GHBullard & Associates LLP
Civil and Traffic Engineering Consultants

Proposed Residential Development

Land East of Trowes Lane, Swallowfield, Reading, Berkshire

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

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LIST OF APPENDICES

1. INTRODUCTION

1.1. This flood risk assessment and drainage strategy is being submitted to accompany an Outline planning application for a development comprising up to 79 residential dwellings (Use Class C3) together with access, landscaping and associated infrastructure, with all matters reserved except for access, at land east of Trowes Lane, Swallowfield, Berkshire. A Site location plan is attached in **Appendix A.**

1.2. The report includes a thorough review of commercially available flood risk and Environment Agency (EA) data indicating potential sources of flood risk to the Site.

1.3. The information provided within this report is based on the best available data currently recorded or provided by a third party. The accuracy of this report is therefore not guaranteed and does not obviate the need to make additional appropriate searches, inspections and enquiries.

1.4. The National Planning Policy Framework (NPPF, February 2025), Section 14 (Meeting the challenge of climate change, flooding and coastal change), Paragraph 170 states that:

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere."

1.5. The NPPF recommends the Environment Agency (EA) Flood Maps as a starting point for Flood Risk Assessment. An extract from the EA Flood maps is reproduced in Figure 1.1 below.

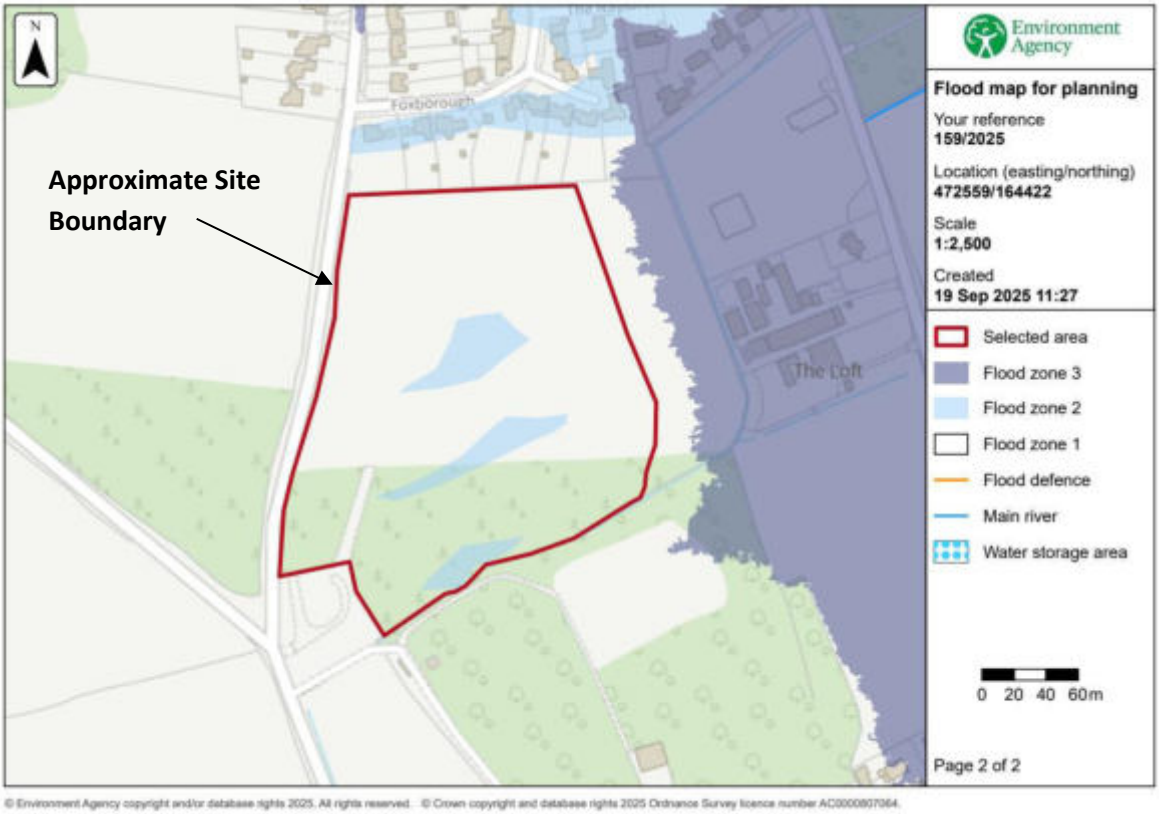


Figure 1.1 – Environment Agency Flood Map (Rivers and Seas)

1.6. The Environment Agency has produced standing guidance for developments dependent on their size and location. As can be seen from Figure 1.1, the Site is located within Flood Zone 1 and 2 with a Low and Medium probability of flooding.

1.7. Industry best practice requires assessment of all flooding sources to be carried out. Despite this document having now been superseded by the NPPF, Figure 3.2 of the "PPS25: Development and Flood Risk" (PPS25) Practice Guide lists five key sources of flooding:

i. Fluvial (refer to Section 5);

ii. Tidal (refer to Section 6);

iii. Pluvial (refer to Section 7);

iv. Groundwater (refer to Section 8); and

v. Infrastructure Failure (refer to Section 9).

2. POLICY CONTEXT

2.1. The purpose of the planning system is to contribute to the achievement of sustainable development – *NPPF, Paragraph 7.*

2.2. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development which does not change the statutory status of the development plan as the starting point for decision making – *NPPF, Paragraph 12.*

2.3. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere – *NPPF, Paragraph 170.*

2.4. The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding from any source – NPPF, Paragraph 174.

2.5. Following the Sequential Test, both elements of the Exception Test will have to be passed for development to be allocated or permitted – *NPPF, Paragraph 179.*

2.6. Current Planning Practice Guidance, issued 17 September 2025, advises the following with regards to the application of the Sequential test in relation to Surface Water flood risk (Paragraph: 027 Reference ID: 7-027-20220825 Revision date: 17 09 2025);

'In applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied.

The absence of a 5-year housing land supply is not a relevant consideration in applying the sequential test for individual applications. However, housing considerations, including housing land supply, may be relevant in the planning balance, alongside the outcome of the sequential test.'

2.7. Wokingham Borough Local Development Framework, Adopted Core Strategy Development Plan Document (Adopted January 2010); Policy CP1 – Sustainable development.

2.8. Wokingham Borough Development Plan, Adopted Managing Development Delivery Local Plan, February 2014; Policy CC01 – Presumption in Favour of Sustainable Development, Policy CC09 – development and Flood Risk (from all sources), Policy CC10 – Sustainable Drainage.

2.9. Wokingham Borough Local Development Framework, Sustainable Design and Construction Supplementary Planning Document Adopted 28 May 2010.

2.10. Wokingham Borough Council, Wokingham Borough Local Plan Update 2023 – 2040 Proposed Submission Plan; Policy SS1- Sustainable development principles, Policy FD1 – Development and flood risk (from all sources), Policy FD2 – Sustainable drainage.

2.11. Wokingham Borough Council, Level 1 Strategic Flood Risk Assessment Final Report May 2023 prepared by JBA Consulting (*Source: Wokingham Borough Council Evidence Studies*).

2.12. Wokingham Borough Council (as lead local flood authority) document Wokingham SuDS Strategy, Guidance on the use of sustainable drainage systems, January 2017, advises on the standards to be used at a local level.

2.13. Environment Agency Flood Risk Assessment guidance.

2.14. DEFRA Guidance - National standards for sustainable drainage systems (SUDS) updated 30 July 2025

2.15. The SuDS Manual (C753) – Ciria Industry Best Practice Guidance 2015.

3. EXISTING SITE INFORMATION

3.1. The Site is located on the south edge of Swallowfield, east of Trowes Lane and is bound by Trowes Lane to the west, residential development (on Foxborough) to the north, further field area with a watercourse beyond to the east, and an access track, areas of woodland, a watercourse and fields to the south. Refer to the Site location plan in **Appendix A**.

3.2. The Site is greenfield with an area of approximately 4.8 ha and comprises an agricultural field with woodland covering the southern area of the Site, with access tracks at the south-west corner. Refer to the drawing in **Appendix B** for the Site layout and topographical levels.

3.3. The Site can be located from the following information:

i. Postcode: RG7 1RW

ii. NG Reference: SU725644

iii. Across the open area of the Site, north of the woodland area, the Site levels range from 45.9m AOD at the south-west corner to 44.7m AOD at the north-east boundary; the area generally slopes to the north and north-east. The levels within the woodland area range from 46.0 m AOD at the south-west corner to 45.2 m AOD with localised high areas. The drawing in **Appendix B** shows the topographic contours and the direction of sloping within the Site area.

3.4. The BGS records describe the geology as:

i. Superficial: River Terrace deposits, 3 – Sand and Gravel (Majority of the Site)
River Terrace deposits, 2 – Sand and Gravel (East Site boundary)

ii. Bedrock: London Clay Formation – Clay, Silt and Sand

3.5. The BGS 1:50,000 scale drift maps (Figure 3.1) show the form of the Superficial deposits.

3.6. The British Geological Survey has borehole records located within the Site area, which are attached in **Appendix C**. The records generally indicate the ground conditions to comprise Topsoil over Clay to around 1.0 - 1.2 m bgl, over Ballast and Clay to approximately 3 m bgl. Groundwater is noted as being at approximately 1.5 to 1.8 m bgl within the west and central area of the Site.

3.7. The Defra Data Services Platform includes Hydrology Data relating to a monitoring Station located at the west Site boundary, a summary of which is attached in **Appendix D**. The monitoring information shows that groundwater levels at the west of the Site have reached a maximum level of 41.1 m AOD since April 2024. Based on the Site topography, this relates to a depth to groundwater of 4.8 m bgl to 3.6m bgl across the Site.

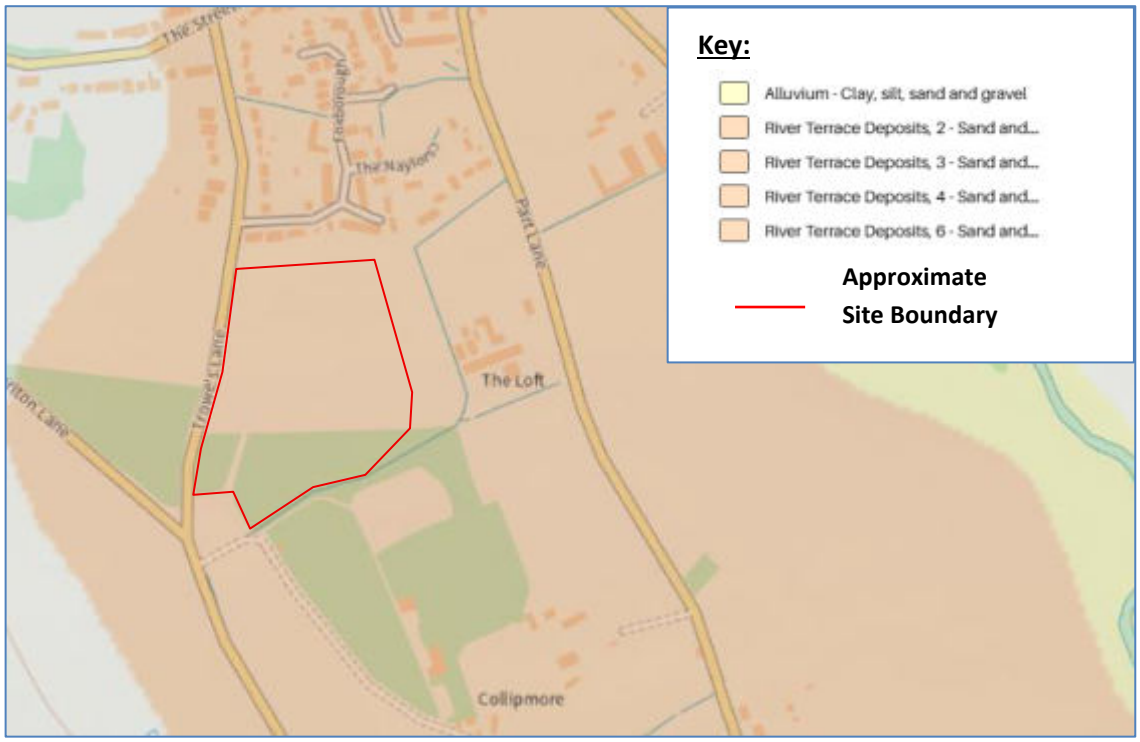


Figure 3.1 - BGS 1:50,000 Superficial Drift Map

3.8. The greenfield runoff rate for the Site area using FEH Statistical Methodology, is assessed as Q_{Bar} = **2.8 l/s/ha**. Refer to the calculation in **Appendix E**.

3.9. The Environment Agency has mapped Source Protection Zones which shows the Site is not located over a source protection zone.

3.10. Environment Agency Aquifer (Bedrock Geology) mapping shows that the Site is located over an Unproductive Aquifer; Unproductive strata are largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them.

3.11. Environment Agency Aquifer (Superficial Drift) mapping shows that the Site is located over a Secondary A aquifer; these comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.

3.12. The Environment Agency has mapped groundwater vulnerability and Figure 3.2 shows the Site is located over a Medium to Low vulnerability aquifer.

3.13. The nearest Main River is a watercourse locally referred to as the Brookside Nursery Ditch located approximately 180m south-east of the Site, which flows to the Whitewater located

approximately 405 south-east of the Site, which flows to the Main Backwater River flowing north. Refer to Figure 3.3 for the watercourse locations.

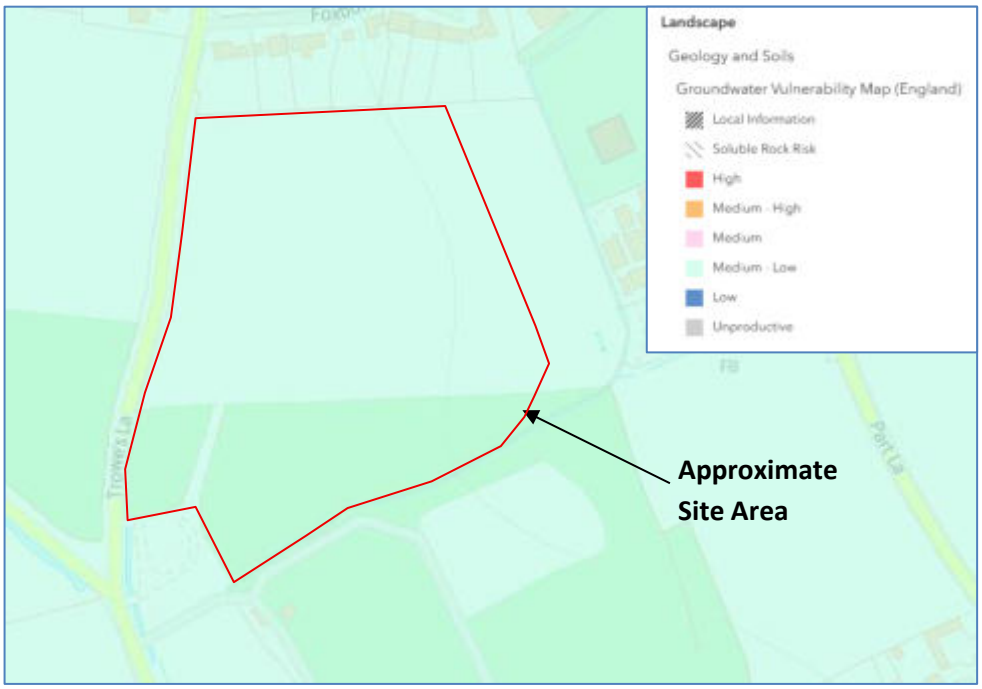


Figure 3.2- Environment Agency Groundwater Vulnerability Zones

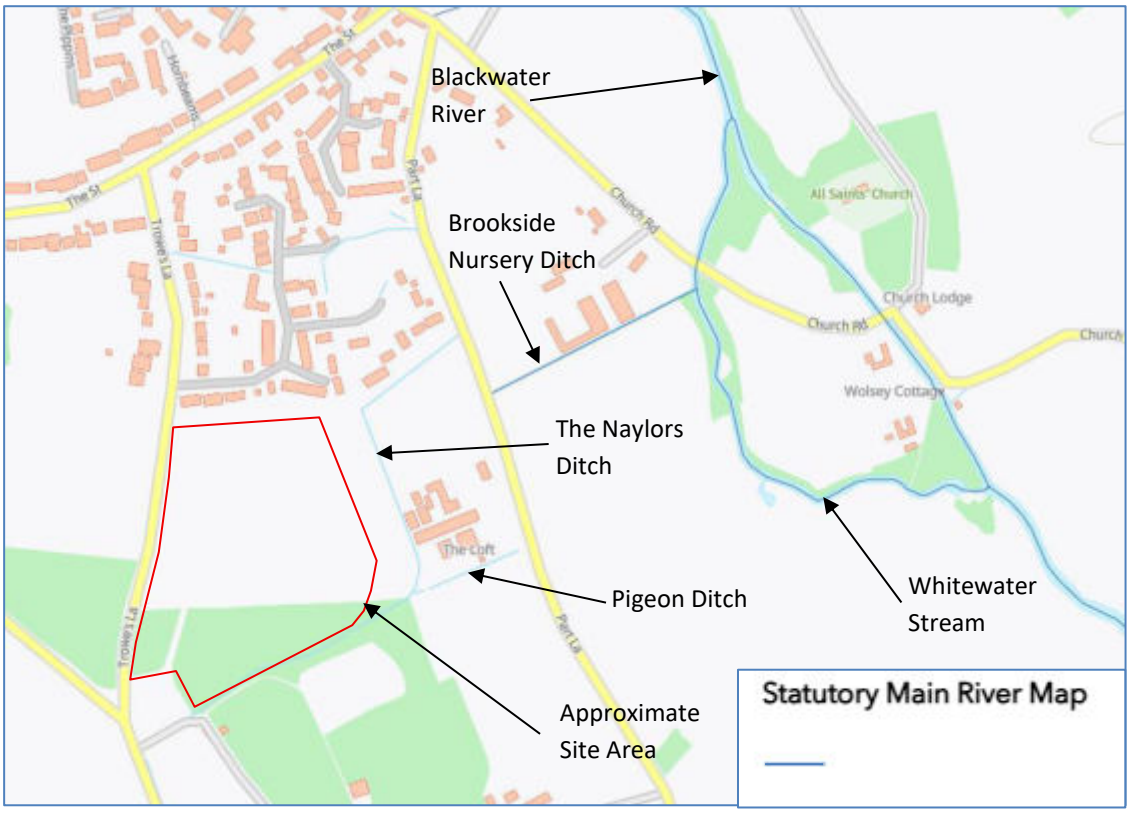


Figure 3.3- Environment Agency Main River Mapping

3.14. The nearest mapped watercourses are located at the west boundary, on both sides of Trowes Lane, and at the south boundary. The watercourses adjacent to Trowes Lane flow north and appear to discharge runoff from Trowes Lane and convey runoff from off-site catchments. The

watercourse at the south, flows east to approximately 60m beyond the Site, from where it appears to turn north-west (becoming The Naylors Ditch), parallel to the Site before turning east and flowing towards Part Lane. Based on information contained within the Winter 2013/2014 Wokingham Borough Council Flood Investigation Report, it is understood that the watercourse is culverted beneath Part Lane, from where it flows south, alongside the road to Brookside Nursey Ditch. There is also a relief ditch locally known as Pigeon Ditch, linked to the watercourse at the south boundary to the east of the Site, located south of Oakleigh Farm. Refer to the drawing in **Appendix B** and Figure 3.3 for the watercourse locations.

3.15. Based on the information in paragraphs 3.4 to 3.6 and the Site topography, the Site area currently drains via very limited surface infiltration and then overland flow towards the watercourse beyond the east boundary. Refer to **Appendix B** for the Site overland flow paths.

3.16. A Thames Water asset plan shows there is a public foul sewer located within Foxborough (road)/Trowes Lane approximately 55m north of the Site. Refer to **Appendix F** for the Thames Water asset plan.

4. PROPOSED DEVELOPMENT

4.1. The planning application is in outline for up to 79 residential dwellings, together with access, landscaping and associated infrastructure, with all matters reserved except access. An illustrative masterplan has been developed to demonstrate how certain aspects of the proposals in more detail. The Land Use Parameter Plan and Illustrative Masterplan Layout is attached in **Appendix G**.

4.2. The residential development is classified as **More Vulnerable**; Buildings used for **dwelling houses**, student halls of residence, drinking establishments, nightclubs and hotels.

4.3. The Environment Agency table (Table 4.1) shows that the development located within Flood Zone 1 does not require the application of the Exception Test.

4.4. The design life of the development is 100 years.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Key:

✓ Exception test is not required

X Development should not be permitted

Table 4.1: Environment Agency Flood Zone/ Classification Table

Sequential test

4.5. The local planning authority (LPA) may require this test to see if there are any reasonably available sites in the area at a lower flood risk on which the development could take place.

4.6. The scope of the sequential test is set by the LPA, unless this Site is allocated within the local development plan.

4.7. This report deals with sequential approach within the proposed Site boundaries.

4.8. Current Planning Practice Guidance, issued 17 September 2025, advises the following with regards to the application of the Sequential test in relation to Surface Water flood risk (Paragraph: 027 Reference ID: 7-027-20220825 Revision date: 17 09 2025);

'In applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied.

The absence of a 5-year housing land supply is not a relevant consideration in applying the sequential test for individual applications. However, housing considerations, including housing land supply, may be relevant in the planning balance, alongside the outcome of the sequential test.'

Climate Change

4.9. The National Planning Policy Framework (NPPF) sets out how the planning system should help to minimise vulnerability and provide resilience to the impacts of climate change.

4.10. The climate change allowances are predictions of anticipated change for:

i. Peak river flow by river basin district

ii. Peak rainfall intensity

iii. Sea level rise

iv. Offshore wind speed and extreme wave height

4.11. The climate change allowances are predictions of anticipated change. The Environment Agency has provided peak rainfall climate change allowances by Management Catchment, which for this Site are summarised in Figure 4.1. In accordance with current Environment Agency guidance, an allowance of 35% and 40% will be used in the design of the drainage strategy for the 3.3% AEP and 1% AEP rainfall events respectfully.

4.12. The Environment Agency has provided peak river flow climate change allowances by Management Catchment, which for this Site are summarised in Figure 4.2. In accordance with current Environment Agency guidance, a central allowance of 14% is applicable to the assessment of the fluvial flood risk, applicable to More Vulnerable development within Flood Zone 2 and 3a.

Figure 4.1: Environment Agency Peak Rainfall Allowances

Figure 4.2: Environment Agency Peak River Flow Allowances

FLOOD RISK ASSESSMENT

5. FLUVIAL FLOODING

5.1. Fluvial flooding is the flooding associated with rivers. This can take the form of:

i. Inundation of floodplains from rivers and watercourses

ii. Inundation of areas outside the floodplain due to influence of bridges, embankments and other features that artificially raise water levels

iii. Overtopping of defences

iv. Breaching of defences

v. Blockages of culverts

vi. Blockages of flood channels or corridors

5.2. Figure 1.1 shows that the Site is located within Flood Zone 1 where the risk of flooding is less than 1 in 1000 (0.1% AEP), with a low probability of flooding. There are localised areas indicated within the Site, remote from nearby watercourses, as Flood Zone 2 where the risk of flooding is 0.1% AEP to 1% AEP, with a medium probability of flooding.

5.3. Flood Level data and information was requested from the Environment Agency (EA), and a copy of their response is attached in **Appendix H**, including a subsequent response to a request for further information. The EA has provided information relating to flood defences, and the modelling output for the

- Loddon (Lower) 2009, dated 1 January 2009 (No defences exist fluvial, no defences exist climate change fluvial)
- Blackwater 2007 – River Blackwater, dated 25 May 2007 (Defended fluvial, defences removed fluvial defended climate change fluvial, defences removed climate change fluvial.

5.4. The modelling shows that the Loddon (Lower) 2009 flood extent does not reach the Site or immediate vicinity. The River Blackwater modelling, shows that in the defended and defences removed scenarios, including for climate change, the flood extent is located beyond the east of the Site boundary, with no flooding indicated within the Site boundary as indicated by the flood map for planning in Figure 1.1. A review of the flood levels associated with the Blackwater 1D model (in channel flow) shows there is no difference in flood levels between the Defended and Defences removed scenario, with flood levels ranging from **44.69 m AOD** (Node 9) to **44.64 m AOD** (Node 4) associated with the 1% AEP plus 20% climate change. It is assumed that the location and level associated with Node 2 is an anomaly in the output based on the provided flood extent mapping. It should be noted that the modelling includes for 20% climate change which is greater than the current guidance allowance of 14%, giving potentially higher flood levels than would be experienced; it was not possible to undertake a stage discharge curve approach to assess the level associated with 14% allowance due to the 1D modelling output data.

5.5. The 1% AEP plus 20% climate change flood level is shown on the drawing in **Appendix B**, with the Site shown to be located to the west of this at a higher ground level.

5.6. A review of the Environment Agency historic flood mapping and flood outline mapping shows flooding within the Site area as indicated by the localised areas of Flood Zone 2 extents in the

Flood Zone Map for Planning (refer to **Appendix I** for the historic and flood outline mapping). The Environment Agency advise that;

'*The Historic Flood Map is a GIS layer showing the maximum extent of individual Recorded Flood Outlines from river, the sea and groundwater springs that meet a set criteria. It shows areas of land that have previously been subject to flooding in England. This excludes flooding from surface water, except in areas where it is impossible to determine whether the source is fluvial or surface water but the dominant source is fluvial*

and;

Recorded Flood Outlines is a GIS layer which shows all our records of historic flooding from rivers, the sea, groundwater and surface water. Each individual Recorded Flood Outline contains a consistent list of information about the recorded flood…….It is also possible that the pattern of flooding in this area has changed and that this area would now flood or not flood under different circumstances.

5.7. Based on the Historic Flood Map, Recorded Flood Outlines, Site topography and the Environment Agency flood modelling output, the Site is considered to be located in Flood Zone 1, presently and in the future. The Flood Zone 2 extent within the Site appears to relate to historic flood extents from other sources of flooding, not indicated by the current modelling.

6. TIDAL FLOODING

6.1. Tidal flooding is a risk of water levels from the sea or an estuary exceeding the normal tidal range. This can take the form of:

i. Overtopping of defences

ii. Breaching of defences

iii. Other flows (fluvial surface water) that could pond due to tide locking

iv. Wave action

6.2. As outlined in 5.2, the Environment Agency Flood Map for Rivers and Seas shows the Site is located within Flood Zone 1, where the likelihood of tidal flooding is less than 0.1% AEP.

6.3. As outlined in 5.3, the EA has provided flood data relating to the Site which is attached in **Appendix H**. The Site is not indicated to be at risk of tidal flooding.

7. PLUVIAL FLOODING

7.1. Pluvial flooding is a risk of overland flows and ponding associated with extreme rainfall events. This can take the form of:

i. Sheet runoff from adjacent land (urban or rural)

ii. Surcharged sewers

7.2. As rain falls everywhere within the United Kingdom, there will always be a residual risk of flooding from extreme rainfall events.

7.3. The Environment Agency has produced long-term flood risk maps with classifications that show the risk of flooding from surface water runoff including for climate change (for the near-term 2050's epoch, central allowance), and this is shown in Figure 7.1. The maps show that the Site is

at a Very Low to High Risk of flooding. The Medium and High flood risk extents are shown on the drawing in **Appendix B** and the Drainage Strategy layout.

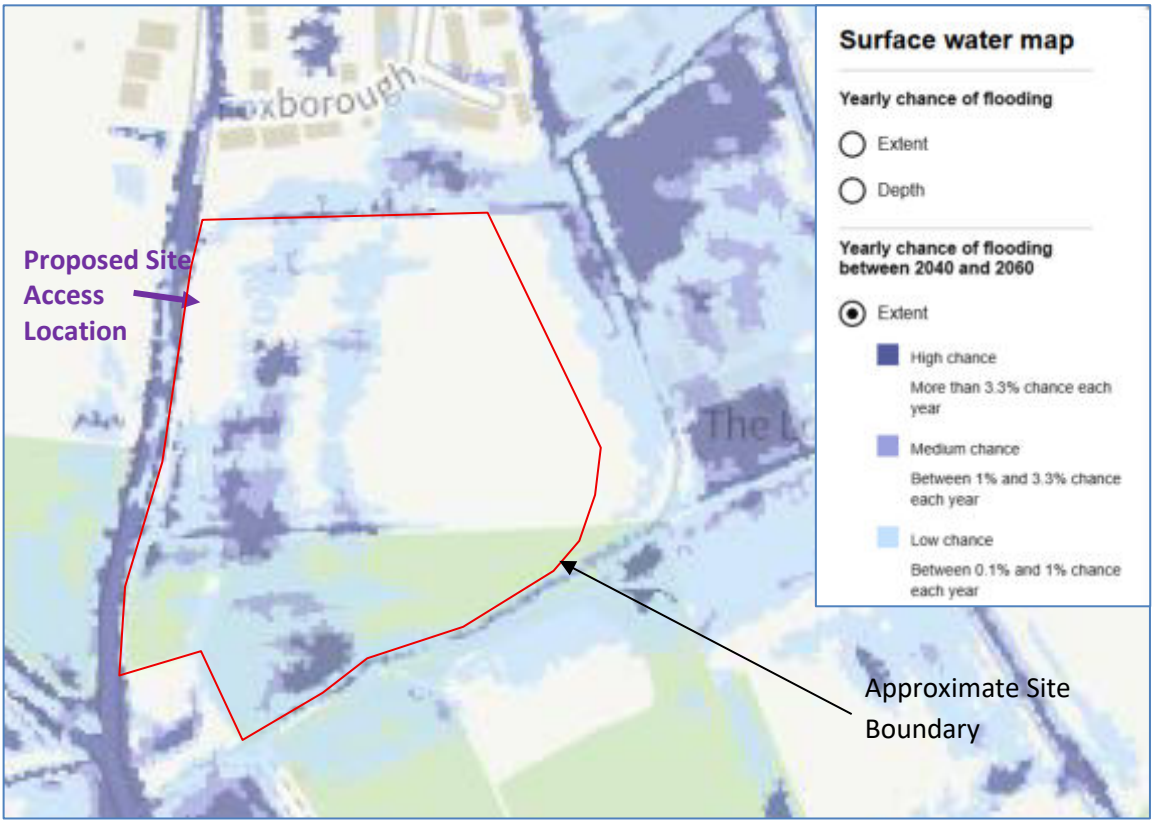


Figure 7.1 – Environment Agency Surface Water Flood Extents with Climate Change (2040-2060)

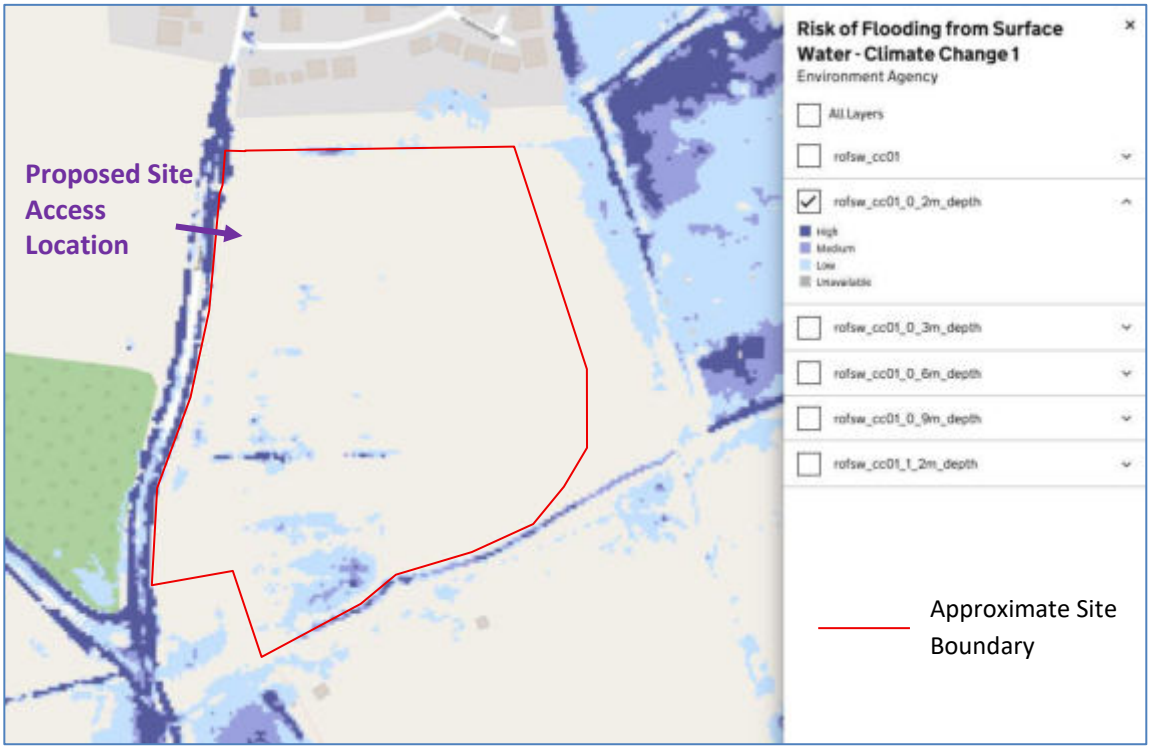


Figure 7.2: Extract from DEFRA Data Services Platform Mapping Showing Risk of Flooding from Surface Water Flood Extents (Climate Change 1) - 0.2m depth

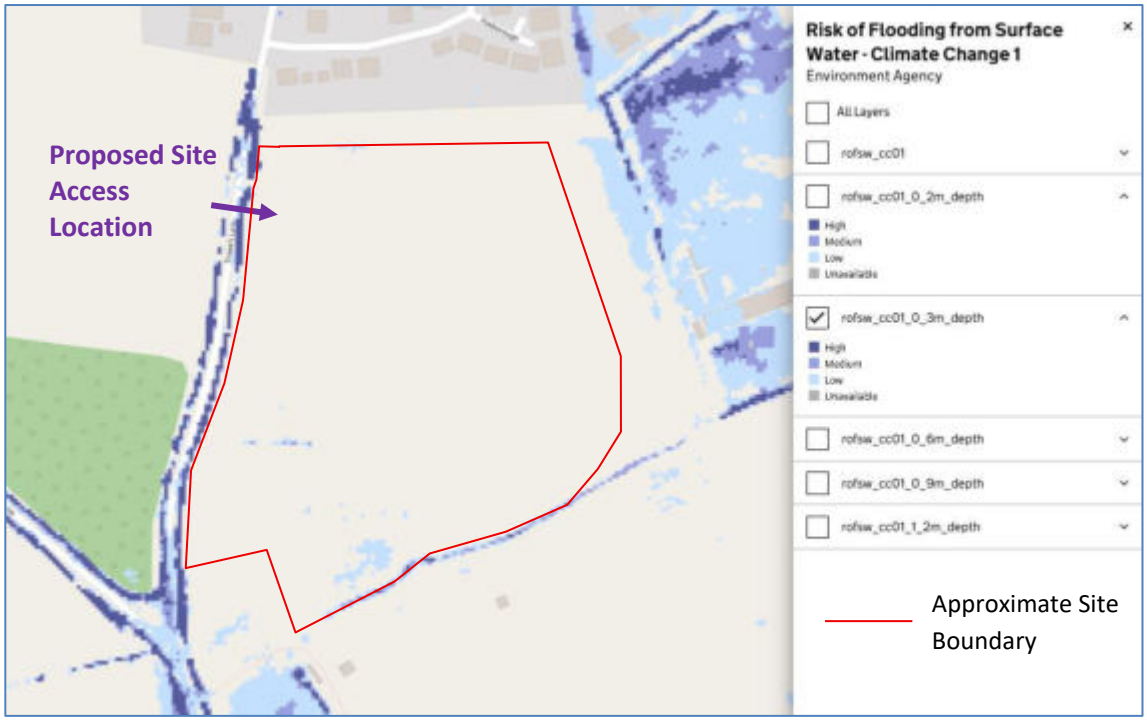


Figure 7.3: Extract from DEFRA Data Services Platform Mapping Showing Risk of Flooding from Surface Water Flood Extents (Climate Change 1) - 0.3m depth

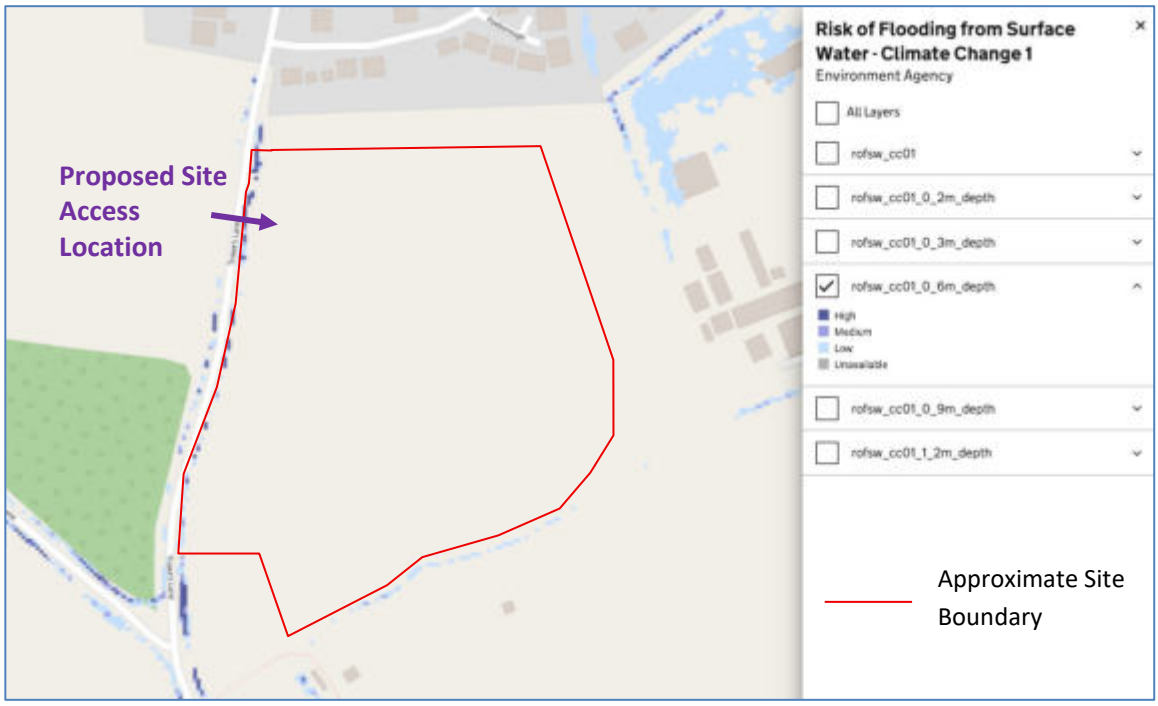


Figure 7.4: Extract from DEFRA Data Services Platform Mapping Showing Risk of Flooding from Surface Water Flood Extents (Climate Change 1) - 0.6m depth

7.4. The Environment Agency has produced maps that show the likelihood associated with 0.2 m, 0.3 m, and 0.6 m depth of surface water flooding with climate change 1 (2040-2060) and extracts from the mapping obtained from the Defra Data Services Platform are shown in Figures 7.2 to 7.4.

7.5. Figure 7.2 shows that there is a Low risk of flooding at 0.2m depth in localised spots at the Site, with larger areas of localised Low risk flooding indicated at the north-west area, also associated

with localised points at Medium to High risk of Flooding. The reduction in flood extents in this figure compared to Figure 7.1 indicates that the Low, Medium and High risk flooding no longer shown is less than 0.2 m deep. The areas at risk of flooding at 0.2 m depth correlate with localised depressions in the ground levels.

7.6. Figure 7.3 shows that there are very localised areas at Low risk of flooding at 0.3 m depth, with spots indicated at Medium risk. Figure 7.4 shows that there is no risk of flooding at 0.6 m depth within the Site, with the indicated flood risk associated with the locations of the watercourses at the west and south boundary.

7.7. Given the location of watercourses at the west and south boundary and Trowes Lane, which would intercept overland flow, and the location of the flooding indicated in Figures 7.2 to 7.4, it is considered that the surface water flooding indicated would result from rainfall falling directly onto the Site and collecting in the lower areas of the Site topography and not from overland inflow.

7.8. It is understood from the Winter 2013/2014 Wokingham Borough Council Flood Investigation Report , prepared January 2016, that the Parish Council and Swallowfield Flood Resilience Group (SFRG) have worked with Landowners and residents to maintain the drainage ditches that connect to the River Blackwater notably Naylor's Ditch and Pigeon Ditch. The Brookside Ditch is maintained by the Environment Agency, with members of the SFRG cleaning the entrance to this ditch when required. During the winter 2013/2014 flood event, all but the Brookfield Nursery Ditch contained the flows. Refer to **Appendix J** for the Flood Investigation Report and plan of the watercourses.

7.9. It is proposed that the development drainage strategy will intercept and discharge the runoff falling on the Site area, with levels altered to intercept the runoff, reducing the flood risk indicated in Figures 7.1 to 7.3.

7.10. The risk of overland flow from adjacent sites is considered to be Low based on the location of the watercourses and Trowes Lane as outlined above; any overland flow would follow the contours of Trowes to the south or flow to the north-east corner of the Site towards the eastern watercourse (The Naylor's Ditch).

Safe Access

7.11. Figure 7.1 shows that Trowes Lane is at a Low to High Risk of flooding in the location of the proposed Site access. Figure 7.2 shows that the access location is at a Low to High risk of flooding to 0.2 m depth, with Figure 7.3 indicating there is a Low risk of flooding at 0.3m, with the High Risk indicated in the watercourse location. This implies that there is a High to Medium Risk of flooding (including for Climate Change 1) at 0.2 m depth at the access location on Trowes Lane.

7.12. Based on the advice given in the Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes, the Hazard to People Classification on the Trowes Lane in the Site access location during a 0.2 m flood depth scenario would be 'Very Low Hazard – Caution' based on flood water velocities up to 0.5 m/s, and 'Danger for Some' (includes children, the elderly and the infirm) based on flood water velocities up to 3.0 m/s. Refer to Figure 7.5. This hazard rating will increase with higher flood water velocities.

7.13. It is recommended that the existing drainage regime to the north of the Site access is reviewed to determine the alignment and condition of the watercourses and the potential culvert linking

the watercourses beneath Trowes Lane. This will allow any potential opportunities to improve the drainage regime and reduce the flood risk on the road north of the Site access to be identified as part of the proposed access works.

Table 4 – Hazard to People Classification using Hazard Rating *(HR= d x (v + 0.5) + DF)* for (Source Table 13.1 of FD2320/TR2 - Extended version)

HR	Depth of flooding - d (m)												
	DF = 0.5				DF = 1								
Velocity v (m/s)	0.05	0.10	0.20	0.25	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.0	0.03+0.5= 0.53	0.05+0.5 = 0.55	0.10+0.5 = 0.60	0.13+0.5 = 0.63	0.15+1.0 = 1.15	0.20+1.0 = 1.20	0.25+1.0 = 1.25	0.30+1.0 = 1.30	0.40+1.0 = 1.40	0.50+1.0 = 1.50	0.75+1.0 = 1.75	1.00+1.0 = 2.00	1.25+1.0 = 2.25
0.1	0.03+0.5= 0.53	0.06+0.5 = 0.56	0.12+0.5 = 0.62	0.15+0.5 = 0.65	0.18+1.0 = 1.18	0.24+1.0 = 1.24	0.30+1.0 = 1.30	0.36+1.0 = 1.36	0.48+1.0 = 1.48	0.60+1.0 = 1.60	0.90+1.0 = 1.90	1.20+1.0 = 2.20	1.50+1.0 = 2.50
0.3	0.04+0.5= 0.54	0.08+0.5 = 0.58	0.15+0.5 = 0.65	0.19+0.5 = 0.69	0.23+1.0 = 1.23	0.30+1.0 = 1.30	0.38+1.0 = 1.38	0.45+1.0 = 1.45	0.60+1.0 = 1.60	0.75+1.0 = 1.75	1.13+1.0 = 2.13	1.50+1.0 = 2.50	1.88+1.0 = 2.88
0.5	0.05+0.5= 0.55	0.10+0.5 = 0.60	0.20+0.5 = 0.70	0.25+0.5 = 0.75	0.30+1.0 = 1.30	0.40+1.0 = 1.40	0.50+1.0 = 1.50	0.60+1.0 = 1.60	0.80+1.0 = 1.80	1.00+1.0 = 2.00	1.50+1.0 = 2.50	2.00+1.0 = 3.00	2.50+1.0 = 3.50
1.0	0.08+0.5= 0.58	0.15+0.5 = 0.65	0.30+0.5 = 0.80	0.38+0.5 = 0.88	0.45+1.0 = 1.45	0.60+1.0 = 1.60	0.75+1.0 = 1.75	0.90+1.0 = 1.90	1.20+1.0 = 2.20	1.50+1.0 = 2.50	2.25+1.0 = 3.25	3.00+1.0 = 4.00	3.75+1.0 = 4.75
1.5	0.10+0.5= 0.60	0.20+0.5 = 0.70	0.40+0.5 = 0.90	0.50+0.5 = 1.00	0.60+1.0 = 1.60	0.80+1.0 = 1.80	1.00+1.0 = 2.00	1.20+1.0 = 2.20	1.60+1.0 = 2.60	2.00+1.0 = 3.00	3.00+1.0 = 4.00	4.00+1.0 = 5.00	5.00+1.0 = 6.00
2.0	0.13+0.5= 0.63	0.25+0.5 = 0.75	0.50+0.5 = 1.00	0.63+0.5 = 1.13	0.75+1.0 = 1.75	1.00+1.0 = 2.00	1.25+1.0 = 2.25	1.50+1.0 = 2.50	2.00+1.0 = 3.00	3.50	4.75	6.00	7.25
2.5	0.15+0.5= 0.65	0.30+0.5 = 0.80	0.60+0.5 = 1.10	0.75+0.5 = 1.25	0.90+1.0 = 1.90	1.20+1.0 = 2.20	1.50+1.0 = 2.50	1.80+1.0 = 2.80	3.40	4.00	5.50	7.00	8.50
3.0	0.18+0.5= 0.68	0.35+0.5 = 0.85	0.70+0.5 = 1.20	0.88+0.5 = 1.38	1.05+1.0 = 2.05	1.40+1.0 = 2.40	1.75+1.0 = 2.75	3.10	3.80	4.50	6.25	8.00	9.75
3.5	0.20+0.5= 0.70	0.40+0.5 = 0.90	0.80+0.5 = 1.30	1.00+0.5 = 1.50	1.20+1.0 = 2.20	1.60+1.0 = 2.60	3.00	3.40	4.20	5.00	7.00	9.00	11.00
4.0	0.23+0.5= 0.73	0.45+0.5 = 0.95	0.90+0.5 = 1.40	1.13+0.5 = 1.63	1.35+1.0 = 2.35	1.80+1.0 = 2.80	3.25	3.70	4.60	5.50	7.75	10.00	12.25
4.5	0.25+0.5= 0.75	0.50+0.5 = 1.00	1.00+0.5 = 1.50	1.25+0.5 = 1.75	1.50+1.0 = 2.50	2.00+1.0 = 3.00	3.50	4.00	5.00	6.00	8.50	11.00	13.50
5.0	0.28+0.5= 0.78	0.60+0.5 = 1.10	1.10+0.5 = 1.60	1.38+0.5 = 1.88	1.65+1.0 = 2.65	2.20	2.75	4.30	5.40	6.50	9.25	12.00	14.75

Flood Hazard Rating (HR)	Colour Code	Hazard to People Classification
Less than 0.75		Very low hazard - Caution
0.75 to 1.25		Danger for some – includes children, the elderly and the infirm
1.25 to 2.0		Danger for most – includes the general public
More than 2.0		Danger for all – includes the emergency services

Figure 7.5: Extract from Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes (Source: GOV.UK)

8. GROUNDWATER FLOODING

8.1. Groundwater flooding is a risk of the water table rising after prolonged rainfall to emerge above ground level remote from a watercourse. It is most likely to occur in low lying areas underlain by aquifers of high vulnerability.

8.2. The Environment Agency has mapped groundwater vulnerability and Figure 3.2 shows the Site is located over a Medium to Low vulnerability Aquifer.

8.3. Wokingham Borough Council, Level 1 Strategic Flood Risk Assessment Final Report May 2023 prepared by JBA Consulting (Source: Wokingham Borough Council Evidence Studies) includes mapping of the Environment Agency Areas Susceptible to Groundwater Flooding (AStGWF) and of Groundwater Emergence. The mapping is attached in **Appendix K**; the AStGWF mapping shows the Site is located within an area of >=50% to <75%, with the Groundwater Emergence indicating a water depth =/-0.025m below the ground surface.

8.4. The Environment Agency Long Term Flood Risk Summary for 15 Foxborough to the north-east of the Site boundary states that flooding from groundwater is unlikely in this area.

8.5. Given the Site geology, groundwater vulnerability, SFRA groundwater mapping outlined in Paragraph 8.3, the variable nature of the depth to groundwater indicated by available information (paragraphs 3.6 to 3.7), and the Site topography, the Site is considered to be at a Medium risk of groundwater flooding. The risk will be mitigated for by setting the dwelling floor levels a minimum of 150 mm above surrounding ground level, with ground levels locally contoured to deflect water away from the building thresholds, ensuring that flow paths are directed away from buildings and vulnerable infrastructure, towards the east Site boundary, replicating the current flow path. Site levels sloping towards the proposed attenuation basin, east boundary and watercourse, will reduce the risk to the development if water was to emerge from the ground. It is recommended that Site investigation work is undertaken to determine the ground conditions across the Site, including for identifying the depth to groundwater and undertaking groundwater monitoring if encountered.

8.6. The development design should also consider the potential impact of shallow groundwater on proposed below ground construction.

9. INFRASTRUCTURE FAILURE FLOODING

9.1. Infrastructure failure flooding is a risk of collapse, failure or surcharging of man-made structures and drainage systems. This could take the form of:

i. Reservoirs

ii. Canals

iii. Burst water mains

iv. Blocked sewers

v. Failed pumping stations

9.2. The Environment Agency have mapped failure of reservoirs, which shows the Site is not located within the maximum extent of flooding from reservoirs; the flood extent when there is also flooding from rivers, is shown just to the east of the Site.

9.3. The EA website advises that “flooding from reservoirs in extremely unlikely, and that an area is considered at risk if peoples’ lives could be threatened in the event of a dam or reservoir failure.” The data gives no indication of likelihood or probability of reservoir flooding”.

9.4. The risk of flooding from blocked sewers is considered to be Low as any flood water would follow the Site contours and enter the network downstream or flow north-east towards the Site boundary and then the watercourse beyond.

10. HISTORIC FLOODING

10.1. The South Essex Level 1 Strategic Flood Risk Assessment, April 2018 has not identified any flood records at the Site.

10.2. The Environment Agency Flood Data response has included mapping of Past Flood extents; the Site is not shown to lie within these extents.

10.3. A review of the Environment Agency (EA) Historic Flood and Outlines Map has indicated three areas of flooding within the Site (refer to paragraph 5.6 and **Appendix I**). It is not known what the source of the flood extent is but EA guidance indicates this could be fluvial, groundwater or surface water. It is not considered to be fluvial flooding as outlined in Section 5. It could have historically been the result of surface water flooding if the Site topography was different to its current form, or it could have been the result of high groundwater levels or saturated ground. As outlined in Paragraph 8.4, it is recommended that further Site investigation work is undertaken in these locations to determine if the risk relates to groundwater flooding.

10.4. A review of Essex County Council's asset register does not indicate a flood investigation at or near to the Site.

DRAINAGE STRATEGY

11. PROPOSED DEVELOPMENT

11.1. The planning application is in outline for up to 79 residential dwellings, together with access, landscaping and associated infrastructure, with all matters reserved except access. An illustrative masterplan has been developed to demonstrate how certain aspects of the proposals in more detail. The Illustrative Masterplan Layout is attached in **Appendix G**.

11.2. Development Site characteristics:

- Total Development area is 4.8 ha
- Total proposed impermeable development area is 1.6 ha
- The Total Contributing Area to the network including the impermeable areas, basin, swale and runoff from greenspaces is 2.10 ha.
- The greenfield rate for the Site is Q_{bar} = **2.8 l/s/ha** giving a rate of 6.0 l/s based on the proposed impermeable area (see section 3.8)

Surface Water Disposal

11.3. In accordance with Government and Local Plan Policies and the requirements of the Building Regulations, surface water runoff from the development will be drained at source in a sustainable way by making full use of Sustainable Drainage Systems (SuDS) where possible.

11.4. The SuDS hierarchy dictates that infiltration at source is considered first. After infiltrating at source has been considered, the next stage is to deal with runoff in individual catchments, followed finally by site wide drainage solutions. Runoff from the development should not adversely impact upon drainage systems outside of the Site boundary.

11.5. Detailed surface water drainage design should take into account the benefits that can be achieved by SuDS, which are referred to as the 'four pillars of SuDS' in the CIRIA SuDS Manual 2015 as listed below:

i. **Water Quantity** - to control the quantity of runoff to manage flood risk and protect the natural water cycle.

ii. **Water Quality** - to manage the quality of runoff to prevent pollution.

iii. **Amenity** - to create and sustain better places for people.

iv. **Biodiversity** – to create and sustain better places for nature.

11.6. Given the ground geology comprising Clay outlined in sections 3.4 to 3.6, the presence of existing watercourses at the Site boundaries indicating a surface water drainage regime in the area, the ground topography and variable groundwater level information, it is proposed that the surface water runoff will discharge to the watercourse beyond the east boundary at a restricted rate, with attenuation provided on Site.

11.7. The drainage strategy has been designed to discharge at a rate of **3 l/s/ha** in accordance with the DEFRA Guidance - National standards for sustainable drainage systems (SUDS), where the 50% AEP greenfield runoff rate (2.5 l/s/ha) is less than 3 l/s/ha. Based upon 3l/s/ha, the discharge rate from the development has been restricted to **6.2l/s**.

11.8. It is proposed that surface water attenuation will be provided in the form of an attenuation basin within the east Site area and a swale along the south of the developed area. The proposed drainage strategy is attached in **Appendix L**.

11.9. It is proposed that the surface water discharge from the development will outfall into the existing watercourse to the east of the development. A sensitivity check has been undertaken to assess the impact of a surcharged outfall on the proposed drainage network, which has shown a submerged outfall has a negligible impact on the capacity of the network.

11.10. Table 11.1 summarises how the use of SuDS components has been considered and utilised in this drainage strategy.

SUDS Type	Component Type	Suitable	Explanation/Comments
Source Control	Rainwater Harvesting systems	No	Not proposed as part of the development.
	Green Roofs	No	Not proposed as part of the development.
	Rain gardens	No	Not proposed due to the potential maintenance issues associated with private ownership.
	Permeable Paving	No	Storage and cleansing provided by other features.
Infiltration	Soakaway	No	Not considered viable due to the presence of Clay and variable groundwater level information.
	Filter Drain/Strips		
	Infiltration Basin		
	Swale		
	Tree Pits		
Conveyance	Swale	Yes	Where space is available a swale has been provided to convey surface water runoff to the basin.
	Filter Drain	No	Not proposed as part of the development
Detention	Sub-surface Storage	No	No storage requirement.
	Detention Basin	Yes	Proposed within the east of the Site area
	Pond	No	Not proposed as part of the development
	Wetland	No	As above

Table 11.1: Table summarising the use of SuDS components.

Quantity

11.11. Info-Drainage has been used to design the storage associated with up to the 1% AEP event plus an allowance for 40% climate change using FEH data, a controlled discharge rate of 6.2l/s and an orifice flow control device. An allowance of 10% urban creep has also been included for at this stage in the calculations.

11.12. The calculations for the 1 in 2 year, 1 in 30 year plus climate change and 1 in 100 year rainfall event plus climate change are attached in **Appendix M,** with the drainage layout shown on the drawing in **Appendix L**. The calculations show that the there is no flooding on or off-site during rainfall events up to the 1% AEP plus climate change scenario.

11.13. The results show the following maximum discharge rates:

- 1 in 2 year = 3.8 l/s
- 1 in 30 year plus climate change = 5.9 l/s
- 1 in 100 year plus climate change = 6.1 l/s

Quality

11.14. The water discharging to the watercourse must be cleansed and therefore treatment processes are introduced through the drainage network. These should be in accordance with Chapter 26 of the Ciria SuDS Manual C753, where the hazard of low to medium is mitigated with the various SuDS components to equal or exceed the hazard indices. Refer to the following Tables 26.2 and 26.3 which show the hazard and mitigation indices associated with the proposed drainage scheme.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

11.15. Where the layout permits the roof areas, driveways and roads will drain via a piped network to the swale along the southern boundary of the Site, with the remainder discharging via piped network to the attenuation basin. It is proposed that the outlet from the basin will comprise a perforated pipe surrounded by granular filter material to reduce the risk of blockage from debris, within the orifice flow control.

11.16. The above tables show that the mitigation indices associated with the swale and basin exceed the hazard indices associated with the driveways and road catchments.

Biodiversity & Amenity

11.17. Amenity and biodiversity are often considered together as they overlap, and linkages are made.

11.18. Amenity is the multi-functional use that should be highlighted for any part of the SuDS landscape, which is available for use by people when not being used for drainage. This is an underlying principle of place making urban design, to make a location desirable to live and work.

11.19. Biodiversity encompasses the number and abundance of all species of life on earth. Locally, biodiversity reflects the character of the plants and wildlife that share the space in which humans live, work and play.

11.20. The development has recognised the existing drainage features and has enhanced them where possible.

11.21. The Site has incorporated the attenuation basin within the open space. When the basin is not at full capacity, the side slopes allow for the area to be enjoyed by the public. The proposed dwelling arrangement is such that the frontages face onto the basin providing an element of safety and inclusion.

11.22. The proposed development landscape and SuDS components, including the swale, provide amenity and biodiversity encouraging growth for native species and interaction with people.

Exceedance

11.23. In an exceedance event in which rainfall surpasses the design capacity, there should be no vulnerable buildings or infrastructure at risk of flooding.

11.24. Site ground levels will be locally contoured to deflect water away from the buildings. The exceedance flow path will be directed away from the building thresholds and to the east Site boundary, replicating the current flow path.

11.25. The exceedance paths have been shown on the layout plan in **Appendix L**.

Foul Water Disposal

11.26. Part H of The Building Regulations (2010) 2015 Edition states that "Foul drainage should be connected to a public foul or combined sewer wherever this is reasonably practicable".

11.27. A Thames Water Drainage Search indicates a public foul sewer located within Foxborough (road)/Trowes Lane approximately 55m north of the Site. Refer to **Appendix F** for the Thames Water's asset plan.

11.28. It is proposed that the development foul drainage will be gravity fed to a pumping station to the north of the access within the Site boundary from where it will be pumped to a level to provide a gravity connection into the Thames Water sewer within Trowes Lane. A Pre-Enquiry has been submitted to Thames Water; at the time of writing this report they have contacted us to advise that their preferred connection point is Manhole 4604 where the sewer becomes a 225 mm diameter and should be able to support a pumped flow. Thames Water are currently carrying out an assessment to confirm suitability of the connection. This connection will be subject to Thames Water consent and Infrastructure Charging. Refer to **Appendix L** for the proposed connection location.

12. ADOPTION & MAINTENANCE

12.1. It is important to establish the adopting authorities at an early stage to define the requirement and how these meet the standards.

12.2. It is not proposed that the drainage will be adopted; it will be maintained by a Management Company associated with the development.

12.3. The local council could designate flood features if they so wish in accordance with 'Flood & Water Management Act 2010 Section 30 and Schedule 1, designation of features', to protect from future change.

12.4. It is important to prevent silt from entering the drainage system during the construction phase and a Construction Surface Water Management Plan should be developed prior to commencement of works.

12.5. Maintenance of the system will include for frequent inspections of the network, swale, attenuation basin and flow control device with debris removal to ensure designed levels of performance are achieved.

13. SUMMARY

13.1. It has been demonstrated that the Site is located within Flood Zone 1, based on Environment Agency (EA) flood modelling information and a review of EA historic mapping and flood outline records.

13.2. Table 13.1 summarises the probability of the Site flooding from the five key sources as listed in PPS25.

Source	Description	Risk	
Fluvial	Rivers	Flood Zone 1	**(<0.1% AEP)**
Tidal	Seas		
Pluvial	Surface Water	Very Low to High	**(<0.1% AEP to >3.3% AEP)**
Groundwater	Aquifers	Medium	**-**
Infrastructure failure	Reservoirs Blocked Sewers	Outside extent of flooding Very Low	**-**

Table 13.1 – Flood Risk Summary

13.3. The Environment Agency Surface Water flood maps indicate that the Site is at a Low risk of flooding at 0.2 m depth in locations, with localised points at Medium to High risk of flooding at 0.2 m depth and 0.3 m depth, with no risk of flooding at 0.6 m depth within the Site, other than in the watercourse locations. The areas at flood risk correlate with depressions and plateaus in the Site topography. Given the location of watercourses at the west and south boundary and Trowes Lane, which would intercept overland flow, it is considered that the surface water flooding indicated would result from rainfall falling directly onto the Site and collecting in the lower areas of the Site topography and not from overland inflow.

13.4. It is proposed that the development drainage strategy will intercept and discharge the runoff falling on the Site area, with ground levels altered to effectively intercept the runoff, mitigating for the surface water flood risk within the Site.

13.5. The risk of groundwater flooding is assessed as Medium at this stage based on available Site information. To mitigate the flood risk, dwelling floor levels will be set a minimum of 150mm above ground level, with Site levels locally contoured to deflect water away from the building thresholds, ensuring that flow paths are directed away from buildings and vulnerable infrastructure towards the proposed attenuation basin, east boundary and watercourse, reducing the risk to the development if water was to emerge from the ground. It is recommended that Site investigation work is undertaken to determine the ground conditions across the Site, including for identifying the depth to groundwater and undertaking groundwater monitoring if encountered. The development design should also consider the potential impact of shallow groundwater on proposed below ground construction.

13.6. The Site has been shown to be located in Flood Zone 1, now and in the future with the surface water flood risk at the Site mitigated through the implementation of the proposed drainage strategy and levels design, incorporating SuDS. The groundwater flood risk will be mitigated by the setting of floor levels and provision of flow paths through the Site to the east, away from buildings and vulnerable infrastructure. Therefore, in accordance with the National Planning

Policy Framework (NPPF, February 2025) and the Changes to Planning Practice Guidance on Flood Risk & Coastal Change, September 2025 Update, it is considered that the Sequential Test does not need to be applied to this development.

13.7. There is a Medium to High risk of flooding to 0.2 m within Trowes Lane at the Site access. Based on the advice given in the Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes, the Hazard to People Classification on the Trowes Lane in the Site access location during a 0.2 m flood depth scenario would be 'Very Low Hazard – Caution' based on flood water velocities up to 0.5 m/s, and 'Danger for Some' (includes children, the elderly and the infirm) based on flood water velocities up to 3.0 m/s, with the hazard increasing with higher velocities. It is recommended that the existing drainage regime to the north of the Site access is reviewed to identify any potential opportunities to provide improvements and reduce the flood risk as part of the proposed Site access works.

13.8. It is proposed that the surface water runoff will discharge to the watercourse beyond the east boundary at a restricted rate of **6.2l/s**, with attenuation provided on Site within a swale and attenuation basin.

13.9. The drainage strategy is designed to store and discharge the runoff associated with up to the 1 in 100 year rainfall event plus an allowance of 40% climate change and 10% urban creep, without flooding within the Site.

13.10. Where the layout permits, it is proposed that the roof areas, driveways and roads will drain via a piped network to the swale along the southern boundary of the Site, with the remainder discharging via piped network to the attenuation basin. It is proposed that the outlet from the basin will comprise a perforated pipe surrounded by granular filter material to reduce the risk of blockage from debris, within the orifice flow control. The SuDS features will sufficiently cleanse the runoff prior to discharge to the watercourse.

13.11. Exceedance flow will be directed away from vulnerable buildings and infrastructure and outflow along its original path to the east towards the watercourse as currently occurs.

13.12. In accordance with government policy, SuDS will be used on Site where possible, and surface water drainage of the Site will be carried out in a sustainable way.

13.13. As long as maintenance of the new drainage systems are correctly carried out, the risk of flooding and the subsequent risks from infrastructure failure or pluvial means, is very Low.

13.14. The Environment Agency accepts that extreme floods will occur and it will never be possible to eliminate flood risk altogether.

13.15. It is considered that the risk of flooding to the Site has been adequately considered and therefore development of the Site, in accordance with the recommendations outlined in this report, does not pose an unacceptable flood risk either to occupants of the Site or to others off site.

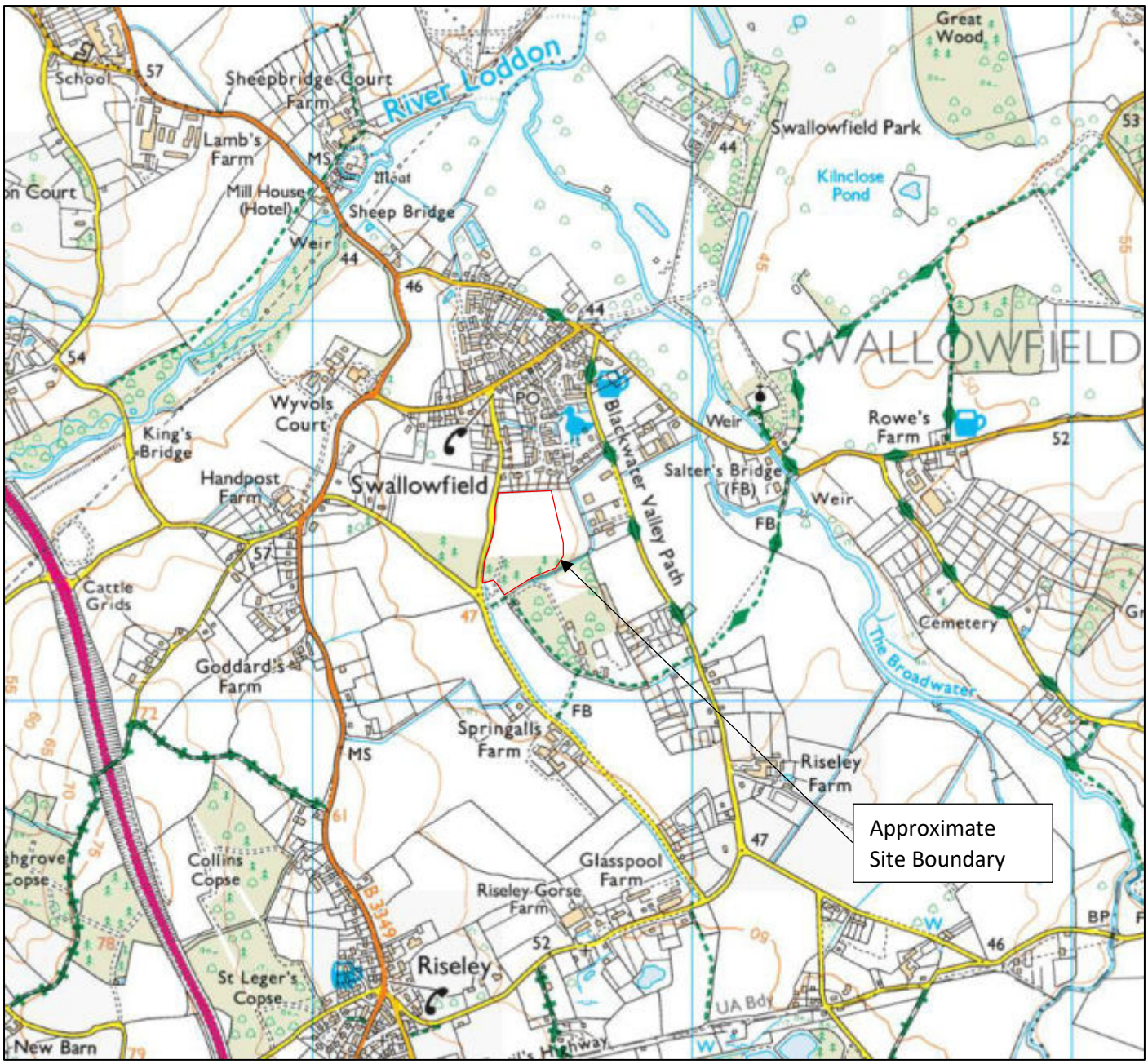
APPENDICES

Appendix A

Site Location Plan

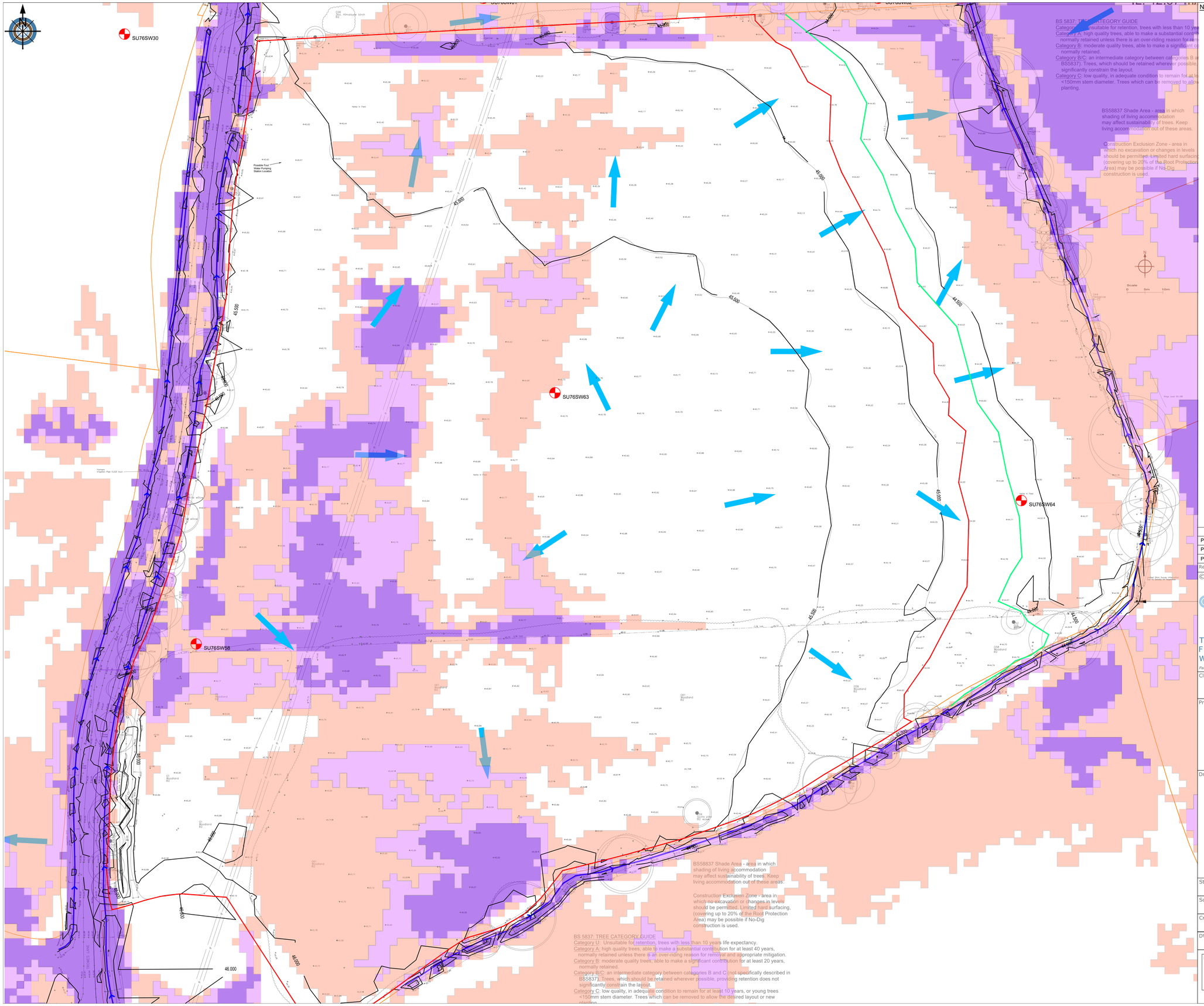
159/2025: Land East of Trowes Lane, Swallowfield, Reading, Berkshire, RG7 1RW

Site Location Plan



Appendix B

Existing Site Layout



NOTES:

1. This drawing is to be read in conjunction with GHB series 159/2025 drawings and documents and any other relevant project team documents.
2. Preliminary Issue - This drawing is not to be used for construction or detailed pricing purposes. Any work undertaken before approvals are received (in writing) are at risk of abortive works.
3. This drawing has been produced based upon the following information:
   Topographical Survey by RANDALL SURVEYS (Ref. 16781/LT/1 dated May 2022) subject to transformation of :
   Scale 1 and translation (0,0,0) about point (0,0,0).
   Architectural Layout by JCN DESIGN (Ref. CC017 dated Sep 2025) subject to transformation of :
   Scale 1 and translation (0,0,0) about point (0,0,0).
4. All site levels and finished floor levels to remain indicative for planning purposes and are subject to verification following detailed design.
5. This drawing has been prepared solely for the purpose of obtaining a Planning Consent based on information available and planning requirements at the date of issue only.

LEGEND

- Site Boundary- Area: 4.8 ha
- Inspire Boundary Polygons
- Overland Flowpath
- Existing Open Channel Watercourse
- Greenfield: Greenfield run-off rate: 2.8 l/s/ha
- Environment Agency Risk of Flooding from River and Seas Climate Change 1 - HIGH RISK
- Environment Agency Risk of Flooding from River and Seas Climate Change 1 - MEDIUM RISK
- Defra Data Services Platform Environment Agency Risk of Flooding from Surface Water Climate Change 1 - HIGH RISK (>3.3% AEP)
- Defra Data Services Platform Environment Agency Risk of Flooding from Surface Water Change 1 - MEDIUM RISK (1%-3.3%)
- Defra Data Services Platform Environment Agency Risk of Flooding from Surface Water Change 1 - LOW RISK (<1%AEP)
- Environment Agency Product 4 Flood Level Data:1%+20% Climate Change Defences Removed Flood Level: 44.69-44.63mAOD.
- Primary Contours (0.5m)
- BGS Borehole Log Locations

Rev	Rev Date	Description	Drawn	Chck'd
P3	19/09/25	Product 4 Data Range Shown	PRJ	JAH
P2	19/09/25	Environment Agency's Risk of Flooding From River's & Sea's Shown	PRJ	JAH
P1	19/09/25	Initial Issue	PRJ	JAH

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Client: CITY AND COUNTRY

Project: TROWE'S LANE, SWALLOWFIELD, WOKINGHAM

Drawing Title: FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY EXISTING SITE LAYOUT

Status: FOR INFORMATION

Scale: 1:500 @ A1

Created: SEP 2025 | Drawn: PRJ

DWG Reference: 159-2025.DWG | Checked: JAH

Drawing Number: 159/2025/003 | Revision: P3

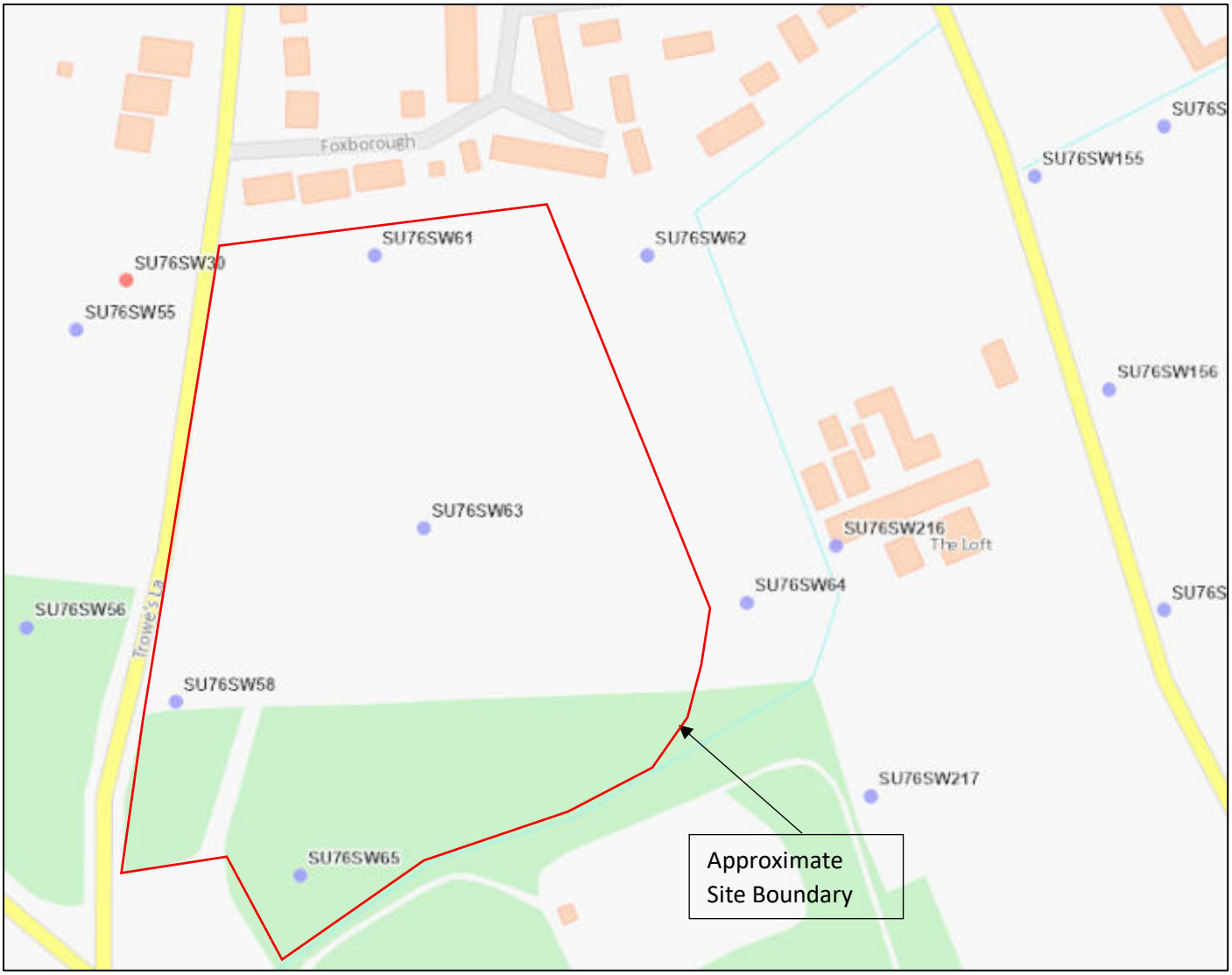
P# = Preliminary, C# = Construction, AB# = As Built

Appendix C

BGS Borehole Logs

159/2025: Land East of Trowe's Lane, Swallowfield, Reading, Berkshire, RG7 1RW

BGS BH Location Plan



SU76SW53 - 65

[illegible] for [illegible]
[illegible]th October, 196[illegible].

SU76SW53 7224 6463

Hole No. 1.

Top Soil	1'0"
Clay – soft brown	1'0"
Ballast	3'0"
Blue Clay	
Water	8'0"

SU76SW54 7235 6471

Hole No. 2.

Top Soil	1'0"
Clay	2'0"
Ballast	8'0"
Blue Clay	
Water	6'0"

SU76SW55 7243 6453

Hole No. 3.

Top Soil	1'0"
Clay	2'0"
Ballast	8'0"
Blue Clay	
Water	6'0"

COMMERCIAL IN CONFIDENCE

SU76SW56 7241 6441

Hole No. 4.

Top Soil	1'0"
Clay and Marl	3'6"
Ballast	4'6"
Blue Clay	
Water	5'0"

NGDC ACCESSION NUMBER 28855

SU76SW57 7224 6443

Hole No. 5.

[redacted]

Top Soil	1'0"
Clay	3'0"
Sandy Clay	1'6"
Ballast	5'0"
Blue Clay	
Water	5'0"

SU76SW 76NW

SU76SW58 7247 6438

Hole No. 6.

Top Soil	1'0"
Clay	2'6"
Ballast	5'6"
Blue Clay	
Water	6'0"

SU76SW59 7222 6457

Hole No. 7.

Top Soil	1'0"
Clay	2'0"
Ballast	7'0"
Blue Clay	
Water	7'0"

SU76SW60 7221 6449

Hole No. 8.

Top Soil	1'0"
Ballast	6'0"
Blue Clay	
Water	7'0"

SU76SW61 7255 6456

Hole No. 9.

Top Soil	1'0"
Clay	4'0"
Ballast	2'0"
Brown Clay	4'0"
Water	5'0"

SU76SW62 7266 6456

Hole No. 10.

Top Soil	1'0"
Clay	2'0"
Sandy Clay	6'0"
Blue Clay	

SU76SW63 7257 6445

Hole No. 11.

Top Soil	1'0"
Sandy Clay	3'0"
Ballast	6'0"
Blue Clay	
Water	5'0"

SU76SW64 7270 6442

Hole No. 12.

Top Soil	1'0"
Clay	3'0"
Ballast	3'6"
Blue Clay	

SU76SW65 7252 6431

Hole No. 13.

Top Soil	1'0"
Sandy Clay	2'6"
Ballast	9'0"
Blue Clay	
Water	5'0"

59

Appendix D

Groundwater Monitoring Station Data

159/2025: Land East of Trowe's Lane, Swallowfield, Reading, Berkshire, RG7 1RW

Groundwater Monitoring Station Data

Station details and identifiers

Station Type
Groundwater

Grid Reference
SU7245064550

Station Reference (Telemetry)
SU76_45

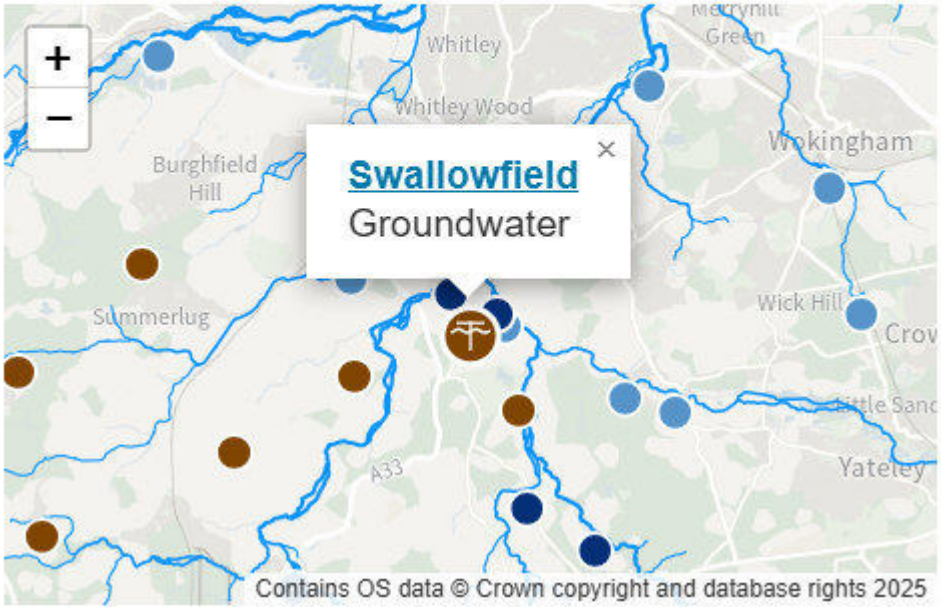
Station ID (WISKI)
SU76_45

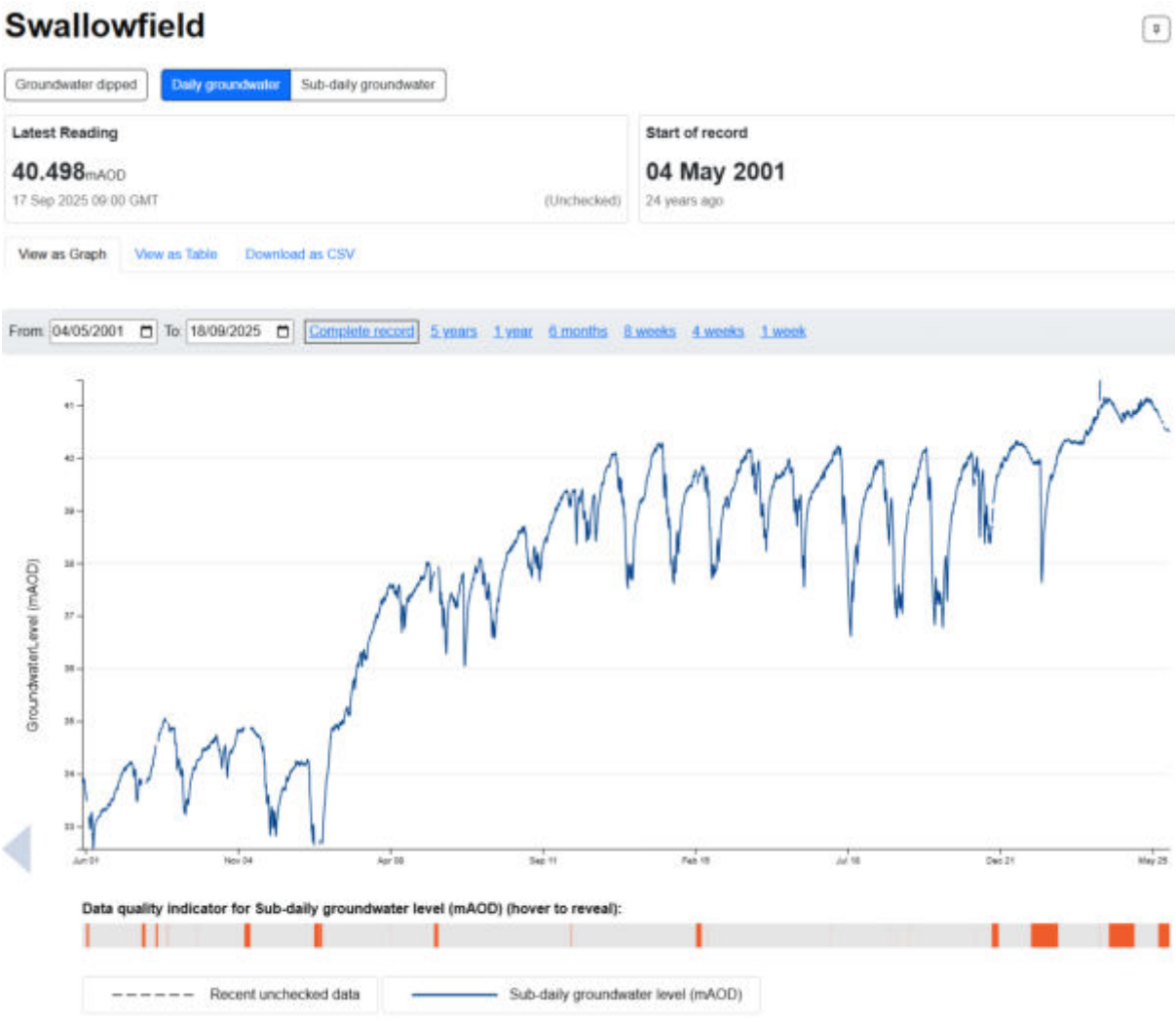
Aquifer
Chalk

Borehole Depth
100 m

Datum
45.77 mAOD

You can access this station's data directly as HTML or as JSON





https://environment.data.gov.uk/hydrology/station/4b92059c-195c-43bc-b22d-804281059921

Appendix E

Greenfield Runoff Rate Calculations

159/2025: Land East of Trowe's Lane, Swallowfield, Reading, Berkshire, RG7 1RW

FEH Data


```
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Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

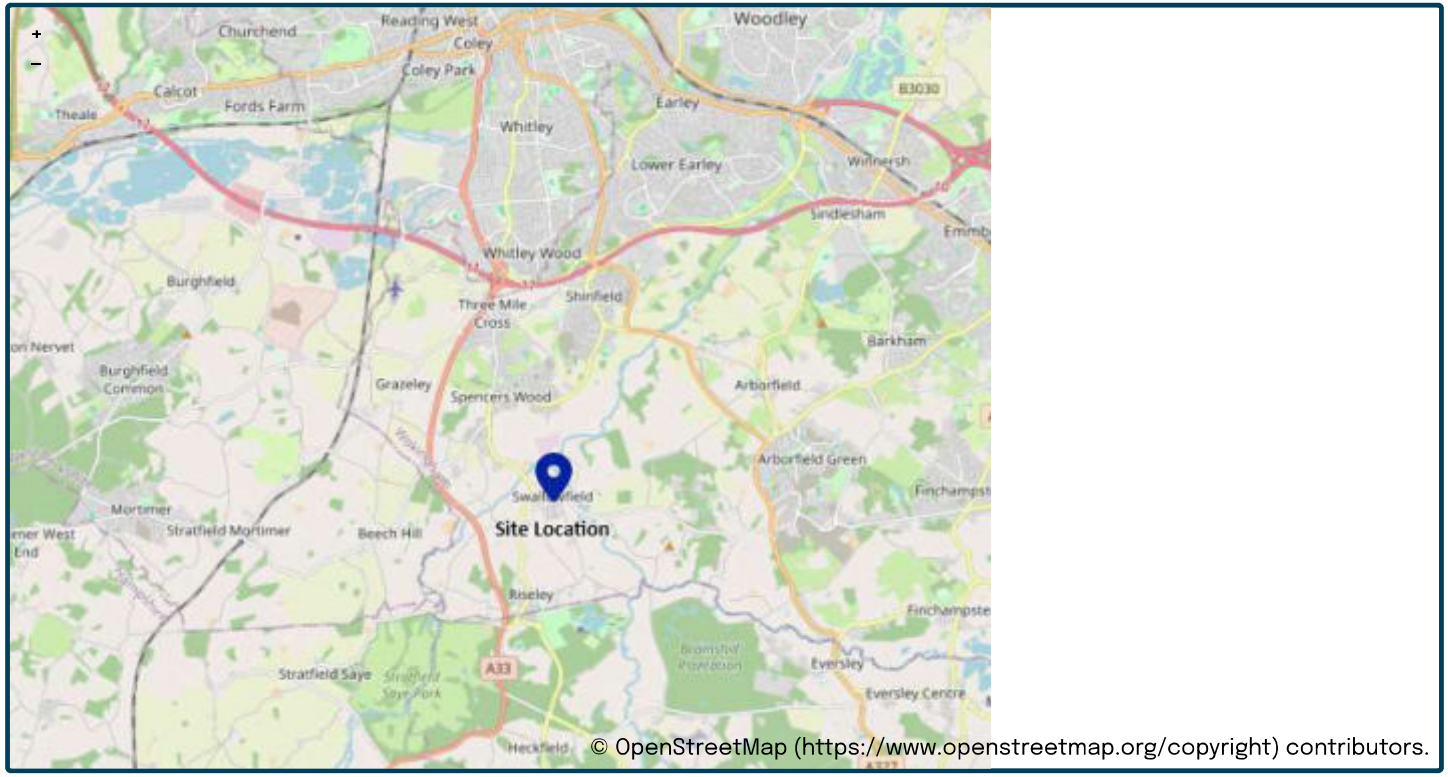
Project details

Date	26/06/2025
Calculated by	PRJ
Reference	159-2025
Model version	2.0.1

Location

Site name: Swallowfield

Site location: Trowe's Lane



Site easting: 472596

Site northing: 164500

Site details

Total site area (ha): 1 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	658	mm	660
BFIHOST	0.497		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	2.5	l/s	
QBar (FEH statistical) (l/s)	2.8	l/s	

Growth curve factors

	My value	Map value
Hydrological region	6	6
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical	
Flow rate 1 year (l/s)	2.4	l/s
Flow rate 2 year (l/s)	2.5	l/s
Flow rate 10 years (l/s)	4.6	l/s
Flow rate 30 years (l/s)	6.5	l/s
Flow rate 100 years (l/s)	9	l/s
Flow rate 200 years (l/s)	10.6	l/s

Disclaimer

Appendix F

Thames Water Asset Plan

Asset Location Search

Property Searches

GH Bullard & Associates LLP
CHALK PIT LODGE, 27 BARTON ROA
THURSTON
IP31 3PA

Search address supplied 5
Foxborough
Swallowfield
Reading
RG7 1RW

Your reference 159-2025

Our reference ALS/ALS Standard/2025_5212152

Search date 20 August 2025

Keeping you up-to-date

Notification of price changes

We're changing our report prices from 4th June 2025. The price will increase by 3.5% based on Retail Price Index (RPI).

Find our new prices on our website thameswater.co.uk/property-searches

Any Questions? We're happy to talk through the changes with you – give our Property Searches team a call on 0800 009 4540 .

Thames Water Utilities Ltd
Property Searches,
Clearwater Court, Vastern Road, Reading RG1 8DB

property.searches@thameswater.co.uk
thameswater.co.uk/propertysearches

0800 009 4540

Asset Location Search

Property Searches

Search address supplied: 5, Foxborough, Swallowfield, Reading, RG7 1RW

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position and size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the contact details below:

Thames Water Utilities Ltd
Property Searches
Clearwater Court
Vastern Road
Reading
RG1 8DB

Email: property.searches@thameswater.co.uk
Web: thameswater.co.uk/propertysearches

Asset Location Search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority. Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners. The public sewer map relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus. The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies. For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. You can do this by emailing customer.feedback@thameswater.co.uk with the email subject header 'Enquiry – TWOSA', along with details of the request.

If you have any questions regarding sewer connections, budget estimates, diversions or building over issues please direct them to our service desk which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

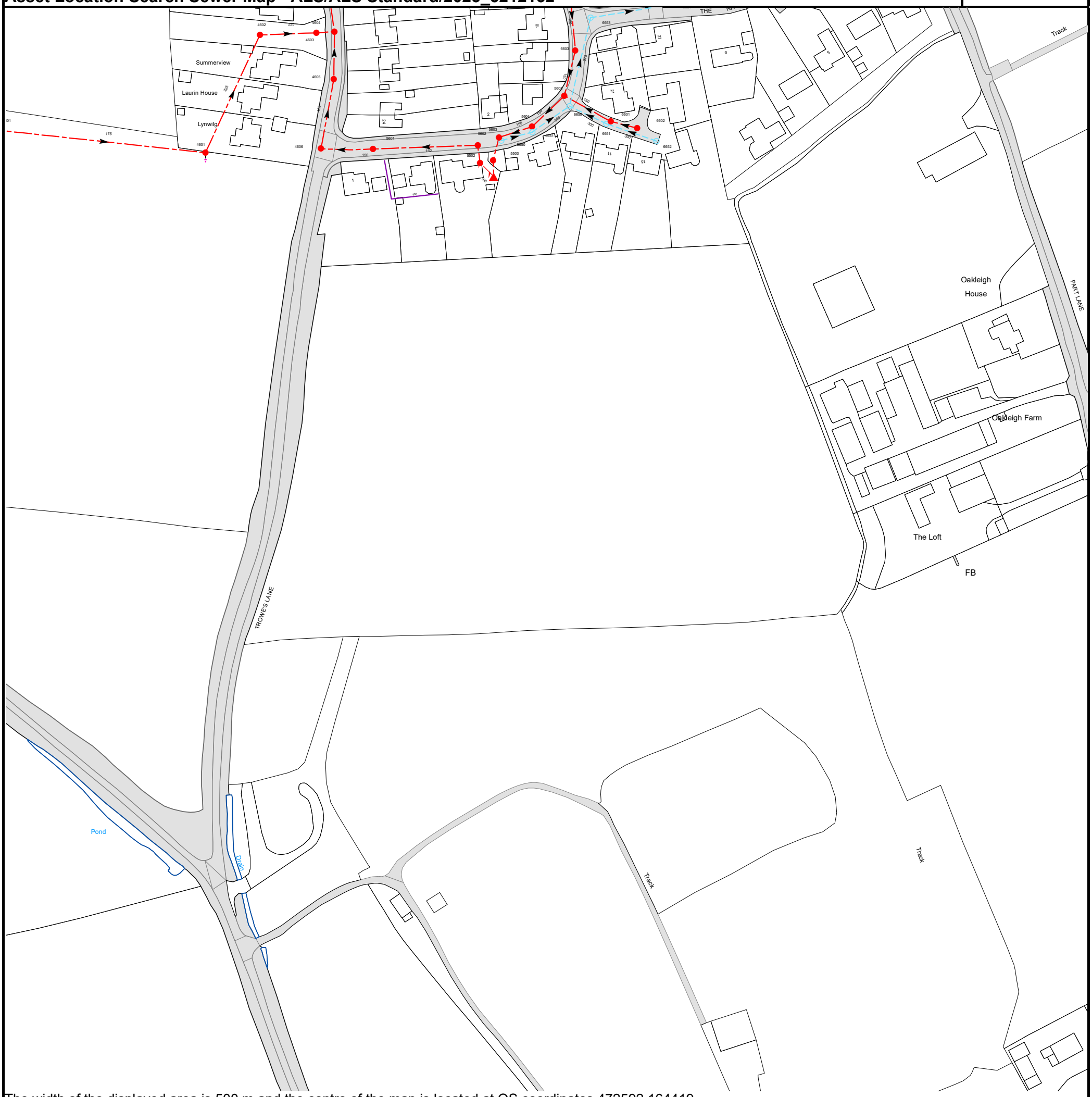
Clean Water queries

Should you require any advice concerning clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2025_5212152



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 472592,164419

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4601	46.29	44.72
4602	45.77	43.49
4603	45.51	43.18
4606	45.42	43.76
4605	45	43.59
4604	44.32	43.07
5601	45.4	43.91
5602	45.28	44.24
5502	45.4	44.33
5503	45.45	42.81
5603	45.3	42.96
5650	45.37	44.13
5604	45.3	42.97
5651	45.3	44.09
5605	45.19	43.11
6650	45.17	43.96
6603	45	44.24
6653	45.1	43.81
6651	45.2	44.08
6601	45.2	43.38
6602	45.2	43.54
6652	45.2	44.15
6654	45	43.73

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement.

If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2025_5212152

The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 472592, 164419.

Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- [illegible]

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Appendix G

Land Use Parameter Plan and Illustrative Masterplan

JCN DESIGN & PLANNING

N

Laurin House

Lynwilg

24

2

21

8

5

27

1

11

15

Oakleigh House

Oakleigh Fa

The Loft

FB

TROWE'S LANE

Drain

Track

Track

Legend

Residential Development Area up to 79 dwellings, all 2 storey including 40% affordable provision and infrastructure, including gardens, drainage and roads.

Public Open space including retention of trees, hedgerows, woodland enhancement, BNG, play formal and informal open space provision & drainage attenuation

Existing Woodland and Trees

Indicative drainage attenuation basin

Site Access Point

0 25 50 metre

Project:-

Land East of Trowe's Lane, Swallowfield

Description:-

Parameter Plan 1
Land Use &
Storey Heights

Date:- September

Drawing Scale:- 1-500@ A0

Drawing number:- CC017 PL-02

Revision:- C

www.jcndesign.co.uk

Plot Date - September 23, 2025

Rev	Date	Description	Drn	Chk
P03	17.09.25	Updates to DAS	KYZ	SV
P02	27.08.25	Updated to adjacent scheme and precedent images	KYZ	SV
P01	22.08.25	First Issue	KYZ	SV

Title: Illustrative Masterplan

Project: Swallowfield, Wokingham
Client: City & Country

Date: August 2025
Scale: NTS @ A3

Drawing No: 2909-LLA-ZZ-GF-SK-L-0001
Revision: P03
Suitability: Planning

Project No: 2909

T: +44 (0)1279 647044 E: office@lizlake.com www.lizlake.com

LIZ LAKE ASSOCIATES
LANDSCAPE ARCHITECTS

Appendix H

Environment Agency Flood Data Response

creating a better place
for people and wildlife

Environment Agency

Peter Jardine
peter.jardine@ghbullard.co.uk

Our ref: EIR2025/15976

Date: 15 July 2025

Dear Peter

RE: Environmental Information Regulations: EIR2025/15976

Thank you for your email regarding the Product 4 reference EIR2025/14997.

The Blackwater (Aldershot to Sandhurst and Bramshill to Swallowfield) 2007 is a 1D model (as described within the model information page of the Product 4), this therefore means that we do not hold 2D data, including height grid data for this model. We are therefore unable to supply the height grid data as requested.

We have supplied the Blackwater (Aldershot to Sandhurst and Bramshill to Swallowfield) 2007 on the following sharefile link: https://ea.sharefile.com/d-sc81c8f89df349339, if you would like to update the model and re-run it to obtain 2D data for your site.

Please refer to the tables below for the permitted use of the supplied information. The following information is not available under the Open Government Licence but we may be able to license it to you under the Environment Agency Conditional Licence.

However, you MUST first check the supporting information and the link to determine if the conditions on use are suitable for your purposes. If they aren't, this information is not provided with a licence for use, and the data is provided for read right only.

Name	Product 5
Description	Report
Licence	Environment Agency Conditional Licence

Information Warnings	*Any mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply.*
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Name	Product 6
Description	Model Output Data for Blackwater (Aldershot to Sandhurst and Bramshill to Swallowfield) 2007
Name	Product 7
Description	Calibrated and Verified Model Input Data for Blackwater (Aldershot to Sandhurst and Bramshill to Swallowfield) 2007
Licence	Environment Agency Conditional Licence
Conditions	1. You may use the Information for your internal or personal purposes and may only sublicense others to use it if you do so under a written licence which includes the terms of these conditions and the agreement and in particular may not allow any period of use longer than the period licensed to you. 2. Notwithstanding the fact that the standard wording of the Environment Agency Conditional Licence indicates that it is perpetual, this Licence has a limited duration of 5 years at the end of which it will terminate automatically without notice. 3. We have restricted use of the Information as a result of legal restrictions placed upon us to protect the rights or confidentialities of others. In this instance it is because of third party data. If you contact us in writing (this includes email) we will, as far as confidentiality rules allow, provide

	you with details including, if available, how you might seek permission from a third party to extend your use rights. 4.1 The Information may contain some data that we believe is within the definition of "personal data" under the Data Protection Act 1998 but we consider that we will not be in breach of the Act if we disclose it to you with conditions set out in this condition and the conditions above. This personal data comprises names of individuals or commentary relating to property that may be owned by an individual or commentary relating to the activities of an individual. 4.2 Under the Act a person who holds and uses or passes to others personal data is responsible for any compliance with the Act and so we have no option but to warn you that this means you have responsibility to check that you are compliant with the Act in respect of this personal data. 5. The location of public water supply abstraction sources must not be published to a resolution more detailed than 1km2. Information about the operation of flood assets should not be published.. 6.1 Where we have supplied model data which may include model inputs or outputs you agree to supply to the Environment Agency copies of any assessments/studies and related outputs, modifications or derivatives created pursuant to the supply to you of the Information, all of which are hereinafter referred to as "the Data". 6.2 You agree, in the public interest to grant to the Environment Agency a perpetual royalty free non-exclusive licence to use the Data or any part thereof for its internal purposes or to use it in any way as

	part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products.
Information Warnings	Please be aware that model data is not raw, factual or measured but comprises of estimations or modelled results based on the data available to us.
Attribution	Contains Environment Agency information © Environment Agency and/or database rights.

It should be noted that the extents of our modelling may not reach your site and may have been provided for access and egress purposes.

Please note that our historic flood event maps may not be comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at your location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system)
- overflowing or backing up of sewer or drainage systems which have been overwhelmed
- groundwater rising up from underground aquifers

You can find recorded flood outlines for this location via the link below:
https://data.gov.uk/dataset/recorded-flood-outlines1

You can find the historic flood map for this location via the link below:
https://data.gov.uk/dataset/historic-flood-map1

Please note, that the new Flood Map for Planning service, published 25 March 2025, is available to view and export maps for your site at: Flood map for planning - GOV.UK

Using modelling for flood risk assessments provides information regarding the use of modelling in flood risk assessments when applying for planning permission. You can view more information at: https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments

Please be aware that from 20th July 2021 the climate change allowances required in flood risk assessments have been updated. Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#contents for more information.

Did you know that many of our datasets are available online? Simply visit environment.data.gov.uk

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

Please get in touch if you have any further queries or contact us within two months if you would like us to review the information we have sent.

Kind Regards

Customers and Engagement Team – Thames Area

creating a better place
for people and wildlife

Environment Agency

Peter Jardine
peter.jardine@ghbullard.co.uk

Our ref: EIR2025/14997

Date: 27 June 2025

Dear Peter

RE: Environmental Information Regulations: EIR2025/14997

Thank you for requesting a Product 4 through the 'getting flood risk information for planning tool' on the .gov website received on 17 June reference APT12VJYV2Y6, – RG7 1RW.

We respond to these requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. Please find attached the requested data (referred to as product 4).

Please be aware that the Environment Agency supply data, but we do not interpret it for use in a Flood Risk Assessment. Flood Risk Assessment's should be completed by a suitably competent and qualified person.

You may be interested in the following guidance / information publicly available:

1. **'Planning Practice Guidance'** - provides information about planning considerations in areas at risk of flooding. https://www.gov.uk/government/collections/planning-practice-guidance
2. **'Planning applications: assessing flood risk'** - information about completing Flood Risk Assessments. https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications
3. **'Site specific flood risk assessment: Checklist'** – a checklist to help ensure you have considered all the relevant factors in your flood risk assessment. https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section
4. **'Using modelling for flood risk assessments'** – provides information regarding the use of modelling in flood risk assessments when applying for

planning permission. https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments

Please note that our historic flood event maps may not be comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at your location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system)
- overflowing or backing up of sewer or drainage systems which have been overwhelmed
- groundwater rising up from underground aquifers

You can find recorded flood outlines for this location via the link below:
https://data.gov.uk/dataset/recorded-flood-outlines1

You can find the historic flood map for this location via the link below:
https://data.gov.uk/dataset/historic-flood-map1

Please note, that the new Flood Map for Planning service, published 25 March 2025, is available to view and export maps for your site. For product 4s produced before the 25 March 2025, we recommend that you check and request a new Flood Map for Planning, via Flood map for planning - GOV.UK

Please be aware that from 20th July 2021 the climate change allowances required in flood risk assessments have been updated. We recommend that you discuss your proposals with the Local Planning Authority at the earliest opportunity. They will be able to advise you on a wide range of planning matters in addition to flood risk.
Due to recent changes in guidance on the allowances for climate change, the 20% increase in river flows should no longer to be used for development design purposes. The data included in this product can be used for interpolation of levels as part of an

intermediate level assessment. For further advice on the new allowances please visit https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Please refer to the table below for the permitted use of the supplied information.

Name	Product 4
Description	Detailed Flood Risk Assessment Map for RG7 1RW
Licence	Open Government Licence
Information Warning - OS background mapping	*The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.*
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

It should be noted that the extents of our modelling may not reach your site and may have been provided for access and egress purposes.

I hope that we have correctly interpreted your request.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind Regards

Customers and Engagement Team – Thames Area

Product 4 (Detailed Flood Risk) for land at SU7258364439
Our Ref: EIR2025/14997

Product 4 is designed for developers where Flood Risk Standing Advice FRA (Flood Risk Assessment) Guidance Note 3 Applies. This is:

i) "all applications in Flood Zone 3, other than non-domestic extensions less than 250 sq metres; and all domestic extensions", and
ii) "all applications with a site area greater than 1 ha" in Flood Zone 2.

Product 4 includes the following information:

Ordnance Survey 1:25k colour raster base mapping;
Flood Zone 2 and Flood Zone 3;
Relevant model node locations and unique identifiers (for cross referencing to the water levels, depths and flows table);
Model extents showing *defended* scenarios;
FRA site boundary (where a suitable GIS layer is supplied);
Flood defence locations (where available/relevant) and unique identifiers; (supplied separately)
Flood Map flood storage areas (where available/relevant);
Historic flood events outlines (where available/relevant, not the Historic Flood Map) and unique identifiers;

Statutory (Sealed) Main River (where available within map extents);

A table showing:

i) Model node X/Y coordinate locations, unique identifiers, and levels and flows for *defended* scenarios.
ii) Flood defence locations unique identifiers and attributes; (supplied seperately)
iii) Historic flood events outlines unique identifiers and attributes; and
iv) Local flood history data (where available/relevant).

Please note:

If you will be carrying out computer modelling as part of your Flood Risk Assessment, please request our guidance which sets out the requirements and best practice for computer river modelling.

This information is based on that currently available as of the date of this letter. You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.
This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at:

https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities

If you would like advice from us regarding your development proposals you can complete our pre application enquiry form which can be found at:

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Red Kite House, Howbery Park, Wallingford, Oxon OX10 8BD
Customer services line: 08708 506 506
Email: enquiries_THM@environment-agency.gov.uk

Defence information

EIR2025/14997

Defence Location:	No defences on Main River
Description:	This location is not currently protected by any formal defences and we do not currently have any flood alleviation works planned for the area. However we continue to maintain certain watercourses and the schedule of these can be found on our internet pages.

Model information

EIR2025/14997

Model: Blackwater (Aldershot to Sandhurst and Bramshill to Swallowfield) 2007

Description: The data provided is taken from the River Blackwater 1D Detailed Flood Risk Mapping Study which was completed in September 2007. The model includes Blackwater, Marrow Brook, Pystock Stream and Vigo Stream. Model re-run to include new climate change allowances in July 2017.

Model design runs and Mapped Outputs:
• 1 in 5 / 20% AEP
• 1 in 20 / 5% AEP
• 1 in 50 / 2% AEP
• 1 in 100 / 1% AEP
• 1 in 100+15% / 1% AEP with 15% AEP climate change allowance
• 1 in 100+25% / 1% AEP with 20% AEP climate change allowance
• 1 in 100+35% / 1% AEP with 25% AEP climate change allowance
• 1 in 100+35% / 1% AEP with 35% AEP climate change allowance
• 1 in 100+70% / 1% AEP with 70% AEP climate change allowance

Model accuracy:
Levels ± 300mm

Model information

EIR2025/14997

Model: Loddon (Lower) 2009

Description: The information provided is taken from the Lower Loddon Detailed Flood Risk Mapping study which was completed in January 2009. This model is a 1D-2D model using ESTRY-TUFLOW. The model was originally built in 2007 but the hydrology was updated and model rerun in 2009. The model was re-run for more return periods on the main Loddon than on some of the tributaries.

River Channel Model: ESTRY 1D model of Lower Loddon, Old Loddon, St. Patricks Stream, River Thames (from Sonning to Marsh Lock), Twyford Brook, Billingbear Brook and Emm Brook (from Toutley Bridge to Loddon), Barkham Brook, Ashridge Stream, Waterloo Road Stream and Upper Emm Brook (from Nine Mile Ride to Toutley Bridge)

Model design runs (Main River Loddon):
1 in 5 / 20% Annual Exceedance Probability (AEP); 1 in 20 / 5% AEP; 1 in 50 / 2% AEP; 1 in 100 / 1% AEP; 1 in 1000 / 0.1% AEP; and 1 in 100+20% / 1% AEP plus 20% increase in flows

Mapped outputs (main River Loddon):
1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 50 / 2% AEP; 1 in 100 / 1% AEP, 1 in 100+20% / 1% AEP plus 20% increase in flows, and 1 in 1000 / 0.1% AEP

Model design runs (tributaries – Emm Brook (Wokingham), Emm Brook (Upstream), Ashridge Stream, Waterloo Road Stream, Barkham Brook):
1 in 5 / 20% Annual Exceedance Probability (AEP); 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; and 1 in 100+20% / 1% AEP plus 20% increase in flows

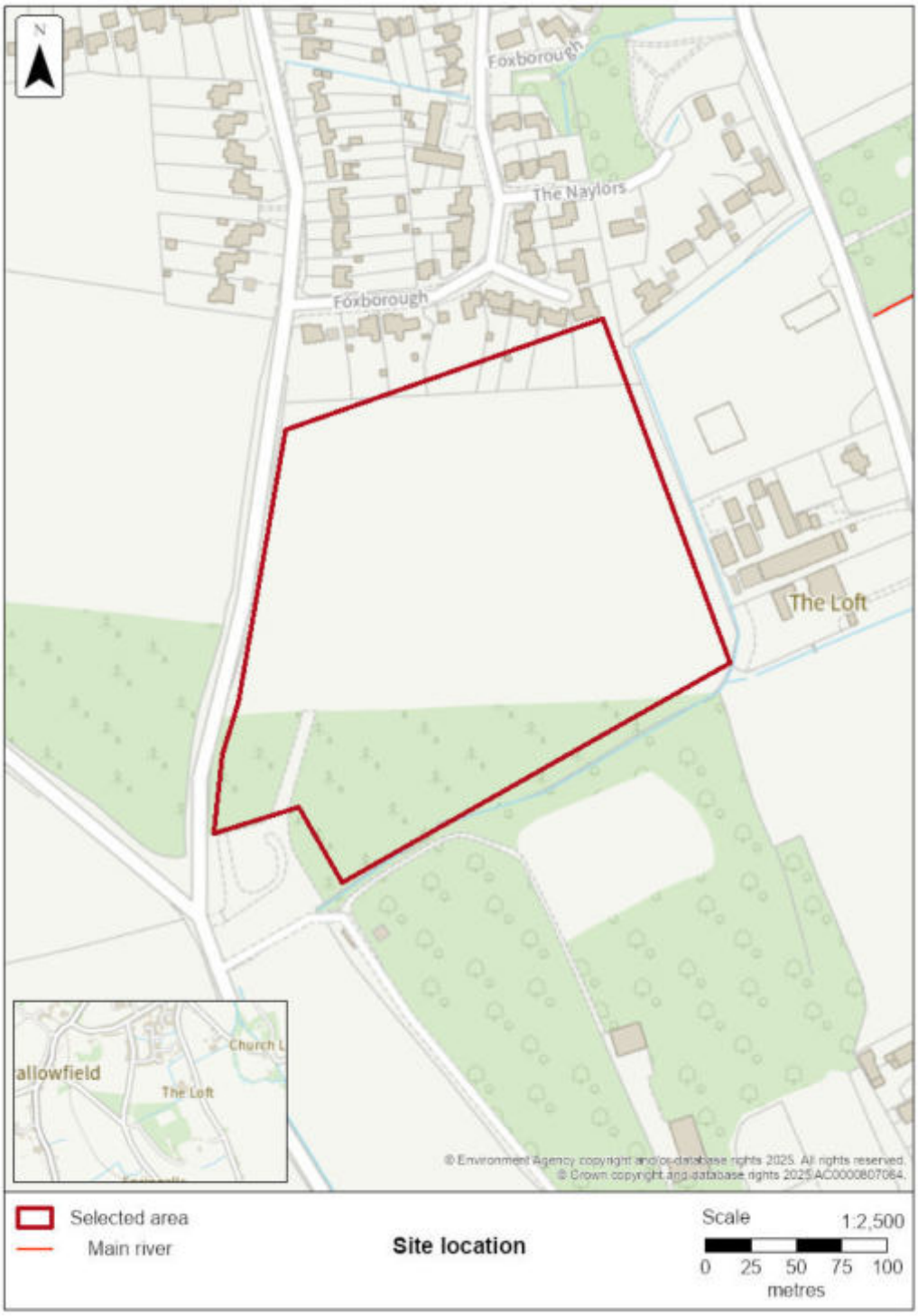
Mapped outputs (tributaries):
1 in 5 / 20% AEP; 1 in 20 / 5% AEP, 1 in 100 / 1% AEP and 1 in 100+20% / 1% AEP plus 20% increase in flows

Model accuracy:
Levels ± 250mm

Flood risk assessment data

Location of site: 472583 / 164439 (shown as easting and northing coordinates)
Document created on: 17 June 2025
This information was previously known as a product 4.
Customer reference number: APT12VJYV2Y6

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- past floods
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Information that's unavailable

This document **does not** contain:

- flood defences and attributes

We aren't able to display flood defence locations and attributes as there are no formal flood defences in the area of interest.

Surface water and other sources of flooding

When using the surface water map on the check your long term flood risk service the following considerations apply:

- surface water extents are suitable for use in planning
- surface water climate change scenarios may help to inform risk assessments, but the available data fall short of what is required to assess planned development
- surface water depth information should not be used for planning purposes

To find out about other factors that might affect the flood risk of this location, you should also check:

- reservoir flood risk
- groundwater flood risk - you could use the British Geological Survey groundwater flooding data, groundwater: current status and flood risk and the guide on mining and groundwater constraints for development - further information may be available from the lead local flood authority (LLFA)
- your local planning authority's SFRA, which includes future flood risk

Your Lead Local Flood Authority is Wokingham.

For information about sewer flooding, contact the relevant water company for the area.

About the models used

Model name: Blackwater 2007 - River Blackwater
Scenario(s): Defended fluvial, defences removed fluvial, defended climate change fluvial, defences removed climate change fluvial
Date: 25 May 2007

Model name: Loddon (Lower) 2009
Scenario(s): No defences exist fluvial, no defences exist climate change fluvial
Date: 1 January 2009

These models contain the most relevant data for your area of interest.

Terminology used

Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occuring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

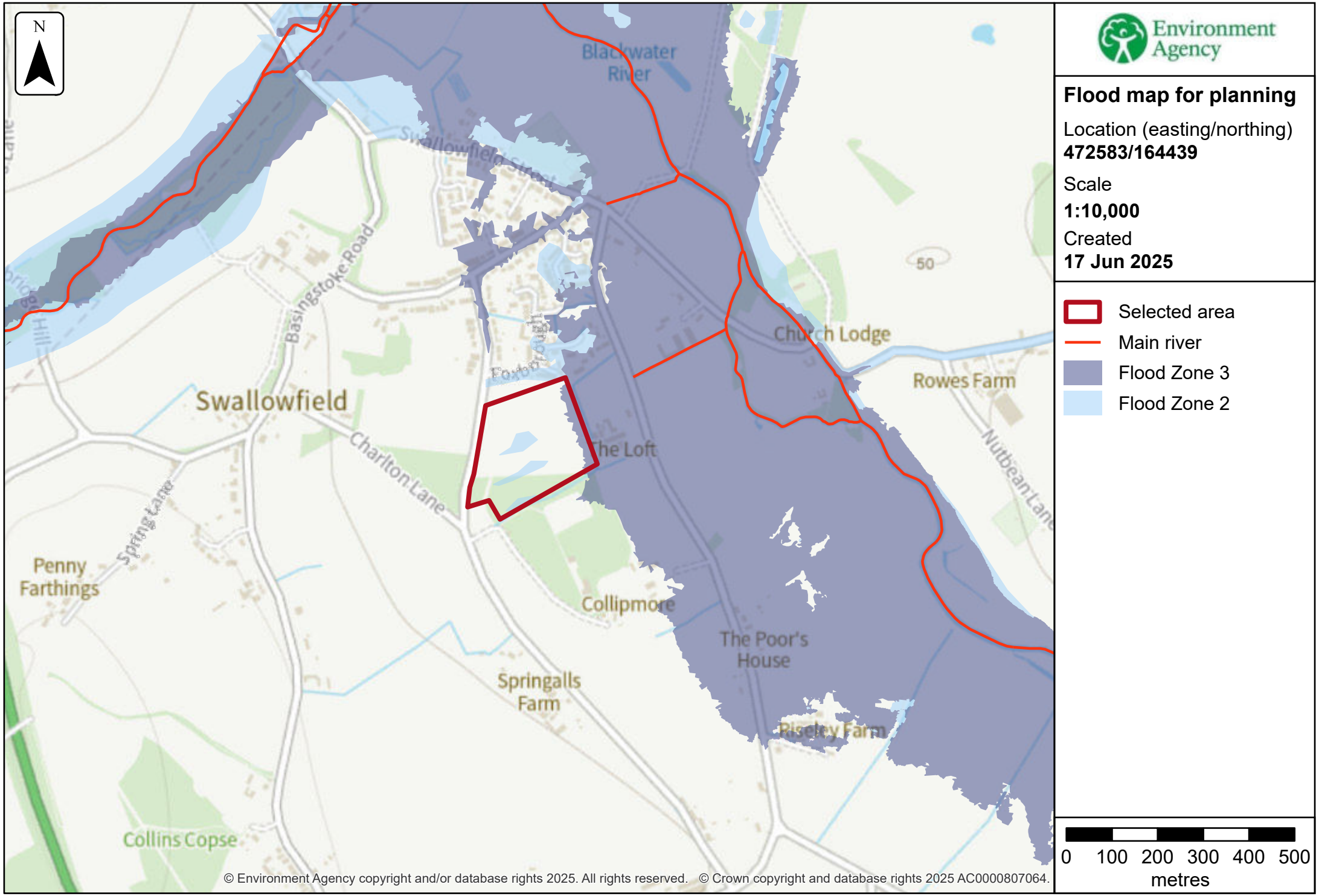
- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change



Environment Agency

Flood map for planning

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

- Selected area
- Main river
- Flood Zone 3
- Flood Zone 2

0 100 200 300 400 500
metres

Past floods

Past flood events included in this document

The recorded flood outlines included in this document are for areas of land local to your site location that have been flooded by any of these sources:

- ephemeral water
- main rivers
- ordinary watercourses
- the sea
- unknown

Data limitations

The outlines do not include flooding from:

- drainage where rainfall has led to surface water ponding or overland runoff
- artificial, water-bearing sewer, water supply and wastewater treatment pipelines

Changes to flood defences

The defences (also known as assets) that were in place may also have changed. For example, assets may have been built more recently than the last recorded flood outline.

What the recorded flood outlines dataset is

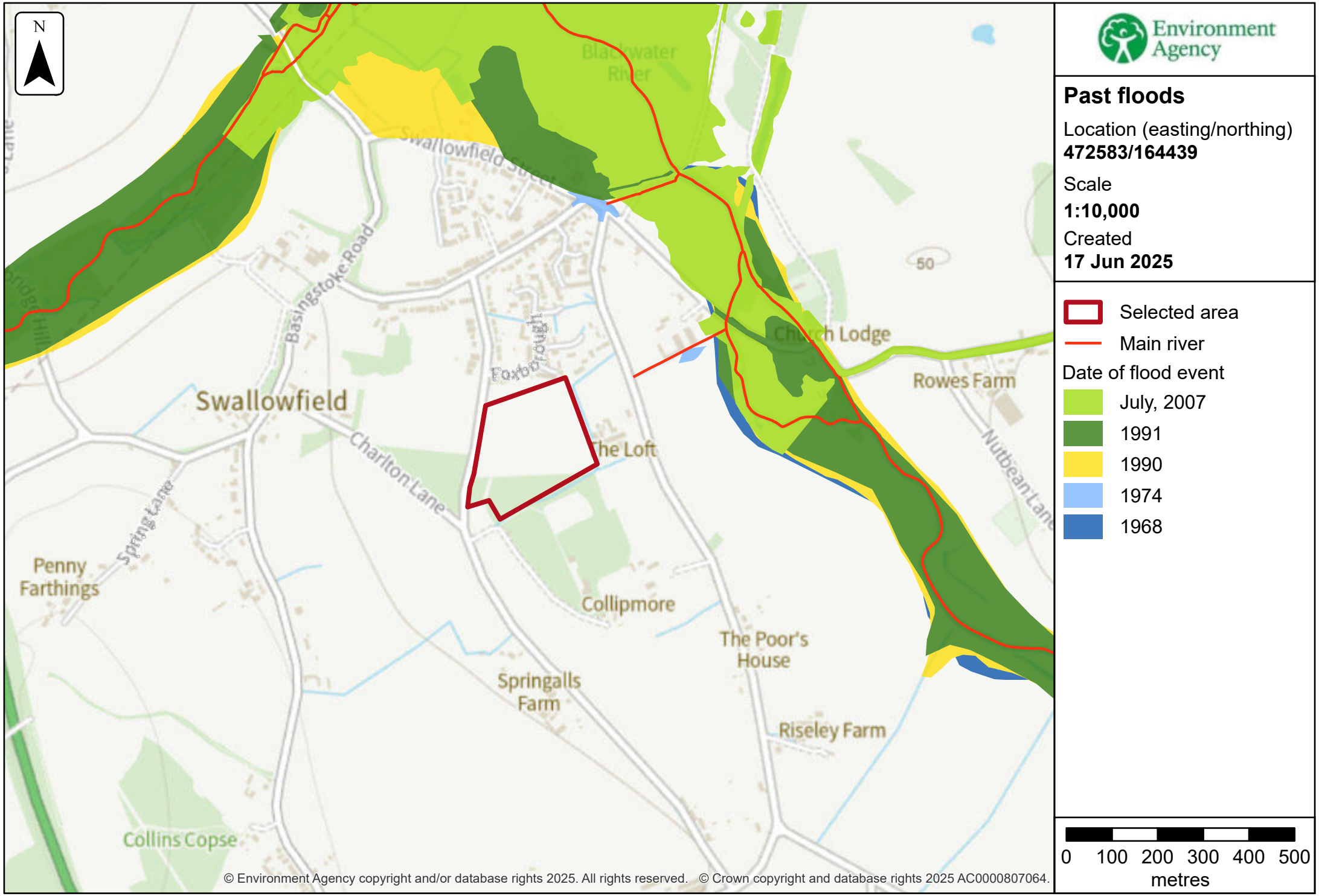
The recorded flood outlines are a geographical information system (GIS) data layer that show our verified records of areas that have flooded in the past from:

- rivers
- the sea
- groundwater
- surface water

Download the complete recorded flood outlines dataset, which includes data quality flags for outlines recorded after April 2020. This indicates the confidence we have in an outline.

Get flood information from other organisations

Contact Wokingham Lead Local Flood Authority (LLFA) and your drainage board to get information about past flooding caused by surface water or drainage systems.



Environment Agency

Past floods

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

Selected area
Main river

Date of flood event
- July, 2007
- 1991
- 1990
- 1974
- 1968

0 100 200 300 400 500
metres

Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
20 July 2007	21 July 2007	main river	channel capacity exceeded (no raised defences)	No
1991	1991	main river	channel capacity exceeded (no raised defences)	No
1990	1990	main river	channel capacity exceeded (no raised defences)	No
1974	1974	unknown	channel capacity exceeded (no raised defences)	No
1968	1968	main river	channel capacity exceeded (no raised defences)	No

Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

Climate change

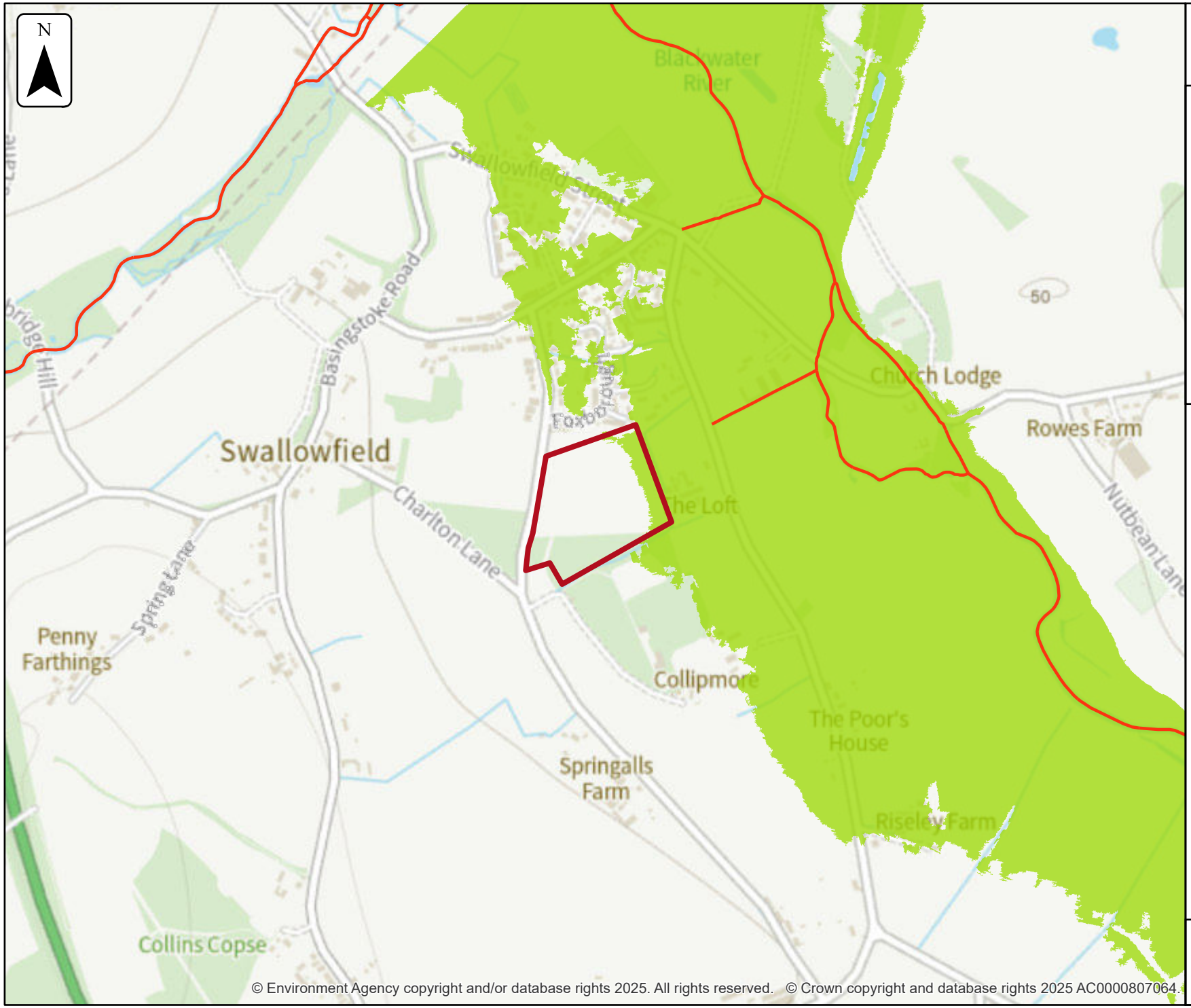
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- No defences exist modelled fluvial: risk of flooding from rivers where there are no flood defences
- Defended climate change modelled fluvial: risk of flooding from rivers where there are flood defences, including estimated impact of climate change
- Defences removed climate change modelled fluvial: risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change
- No defences exist climate change modelled fluvial: risk of flooding from rivers where there are no flood defences, including estimated impact of climate change



Environment Agency

Defences removed climate change modelled fluvial extent

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

Model name
Blackwater 2007 - River Blackwater

Selected area

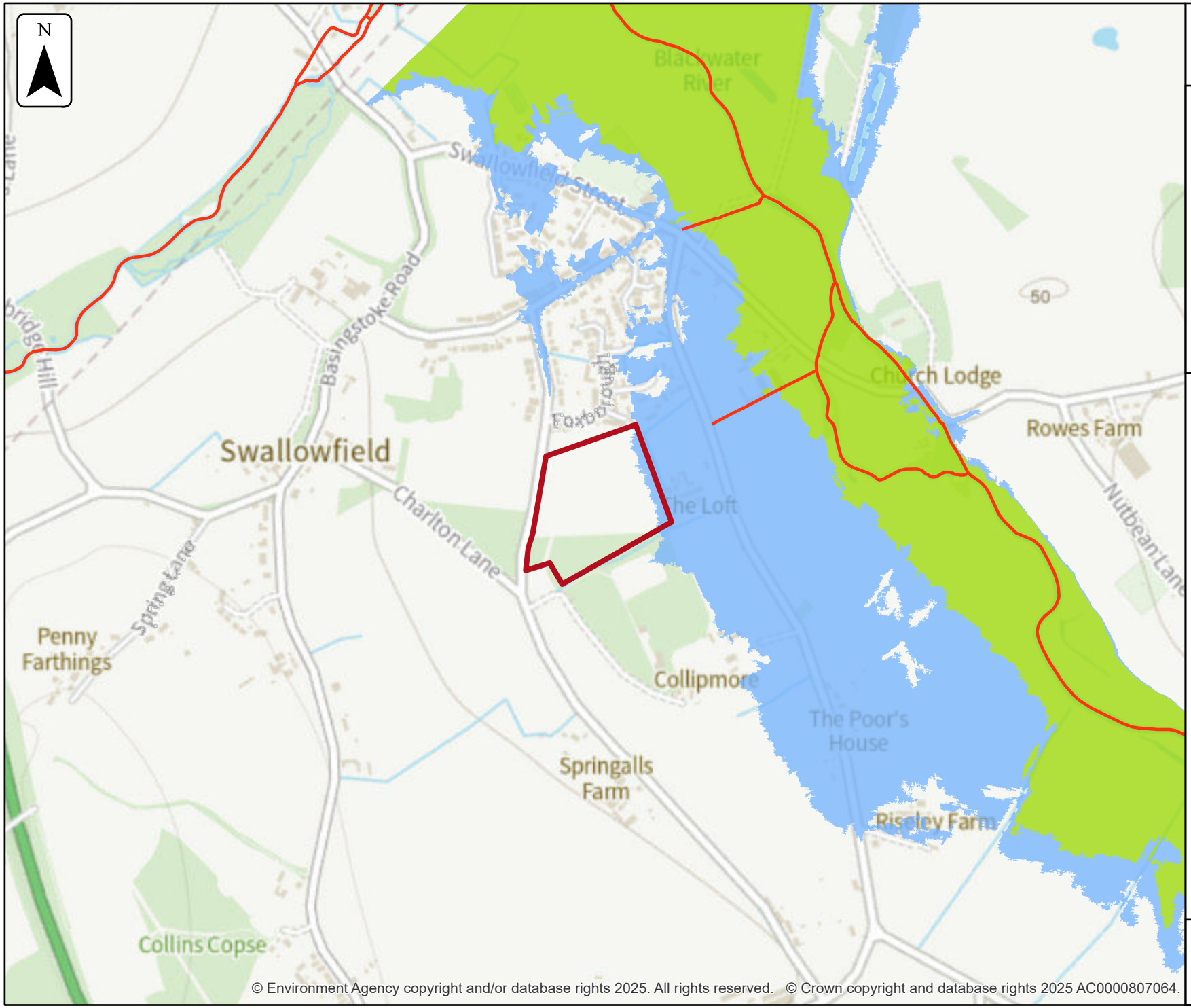
Main river

Modelled flood extent

1% AEP (+20%)

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres



Environment Agency

Defences removed modelled fluvial extent

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

Model name
Blackwater 2007 - River Blackwater

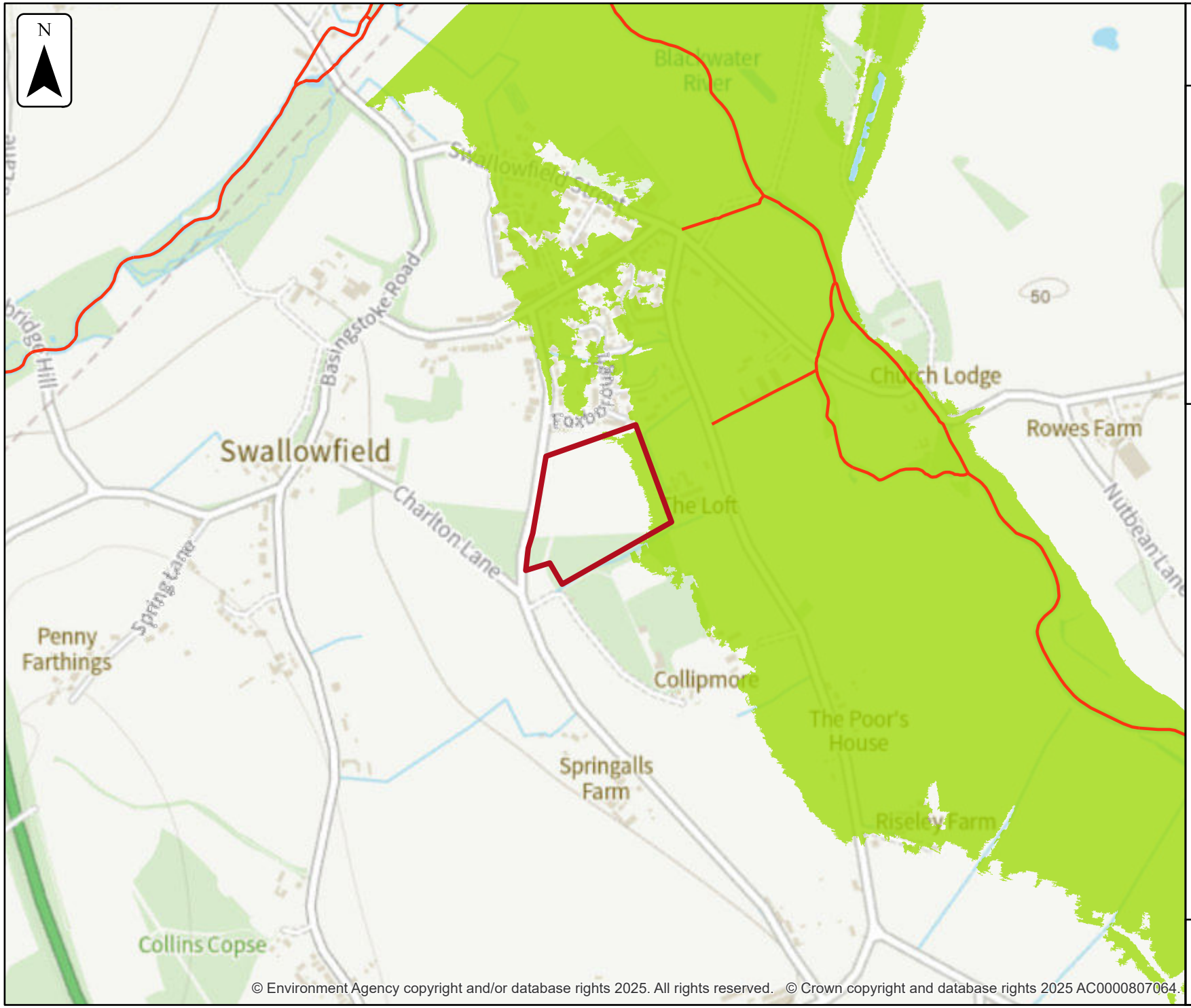
- Selected area
- Main river

Modelled flood extent

- 5% AEP
- 1% AEP

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres



Environment Agency

Defended climate change modelled fluvial extent

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

Model name
Blackwater 2007 - River Blackwater

Selected area

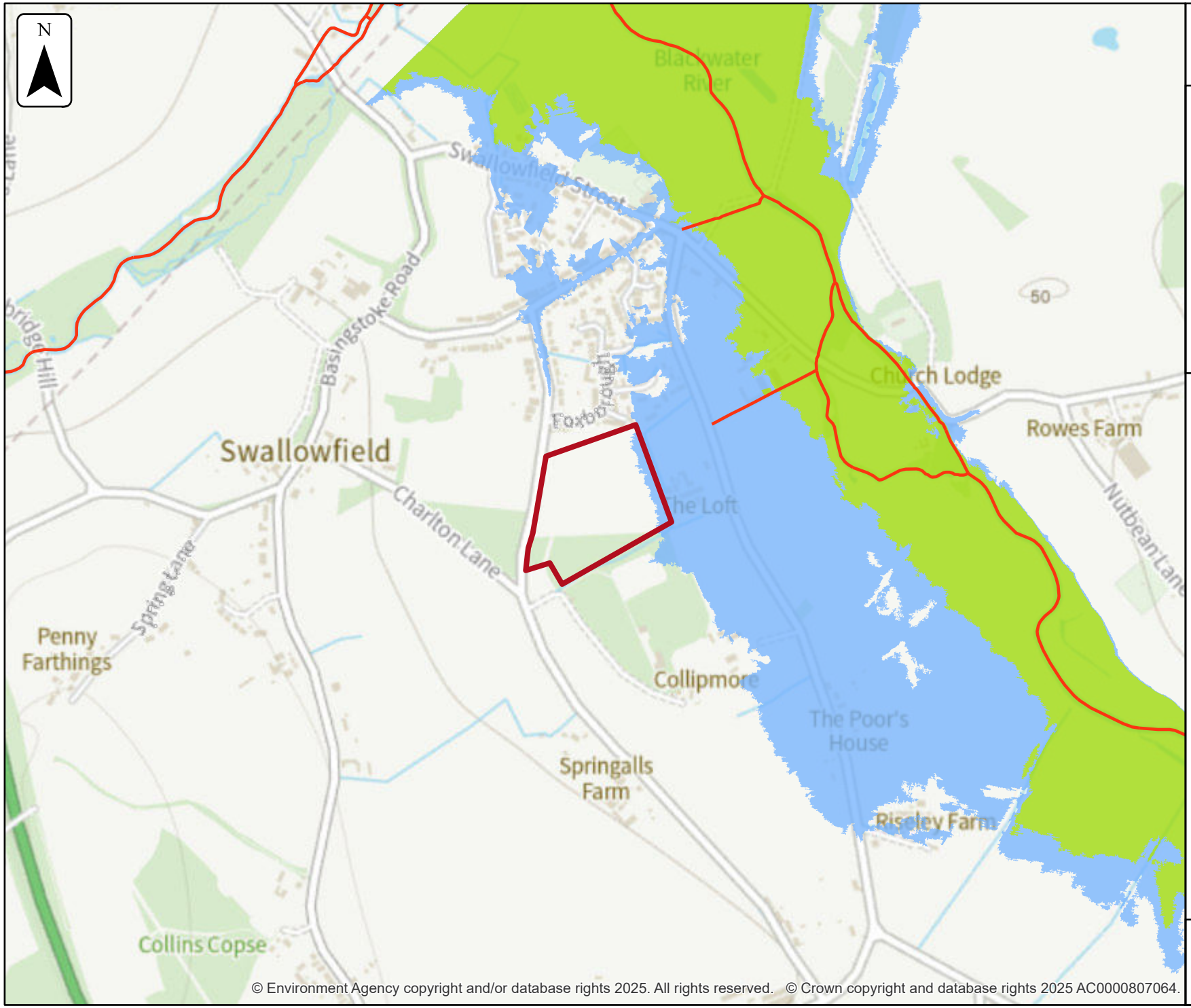
Main river

Modelled flood extent

1% AEP (+20%)

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres



Environment Agency

Defended modelled fluvial extent

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

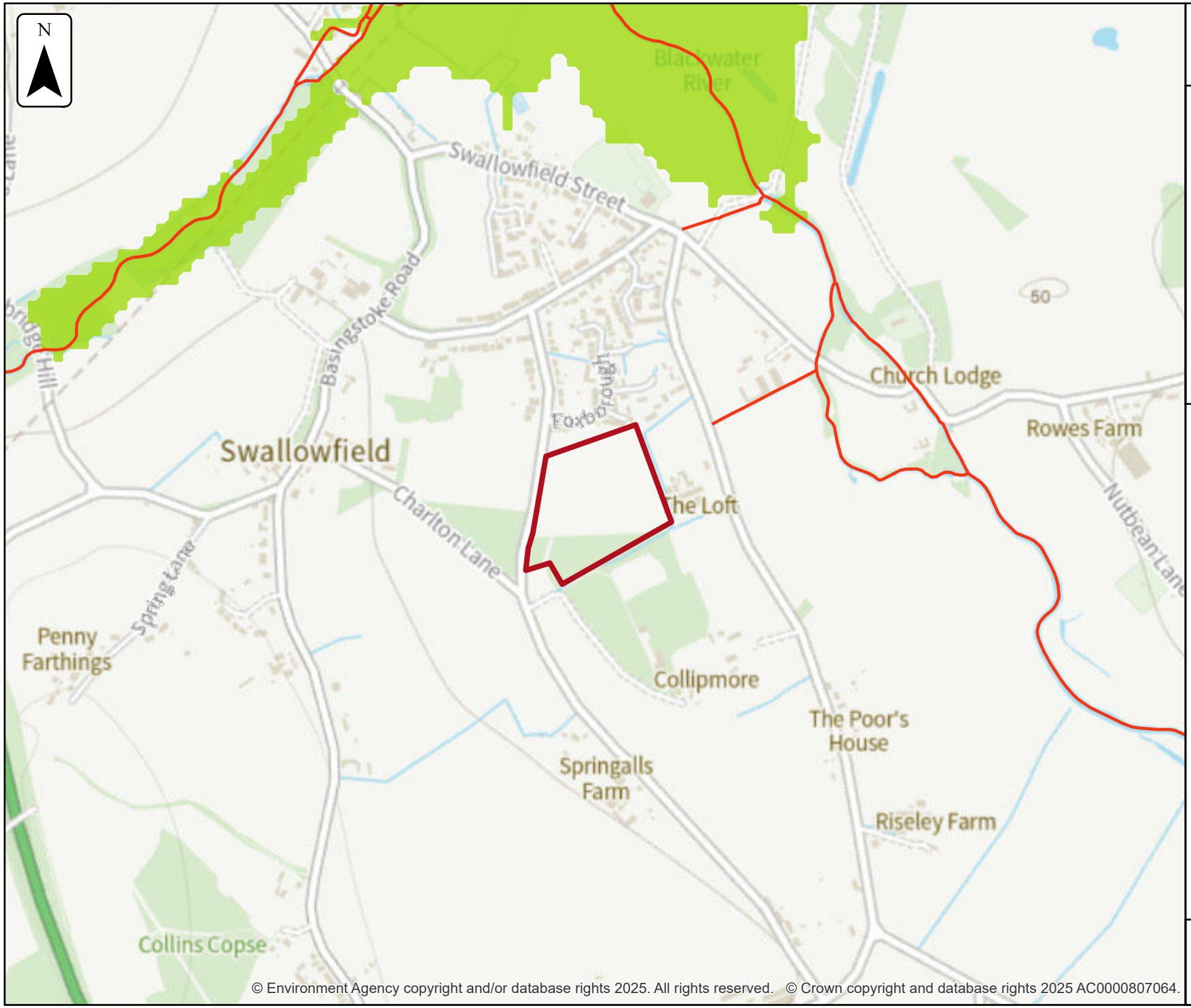
Model name
Blackwater 2007 - River Blackwater

- Selected area
- Main river

Modelled flood extent
- 5% AEP
- 1% AEP

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres



Environment Agency

No defences exist climate change modelled fluvial extent

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

Model name
Loddon (Lower) 2009

Selected area

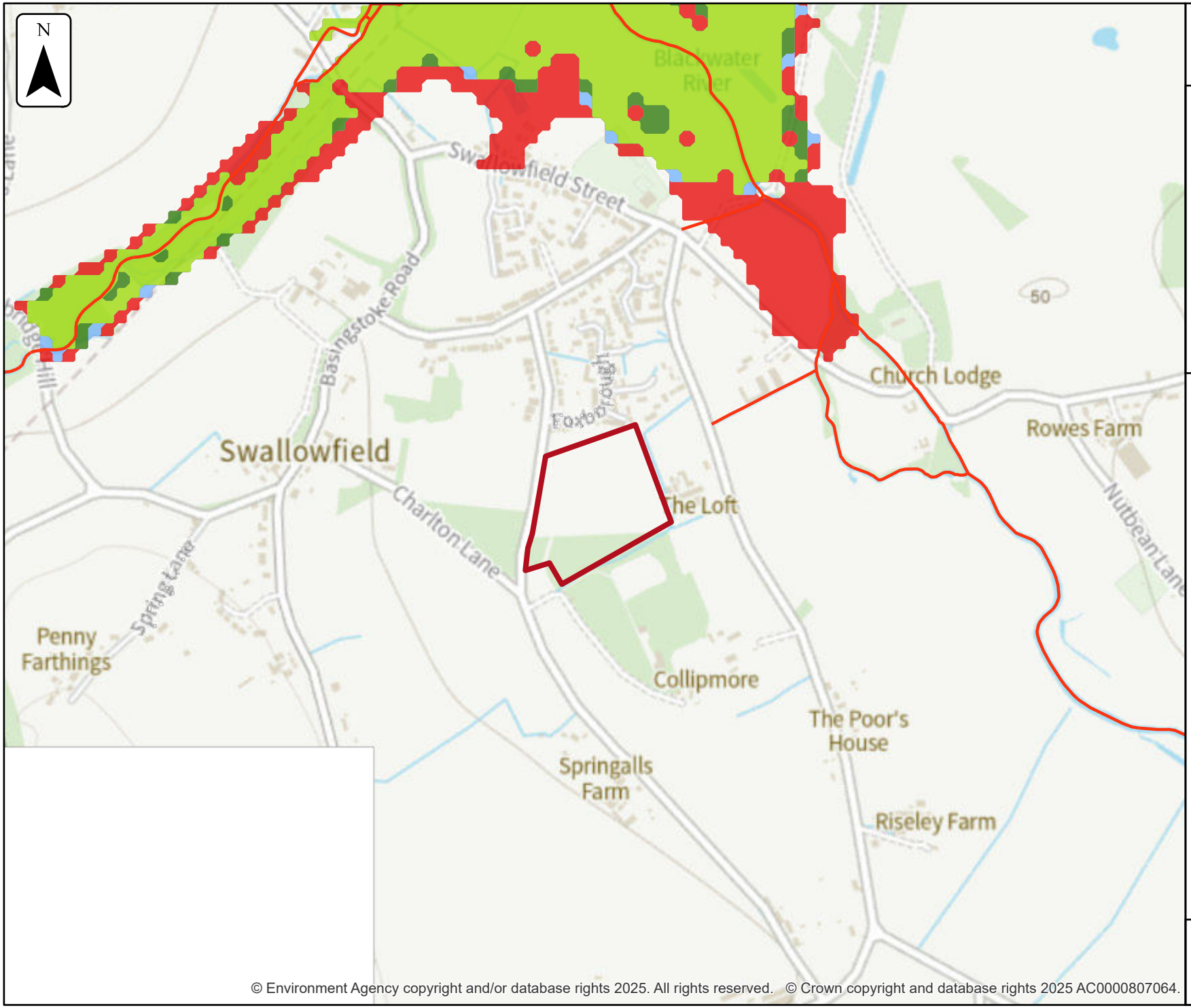
Main river

Modelled flood extent

1% AEP (+20%)

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres



Environment Agency

No defences exist modelled fluvial extent

Location (easting/northing)
472583/164439

Scale
1:10,000

Created
17 Jun 2025

Model name
Loddon (Lower) 2009

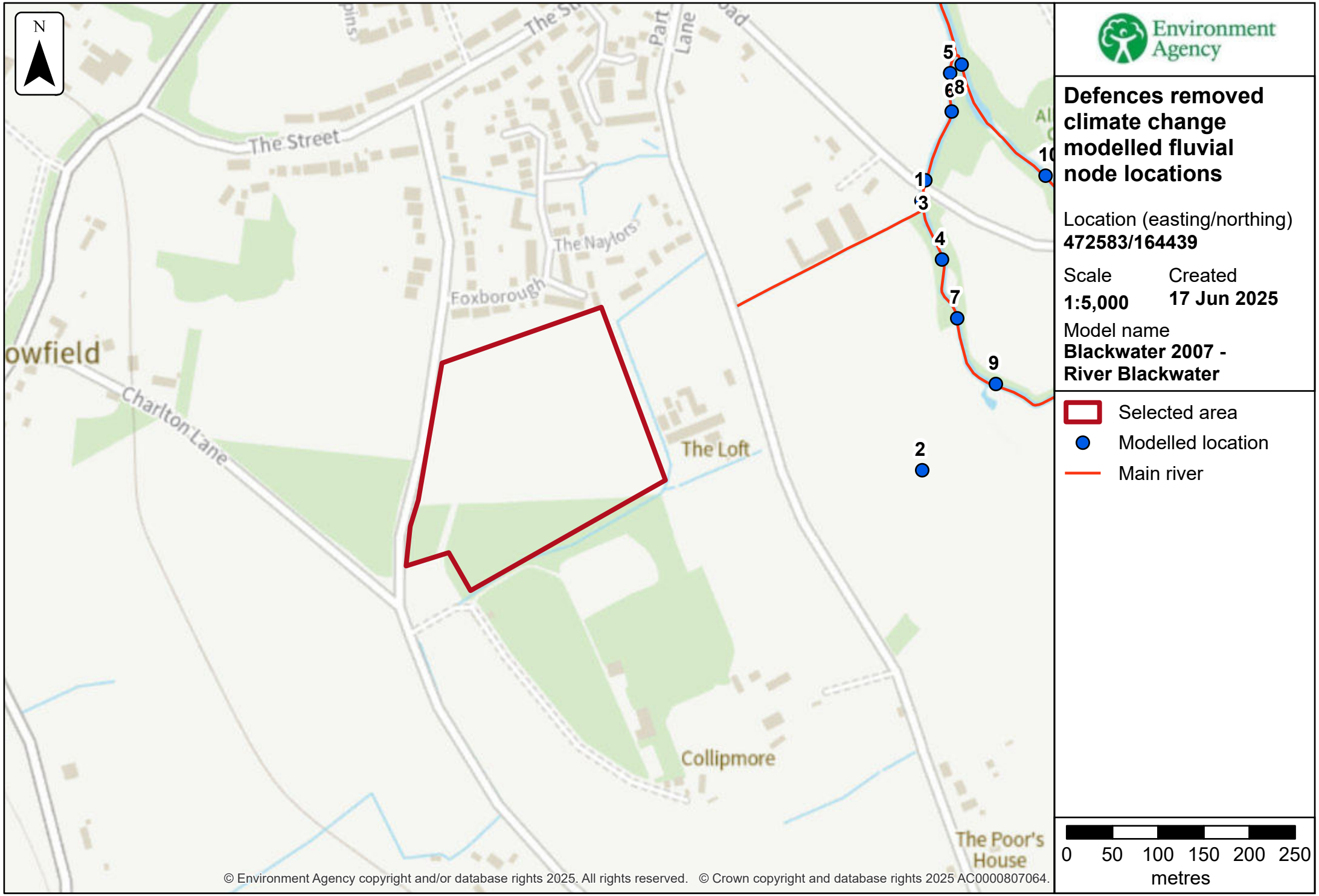
- Selected area
- Main river

Modelled flood extent

- 5% AEP
- 2% AEP
- 1% AEP
- 0.1% AEP

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres


N
The Street
The Naylors
Foxborough
Charlton Lane
owfield
The Loft
Collipmore
The Poor's House
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Environment Agency
Defences removed climate change modelled fluvial node locations
Location (easting/northing)
472583/164439
Scale
1:5,000
Created
17 Jun 2025
Model name
Blackwater 2007 - River Blackwater
Selected area
Modelled location
Main river
0 50 100 150 200 250
metres
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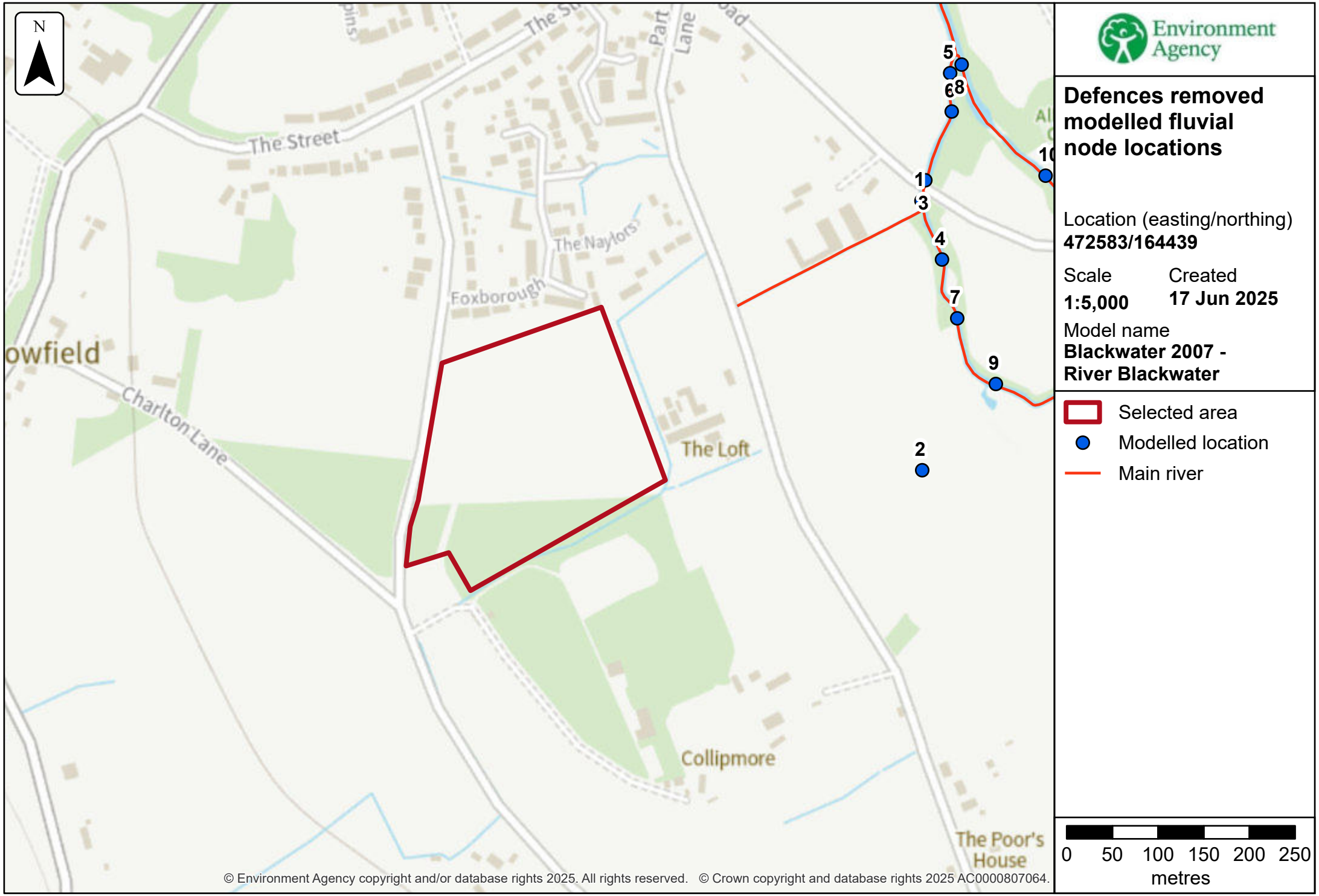
Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+20%)	1% AEP (+20%)
				Level	Flow
1	1102727	473012	164710	44.63	41.09
2	1102319	473013	164415	64.85	0.0
3	1102406	473016	164732	44.31	41.09
4	1102823	473034	164646	44.64	41.09
5	1102565	473043	164850	44.23	42.49
6	1102331	473045	164808	44.27	42.47
7	1102608	473051	164581	44.65	41.10
8	1102297	473056	164859	44.23	21.90
9	1102675	473093	164509	44.69	21.21
10	1102628	473148	164737	44.48	21.97

Data in this table comes from the Blackwater 2007 - River Blackwater model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.


N
The Street
The Naylors
Foxborough
Charlton Lane
owfield
The Loft
Collipmore
The Poor's House
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Environment Agency
Defences removed modelled fluvial node locations
Location (easting/northing)
472583/164439
Scale
1:5,000
Created
17 Jun 2025
Model name
Blackwater 2007 - River Blackwater
Selected area
Modelled location
Main river
0 50 100 150 200 250
metres
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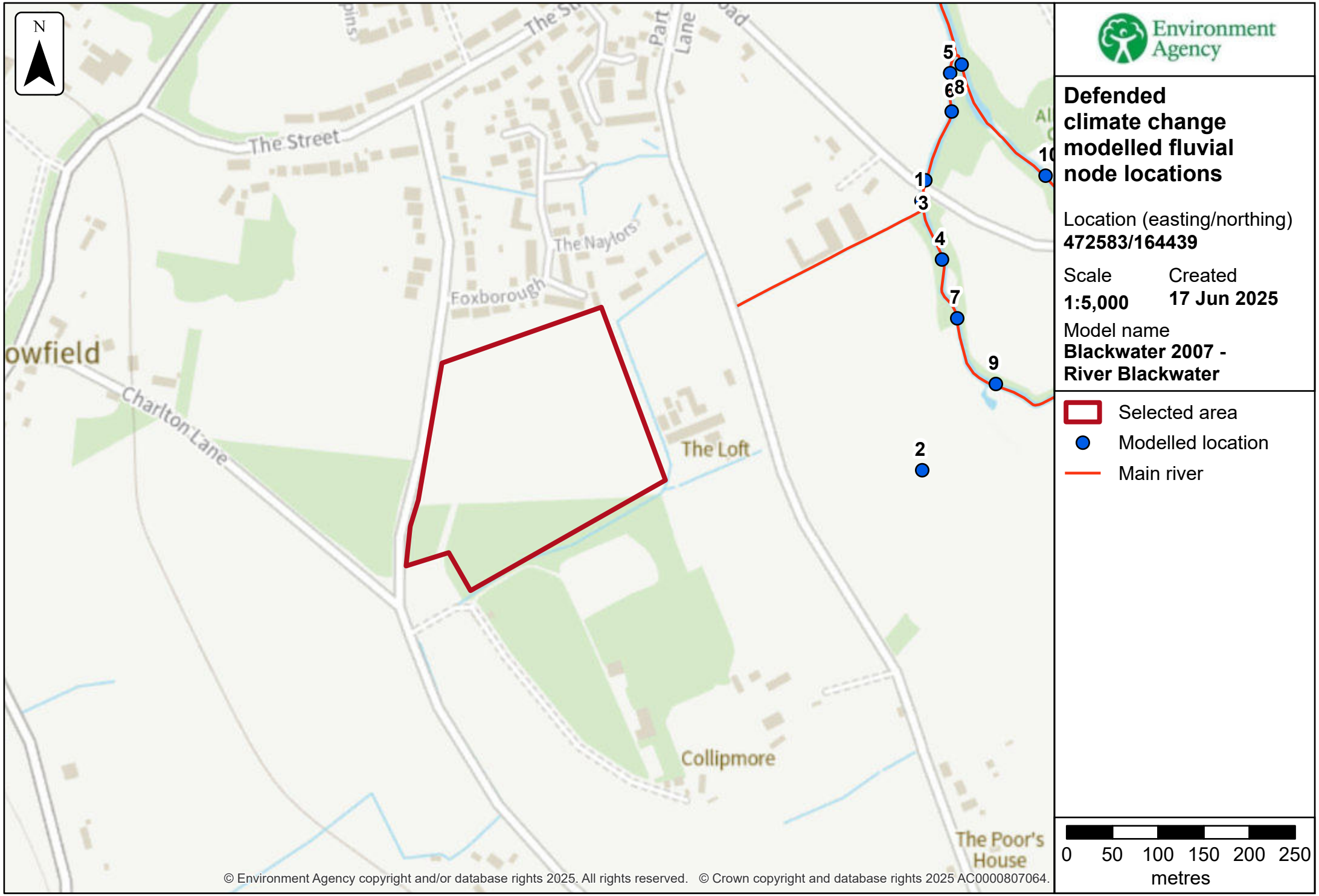
Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	20% AEP	5% AEP	1% AEP	20% AEP	5% AEP	1% AEP
				Level	Level	Level	Flow	Flow	Flow
1	1102727	473012	164710	43.68	43.94	44.35	19.59	25.03	34.07
2	1102319	473013	164415	64.88	64.88	64.88	0.0	0.0	0.0
3	1102406	473016	164732	43.62	43.82	44.12	19.59	25.02	34.07
4	1102823	473034	164646	43.71	43.96	44.36	19.59	25.05	34.07
5	1102565	473043	164850	43.49	43.70	44.02	19.58	25.05	34.66
6	1102331	473045	164808	43.56	43.76	44.07	19.58	25.05	34.64
7	1102608	473051	164581	43.74	43.99	44.38	19.60	25.06	34.09
8	1102297	473056	164859	43.49	43.70	44.02	13.66	16.28	19.94
9	1102675	473093	164509	43.83	44.07	44.43	8.59	9.70	15.60
10	1102628	473148	164737	43.87	44.05	44.32	13.67	16.29	19.98

Data in this table comes from the Blackwater 2007 - River Blackwater model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

Defended climate change modelled fluvial node locations

Location (easting/northing)
472583/164439

Scale
1:5,000

Created
17 Jun 2025

Model name
Blackwater 2007 - River Blackwater

Selected area
Modelled location
Main river

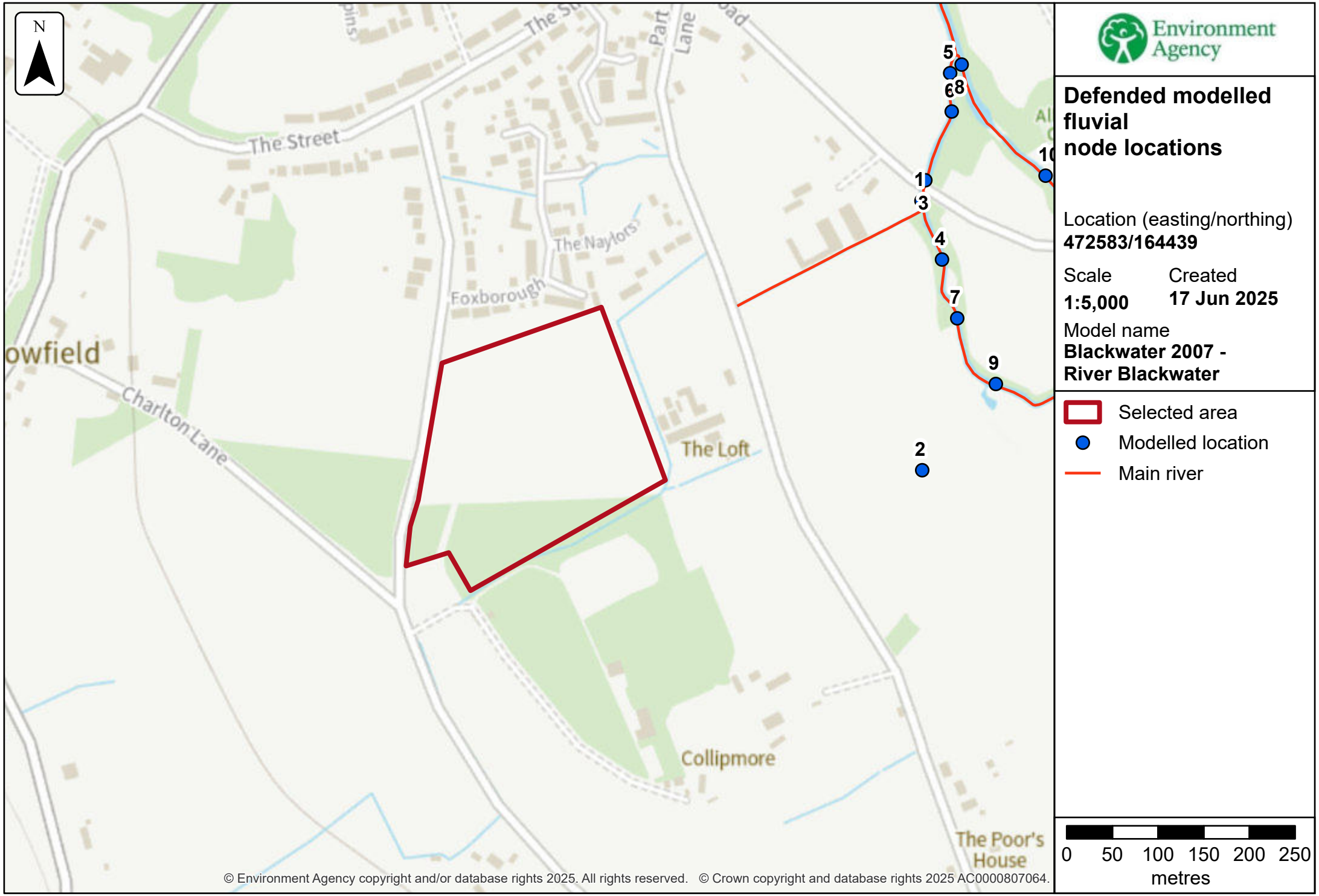
0 50 100 150 200 250
metres

Modelled node locations data

Defended climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+20%)	1% AEP (+20%)
				Level	Flow
1	1102727	473012	164710	44.63	41.08
2	1102319	473013	164415	64.88	0.0
3	1102406	473016	164732	44.31	41.09
4	1102823	473034	164646	44.64	41.08
5	1102565	473043	164850	44.23	42.49
6	1102331	473045	164808	44.27	42.46
7	1102608	473051	164581	44.65	41.10
8	1102297	473056	164859	44.23	21.90
9	1102675	473093	164509	44.69	21.21
10	1102628	473148	164737	44.48	21.97

Data in this table comes from the Blackwater 2007 - River Blackwater model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.


N
The Street
The Naylors
Foxborough
Charlton Lane
The Loft
Collipmore
The Poor's House
owfield
1
2
3
4
5
6
7
8
9
10
Environment Agency
Defended modelled fluvial node locations
Location (easting/northing)
472583/164439
Scale
1:5,000
Created
17 Jun 2025
Model name
Blackwater 2007 - River Blackwater
Selected area
Modelled location
Main river
0 50 100 150 200 250
metres
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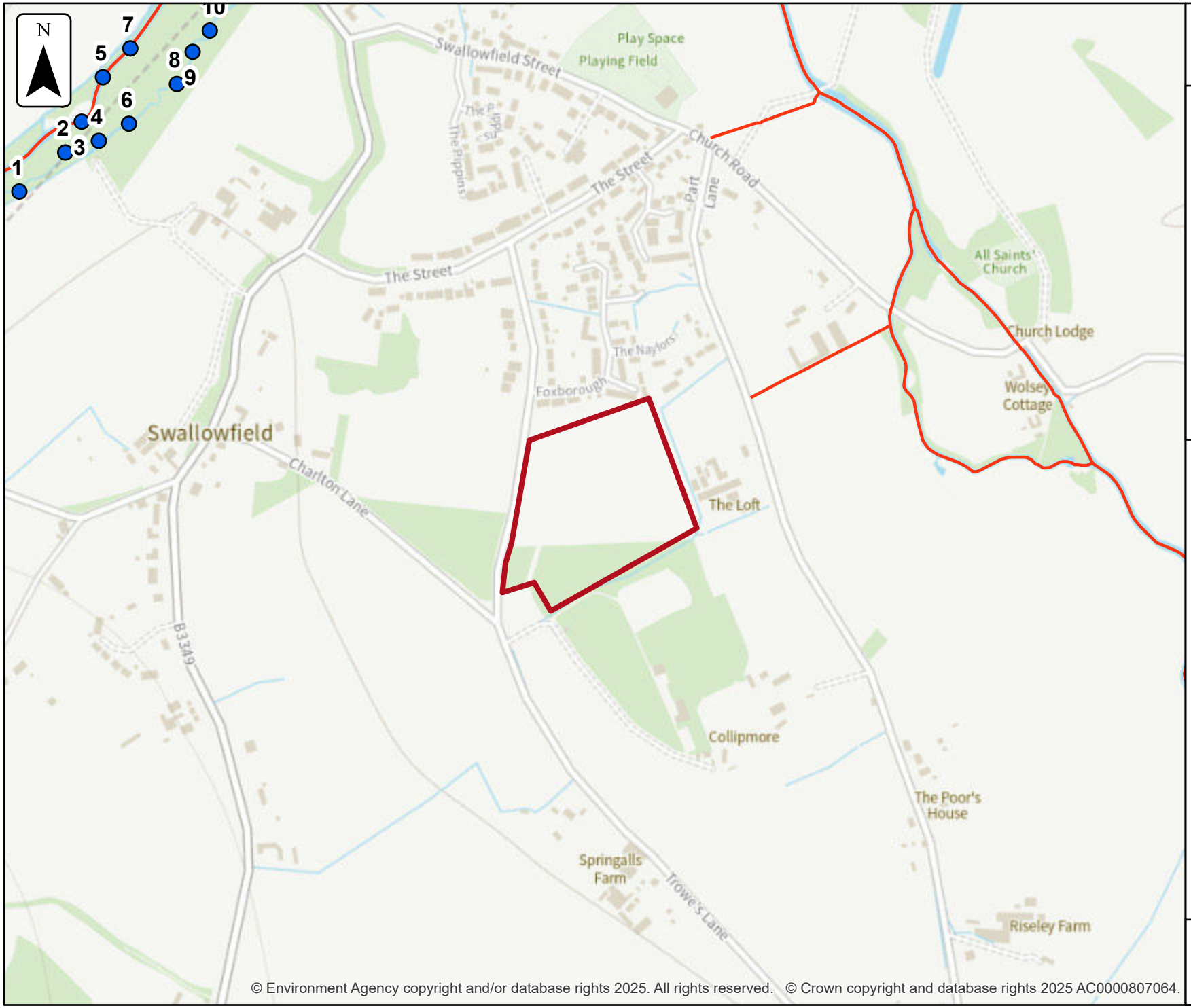
Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	20% AEP	5% AEP	1% AEP	20% AEP	5% AEP	1% AEP
				Level	Level	Level	Flow	Flow	Flow
1	1102727	473012	164710	43.68	43.94	44.35	19.58	25.02	34.07
2	1102319	473013	164415	64.88	64.88	64.88	0.0	0.0	0.0
3	1102406	473016	164732	43.62	43.82	44.12	19.58	25.02	34.07
4	1102823	473034	164646	43.71	43.96	44.36	19.60	25.05	34.07
5	1102565	473043	164850	43.49	43.70	44.02	19.58	25.04	34.66
6	1102331	473045	164808	43.56	43.76	44.07	19.58	25.04	34.64
7	1102608	473051	164581	43.74	43.99	44.38	19.60	25.06	34.09
8	1102297	473056	164859	43.49	43.70	44.02	13.66	16.28	19.94
9	1102675	473093	164509	43.83	44.07	44.43	8.59	9.70	15.60
10	1102628	473148	164737	43.87	44.05	44.32	13.67	16.29	19.98

Data in this table comes from the Blackwater 2007 - River Blackwater model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

No defences exist climate change modelled fluvial node locations

Location (easting/northing)
472583/164439

Scale
1:7,500

Created
17 Jun 2025

Model name
Loddon (Lower) 2009

- Selected area
- Modelled location
- Main river

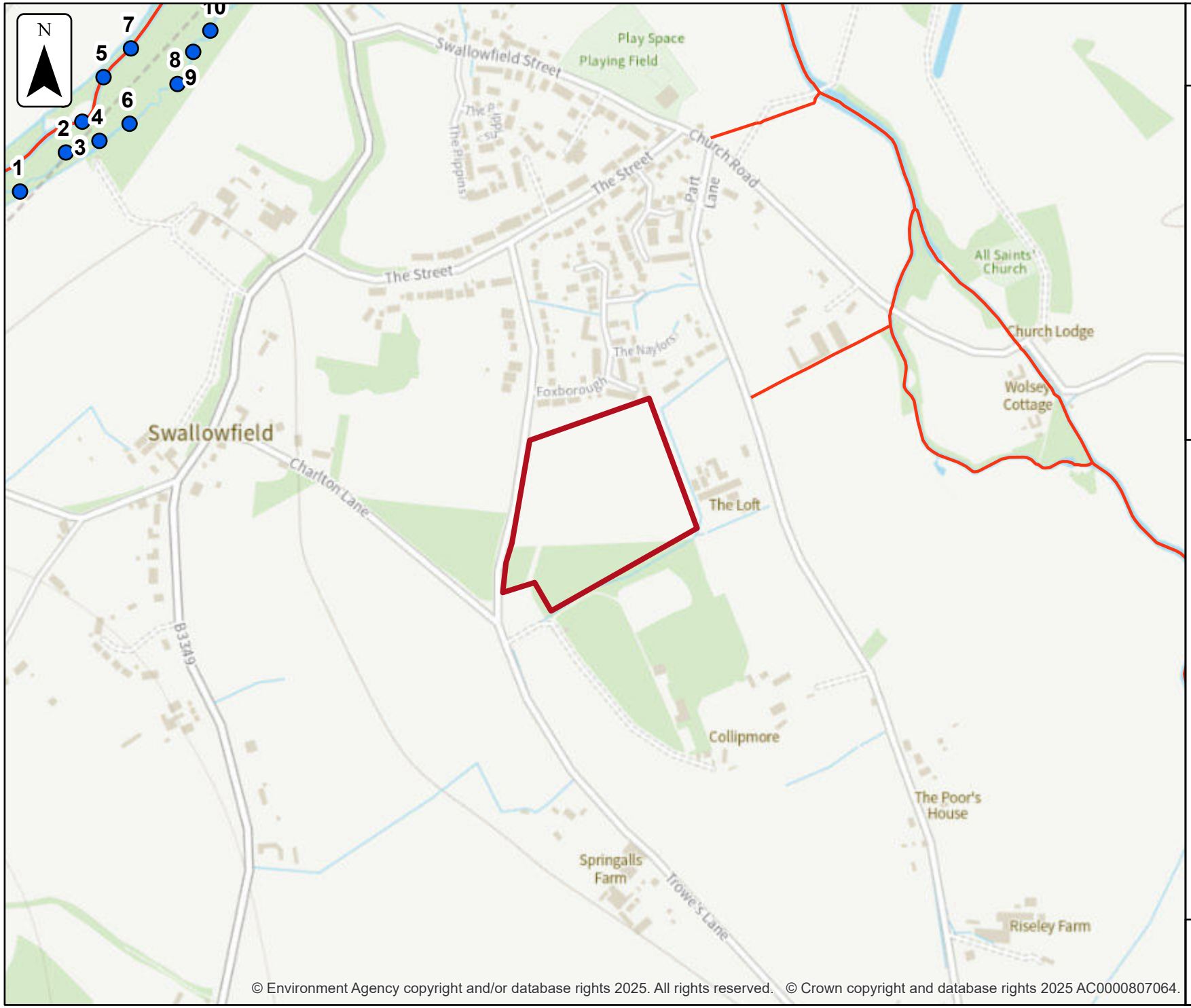
0 100 200 300
metres

Modelled node locations data

No defences exist climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+20%)	1% AEP (+20%)
				Level	Flow
1	1207754	471743	164896	0.0	1.10
2	1207481	471810	164953	0.0	1.10
3	1208002	471834	164998	44.10	0.0
4	1208031	471859	164970	44.24	0.0
5	1207890	471865	165063	44.04	0.0
6	1208032	471903	164995	0.0	1.10
7	1207578	471905	165105	0.0	17.30
8	1207535	471973	165053	0.0	1.10
9	1207124	471996	165100	43.61	0.0
10	1207612	472021	165131	0.0	1.10

Data in this table comes from the Loddon (Lower) 2009 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

No defences exist modelled fluvial node locations

Location (easting/northing)
472583/164439

Scale
1:7,500

Created
17 Jun 2025

Model name
Loddon (Lower) 2009

- Selected area
- Modelled location
- Main river

0 100 200 300
metres

Modelled node locations data

No defences exist

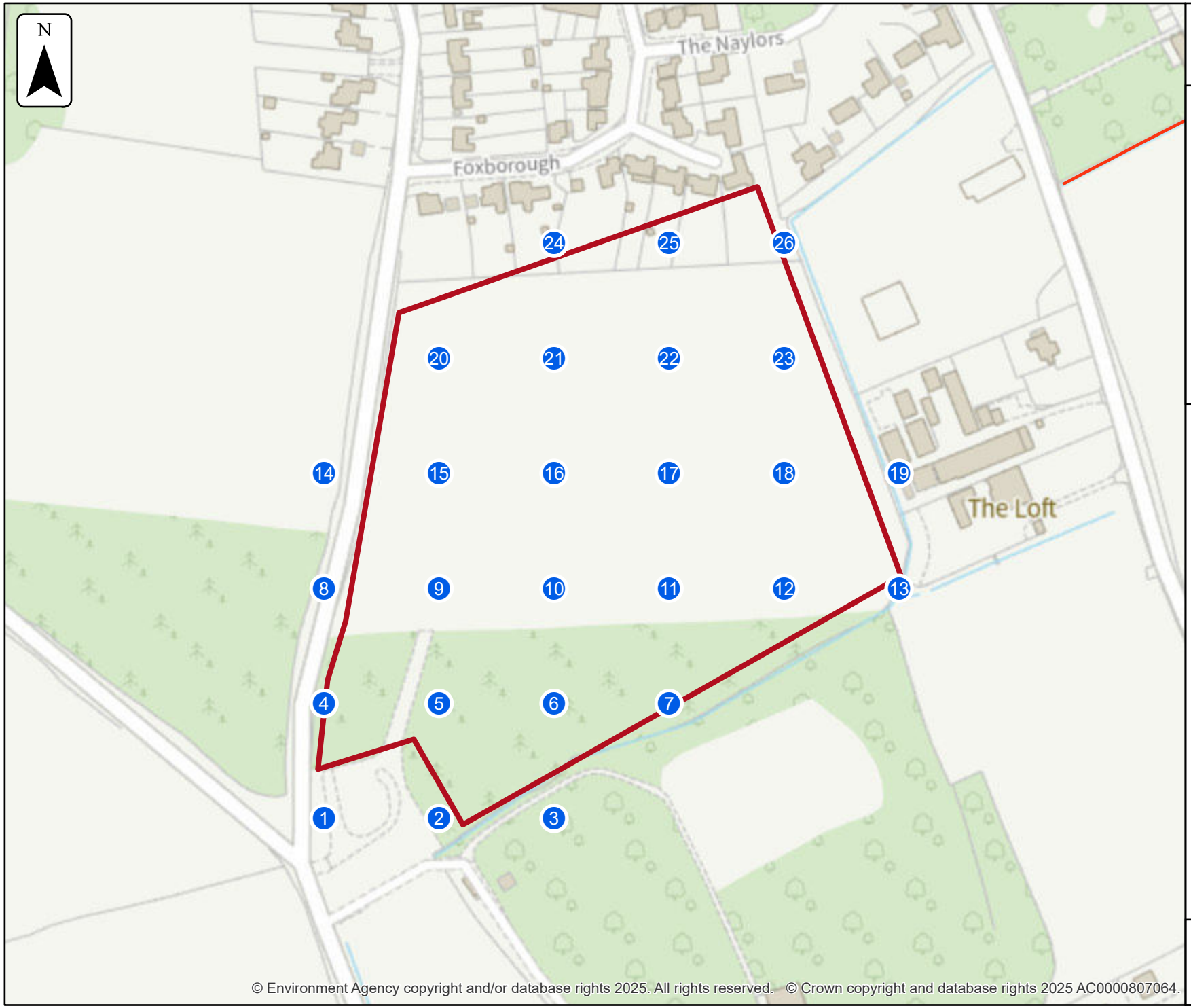
Label	Modelled location ID	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
				Level	Level	Level	Level	Level
1	1207754	471743	164896	0.0	0.0	0.0	0.0	0.0
2	1207481	471810	164953	0.0	0.0	0.0	0.0	0.0
3	1208002	471834	164998	43.87	43.98	44.01	44.03	44.56
4	1208031	471859	164970	43.54	44.06	44.09	44.15	44.70
5	1207890	471865	165063	43.80	43.91	43.94	43.96	44.49
6	1208032	471903	164995	0.0	0.0	0.0	0.0	0.0
7	1207578	471905	165105	0.0	0.0	0.0	0.0	0.0
8	1207535	471973	165053	0.0	0.0	0.0	0.0	0.0
9	1207124	471996	165100	43.26	43.40	43.45	43.51	44.13
10	1207612	472021	165131	0.0	0.0	0.0	0.0	0.0

Data in this table comes from the Loddon (Lower) 2009 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.

No defences exist

Label	Modelled location ID	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
				Flow	Flow	Flow	Flow	Flow
1	1207754	471743	164896	0.10	0.50	0.60	0.80	3.30
2	1207481	471810	164953	0.10	0.50	0.60	0.80	3.30
3	1208002	471834	164998	0.0	0.0	0.0	0.0	0.0
4	1208031	471859	164970	0.0	0.0	0.0	0.0	0.0
5	1207890	471865	165063	0.0	0.0	0.0	0.0	0.0
6	1208032	471903	164995	0.0	0.50	0.60	0.80	3.30
7	1207578	471905	165105	14.60	16.10	16.50	16.50	23.40
8	1207535	471973	165053	0.0	0.50	0.60	0.80	3.30
9	1207124	471996	165100	0.0	0.0	0.0	0.0	0.0
10	1207612	472021	165131	0.10	0.50	0.60	0.80	3.30

Data in this table comes from the Loddon (Lower) 2009 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.



Environment Agency

No defences exist modelled fluvial extent and height

Location (easting/northing)
472583/164439

Scale
1:2,500

Created
17 Jun 2025

Model name
Loddon (Lower) 2009

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 31
- 31 - 31.5
- 31.5 - 32
- 32 - 32.5
- 32.5 - 33
- 33 - 33.5
- 33.5 - 34
- 34 - 34.5
- 34.5 - 35

This map shows the 0.1% AEP height data

0 25 50 75 100
metres

Sample point data

No defences exist

Label	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
			Height	Height	Height	Height	Height
1	472451	164286	NoData	NoData	NoData	NoData	NoData
2	472507	164286	NoData	NoData	NoData	NoData	NoData
3	472563	164286	NoData	NoData	NoData	NoData	NoData
4	472451	164342	NoData	NoData	NoData	NoData	NoData
5	472507	164342	NoData	NoData	NoData	NoData	NoData
6	472563	164342	NoData	NoData	NoData	NoData	NoData
7	472619	164342	NoData	NoData	NoData	NoData	NoData
8	472451	164398	NoData	NoData	NoData	NoData	NoData
9	472507	164398	NoData	NoData	NoData	NoData	NoData
10	472563	164398	NoData	NoData	NoData	NoData	NoData
11	472619	164398	NoData	NoData	NoData	NoData	NoData
12	472675	164398	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
			Height	Height	Height	Height	Height
13	472731	164398	NoData	NoData	NoData	NoData	NoData
14	472451	164454	NoData	NoData	NoData	NoData	NoData
15	472507	164454	NoData	NoData	NoData	NoData	NoData
16	472563	164454	NoData	NoData	NoData	NoData	NoData
17	472619	164454	NoData	NoData	NoData	NoData	NoData
18	472675	164454	NoData	NoData	NoData	NoData	NoData
19	472731	164454	NoData	NoData	NoData	NoData	NoData
20	472507	164510	NoData	NoData	NoData	NoData	NoData
21	472563	164510	NoData	NoData	NoData	NoData	NoData
22	472619	164510	NoData	NoData	NoData	NoData	NoData
23	472675	164510	NoData	NoData	NoData	NoData	NoData
24	472563	164566	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
			Height	Height	Height	Height	Height
25	472619	164566	NoData	NoData	NoData	NoData	NoData
26	472675	164566	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData

Data in this table comes from the Loddon (Lower) 2009 model. Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

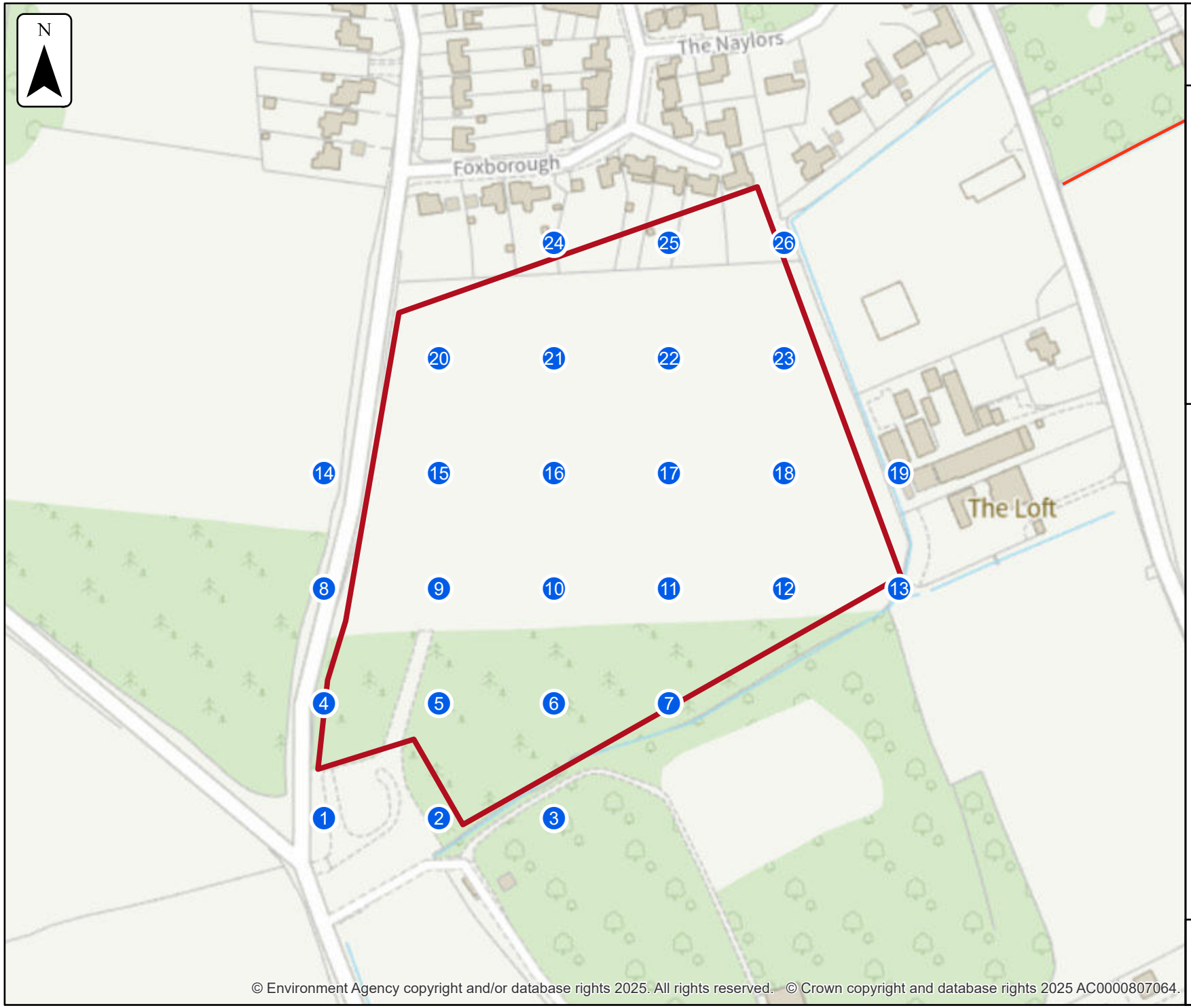
No defences exist

Label	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth
1	472451	164286	NoData	NoData	NoData	NoData	NoData
2	472507	164286	NoData	NoData	NoData	NoData	NoData
3	472563	164286	NoData	NoData	NoData	NoData	NoData
4	472451	164342	NoData	NoData	NoData	NoData	NoData
5	472507	164342	NoData	NoData	NoData	NoData	NoData
6	472563	164342	NoData	NoData	NoData	NoData	NoData
7	472619	164342	NoData	NoData	NoData	NoData	NoData
8	472451	164398	NoData	NoData	NoData	NoData	NoData
9	472507	164398	NoData	NoData	NoData	NoData	NoData
10	472563	164398	NoData	NoData	NoData	NoData	NoData
11	472619	164398	NoData	NoData	NoData	NoData	NoData
12	472675	164398	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth
13	472731	164398	NoData	NoData	NoData	NoData	NoData
14	472451	164454	NoData	NoData	NoData	NoData	NoData
15	472507	164454	NoData	NoData	NoData	NoData	NoData
16	472563	164454	NoData	NoData	NoData	NoData	NoData
17	472619	164454	NoData	NoData	NoData	NoData	NoData
18	472675	164454	NoData	NoData	NoData	NoData	NoData
19	472731	164454	NoData	NoData	NoData	NoData	NoData
20	472507	164510	NoData	NoData	NoData	NoData	NoData
21	472563	164510	NoData	NoData	NoData	NoData	NoData
22	472619	164510	NoData	NoData	NoData	NoData	NoData
23	472675	164510	NoData	NoData	NoData	NoData	NoData
24	472563	164566	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	20% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth
25	472619	164566	NoData	NoData	NoData	NoData	NoData
26	472675	164566	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData

Data in this table comes from the Loddon (Lower) 2009 model. Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.



Environment Agency

No defences exist climate change modelled fluvial extent and height

Location (easting/northing)
472583/164439

Scale
1:2,500

Created
17 Jun 2025

Model name
Loddon (Lower) 2009

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 31
- 31 - 31.5
- 31.5 - 32
- 32 - 32.5
- 32.5 - 33
- 33 - 33.5
- 33.5 - 34
- 34 - 34.5
- 34.5 - 35

This map shows the
1% AEP +20% height data

0 25 50 75 100
metres

Sample point data

No defences exist climate change

Label	Easting	Northing	1% AEP (+20%)	1% AEP (+20%)
			Height	Depth
1	472451	164286	NoData	NoData
2	472507	164286	NoData	NoData
3	472563	164286	NoData	NoData
4	472451	164342	NoData	NoData
5	472507	164342	NoData	NoData
6	472563	164342	NoData	NoData
7	472619	164342	NoData	NoData
8	472451	164398	NoData	NoData
9	472507	164398	NoData	NoData
10	472563	164398	NoData	NoData
11	472619	164398	NoData	NoData
12	472675	164398	NoData	NoData

Label	Easting	Northing	1% AEP (+20%)	1% AEP (+20%)
			Height	Depth
13	472731	164398	NoData	NoData
14	472451	164454	NoData	NoData
15	472507	164454	NoData	NoData
16	472563	164454	NoData	NoData
17	472619	164454	NoData	NoData
18	472675	164454	NoData	NoData
19	472731	164454	NoData	NoData
20	472507	164510	NoData	NoData
21	472563	164510	NoData	NoData
22	472619	164510	NoData	NoData
23	472675	164510	NoData	NoData
24	472563	164566	NoData	NoData

Label	Easting	Northing	1% AEP (+20%)	1% AEP (+20%)
			Height	Depth
25	472619	164566	NoData	NoData
26	472675	164566	NoData	NoData
Max value in selected area:			NoData	NoData

Data in this table comes from the Loddon (Lower) 2009 model. Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is Wokingham.

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

Find out more about flood risk activity permits

Help and advice

Contact the Thames Environment Agency team at enquiries_thm@environment-agency.gov.uk for:

- more information about getting a product 5, 6, 7 or 8
- general help and advice about the site you're requesting data for