

Ref	SPS5
Primary Flood Zone	Flood Zone 1
Vulnerability Classification	Less vulnerable

Site Details

Site Location:	X:	451862	Address: Oxford Science Park, OX4 4GA
	Y:	204066	
Site Area:	27.1 ha		Additional Information: The site is an existing development- the Oxford Science Park. Land use is predominantly impermeable with some open spaces and ponds. It comprises a larger western site (23.2 ha) and a smaller eastern site (3.3 ha).
Proposed Function:	Employment		
Ground Level Range (m AOD):	Western Site- 55.877m-67.593m Eastern Site- 57.716m-60.926m		

Fluvial Flood Risk

	1 in 100 Yr (+26%)	1 in 100 Yr (+84% CC)
Percentage Inundated (%)	12%	22%
Average Flood Depth (m)	Western Site- 0.70m (Max-2.39m) Eastern Site- 0.25m (Max-0.58m)	Western Site- 0.84m (Max-2.77m) Eastern Site- 0.39m (Max-0.94m)
Average Velocity (m/s)	Western Site- 0.18m/s (Max-1.43m/s) Eastern Site- 0.15m/s (Max-0.55m/s)	Western Site- 0.25m/s (Max-1.72m/s) Eastern Site- 0.16m/s (Max-0.65m/s)
Speed of Onset (hrs)	<1 hrs	<1 hrs

Summary: The site is at moderate risk of fluvial flooding. Whilst the majority of the site is in Flood Zone 1 the Littlemore Brook runs through the site and a significant proportion of the site near the watercourse lies within Flood Zone 2. Some of the site is also within Flood Zones 3a and 3b (see fluvial flood map overpage). When accounting for climate change, for the design 100-year (+26% climate change) event, 12% of the site is modelled to be inundated. The hazard map for this event (see hazard maps) shows the hazard rating to be high especially close to the river channel (*Danger for most*) indicating significant flood depths and velocities. The extent and hazard are greater for the extreme climate change scenario, however given the proposed development type this scenario should not be relevant. The fluvial flood risk is generally greater at the larger western site.

Defence Infrastructure

Description:	There is some minor bank protection along the Littlemore Brook within the western site. This is not considered to have significant impact on flooding at site.
Owner:	Unknown
Standard of Protection:	Unknown
Condition:	Unknown

Potential Access & Egress Route: Access/Egress from the site is possible via Grenoble Rd. Subsequent travel would likely be along the A4074(see access/egress map overpage).

Flood Risk: The route is predominantly flood-free although there is a small section of the route near the eastern site that lies in Flood Zone 2. Flood hazard along this section is generally low and would have no impact on the larger western site. There are potential issues with access on the western site if development is to be located north of the Littlemore Brook. This area is at significant flood risk and a railway embankment prevents a clear access route to this location during an extreme flood event. Speed of onset values at the site are also fast due to its location adjacent to the Littlemore Brook. For most of the site in flood zone 1 this should not be a significant issue as safe refuge onsite will be possible during an extreme flood event, however for at risk areas particularly in the north of the site early warning will be essential.

Pluvial & Other Sources of Flood Risk

The risk of pluvial flooding has been assessed using the EA surface water flood maps (see pluvial flood map overpage). Parts of the site are shown to be at medium to high risk of pluvial flooding. In most of these areas the principal flood mechanism is thought to be fluvial. The flood maps use a DTM to simulate runoff, meaning that water gravitates to low points, such as streams. The flooding appears to originate from the Littlemore Brook and shows similar extents to the fluvial flood map. Where flooding is considered to be pluvial in origin, it is predominantly limited to the road network to the south of the site which could have implications upon access.

The underlying geology at the site comprises freely draining slightly acid loamy soils underlain by sedimentary bedrock in the form of Sandstone. In this regard, the water table is likely to be mobile and groundwater flood risk is considered to be moderate.

The EA's Flood Risk from Reservoirs Map shows no risk of reservoir flooding at the site and based on the LLFA's flood incident data, there have been no recent historical flood incidents recorded close to the site.

FRA Implications, SuDS & Exception Test

Hydraulic modelling of the Littlemore Brook and Northfield Brook has indicated that the site is at moderate risk of fluvial flooding. Most of the site lies within Flood Zone 1, however there is a significant proportion of the site within Flood Zone 2 and Flood Zones 3a and 3b (particularly in the western site). Employment (less vulnerable) infrastructure is proposed at the site. This is permissible within Flood Zones 2 and 3a. It is not permissible in Flood Zone 3b under any circumstances. When accounting for climate change, 12% of the site is at risk during the design defended 100-year (+26% Climate change) event.

The site's access route is largely flood free for the fluvial events assessed. However, as speed of onset values are very fast at the site, adequate flood warning will be vital particularly in the north of the western site to ensure that the route can be utilised in an extreme flood event. A site-specific FRA should look into this in more detail.

The pluvial flood risk at the site is considered to be low, the flooding shown by the EA surface water flood maps appears to be mostly fluvial in origin. Several roads to the south of the site and parts of the identified access route are shown to be at pluvial risk. A site-specific FRA should consider in more detail the nature of the flood risk to determine how quickly it occurs and the degree of hazard on site. The drainage strategy for the proposed development should be suitably designed to manage additional runoff arising from the development and ensure that pluvial flood risk at the site and to third party land is not increased.

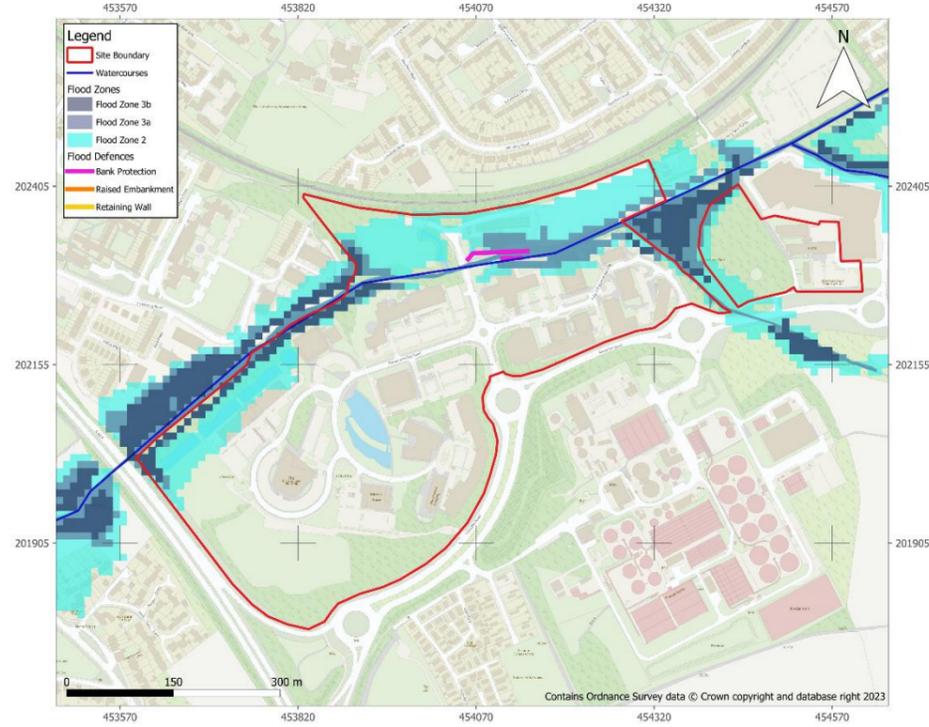
In assessing and demonstrating the viability of any SuDS solution for the site, a site-specific FRA should follow the Non-statutory technical standards for SuDS. The geology at the site consists of freely draining slightly acid loamy soils in this regard the use of infiltration SuDS solutions should be explored. It is recommended that a geotechnical investigation is undertaken at this site to obtain further information relating to infiltration rates, this will confirm whether infiltration could be viable in some areas.

Overall, a new employment development at the site should be achievable, with a large proportion of the site lying in Flood Zone 1. It is important that a sequential approach is implemented at the site, prioritising development in Flood Zone 1 and Flood Zone 2 where possible, with ancillary infrastructure (i.e., car parks) located in Flood Zone 3a if more space is required. No development (unless water compatible development) is permissible in Flood Zone 3b.

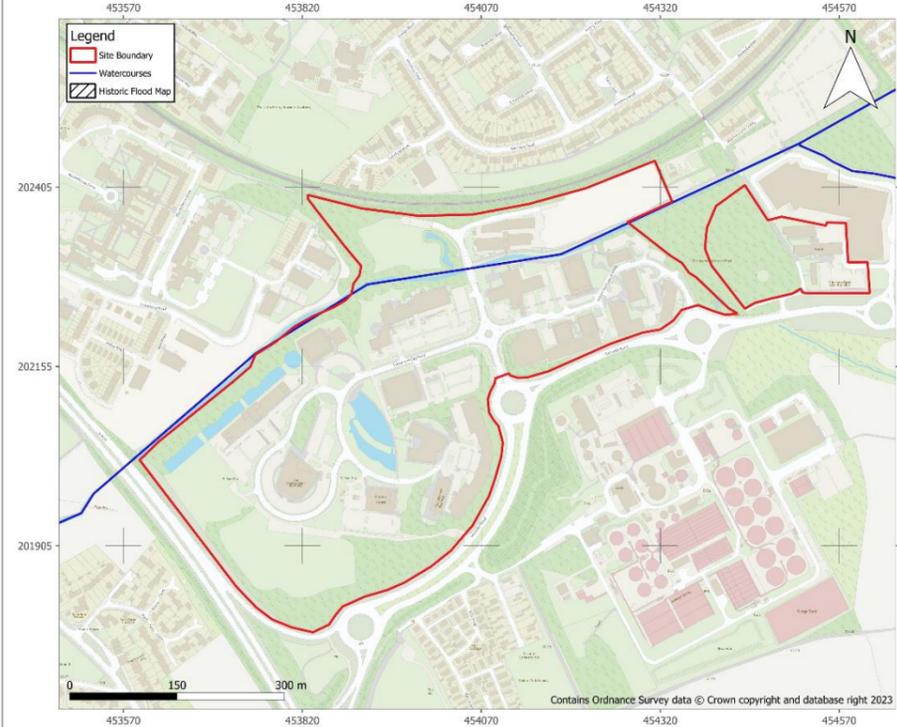
Development may need to be set at a floor level to provide an appropriate freeboard above the flood level for the 100-year (+26% climate change) design event, estimated at 58.76 m AOD for the eastern site and 58.54 m AOD and 58.26 m AOD at the upstream and downstream extent of the Littlemore Brook relative to the western site. The majority of the two sites are higher than these levels, so ground raising should be limited and can be reduced by locating development outside of low-lying areas. A site-specific FRA should confirm any requirements with the EA including the need to provide compensatory storage and assess 3rd party impacts if ground raising is implemented.

Fluvial Hazard	Moderate Risk
Pluvial Hazard	Low Risk
Developable	Proposed development type should be appropriate, a sequential approach to development is advised

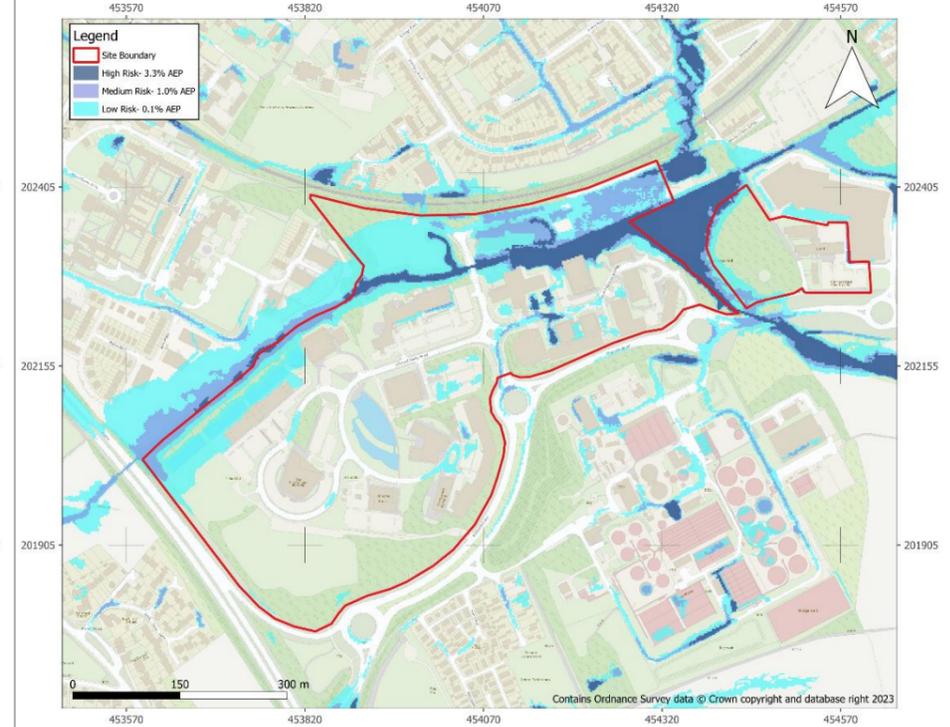
Fluvial Flood Map



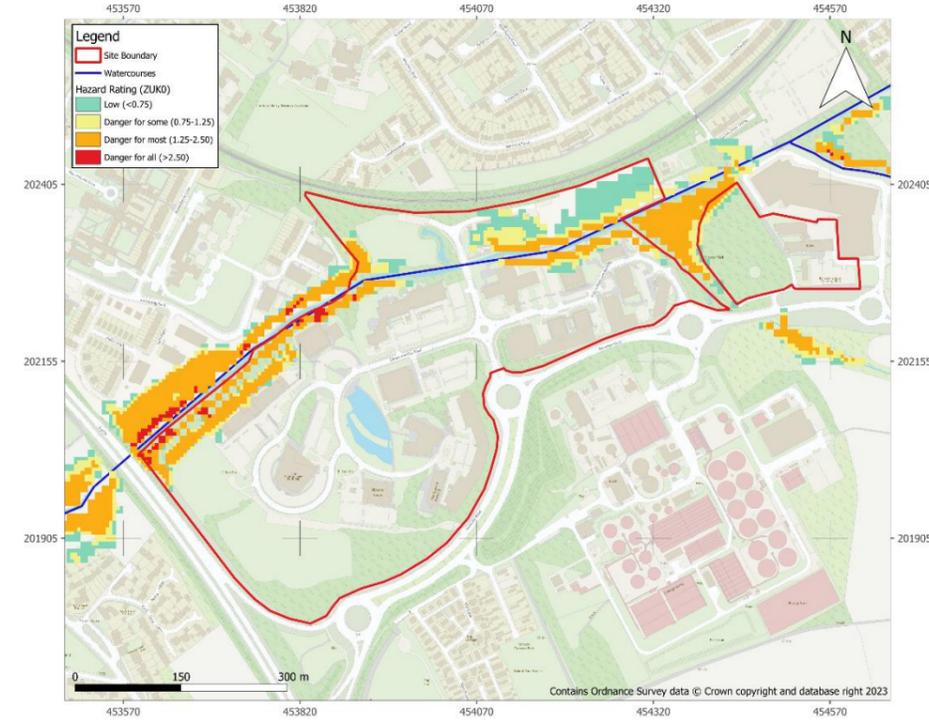
Historical Flood Map



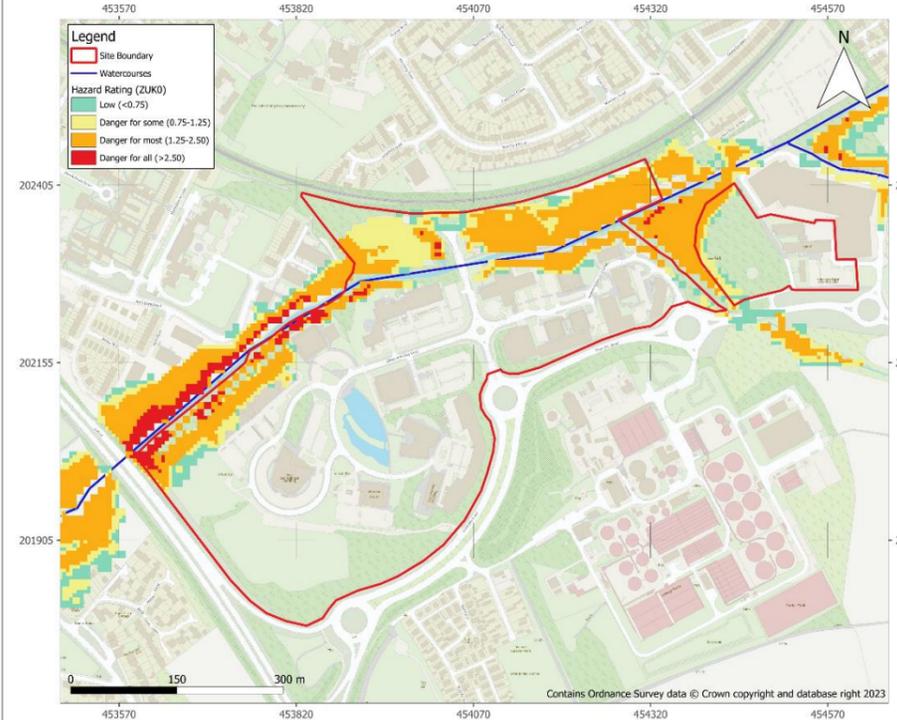
Pluvial Flood Map



Hazard Map (100 Yr + 26% Climate Change)



Hazard Map (100 Yr + 84% Climate Change)



Access/Egress Routes

