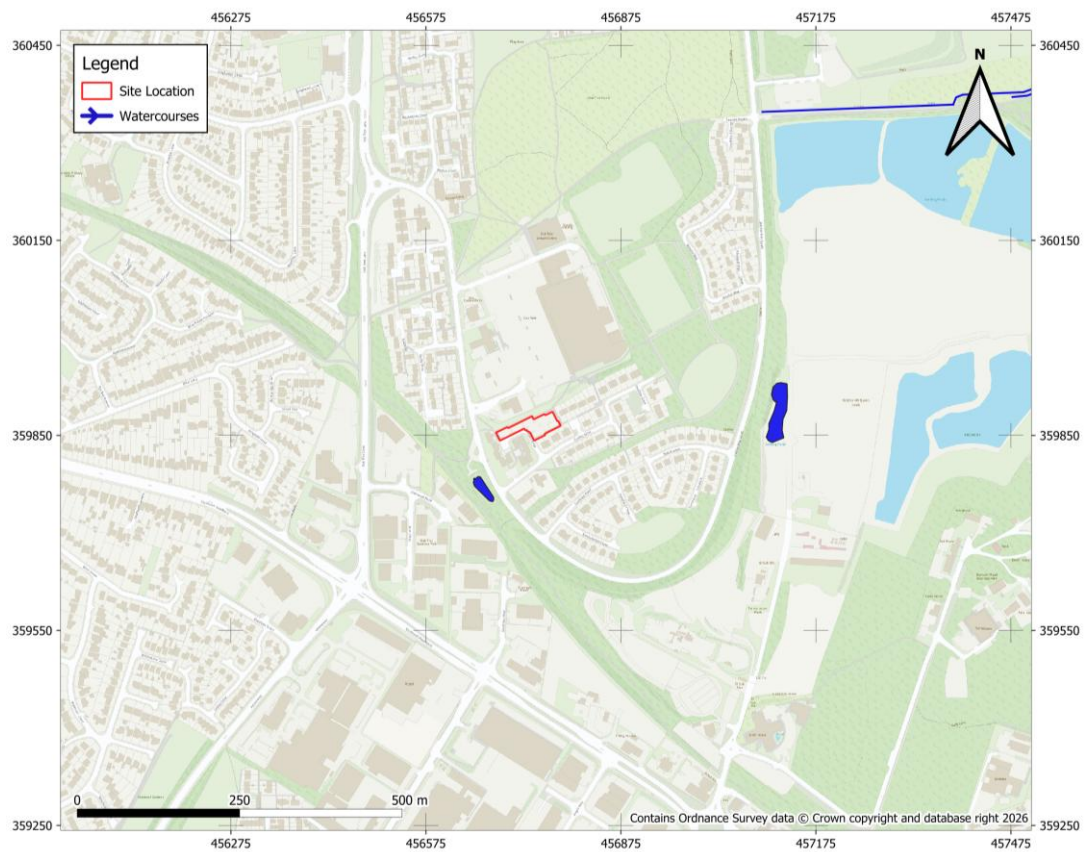


Figure 1 - Site Location

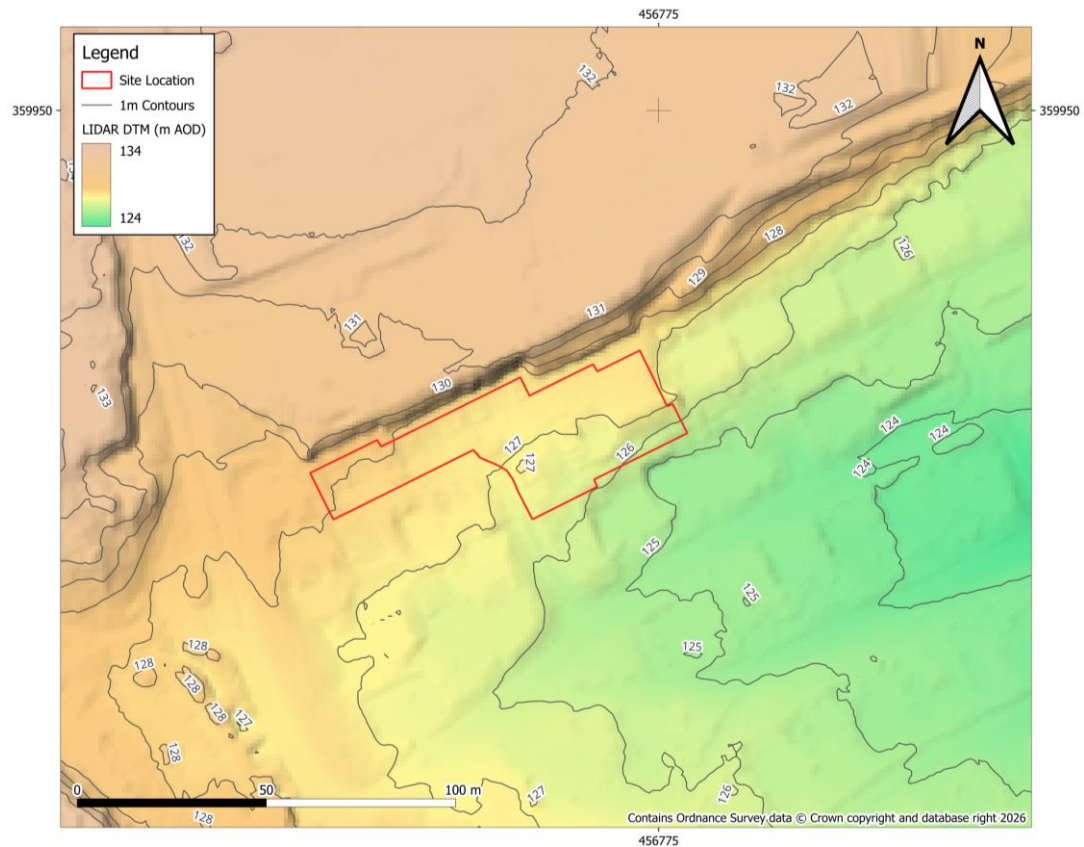


Figure 2 – Topography

3 Flood Risk

3.1 Historical Flooding

The EA hold no records of historic flooding at the site. The nearest recorded flood event occurred in approximately 3 km northwest of the site in January 1947 and 1977, both from the River Maun exceeding its channel capacity.

3.2 Fluvial Flood Risk

In the EA Flood Map for Planning (FMfP), the entire site is located within Flood Zone 1, defined as land having a less than 0.1% annual chance of flooding, see Figure 3.

When considering an allowance for climate change, no changes are shown in the extent of inundation within the site, Figure 4.

Fluvial flood risk is considered to be low and no further assessment is required.

3.3 Flood Defence Infrastructure

There are no formal flood defences in the vicinity of the site nor is it located within a flood storage area.

3.4 Surface Water Flood Risk

The EA's surface water flood maps show that the site is not at risk of pluvial flooding for present-day conditions, see Figure 5.

When accounting for climate change impacts, the site remains outside the mapped pluvial flood extents, see Figure 6.

Although the main site is located outside the present-day and climate change pluvial flood extents, flooding is indicated adjacent to the southern and eastern boundaries. It is also present along the Sawley Drive which serves as the primary access route to the site during the 3.3% AEP, 1.0% AEP and 0.1% AEP events. For these reasons it is assessed in more detail in section 4.

3.5 Groundwater Flooding

The site is entirely underlain by bedrock deposits of the Chester Formation comprised of sandstone. It is classed as a highly productive principal aquifer with significant intergranular flow. The overlying soils are freely draining slightly acid sandy soils.

Based on the underlying site geology and hydrogeology, the overall risk of groundwater flooding is considered moderate. The geology underlying the site could lead to a mobile water table and groundwater emergence. A geotechnical assessment is recommended at the planning stage to confirm the level of risk from groundwater flooding.

3.6 Reservoir Flood Risk

The EA's reservoir flood map shows the site is not at risk under either the Wet-Day or Dry-Day scenario, see Figure 7.

3.7 Flood Warning Service

The site is not located within an EA Flood Warning Area.

Shirland Drive Boiler House Level 2 SFRA

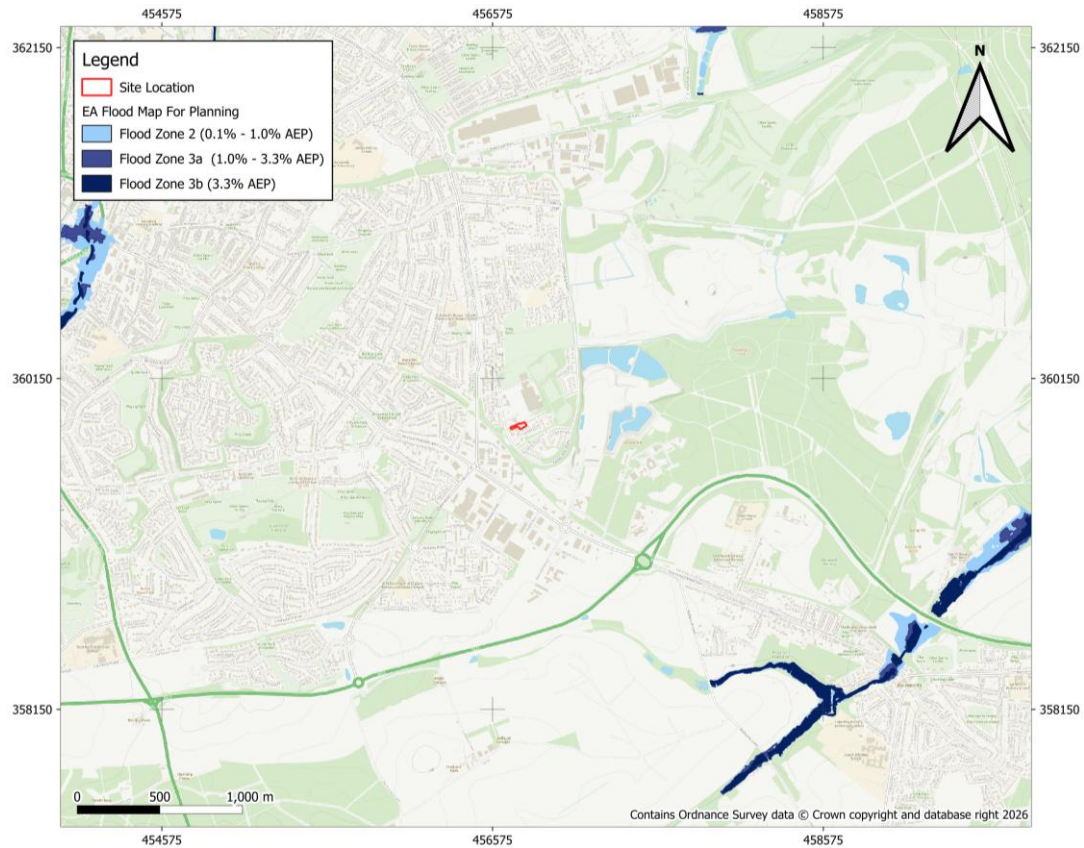


Figure 3 - Fluvial Flood Map

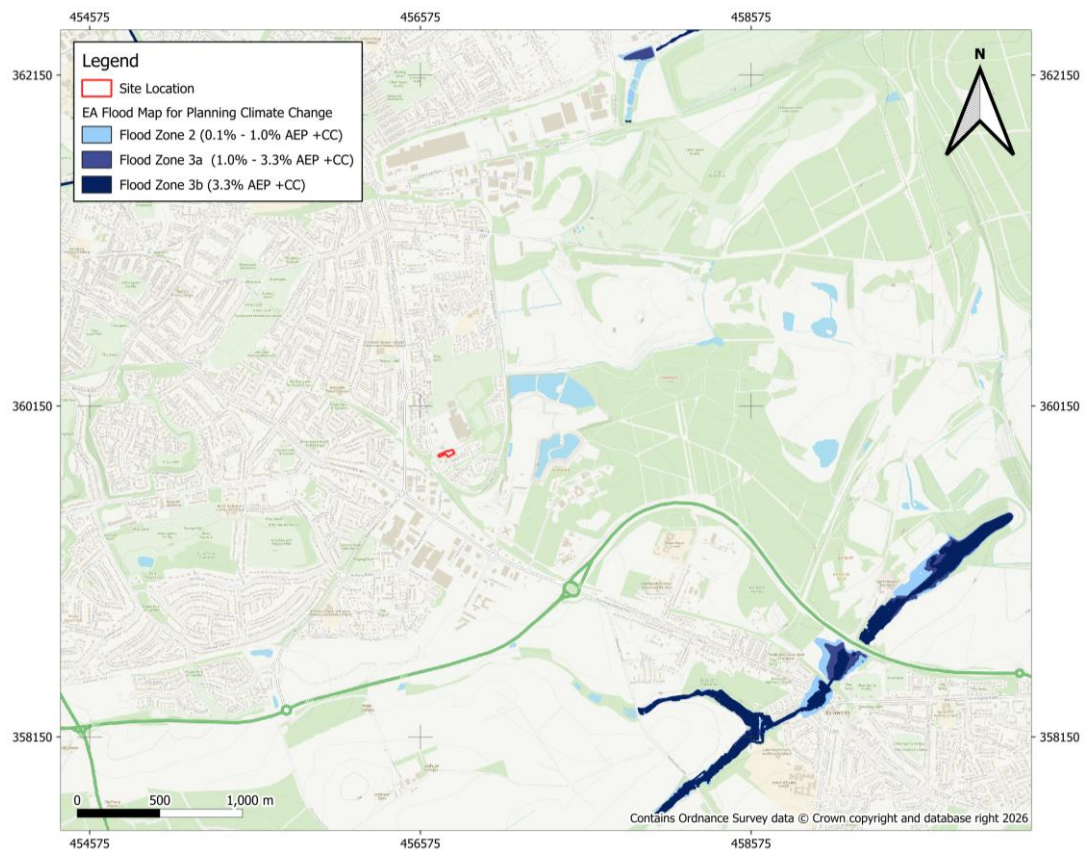


Figure 4 - Fluvial Climate Change Flood Map



Figure 5 – Surface Water Flood Map



Figure 6 -Surface Water Climate Change Flood Map

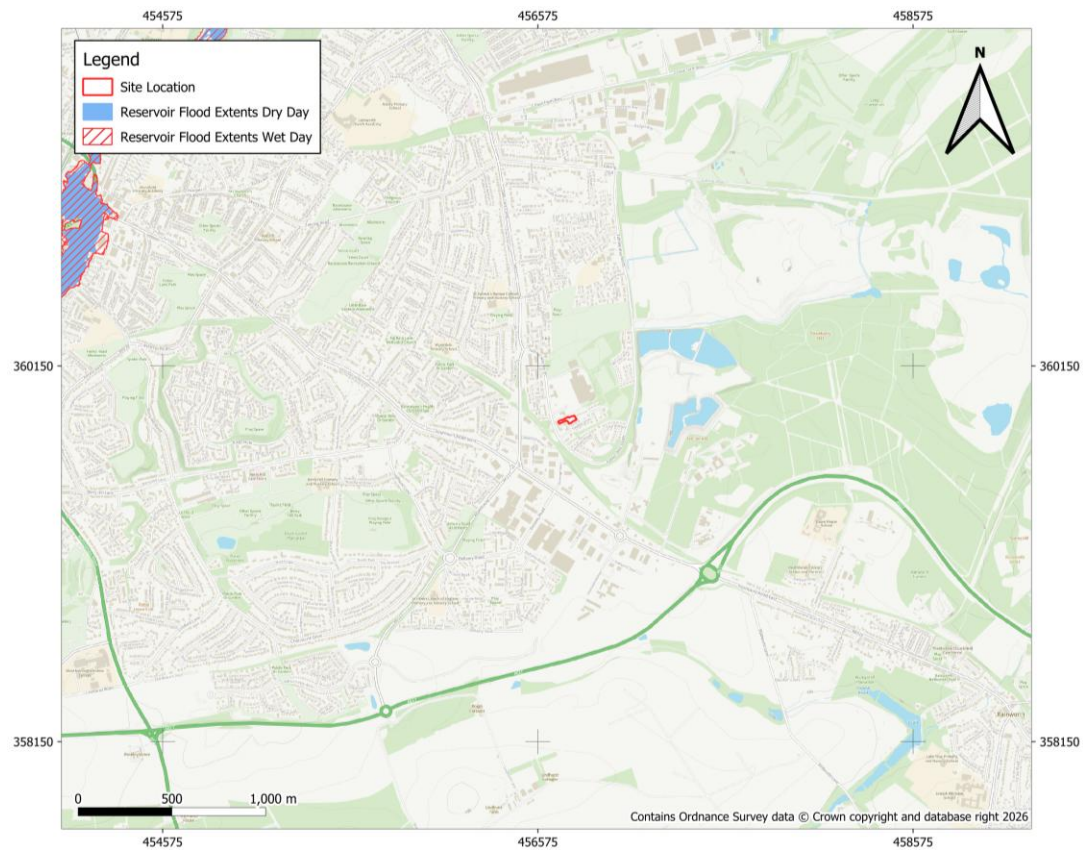


Figure 7 - Reservoir Failure Flood Map

4 Detailed Review of Primary Flood Risk

4.1 Primary Flood Risk

Although the main site is not at risk of flooding, significant pluvial flooding is indicated along the primary access route. Flooding is also present adjacent to the southern and eastern site boundaries. These risks are assessed in more detail below.

4.2 Flood Risk Metrics

The FMfP Surface Water Spatial Extents depth data for the 100-yr plus climate change design event was assessed for more details on surface water flooding. It applies an Upper End allowance for the 2070s epoch, which is appropriate to support long-term planning and development. During this event, the site is flood free; however, flood risk is indicated adjacent to the southern and eastern site boundaries. The mapped flood extents result from overland flow paths along roads close to the site, see Figure 8.

Flood depths within the flooded areas, including the primary access route to the site (Sawley Drive), generally range between < 150 mm and 300 mm with isolated areas reaching 300-600 mm. Flow velocities are expected to be low (< 0.5 m/s) given the limited range of levels in the areas inundated and across the wider area.

4.3 Access and Egress

The main access and egress route will be via Shirland Drive, which connects onto Swaley Drive before joining the main Jubilee Way South (A6117) road. During an extreme pluvial flood (0.1% AEP + CC), this route is at risk, flood depths are generally <150mm to 300mm, however do reach up to 600 mm in some isolated areas, see Figure 9.

This access route is located within fluvial Flood Zone 1, i.e., is at low-risk flooding from the river.

A site-specific FRA should assess the provisions for safe access/egress at the site in more detail once the final site layout is known. It should assess nature of the flood risk to determine how quickly it occurs and the degree of hazard. Pluvial modelling may be required to inform this.

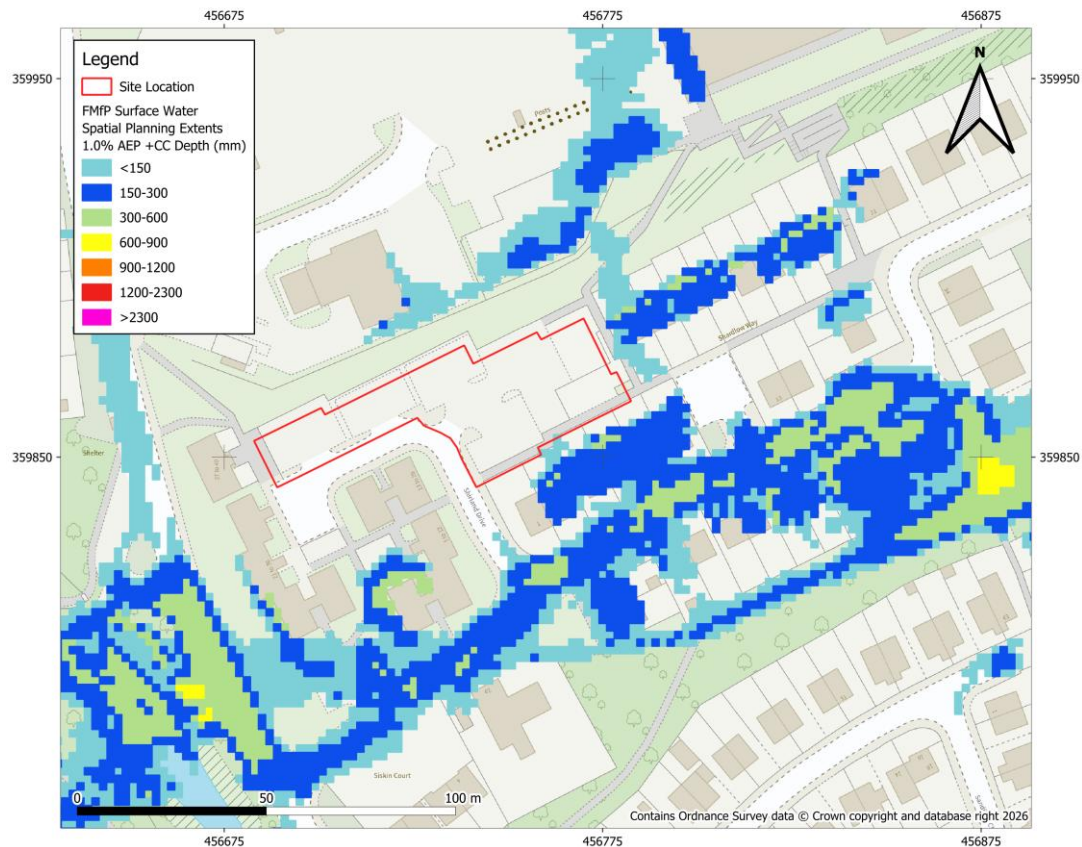


Figure 8 - FMfP Surface Water Spatial Extents - 1.0% AEP + CC Depth

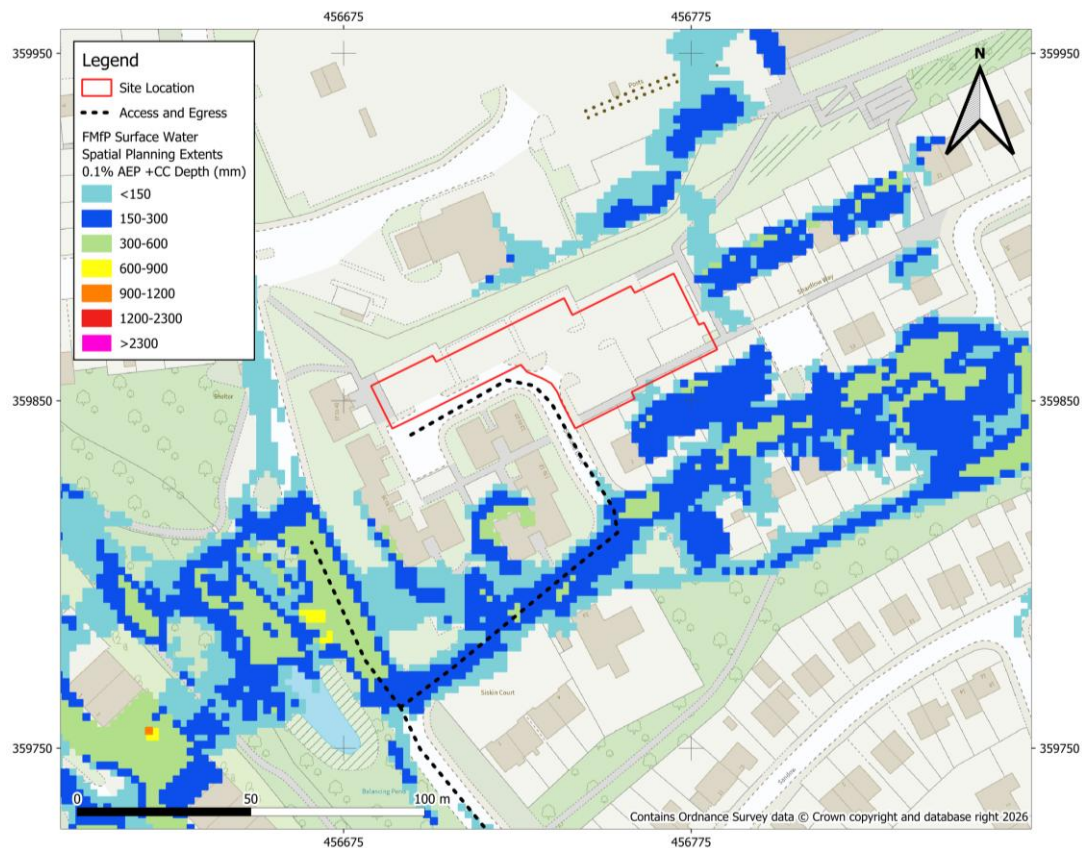


Figure 9 - Access and Egress Routes

5 Development Viability and FRA recommendations

5.1 Development Categorisation

The development proposed is residential and categorised as *More Vulnerable Development*. All infrastructure at this site will be within Flood Zone 1 with low risk of fluvial flooding to people and property.

The site also lies outside the surface water flood extents; however, access routes to and from the site are at risk of surface water flooding. Development is already established in the area, and the overall flood hazard is expected to be manageable, given the limited flood depths across most locations and the low flow velocities anticipated. Nevertheless, a site-specific FRA will be required to assess the flood hazard, depth and speed of onset along the access routes in greater detail, and to demonstrate that safe access and egress can be maintained. This assessment may need to be supported by detailed pluvial flood modelling.

5.2 Scale of Development

The total site area is 0.2 ha, allocated for 7 dwellings. Assuming medium density housing (35 dwellings per hectare) 7 dwellings would require approximately 0.2 ha of land.

As the entire site is located within Flood Zone 1 and is outside the pluvial flood extents, the scale of development should be possible.

5.3 Sequential Approach

As the entire site is located within Flood Zone 1 and outside of the surface water flood extents, development should be possible throughout the site. A sequential approach may be required for access, ensuring that dwellings are in locations allowing for site occupants to quickly utilise safe access routes.

5.4 Other Site-Specific Considerations

Whilst this SFRA report has reviewed surface water flood risk, a site-specific FRA should consider in more detail how quickly it occurs, the degree of hazard and its overall impact on access considering the final layout. As only national scale modelling is available at the site, detailed modelling may be required as part of a site-specific FRA to accurately determine flood depths, hazard ratings, and safe access and egress arrangements.

The drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that surface water flood risk at the site and to third party land is not increased. In assessing and demonstrating the viability of any drainage solution for the site, a site-specific FRA should follow the national standards for SuDS and any relevant Local Authority Local Plan policies. The geology at the site is likely to be permeable and such infiltration SuDS solutions are likely to be appropriate; however, this should be confirmed through further geotechnical investigation. Attenuated discharge to a watercourse or a sewer may also need consideration as part of the development's drainage design.