

**Greater Norwich
Level 2
Strategic Flood
Risk Assessment
Detailed Site
Summary Tables**



Site details

Site Code	GNLP0608
Address/Grid Ref.	Bridge Farm Field, St Faiths Close/ 610060,318393
Area	1.75ha
Current land use	Greenfield
Proposed land use	Residential

Sources of flood risk

Location of site within catchment
The site is located in the catchment of the River Wensum, approximately 7km upstream of Norwich. The River Wensum is an Environment Agency designated main river and flows in an easterly through Norwich, towards its confluence with the River Yare.

Existing drainage features
The site is located approximately 180m from the river Wensum, on the east bank. The site is directly adjacent to a lake on the northern edge and a second lake on the eastern edge. There are also a number of ordinary watercourses and lakes in the vicinity of the site.

Fluvial

Proportion of site at risk:
FZ3b – 0%
FZ3a – 0%
FZ2 – 0%
FZ1 – 100%

The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).

Available data:
This assessment is based on 1D modelling data. As this site shows very low fluvial risk and topography shows the site to be elevated, 2D modelling wasn't extended to include the site.

Flood characteristics:
The site is not currently at risk of flooding from fluvial sources. The site is sufficiently raised above the adjacent lakes that the entire sight remains dry during even the 0.1% AEP fluvial event.

Coastal and Tidal

The site is not at risk from coastal or tidal flooding.

Surface Water

Proportion of site at risk (RoFfSW):
3.3% AEP – 0%
1% AEP – 0%
0.1% AEP – 3%
 Max depth >0.3m
 Max velocity >0.25m

The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP includes the 3.3% AEP %)

Description of surface water flow paths:

	<p>The site is elevated compared to the surrounding area and is not at risk of surface water flooding during the 3.3% AEP or 1% AEP events. During the 0.1% AEP event there are limited patches of shallow standing water to the south of the site presenting a low hazard level.</p> <p>As this is currently a greenfield site, it is recommended that the developer demonstrate that the change in land use does not increase the risk of surface water flooding on site and to the surrounding area.</p>
Reservoir	The site is not shown to be at risk from reservoir flooding from available online maps.
Groundwater	<p>The Environment Agency Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The following comments can be made about groundwater flood risk:</p> <ul style="list-style-type: none"> The entire site is shown to have between a 50% and 75% susceptibility to groundwater flood emergence. <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage.</p>
Flood history	<p>The Environment Agency's historic flooding and recorded flood outlines dataset does not have any record of historic flooding on the site.</p> <p>The site is located in a postcode area which has previously experienced 4 incidences of sewer flooding (as identified in the Level 1 SFRA).</p>
Flood risk management infrastructure	
Defences	This site is not protected by any formal flood defences.
Residual risk	There is no residual risk to the site from flood risk management structures.
Emergency planning	
Flood warning	The site is not located in an Environment Agency Flood Warning Area, however it is directly adjacent to the Environment Agency's 'The River Wensum from Swanton Morley to Costessey' Flood Warning Area.
Access and egress	There is one main road providing access and egress to the site, Fakenham Road to the south. Access and egress from the site via Fakenham road may be affected by both fluvial and surface water flooding travelling west from the site in all scenarios, however access and egress travelling east remains unaffected even in the most extreme modelled scenarios (0.1% AEP).
Dry islands	The site is not located on a dry island.
Climate change	
Implications for the site	This modelling for the River Wensum at this point is 1D and climate change scenarios were not assessed in this study. Whilst the site is not currently at risk of flooding, due to the site's close proximity to existing flood zones, it is recommended that developers undertake further investigation at the site-specific FRA stage to determine whether the site may be at risk of flooding in the future.
Requirements for drainage control and impact mitigation	
Broad scale assessment of possible SuDS	<ul style="list-style-type: none"> Geology at the site consists of: <ul style="list-style-type: none"> Bedrock – Wroxham Crag Formation - Sand and Gravel. Superficial – Alluvium Deposits - Clay, Silt, Sand and Gravel; Head - Clay, Silt, Sand and Gravel (southern half). Most source control techniques are likely to be suitable. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk both to and from groundwater. Infiltration may be suitable. Mapping suggests a medium risk of groundwater flooding and underlying soils may be permeable. Further site investigation should be carried out to assess potential for drainage by infiltration. If infiltration is suitable it should be avoided in areas where the depth to the water table is <1m. As the site is located within a Source

	<p>Protection Zone, infiltration techniques should only be used where there are suitable levels of treatment although it is possible that infiltration may not be permitted. Additionally, proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.</p> <ul style="list-style-type: none"> • Detention may be feasible provided site slopes are <5% at the location of the detention feature. If the site has contamination or groundwater issues, a liner will be required. • Filtration is probably suitable provided site slopes are <5% and the depth to the water table is >1m. If the site has contamination or groundwater issues, a liner will be required. • All forms of conveyance are likely to be suitable. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. If the site has contamination or groundwater issues, a liner will be required. • Developers should investigate and consider in full all SuDS options and demonstrate that SuDS are not appropriate where they are not implemented. • The site is not designated by the Environment Agency as previously being a landfill site.
<p>Opportunities for wider sustainability benefits and integrated flood risk management</p>	<ul style="list-style-type: none"> • Due to the size and greenfield nature of the site, there are likely to be opportunities to install green infrastructure and preserve existing natural features. This could include features such as rain gardens, wild verges and the preservation of existing mature trees.
<p>NPPF and planning implications</p>	
<p>Exception Test requirements</p>	<ul style="list-style-type: none"> • Given the low risk to the site, the site is likely to be suitable for development with some mitigation. • The site is however in close proximity to existing flood zones and it is recommended that a precautionary approach is taken. Any developer should undertake a site-specific flood risk assessment including- <ul style="list-style-type: none"> ○ surface water modelling to demonstrate that the change in land use does not increase the risk of surface water on the site and to nearby properties ○ 2D modelling including climate change scenarios to demonstrate that the site is not at increased risk of flooding in the future
<p>Requirements and guidance for site-specific Flood Risk Assessment</p>	<p>Flood Risk Assessment:</p> <ul style="list-style-type: none"> • As the site is not located in a Flood Zone, no site-specific Flood Risk Assessment is required at application stage. However, owing to the sites close proximity to existing flood zones it is recommended that a precautionary approach is taken and a site specific flood risk assessment undertaken, including an assessment of future flood risk accounting for climate change. • The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Norwich City Council's Local Plan policies, and the Norfolk County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document. • Consultation with the Local Authority, Lead Local Flood Authority and the Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. Whilst the site is not currently at risk of flooding, no assessment of future flood risk with regard to climate change has been made. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG). • The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates. • Developers should refer to Norfolk County Council's 'Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning Guidance Document' and the Level 1 SFRA

for information on SuDS for guidance on the information required by the LLFA from applicants to enable it to provide responses to planning applications.

Key messages

The development is likely to be able to proceed if:

- A carefully considered and integrated flood resilient and sustainable drainage design is put forward.
- A site specific Flood Risk Assessment demonstrates that the site is not at an increased risk of flooding in the future as a result of climate change, and that the development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties.
- A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates.

Mapping Information

The key datasets used to make planning recommendations regarding this site were the broadscale 2D modelling outputs from the Environment Agency's Flood Map for Planning, River Wensum flood model (only 1D available in this part of the channel), and the Risk of Flooding from Surface Water map. More details regarding data used for this assessment can be found below.

Flood Zones	Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning mapping.
Climate change	Climate change results were not used for this section of the River Wensum in 1D.
Fluvial depth, velocity and hazard mapping	Fluvial depth, hazard and velocity results were unavailable for this part of the River Wensum model.
Surface Water	The Risk of Flooding from Surface Water map has been used to define areas at risk from surface water flooding.
Surface water depth, velocity and hazard mapping	The surface water depth and hazard mapping for the 1 in 1% AEP event is taken Environment Agency's Risk of Flooding from Surface Water mapping.