Flood Risk Assessment

28 Mauldeth Road, Manchester, M20 4WD

Reference: 289 FRA- 001

Nov-22

www.urban-water.co.uk

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The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

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Introduction 1

Purpose of this report

1.1 Urban Water has been appointed to undertake a Level 2 – Scoping Study Flood Risk Assessment for a development located at M20 4WD.

Objectives

1.2 The objectives of this FRA are to demonstrate the following:

* Whether the proposed development is likely to be affected by current or future flooding.
* Whether the proposed development will increase flood risk elsewhere.
* Whether the flood risks associated with the proposed development can be satisfactorily managed.
* Whether the measures proposed to deal with the flood risk are sustainable.

Documents Consulted

1.3 To achieve these objectives the following documents have been consulted and/or referenced:

The National Planning Policy Framework (NPPF)
CIRIA C753 document The SuDS Manual, 2015
Local Flood Risk Management Strategy (LFRMS)
Level 1 Strategic Flood Risk Assessment (SFRA)
Aerial photographs and topographical survey of the site
British Geological Society Records
Local Council flood Maps
Environment Agency flood maps
The CIRIA publication 'C635 Designing for exceedance in urban drainage— Good practice'

Development Site and Location

2.1 The site is located at Mauldeth Road, Manchester. The nearest post code is M20 4WD. Refer to appendix A for site location plan.

2.2 The current use of the site is the garden of the property. The current use vulnerability clasification of the site is Water compatible. The site is located in the River Flood Zone 3. Refer to Appendix B for more details.

Development Proposals

2.3 The proposed development includes the extension of the property. The total development area (shown in within the red line) is approximately 320 sqm. Refer to Appendix B for layout of the proposed development.

2.4 The vulnerability classification of the proposed development is More vulnerable with an estimated lifetime between 50 and 100 years.

Site Hydrology and Hydrogeology

Hydrology

2.5 The Platt Brook is located approximately 300 m away from the development.

Aquifer

2.6 The development is located within a secondary undifferentiated aquifer. The aquifer's layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Source Protection Zone

2.7 The site is not located within a Source Protection Zone.

Groundwater Levels

2.8 The ground water levels for this site are unknown.

Site Geology

Bedrock

2.9 The British Geological Society records of the site show that it is located within the Chester Formation - Sandstone.

Superficial Deposits

2.10 The British Geological Society records show that the superficial deposits are Till, Devensian - Diamicton.

National and Local Planning Policy 3

National Planning Policy Framework (NPPF)

3.1 The NPPF and its technical guidance is a set of planning policies with the key objective to contribute to the achievement of sustainable development. As part of it, they ensure that flood risk and sustainability are taken into account during the planning process. This ensures that developments are not located in flood risk areas and directs developments to lower risk areas. The NPPF applies a sequential risk-based approach to determining the suitability of land for development in flood risk areas. The NPPF also encourages developers to seek opportunities to reduce the overall level of flood risk through the layout of the development and the application of Sustainable Drainage Systems (SuDS).

The Flood and Water Management Act (2010)

3.2 The Flood and Water Management Act aims to reduce the flood risk associated with extreme weather events. It provides a robust management of flood risk for people, homes and businesses and also encourages the use of SuDS for developments. A robust SuDS strategy should take into account the recommendations given in this Flood Risk Assessment.

Strategic Flood Risk Assessment (SFRA)

3.3 Planning policy with regard to development and flood risk in the area is detailed in the Strategic Flood Risk Assessment (SFRA) which was published in 2010. The proposed development site is located within the administrative boundary of the Manchester City.

3.4 The SFRA commits to direct new development to locations at lowest flood risk. The SFRA provides information on the levels and flood hazards that could result from flooding. The Environment Agency flood zone maps and the SFRA ignore the presence of existing flood defences when defining the potential extent of flooding.

3.5 This report follows the guidance given in the Strategic Flood Risk Assessment by evaluating the flood risk and providing relevant flood mitigation.

4.1 The flood risks were determined by identifying the sources of flooding and assessing their possible impact and likelihood to the development.

Fluvial Flood Risk Assessment

4.2 Fluvial flood risk for this extension was assessed using the Environment Agency Flood Zone Maps and the standing advice approach recommended in the NPPF guidelines. The standing advice takes into account the size of the development and the flood risk vulnerability of land uses.

Standing Advice

Step 1
Flood Zone categorisation

4.3 The proposed development falls within The Environment Agency Flood Zone 3. The Flood Zone 3 is considered to have a high probability of flooding with a 100 years or less annual probability or >1%AEP.

Step 2
Flood risk vulnerability

4.4 The development a minor extension in flood zone 3. A minor extension is a household or non-domestic extension with a floor space of no more than 250 square metres.

Step 3
Standing Advice

4.5 The proposed development falls within the remit of the standing advice and therefore it is appropriate in this area.

Flood hazard assessment 5

5.1 The development has been assessed for all potential flood risks such as river and tidal flood risk, surface water flooding, flooding from groundwater, reservoir flood risk and drainage systems.

Historic Flooding

5.2 The site does not benefit from flood defences. The Environment Agency records show that the area around the site has not been flooded in the past.

Flooding from river and sea

5.3 The proposed development falls within The Environment Agency Flood Zone 3. The Flood Zone 3 is considered to have a high probability of flooding with a 100 years or less annual probability or >1%AEP.

5.4 The climate change allowances are as per the vulnerability of the development , the design life of the building , and the flood zone classification. The climate change allowance for this development is 41%. The nearest climate change allowance provided by the Environment Agency has been taken to complete this assessment.

5.5 The levels provided by the Environment Agency are shown in table 1 below. Further details are provided in appendix D.

Flood Levels - Undefended

Return Period	Flood Level (m AOD)
1 in 20 (5%)	38.45
1 in 100 (1%)	38.47
1 in 100 + 35%(CC)	38.50
1 in 100 + 70%(CC)	38.53
1 in 1000 (0.1%)	38.61

5.6 The flood risk levels taken to complete this assessment is: 38.53m AOD. This is the 1 in 100 + 70%(CC) level.

Surface water (overland flows) flood risk

5.7 The Environment Agency maps show that the flood risk from surface water is low. A residual risk of localised shallow ponding remains likely. The Environment Agency surface water flood risk maps are defined through application of a specific procedure based on digital terrain models and assumptions regarding losses to infiltration and/or urban drainage. The surface water flood maps is defined by the Environment Agency as follows.

5.8 *"The nationally produced surface water flood mapping only indicates where surface water flooding could occur as a result of local rainfall. It does not fully represent flooding that occurs from:*

- Ordinary watercourses
- Drainage systems or public sewers caused by catchment-wide rainfall events
- Rivers
- Groundwater

Due to the modelling techniques used, the mapping picks out depressions in the ground surface and simulates some flow along natural drainage channels, rivers, low areas in floodplains, and flow paths between buildings. Although the maps appear to show flooding from ordinary watercourses, they should not be taken as definitive mapping of flood risk from these as the conveyance effect of ordinary watercourses or drainage channels is not explicitly modelled. Also, structures (such as bridges, culverts and weirs) and flood risk management infrastructure (such as defences) are not represented.

The nationally produced surface water flood mapping does not take account of the effect of pumping stations in catchments with pumped drainage. No allowance is made for tide locking, high tidal or fluvial levels where sewers cannot discharge in to rivers or the sea."

5.9 The strategic flood risk for the Manchester City confirms that the flood risk for the site is Low.

5.10 On the basis of Environment Agency and the Strategic flood risk assessment's surface water mapping, together with the presence of surface water drainage systems at the site and surrounding area it is concluded that the site is at Low risk of flooding from surface water sources. The depth of water is potentially below 300mm. For the purpose of this assessment a depth of water of 0.15m has been taken as the most relevant depth to the site.

Flooding from drainage systems in adjacent areas

5.11 The council records have been reviewed. The flooding from drainage incidents maps were not found in the Strategic Flood Risk Assessment. Therefore, for the purpose of this report, it has been assumed that the risk of flooding from drainage systems is low.

Reservoirs Risks

5.12 The Reservoir Flood Map (RFM) produced by the Environment Agency do not show the risk to individual properties of dam breach flooding. The maps do not indicate or relate to any particular probability of dam breach flooding. The maps were prepared for emergency planning purposes and can be used to help reservoir owners produce on-site plans and the Local Resilience Forum produce off-site plans, and to prioritise areas for evacuation/early warning in the event of a potential dam failure. The RFM shows that the development could be within the possible dam breach flooding path. See Appendix C.

Groundwater flood risk

5.13 The British Geological Survey's flood risk susceptibility maps show that the development has limited susceptibility to ground water flooding. The risk from groundwater flood to the site is considered very low. Refer to appendix C for record drawings.

Critical Drainage Areas

5.14 The development falls within a Critical Drainage Area. The risks of critical problems and increase of downstream flooding is high. Critical Drainage Area (CDA) is an area that has critical drainage problems and which has been notified to the local planning authority by the Environment Agency.

6.1 The Flood hazard assessment has demonstrated that the site is:

- In Flood Zone 3
- At Low risk of surface flooding
- At very low risk of groundwater flooding
- Within a critical drainage area
- Outside of an area with sewer flooding

6.2 Under the NPPF it is necessary to demonstrate that, for any new development on the site, it is possible to provide an adequate level of flood protection for personnel working or living at the development.

Flood Protection

6.3 Where possible, flood protection for this development is typically provided by establishing the development's floor levels 300mm above the 1:100 year flood level, including allowance for climate change.

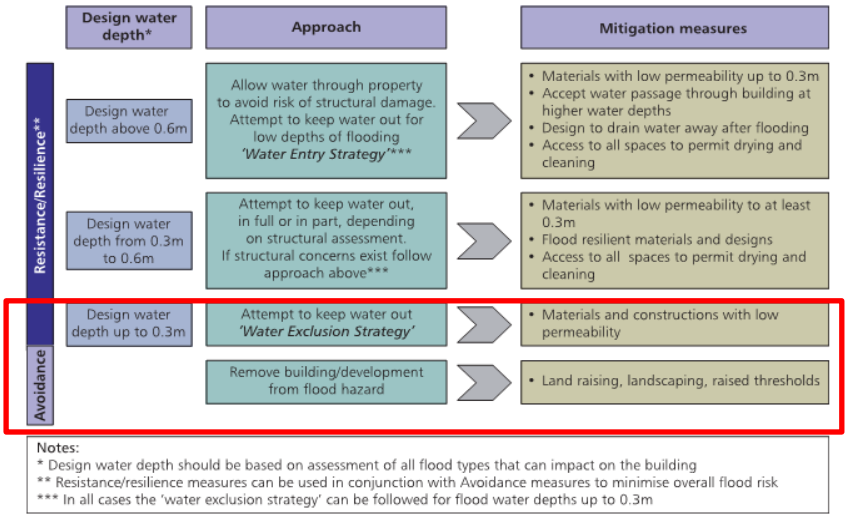
6.4 The flood levels have been obtained from the Environment Agency. This information is used to make the fluvial flood risk assessment for this development

6.5 The appropriate 1:100+CC reference level for the proposed development site is 38.53 mAOD. The existing ground level at the site is an average of 38.75mAOD. The finished floor should be 38.83mAOD.

6.6 The existing FFL is 39.4m AOD. It is proposed that the extension has the same level as the the existing FFL. The site is already in compliance with the minimun FFL. As some parts of the building may be in contact with water the following flood protection interventions should be provided.

6.7 The flood resilience strategy for the development has been based on the CLG 2007 Improving the Flood Performance of New Buildings. See figure below. The strategy is based on the water level within the proximity to the building.

Rationale for flood resilient and/or resistant design strategies.



6.8 The design water depth for this site is 0.15m. The development should utilise building materials that are suitable for a 'water exclusion strategy'. Materials classified as "Good" (highlighted in red) in the Figure below shall be used for construction upto the water depth.

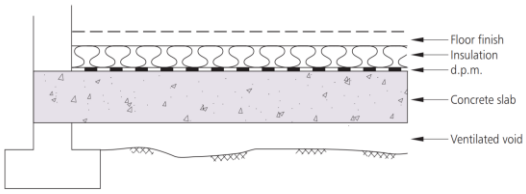
Figure 2: Flood resilience characteristics of building materials (based on laboratory testing)

Material	Resilience characteristics*		
	Water penetration	Drying ability	Retention of pre-flood dimensions, integrity
Bricks			
Engineering bricks (Classes A and B)	Good	Good	Good
Facing bricks (pressed)	Medium	Medium	Good
Facing bricks (handmade)	Poor	Poor	Poor
Blocks			
Concrete (3.5N, 7N)	Poor	Medium	Good
Aircrete	Medium	Poor	Good
Timber board			
OSB2, 11mm thick	Medium	Poor	Poor
OSB3, 18mm thick	Medium	Poor	Poor
Gypsum plasterboard			
Gypsum Plasterboard, 9mm thick	Poor	Not assessed	Poor
Mortars			
Below d.p.c. 1:3(cement:sand)	Good	Good	Good
Above d.p.c. 1:6(cement:sand)	Good	Good	Good

Resilience characteristics are related to the testing carried out and exclude aspects such as ability to withstand freeze/thaw cycles, cleanability and mould growth

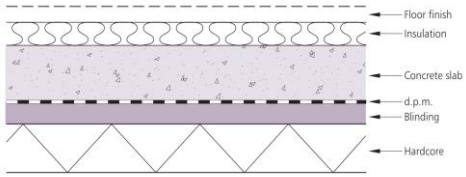
6.9 Foundations: Suspended concrete floor slabs at least 150mm thick is the preferred option. Suspended slabs can also be used. There should be a minimum space of 150mm ventilated void between the ground level and the bottom of the floor slab. Damp proof membranes should be included in the design. Floor insulation should be of the closed-cell type. Under floor services using ferrous materials should be avoided. Ceramic/concrete-based floor tiles, sitting on a bed of sand, cement render and water resistant grout can be used. See figures below.

Suspended Concrete Slab detail



- Reinforced concrete slab at least 150mm thick and complying with structural requirements for uplift forces
- Damp proof membrane of polythene at least 1200 gauge
- Insulation as rigid closed-cell material
- Ceramic tiles or stone floor finishes and including skirting boards.

Ground bearing Concrete Slab detail

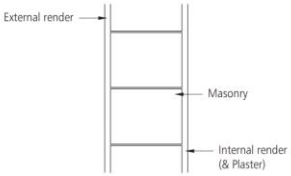


- Hardcore bed at least 100mm thick of well compacted inert material, blinded with fine inert material to provide a smooth base
- Damp proof membrane of polythene at least 1200 gauge
- Concrete slab at least 150mm thick
- Insulation as rigid closed-cell material
- Ceramic tiles or stone floor finishes and skirting boards.

6.10 Concrete blocks used in foundations should be sealed with an impermeable material or encased in concrete to prevent water movement from the ground to the wall construction.

6.11 External Walls: Good quality facing bricks or external renders with water repellent properties can be used for the external face. See below examples of external walls that can be used.

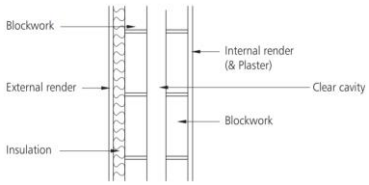
Solid External Wall



- External cement based render, preferably with lime content. Composition depends on masonry. The following mixes have good resilient properties:
  - 1 cement : 6 sand on bricks;
  - 1 cement : 4 sand: ½ lime on concrete blockwork or bricks;
  - 1 cement : 6 sand: 1 lime on Aircrete blocks.
- Masonry with minimum thickness of 300mm (thin mortar joint construction using Aircrete blocks is effective as demonstrated in laboratory tests) or alternatively reinforced concrete wall
- Internal cement-based render, preferably with lime content. Composition depends on masonry; the following mix is effective for flood resilience:
  - 1 cement : 6 sand: 1 lime on Aircrete.

  Apply external and internal renders, following good practice guidance, ensuring minimum total thickness of 20mm and at least two coats.
- Use external insulation in preference to internal insulation.

Cavity External Walls – Clear cavity

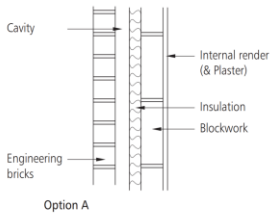


Clear cavity

- External cement based render, preferably with lime content. Composition depends on masonry; the following mixes are effective for flood resilience:
  - 1 cement: 4 sand: ½ lime on concrete blockwork (or bricks);
  - 1 cement: 6 sand: 1 lime on Aircrete.

  Apply render following good practice guidance, ensuring minimum total thickness of 20mm and two coats.
- Internal cement based render, preferably with lime content. Composition depends on masonry. The following mix works well:
  - 1 cement: 6 sand: 1 lime on Aircrete.
- Stainless steel wall ties should be used to minimise corrosion and consequent staining.

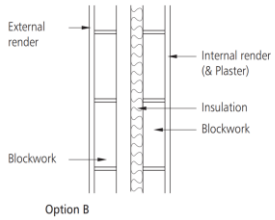
Cavity External Walls- Part fill Option A



Part-filled cavity – Option A

- External face consisting of engineering bricks up to required level for flood protection (up to 0.6m maximum above floor level plus one course). Other external facing materials can be used above this level, but ensure interface is watertight.
- Rigid insulation.
- Internal face consisting of blocks.
- Internal cement based render, preferably with lime content. Composition depends on masonry; the following mix is effective:
  - 1 cement : 6 sand: 1 lime on Aircrete.
- Ensure stainless steel wall ties are used to minimise corrosion and consequent staining.
- Sacrificial plasterboard can be used, but it needs to be removed between ground floor and flood level. The board should be fitted horizontally to make removal easier. In some cases a dado rail can be used to cover the joints.

Cavity External Walls- Part fill Option B



Part-filled cavity – Option B

- External cement based render, preferably with lime content. Composition depends on masonry; the following mixes are effective:
  - 1 cement : 4 sand: ½ lime on concrete blockwork
  - 1 cement : 6 sand: 1 lime on Aircrete.
- External face consisting of blocks.
- Rigid insulation.
- Internal face consisting of blocks.
- Internal cement based render, preferably with lime content. Composition depends on masonry; the following mix is effective for flood resilience:
  - 1 cement : 6 sand: 1 lime on Aircrete.
- Ensure stainless steel wall ties are used to minimise corrosion and consequent staining.

6.12 Services and fittings (communications wiring, hearing systems, electrical services, water, electricity and gas meters) should be placed at 600mm above the flood level. Where possible, all service entries should be sealed (e.g. with expanding foam or similar closed cell material). Closed cell insulation should be used for pipes which are below the predicted flood levels. Sealed PVC external framed doors should be used. Should wooden doors be used then a good fit and sealed to the frames must be obtained. Hollow core timber internal doors should not be used unless sufficient flood warning is given, butt hinges, can be used to allow internal doors to be easily removed and stored.

6.13 Fittings should be designed to be replaced after a flood, it is advisable to specify durable fittings that are not appreciably affected by water and can be easily cleaned (e.g. use of plastic materials or stainless steel). The cost of these units may need to be balanced against the predicted frequency of flooding. Avoid wood fibre based carcases and use easily removable solid wood doors and drawers.

6.14 The development is within a Critical Drainage Area, the local authority expects that the new development to reduce flood risks downstream, rather than having just neutral impact. It also expects that Sustainable Drainage Systems (SuDS) are used for managing surface water. Refer to section 7 of this report.

7.1 The NPPF specifically stipulates that consideration should be given to potential off-site flood impacts of any proposed development. These off-site impacts are in relation to:

- Surface water management

- Flood flow conveyance, storage and climate change

Surface Water Management

7.2 The surface water run-off will be disposed using SuDS techniques. The aim is to provide a sustainable design that accommodates the proposed attenuation volume and replicated the existing drainage regime using the SuDS hierarchy is shown in the figure below.

7.3 The SuDS techniques highlighted in red below could be used on site. This assessment is based on the ground conditions and the potential discharge points available.

The SuDS Hierarchy (Source:EA Thames region, SuDS a practical guide)

Most Sustainable	*SUDS technique*	*Flood Reduction*	*Pollution Reduction*	*Landscape & Wildlife Benefit*
	Living roofs	✓	✓	✓
	Basins and ponds - Constructed wetlands - Balancing ponds - Detention basins - Retention ponds	✓	✓	✓
	Filter strips and swales	✓	✓	✓
	Infiltration devices - soakaways - infiltration trenches and basins	✓	✓	✓
	Permeable surfaces and filter drains - gravelled areas - solid paving blocks - porous paviors	✓	✓	
Least Sustainable	**Tanked systems** - over-sized pipes/tanks - storms cells	✓		

7.4 With no increase in the rate of surface water discharge from the site, compared to the site in its current configuration, the proposed development would have no adverse impact on surface water flood risk at the site or surrounding area. The SuDS should be designed at detailed project stage.

Flood Flow conveyance and storage

7.5 Due to the size of the development and its location on the flood zone, flood compensation for this development is not required.

8.1 This flood risk assessment has identified the potential flooding mechanisms that could affect the site. This assessment has concluded that the development site requires additional flood risk mitigation strategies so all the flood risk can addressed.

Site access and public safety

8.2 This assessment has demonstrated that the proposed development will have no adverse impact on flood risk in the area surrounding the site. Available evidence indicates that the development would result in no change in surface water generation. There is therefore no basis to indicate that, with respect to flood risk, the proposed development would have adverse impact on public safety.

8.3 It will be necessary to ensure that all building users are fully informed of procedures to be implemented during threat of imminent flooding.

Flood Warning and evacuation

8.4 The site is located within an area that is covered by the Environment Agency Flood Alert service. It is recommended that the proposed development is registered with this service to receive early warning of imminent flood hazard.

8.6 The occupants of the site are encouraged to sign up to the alerts and should use these to form an appropriate Flood Management and Evacuation Plan tailored to their operations prior to occupation of the site. Table 4 below shows the actions that will be taken for each flood warning.

8.7 Action to be taken in the event of Alarm being Raised or Flood Warning Received:

a. Raise the alarm and evacuate the site following the established Fire Drill procedures. The main assembly as per the main house fire drill assembly point.

b. Contact Emergency Fire Services (999) if necessary and/or Environment Agency Floodline: (0845 988 1188) if event was not expected.

c. If safe to do so, locate and turn off key services e.g. water, gas & electricity.

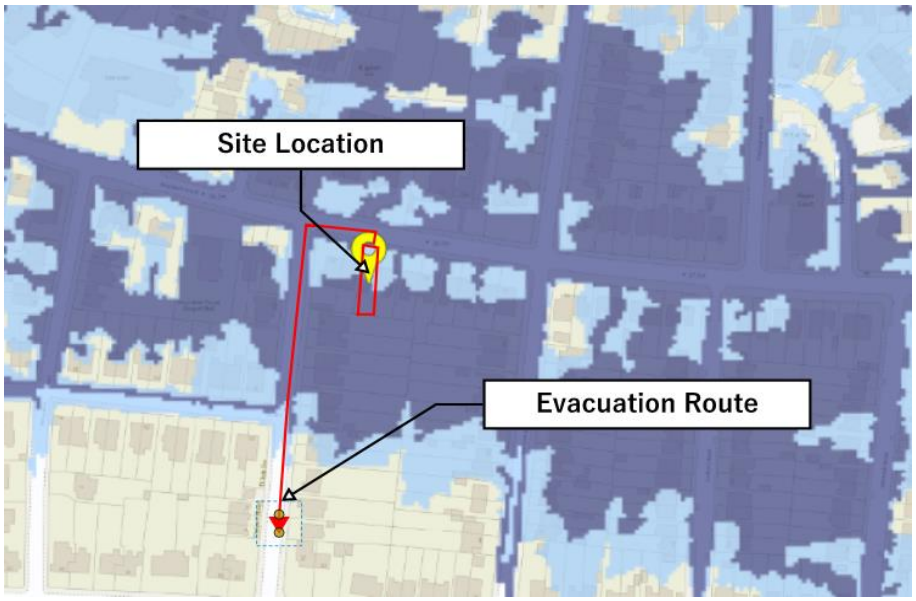
d. Follow the routes below to evacuate the site completely.

Actions that will be taken for each flood warning

Warning	Message	Timing	Action
FLOOD ALERT	Flooding is possible. Be prepared.	2 hours to 2 days in advance of flooding.	- Be prepared for flooding. - Prepare a flood kit.
FLOOD WARNING	Flooding is expected. Immediate action required.	Half an hour to 1 day in advance of flooding.	- Act now to protect your property. - Block doors with flood boards or sandbags and cover airbricks and other ventilation holes. - Move pets and valuables to a safe place. - Keep a flood kit ready. - Move any critical equipment and information to a safe location
SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life and different actions are required.	- Be ready should you need to evacuate from the property. - Co-operate with the emergency services and call 999 if you are in immediate danger.
Warning Removed	No further flooding is currently expected for your area.	Issued when a flood warning is no longer in force.	- Flood water may still be around and could be contaminated. - If you've been flooded, ring your buildings and contents insurance company as soon as possible.

8.8 Safe egress is achievable by following Mauldeth Road up to Alan Road, which is shown to be beyond the extent of flooding. See figure below for details.

Evacuation Route



Conclusions 9

9.1 It is concluded that subject to the proposed mitigation measures, the site can be developed in accordance with the provisions of the NPPF and the requirements of the Environment Agency and the local planning authority.

9.2 It is proposed that a formal Flood Warning and Emergency Response Plan is developed for the proposed development to communicate flood emergency response procedures to all the occupants of the site.

9.3 This report demonstrates that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.

Appendix A

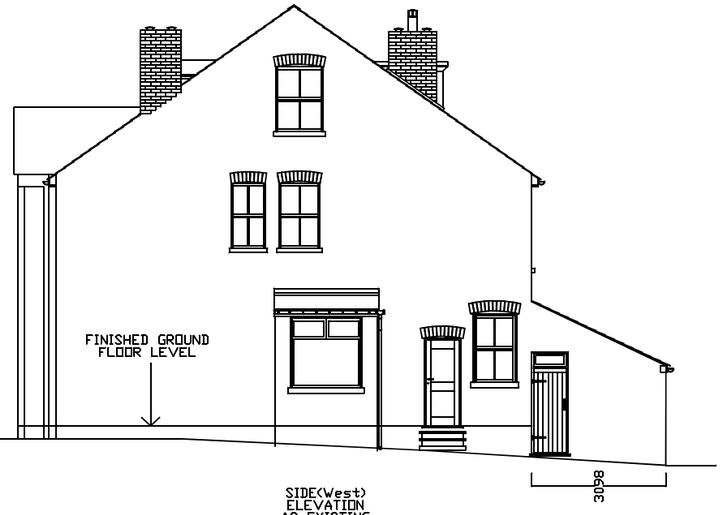
Location Plan - 28 Mauldeth Road, Manchester, M20

Map area bounded by: 385308,393082 385508,393282. Produced on 14 April 2022 from the OS National Geographic Database. Reproduction in whole or part is prohibited without the prior permission of Ordnance Survey. © Crown copyright 2022. Supplied by UKPlanningMaps.com a licensed OS partner (100054135). Unique plan reference: p4b/uk/783897/1060197

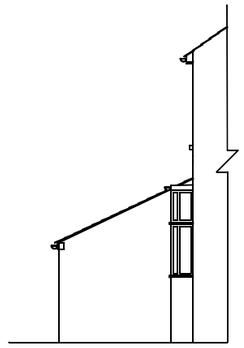
Appendix B

FRONT ELEVATION
AS EXISTING

FRONT OF PROPERTY

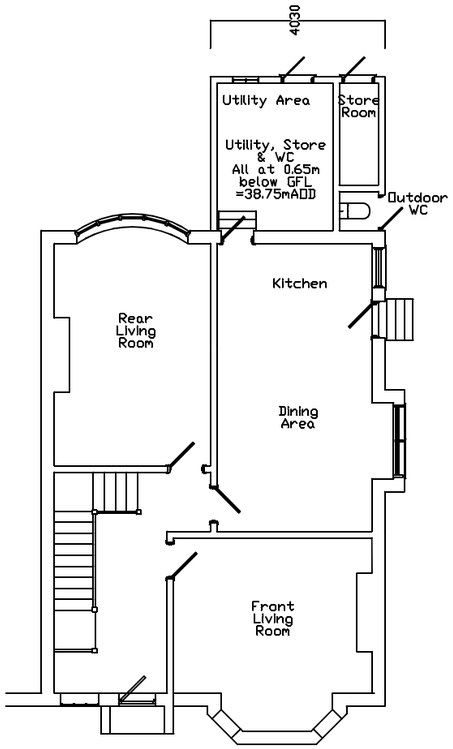


SIDE(West)
ELEVATION
AS EXISTING

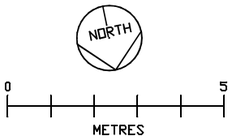


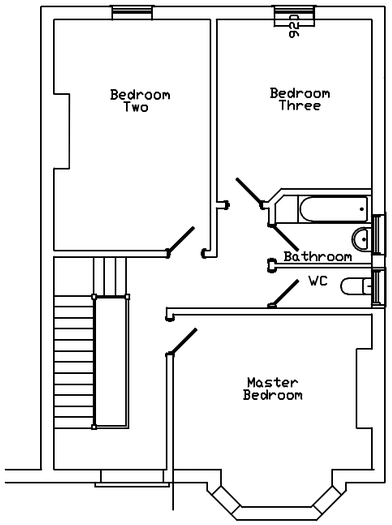
SIDE(East)
ELEVATION
REAR OF HOUSE
AS EXISTING
VIEWED FROM
ADJACENT PROPERTY

REAR ELEVATION
AS EXISTING

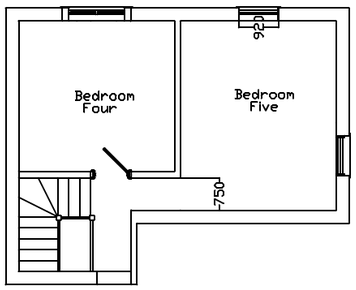


GROUND FLOOR PLAN
AS EXISTING





FIRST FLOOR PLAN
AS EXISTING



ATTIC FLOOR PLAN
AS EXISTING

Notes
1. EXISTING FINISHED GROUND FLOOR LEVEL IS 39.4mAOD WITH THE EXCEPTION OFAREAS LISTED IN NOTE 2.

2. THE UTILITY AREA, OUTDOOR WC AND STORE WHICH ARE AT 38.75mAOD

3. THE PRIMARY FLOOD EVACUATION ROUTE IS THROUGH THE FRONT DOOR ONTO MAULDETH ROAD WHICH IS THE HIGHER GROUND, WITH THE SECONDARY OPTION BEING THROUGH SIDE DOOR INTO THE GARDEN

4. DO NOT SCALE PLANS

PLANS & ELEVATIONS AS EXISTING

28 MAULDETH ROAD MANCHESTER M20 4WD MR IAN G MILLER

JULY 2022
Scale 1:100 @A2
SCale 1:50 @A0

Drawing
28MR/01A

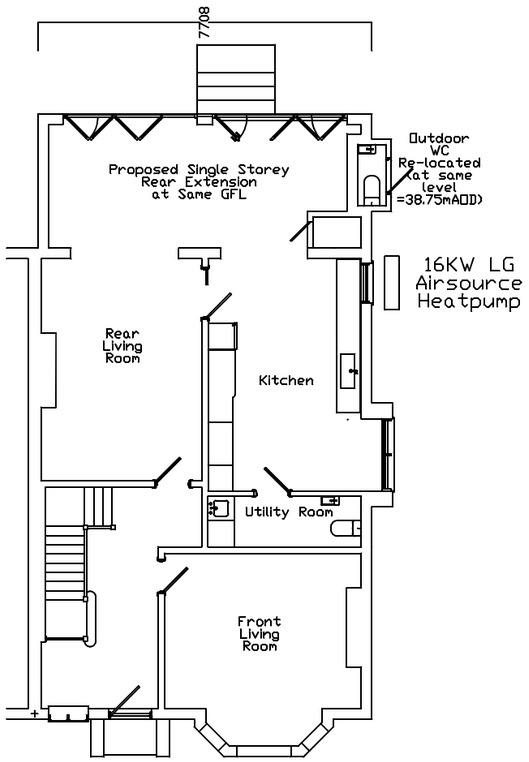
FRONT ELEVATION
PROPOSED

FRONT OF PROPERTY

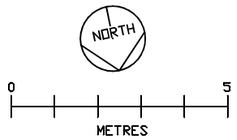
SIDE ELEVATION
PROPOSED

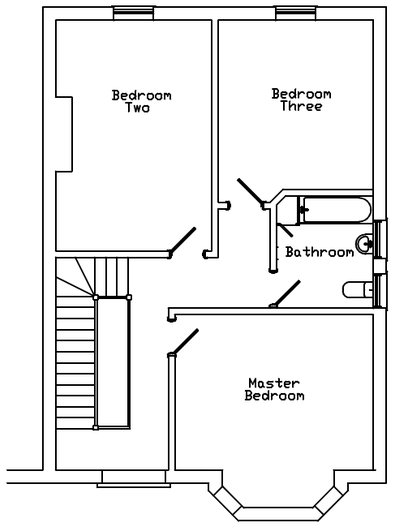
SIDE(East)
ELEVATION
REAR OF HOUSE
PROPOSED
VIEWED FROM
ADJACENT PROPERTY

REAR ELEVATION
PROPOSED

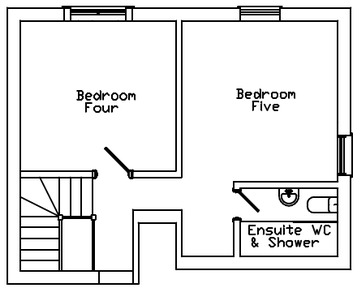


GROUND FLOOR PLAN
AS PROPOSED





FIRST FLOOR PLAN
AS PROPOSED



ATTIC FLOOR PLAN
AS PROPOSED

Notes
1. FINISHED FLOOR LEVEL OF PROPOSED REAR EXTENSION IS THE SAME AS THE EXISTING FINISHED GROUND FLOOR LEVEL WHCIH IS 39.4mAOD

2. PROPOSED FINISH FLOOR LEVEL OF THE PROPOSED OUTDOOR TOILET IS AT THE SAME LEVEL AS THE EXISTING OUTDOOR TOILET WHICH IS 38.75mAOD

3. PRIMARY FLOOD EVACUATION ROUTE REMAINS THROUGH THE FRONT DOOR ONTO MAULDETH ROAD WHICH IS THE HIGHER GROUND, WITH THE SECONDARY OPTION BEING THROUGH THE PROPOSED REAR DOORS INTO THE REAR GARDEN

4. DO NOT SCALE PLANS

PLANS & ELEVATIONS AS PROPOSED

28 MAULDETH ROAD
MANCHESTER M20 4WD
MR IAN G MILLER

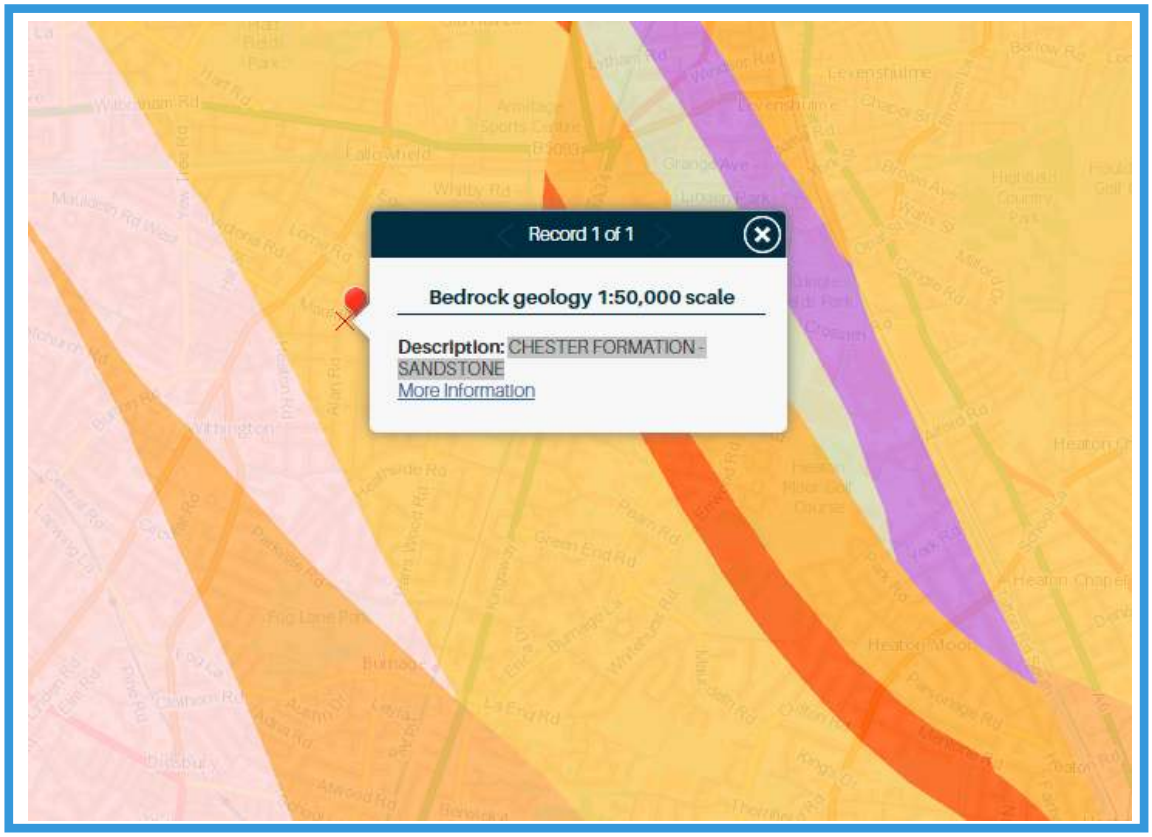
JULY 2022
Scale 1:100 @A2
SCale 1:50 @A0

Drawing
28MR/02A

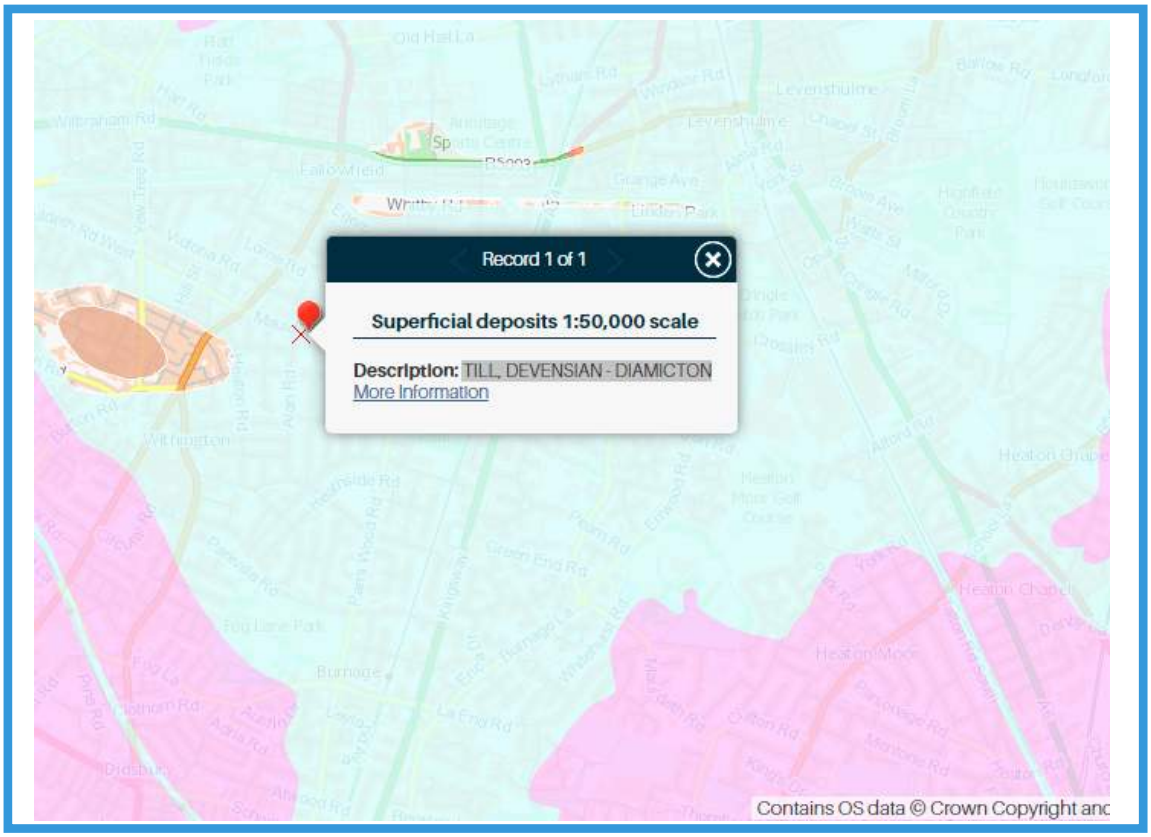
Appendix C

SITE GEOLOGY

GEOLOGY - BEDROCK - CHESTER FORMATION - SANDSTONE

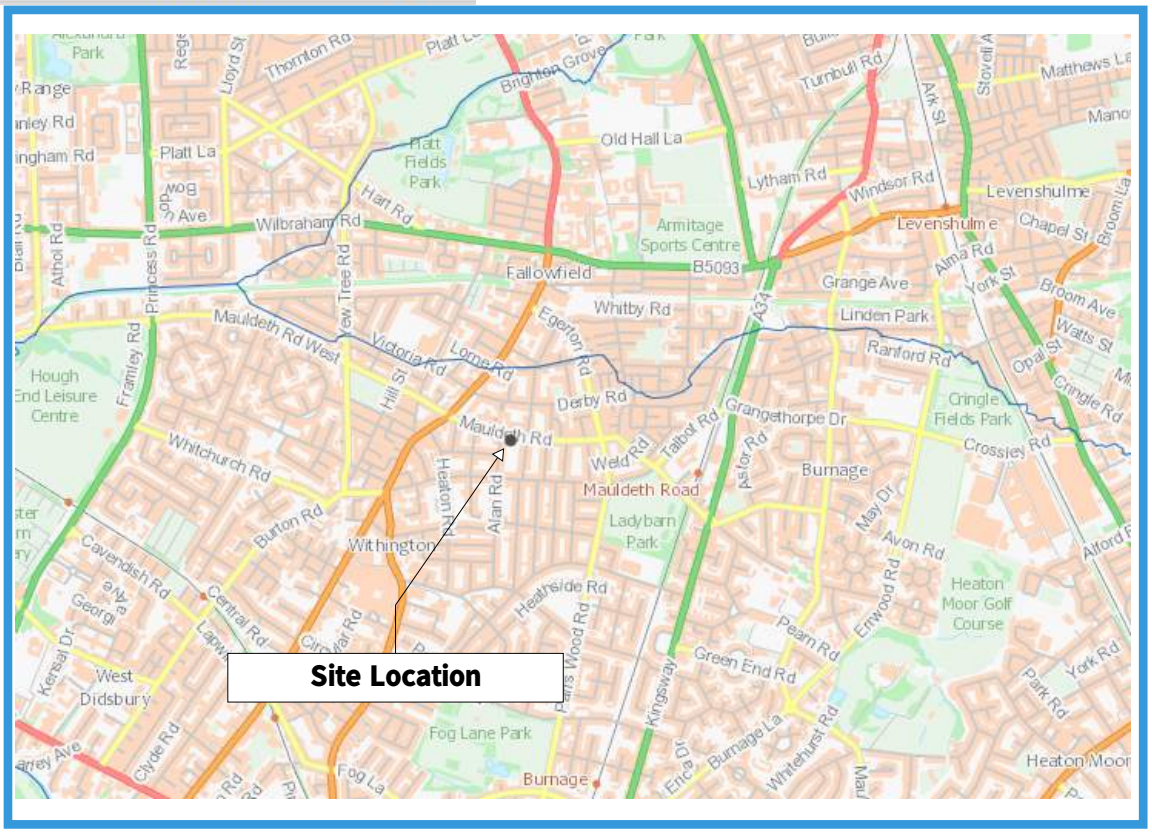


GEOLOGY - SUPERFICIAL DEPOSITS - TILL, DEVENSIAN - DIAMICTON



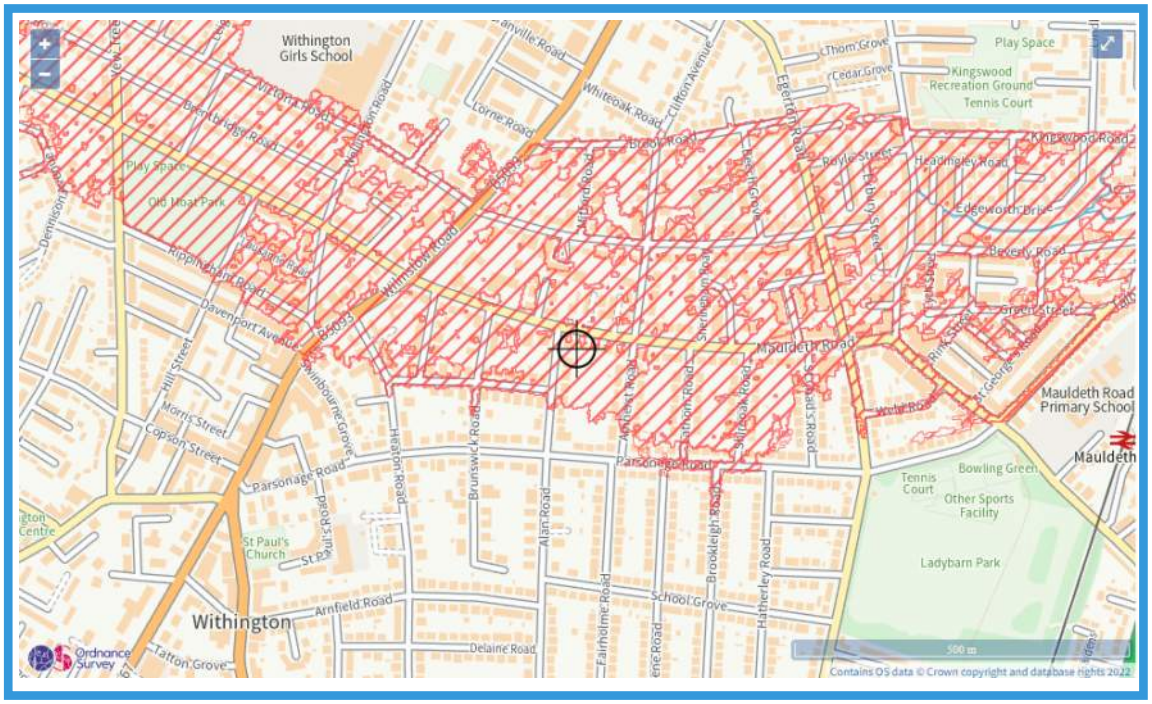
SITE HYDROGEOLOGY

Main River Map



Flood risk from reservoirs

Extent of flooding

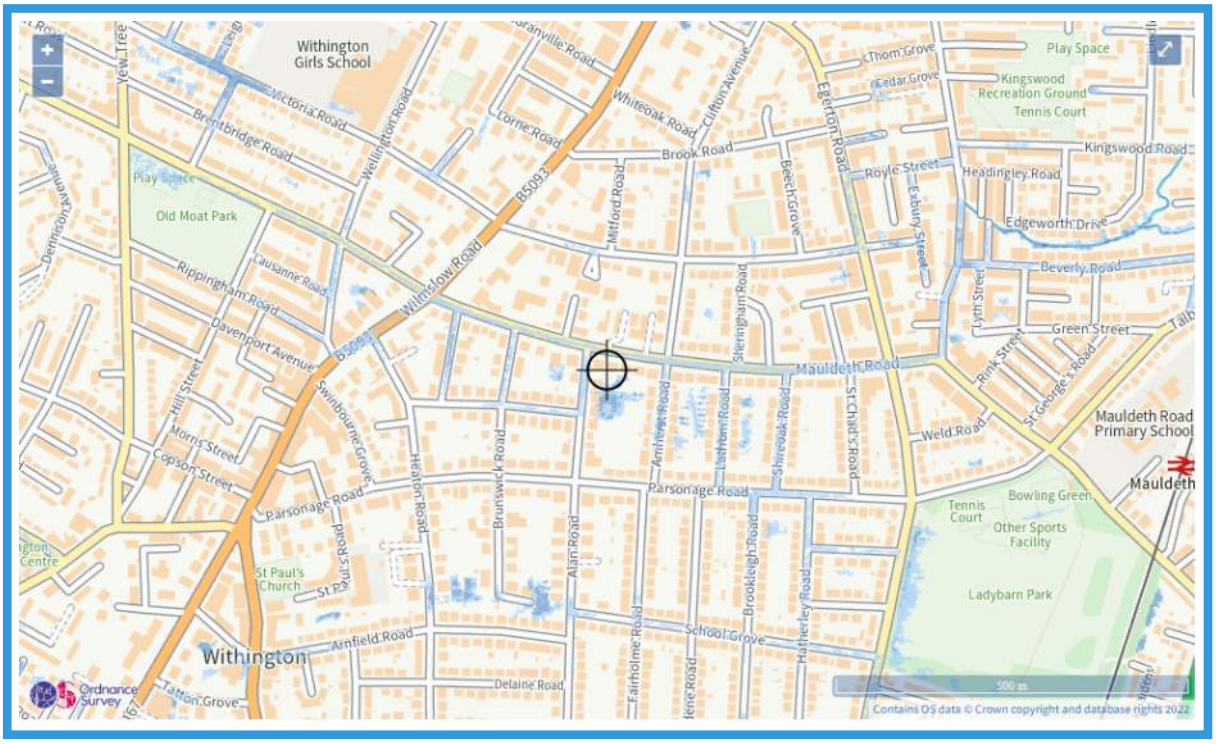


SITE SURFACE WATER FLOOD RISK

Flood risk from surface water

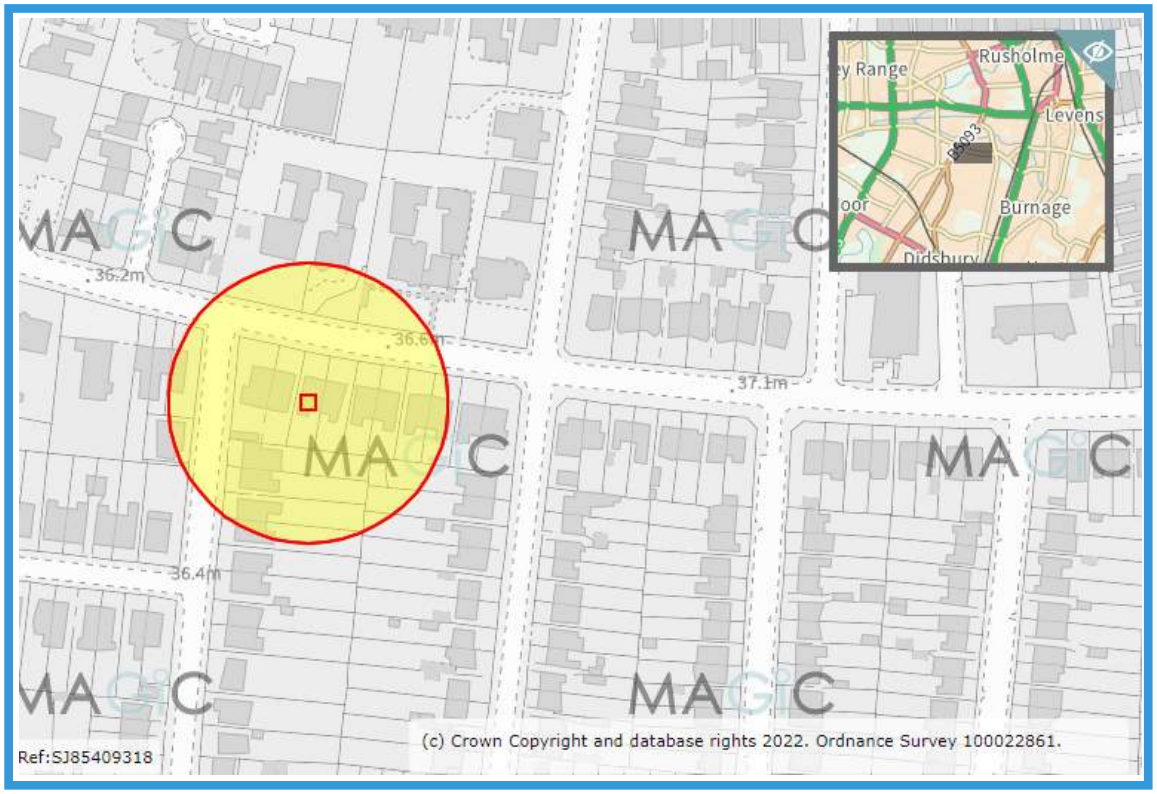
Extent of flooding

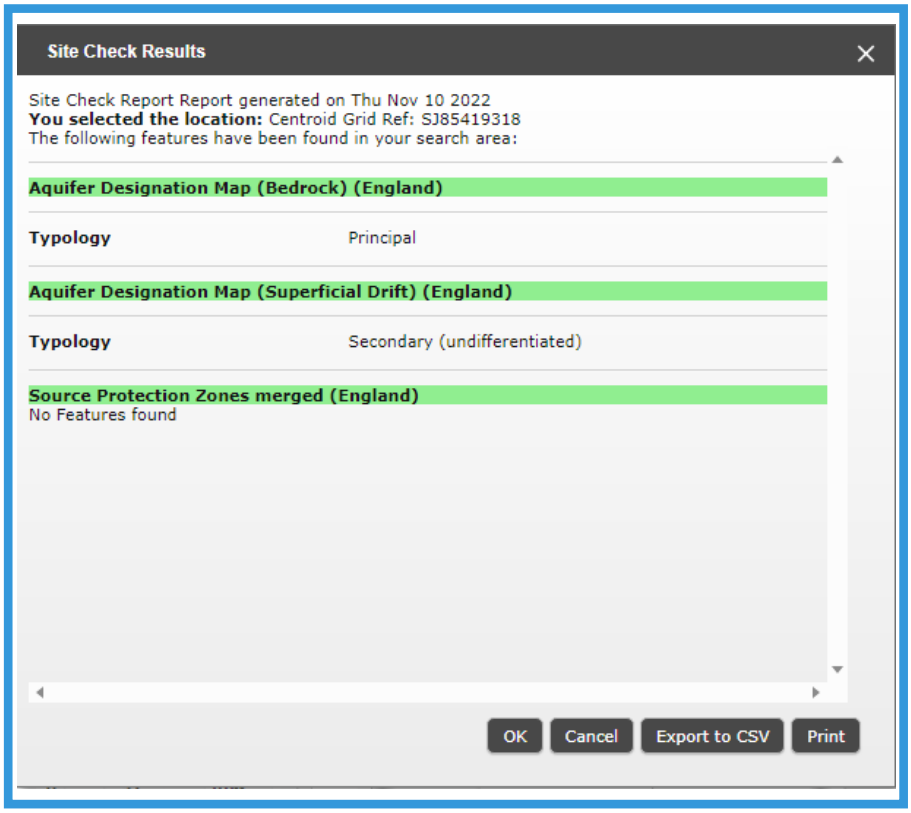
High risk means a chance of flooding greater than 3.3% (1:30)
Medium risk means a chance of flooding of btw 1% (1:100) and 3.3%
Low risk means a chance of flooding of btw 0.1% (1:1000) and 1%
Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding



Over 900mm 300 to 900mm Below 300mm

MAGIC RESULTS





Site Check Results

Site Check Report Report generated on Thu Nov 10 2022
You selected the location: Centroid Grid Ref: SJ85419318
The following features have been found in your search area:

Aquifer Designation Map (Bedrock) (England)

Typology	Principal

Aquifer Designation Map (Superficial Drift) (England)

Typology	Secondary (undifferentiated)

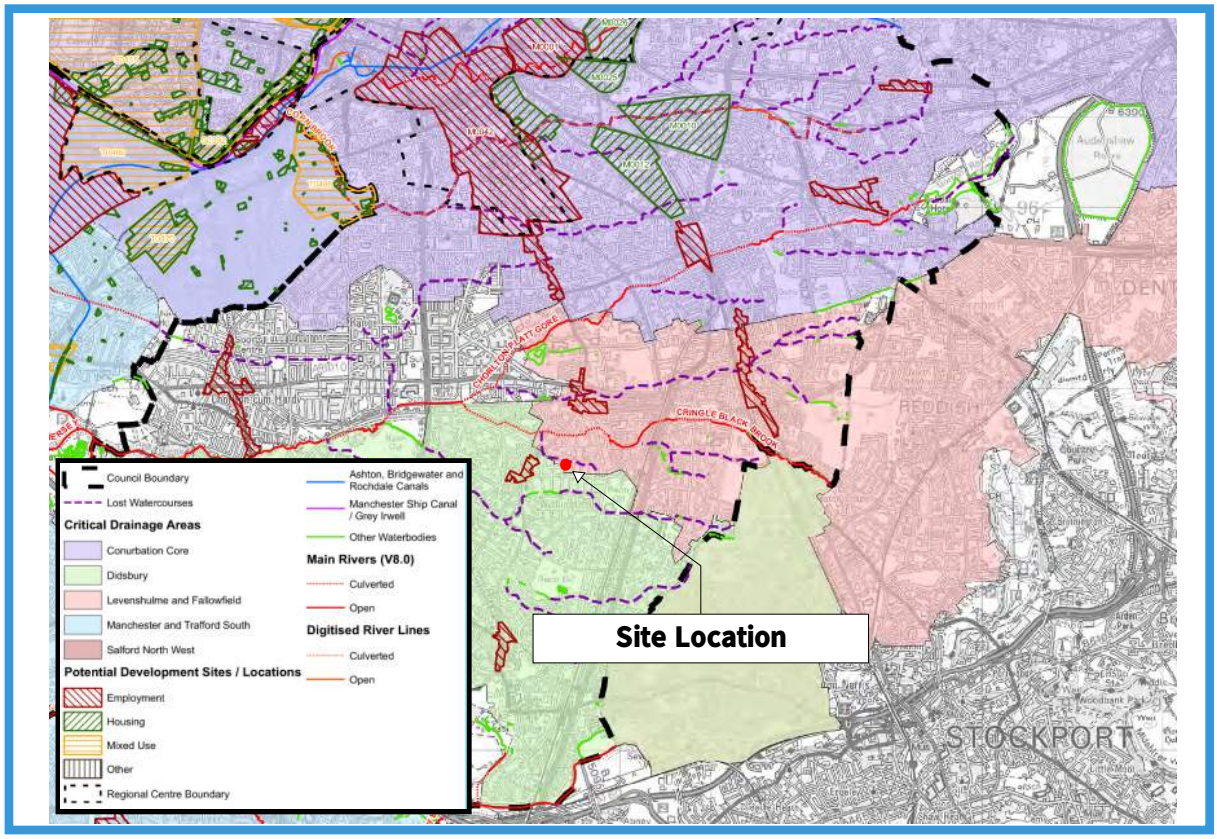
Source Protection Zones merged (England)
No Features found

OK Cancel Export to CSV Print

FLOOD WARNING AREA

Flood Warning areas

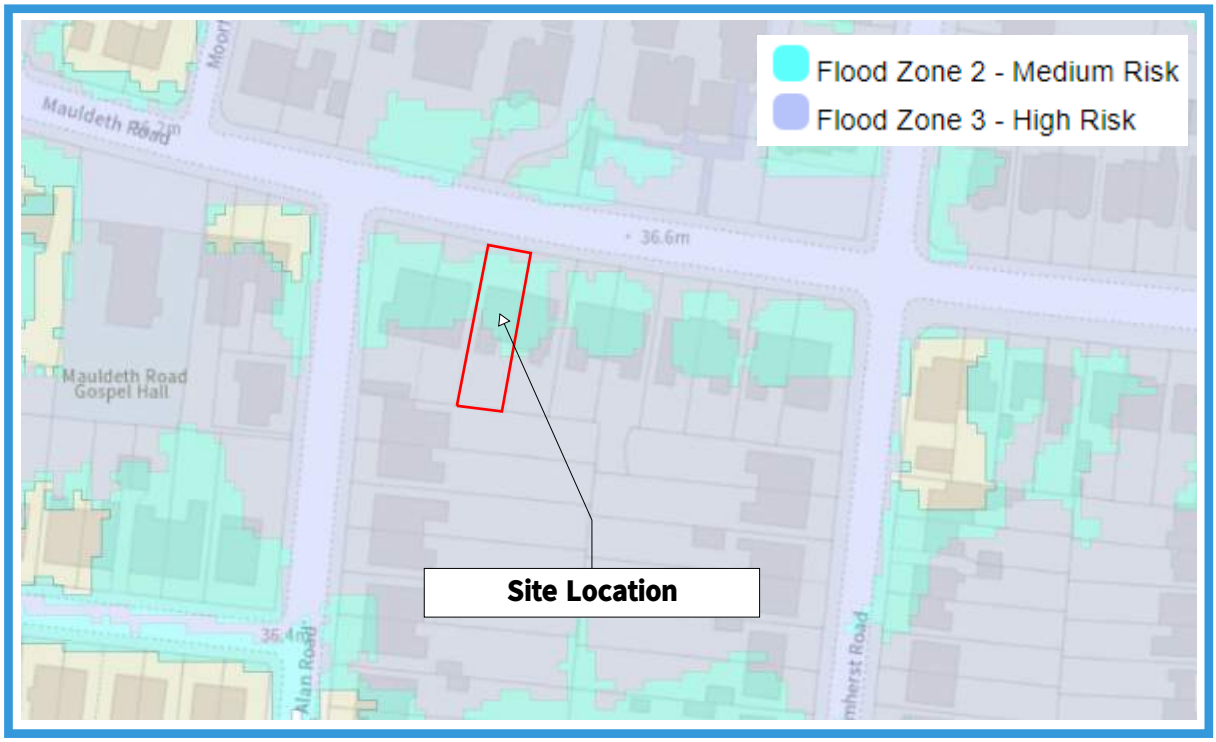
CRITICAL DRAINAGE AREA



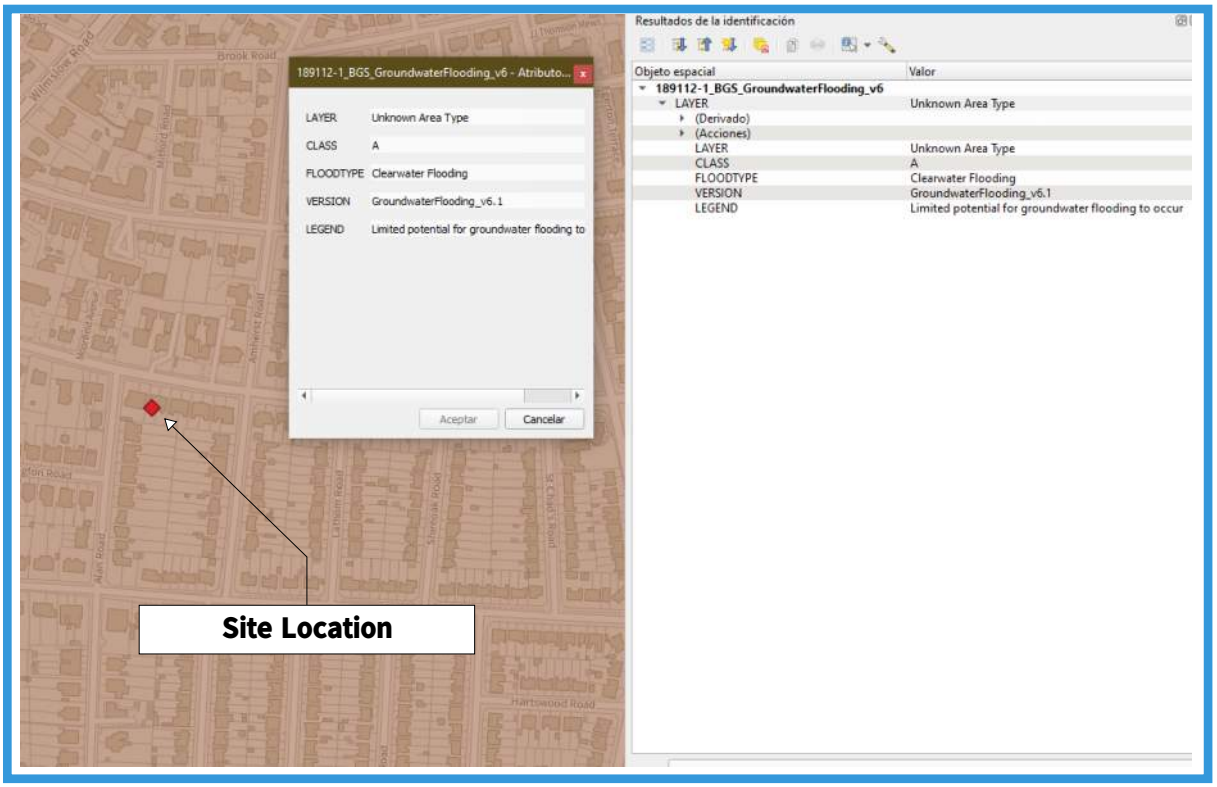
HISTORIC FLOOD MAP

Historic Flood Outline

Flood Risk Rivers and Sea



GROUND WATER FLOOD RISK



Flood map for planning

Your reference	Location (easting/northing)	Created
28 Mauldeth Rd Flood Risk	**385411/393185**	**13 Oct 2022 15:18**

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see www.gov.uk/guidance/flood-risk-assessment-standing-advice)

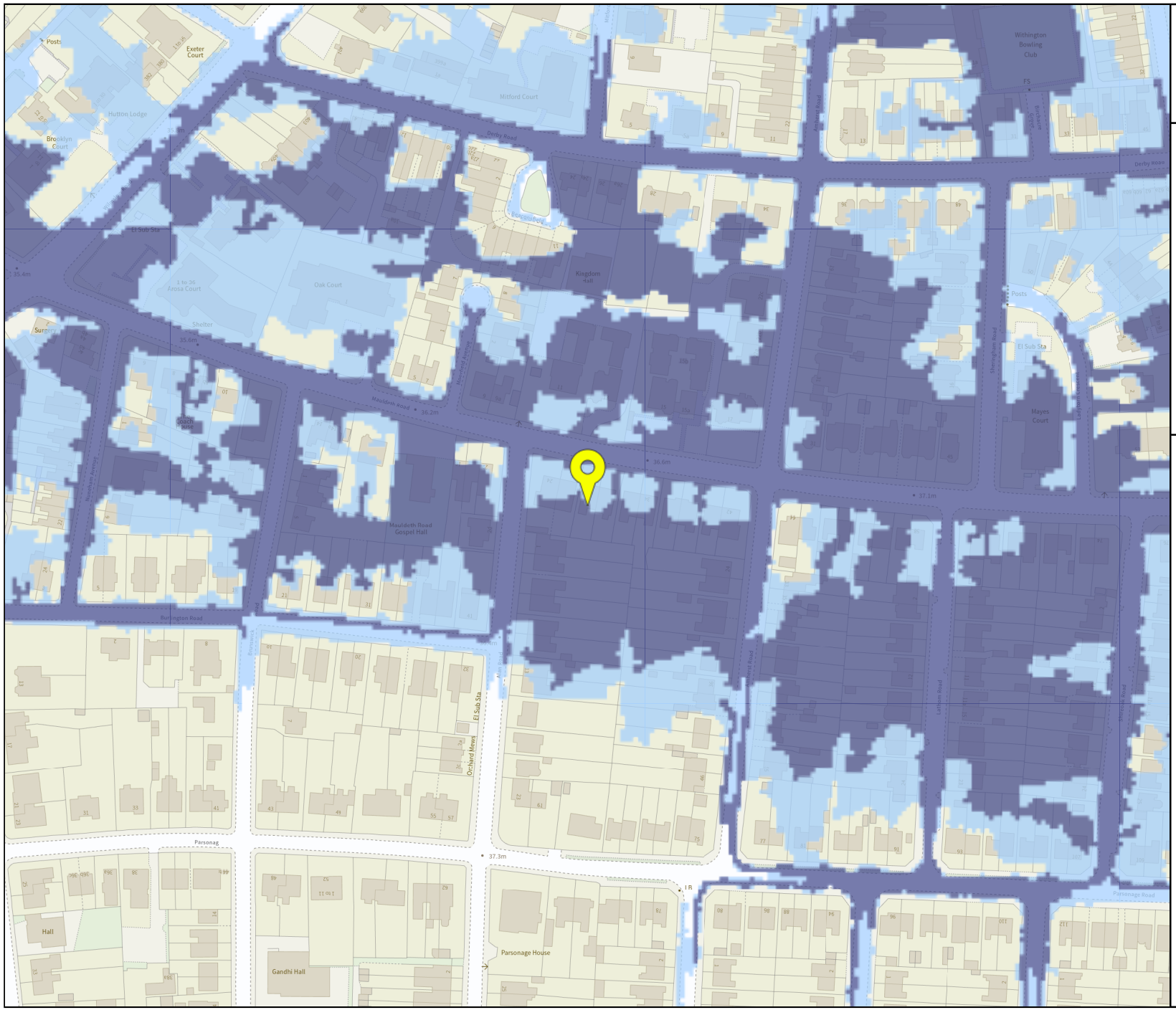
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. https://flood-map-for-planning.service.gov.uk/os-terms



Environment Agency

Flood map for planning

Your reference
28 Mauldeth Rd Flood Risk

Location (easting/northing)
385411/393185

Scale
1:2500

Created
13 Oct 2022 15:18

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

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Appendix D

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)
- historic flooding
- flood defences and attributes
- 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:

- climate change modelled data

There is not any modelled climate change data for this location. This is because detailed modelling hasn't been carried out in this area. You will need to consider the latest flood risk assessment climate change allowances and factor in the new allowances to demonstrate the development will be safe from flooding.

Surface water and other sources of flooding

Use the long term flood risk service to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

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

About the models used

Model name: Cringle Brook
Scenario(s): Defended fluvial, Defences removed fluvial
Date: 17 May 2018

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

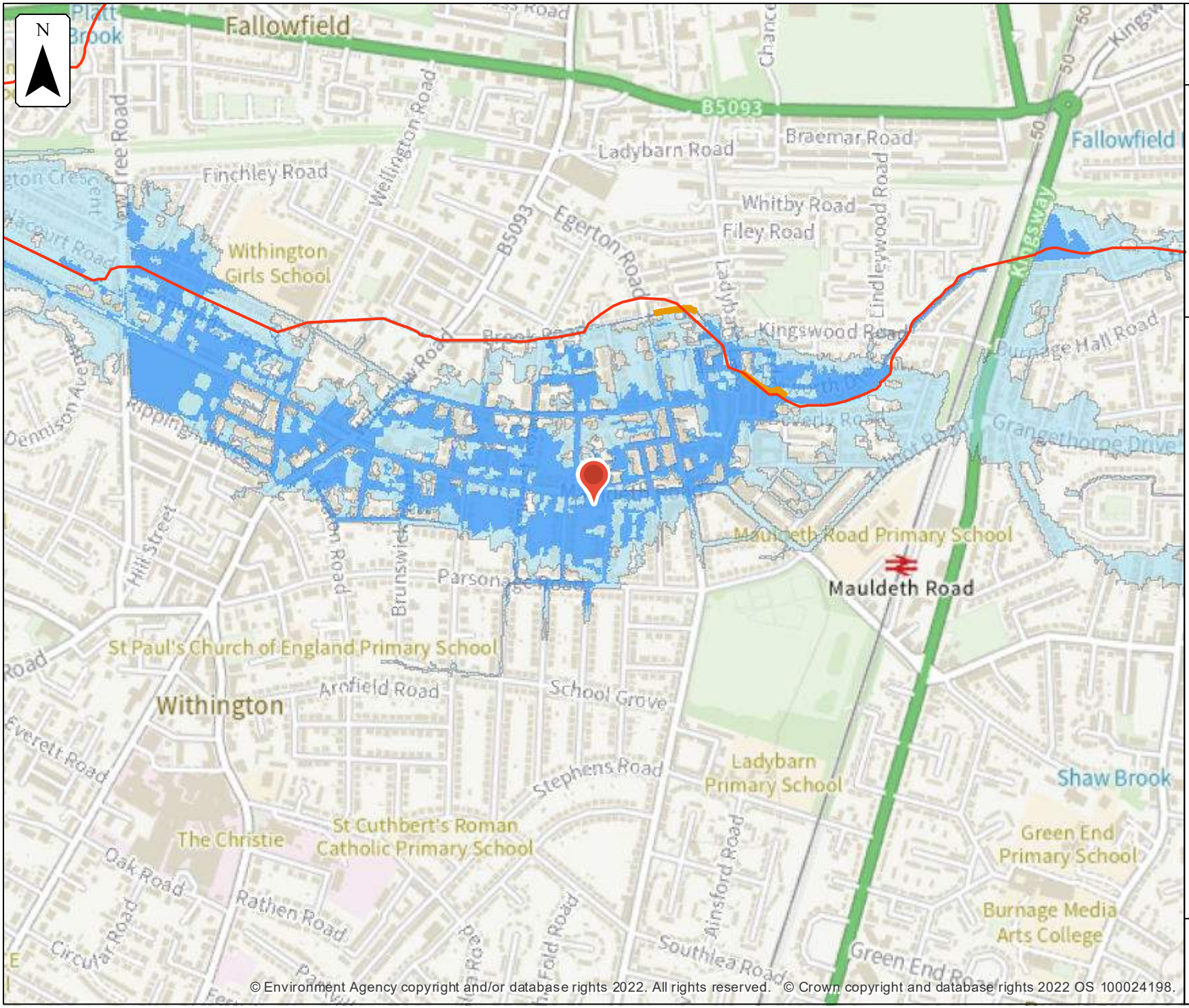
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- 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

This data is updated on a quarterly basis as better data becomes available.



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Environment Agency

Flood map for planning

Location (easting/northing)
385631/393164

Scale
1:10,000

Created
26 Jul 2022

- Selected location
- Main river
- Flood defence
- Flood zone 3
- Flood zone 2

0 100 200 300 400 500
metres

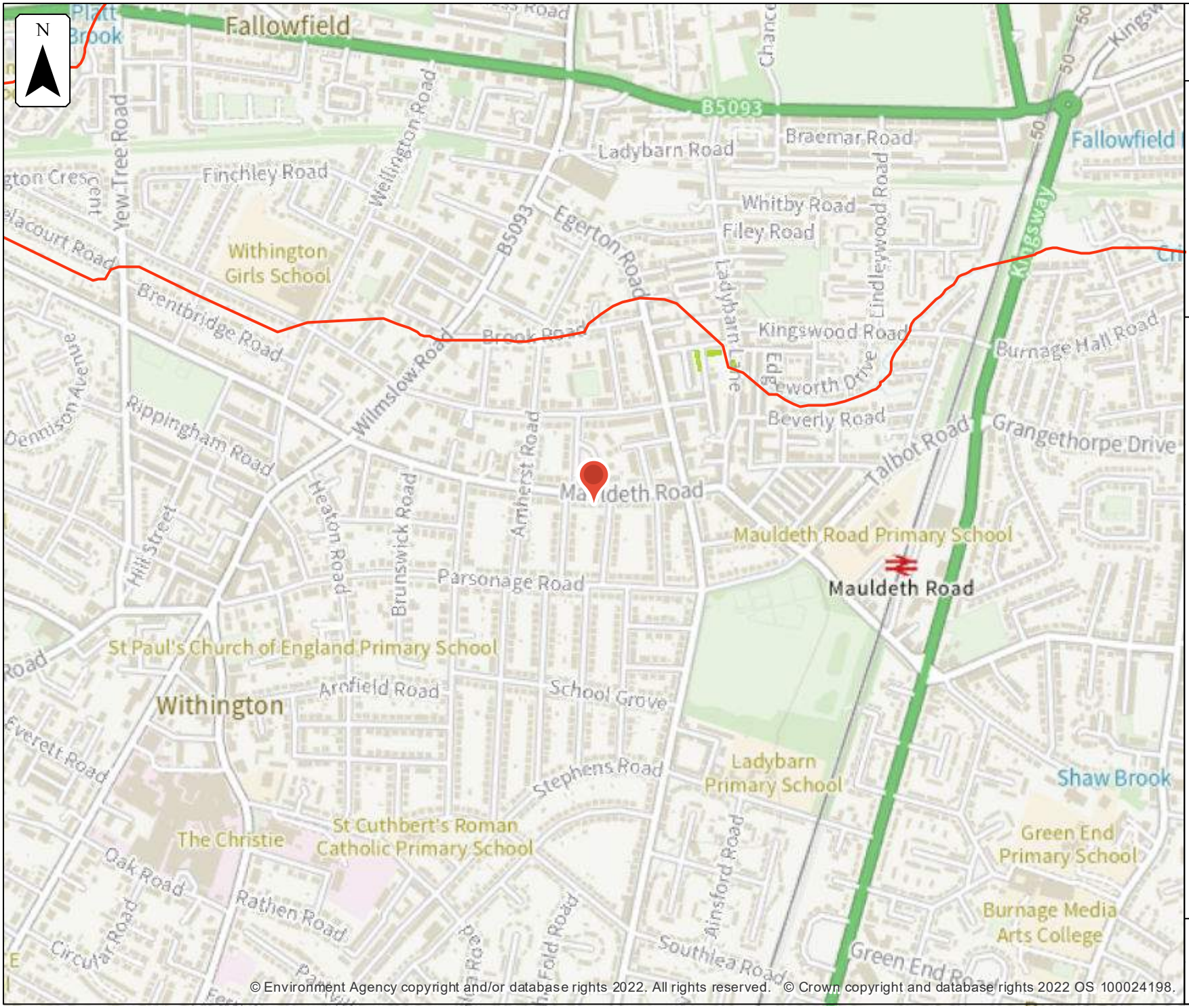
Historic flooding

This map is an indicative outline of areas that have previously flooded. Remember that:

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other flooding may have occurred that we do not have records for
- flooding can come from a range of different sources - we can only supply flood risk data relating to flooding from rivers or the sea

You can also contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

Download recorded flood outlines in GIS format



Environment Agency

Historic flood map

Location (easting/northing)
385631/393164

Scale
1:10,000

Created
26 Jul 2022

Selected location

Main river

Date of flood event

October, 2001

0 100 200 300 400 500
metres

Historic flood event data

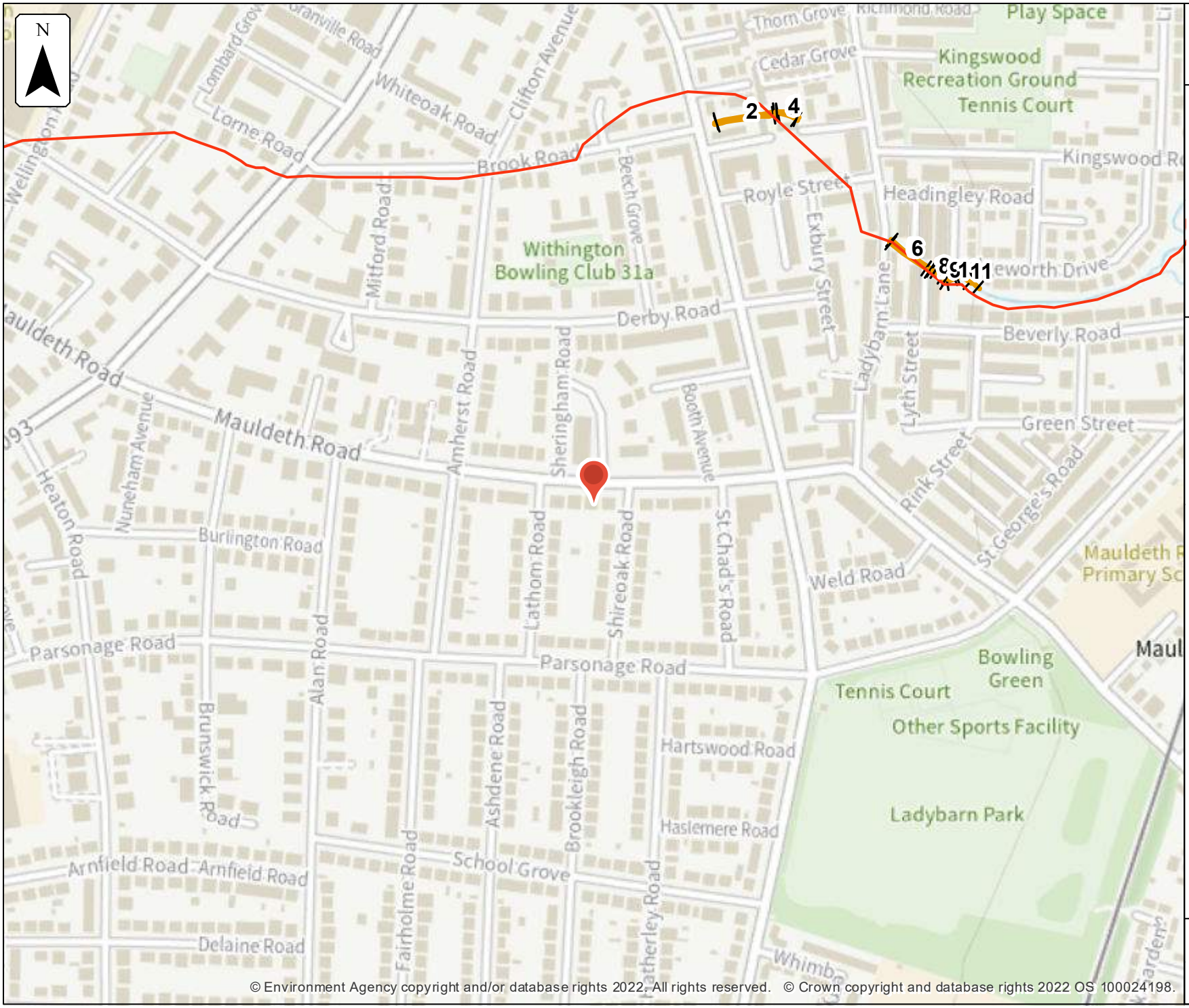
Start date	End date	Source of flood	Cause of flood	Affects location
26 October 2001	27 October 2001	main river	obstruction/blockage - channel	No

Flood defences and attributes

The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is In mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.



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Environment Agency

Flood defences

Location (easting/northing)
385631/393164

Scale
1:5,000

Created
26 Jul 2022

Selected location

Main river

Flood defence

0 50 100 150 200 250
metres

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	121699	Wall	100	Good	39.28	39.24	
2	32270	Wall	100	Good	39.21	39.28	
3	32271	Wall	100	Good	39.40	39.73	
4	32836	Wall	100	Good	39.40	39.36	
5	32357	Wall	100	Good	40.67	40.97	
6	121698	Wall	100	Good	40.70	40.96	
7	32358	Wall	100	Good	40.72	40.71	
8	59161	Wall	100	Good	40.13	40.13	
9	8872	Embankment	100	Good	39.78	39.77	
10	8870	Wall	100	Good	39.84	39.83	
11	9557	Engineered High Ground	100	Fair	39.86	39.89	

Any blank cells show where a particular value has not been recorded for an asset.

Modelled data

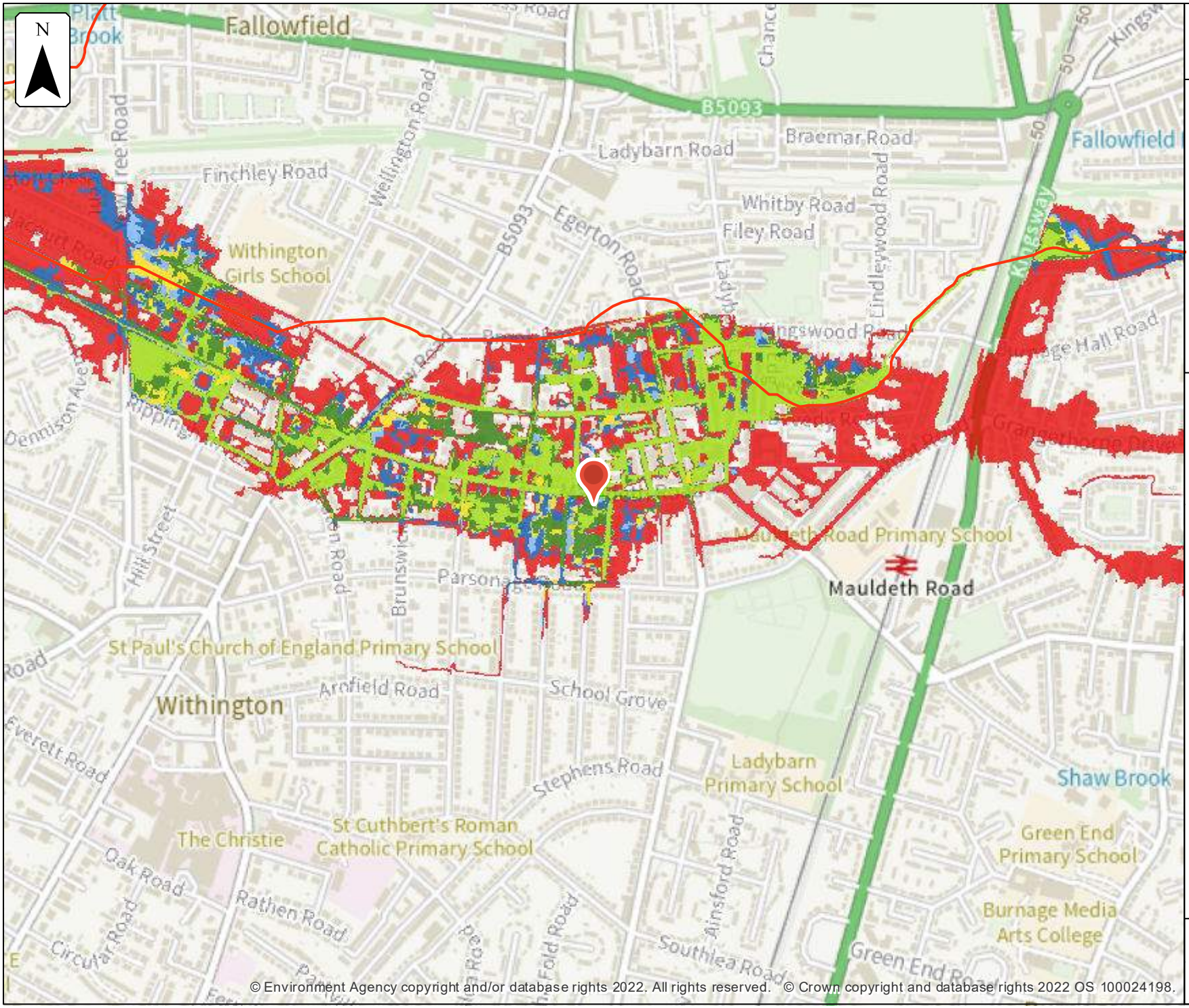
This section provides details of different scenarios we have modelled and includes the following (where available):

- 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

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 there are no flood defences



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Environment Agency

Defended modelled fluvial extent

Location (easting/northing)
385631/393164

Scale
1:10,000

Created
26 Jul 2022

Model name
Cringle Brook

Selected location

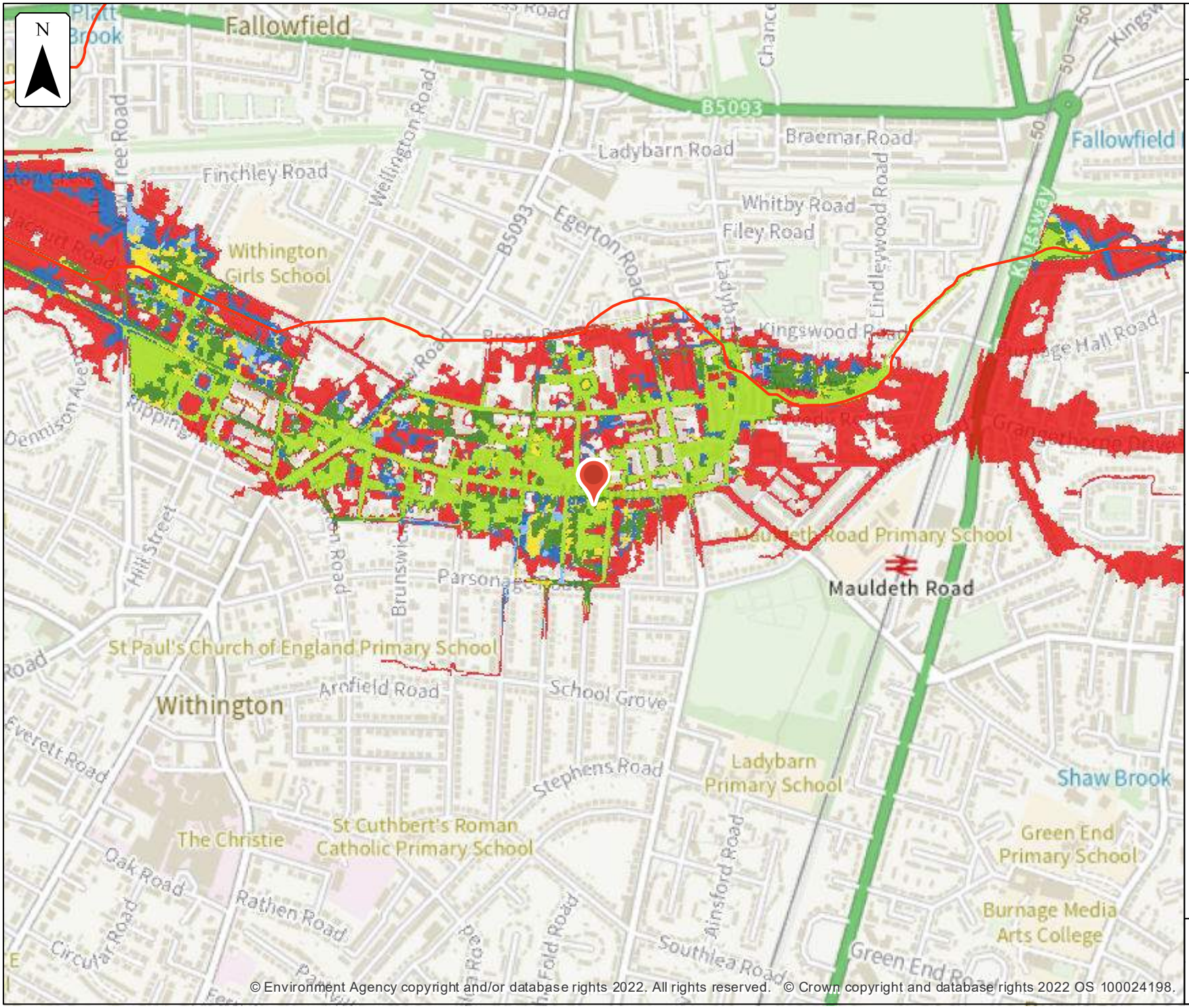
Main river

Modelled flood extent

- 5% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.5% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres



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Environment Agency

Defences Removed modelled fluvial extent

Location (easting/northing)
385631/393164

Scale
1:10,000

Created
26 Jul 2022

Model name
Cringle Brook

Selected location

Main river

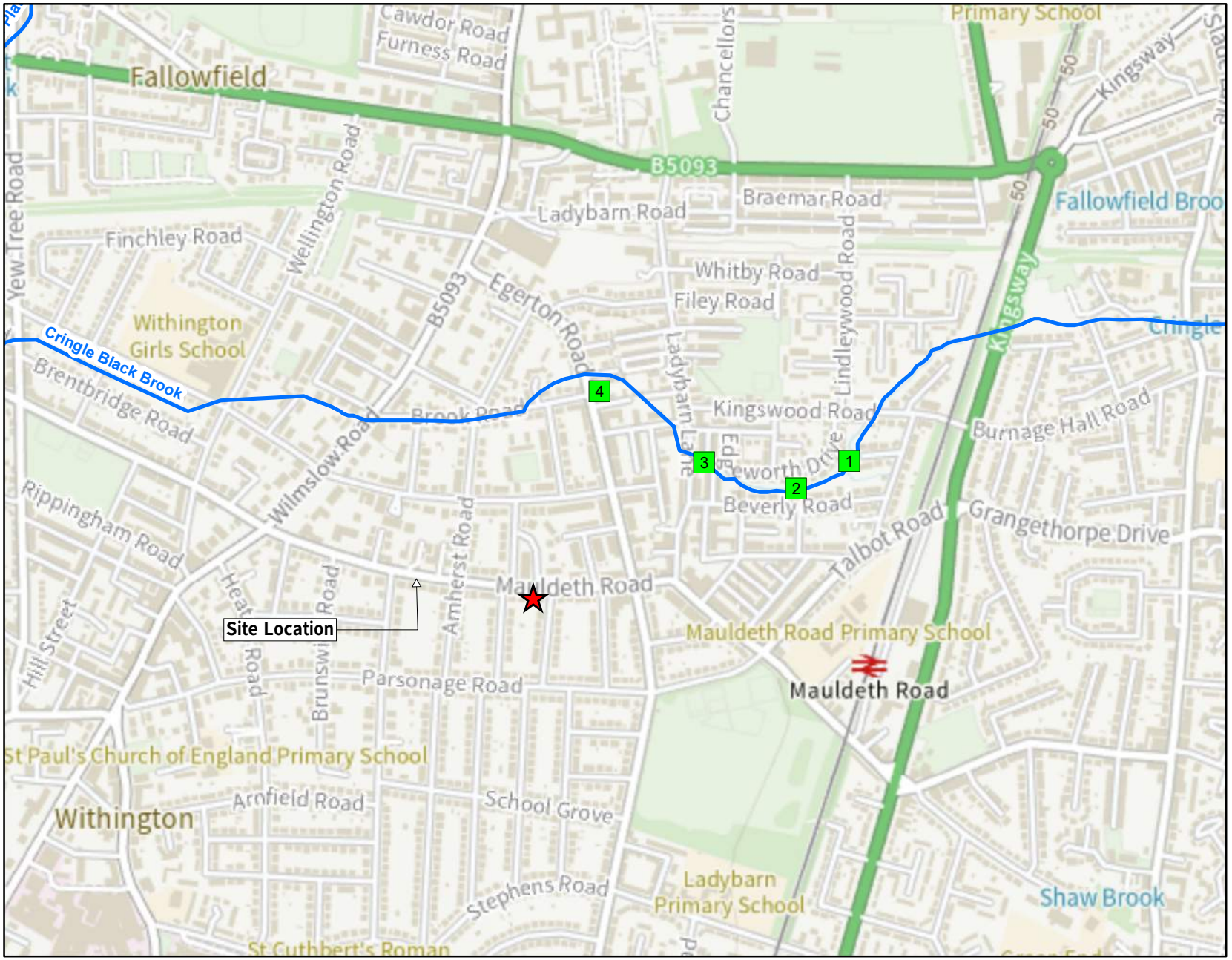
Modelled flood extent

- 5% AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.5% AEP
- 0.1% AEP

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

0 100 200 300 400 500
metres

Model Measurement Map centred on Mauldeth Road. Created on 13/09/2022 [GMMC272756SPW/E3N2TRYE7DT1]



Environment Agency

1:10,001

N

Legend

- Site Location
- Model Measurements
- Main River

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

					Undefended																																			
Map Reference	Model Node Reference	Easting	Northing	Data	50 % AEP (1 in 2 year)	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flow	50 % AEP (1 in 2 year)	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flow
1	ea013_023E_ORN01_2102d	386184	393410	**Modelled Water Level (m ausDN)**	40.13	40.28	40.41	40.51	40.53	40.60	40.62	40.64	40.69	40.70	40.72	40.87	40.78	40.61	40.13	40.29	40.41	40.51	40.53	40.60	40.62	40.64	40.69	40.70	40.72	40.87	40.78	40.81
				Modelled Flow (cumecs)	3.03	3.70	4.57	4.83	4.87	5.10	5.29	5.42	6.33	6.49	7.76	5.97	10.89	13.25	3.03	3.70	4.57	4.83	4.87	5.10	5.29	5.42	6.33	6.49	7.76	5.97	10.89	13.25
2	ea013_023E_ORN01_1991	386099	393361	**Modelled Water Level (m ausDN)**	39.77	39.87	39.99	40.04	40.05	40.09	40.11	40.12	40.17	40.18	40.23	40.16	40.26	40.31	39.77	39.87	39.99	40.04	40.05	40.09	40.11	40.12	40.17	40.18	40.23	40.16	40.26	40.31
				Modelled Flow (cumecs)	3.03	3.70	4.57	5.07	5.17	5.54	5.71	5.81	6.37	6.46	7.27	6.10	9.19	12.58	3.03	3.70	4.57	5.07	5.17	5.54	5.71	5.81	6.37	6.46	7.27	6.18	9.19	10.58
3	ea013_023E_ORN01_1807a	385936	393408	**Modelled Water Level (m ausDN)**	38.56	38.66	39.35	39.37	39.37	39.38	39.38	39.38	39.39	39.39	39.40	39.39	39.41	39.43	38.56	38.66	39.35	39.37	39.37	39.38	39.38	39.38	39.39	39.39	39.40	39.39	39.41	39.43
				Modelled Flow (cumecs)	3.03	3.69	4.26	4.40	4.45	4.62	4.68	4.72	4.93	4.98	5.27	4.84	5.88	6.25	3.03	3.69	4.26	4.40	4.45	4.62	4.68	4.72	4.93	4.98	5.27	4.84	5.88	6.25
4	ea013_023E_ORN01_1551c	385749	393534	**Modelled Water Level (m ausDN)**	37.83	38.02	38.43	38.45	38.45	38.47	38.47	38.47	38.49	38.50	38.53	38.46	38.49	38.53	37.83	38.02	38.43	38.45	38.45	38.47	38.47	38.47	38.49	38.50	38.53	38.48	38.56	38.61
				Modelled Flow (cumecs)	3.03	3.69	4.27	4.37	4.38	4.40	4.41	4.42	4.44	4.44	4.44	4.43	4.47	4.49	3.03	3.69	4.27	4.37	4.38	4.40	4.41	4.42	4.44	4.44	4.44	4.43	4.47	4.49

Model data taken from Cringle Brook 2017

AEP - Annual Exceedence Probability

m ausDN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes:

*Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

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

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 Greater Manchester Merseyside and Cheshire Environment Agency team at inforequests.gmmc@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