FLOOD RISK ASSESSMENT

LOCATION:
Cliff Road, Darfield

CLIENT:
PFPI Developments Ltd

DOCUMENT REF:
25195-FRA-001

DATE:
October 2025

DART ENGINEERS LTD
CIVIL AND STRUCTURAL ENGINEERING

CONTENTS & AMENDMENT HISTORY

Revision	Description	Date	Author	Checked
A	First Issue	October 2025	A Dyson	R Thacker

1.0 INTRODUCTION

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of PFPI Developments Ltd in respect of a planning application for the proposed residential development at Cliffe Road, Darfield.

Site Name	Cliff Road, Darfield
Location	COXBENCH HOUSE, 60 DONCASTER ROAD, DARFIELD, BARNSLEY, S73 9HN
NGR (approx.)	463970, 451727
Development Type	Residential
NPPF Vulnerability	Low
EA Flood Zone	Flood Zone 1, 2 and 3
EA Office	Yorkshire
Local Planning Authority	Barnsley Council

Table 1.1 - Site Summary

1.1 SOURCES OF DATA

The report is based on the following information:

i. Topographical Survey (Appendix A)
ii. Environment Agency information (Appendix B)
iii. South Yorkshire Council Strategic Flood Risk Assessment

1.2 EXISTING SITE

The site in question is located to the far east of Darfield in South Yorkshire. It is bounded to the north by Doncaster Road and existing residential properties and the south and east by residential properties and to the west by Cliff Road.

From Appendix A it can be considered that the development area falls form east t west. The east of site is the highest point at circa 31.3m AOD and the west is the lowest at circa 23.7m AOD.

There are several waterbodies and watercourses within the neighbouring areas of the site. Approximately 100m to the north is the River Dearne.

Figure 1.1 - Site Location

1.3 PROPOSED DEVELOPMENT

The proposed development is set to consist of outline application for 10 no. residential dwellings with all matters reserved apart from layout and access.

1.4 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online.

The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.

This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance.

Flood Zones

The Flood Zone Map for Planning has been prepared by the Environment Agency. This identifies areas potentially at risk of flooding from fluvial or tidal sources. An extract from the mapping is included as Figure 1.2.

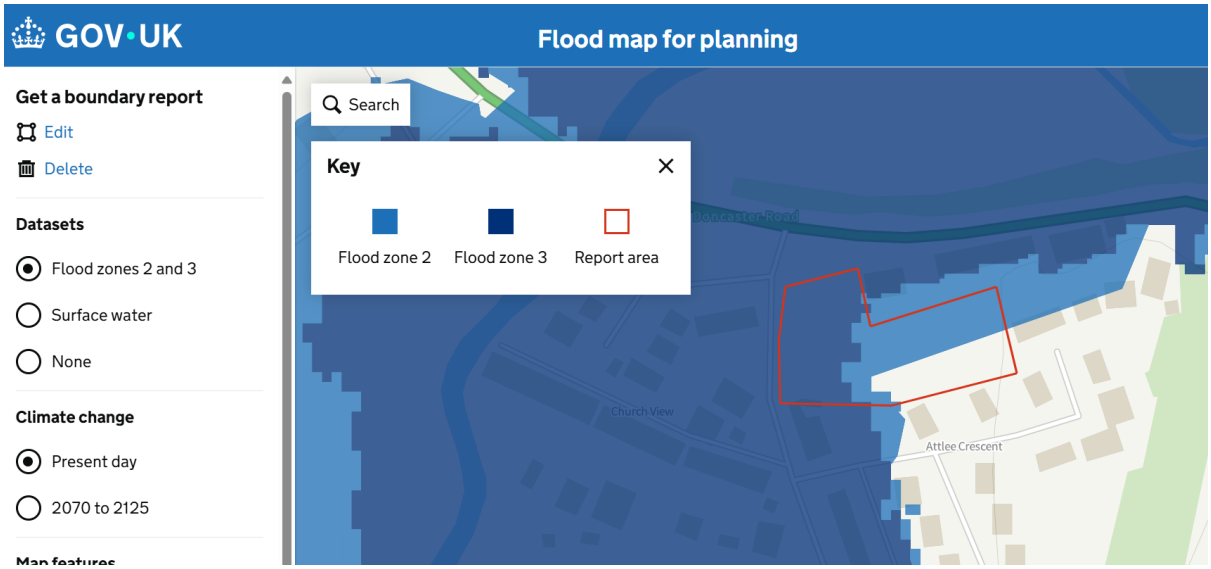


Figure 1.1 - Environment Agency Flood Zone Mapping

The site is shown to be located partially within Flood Zone 1 (Low Probability), Flood Zone 2 (Medium Probability) and Flood Zone 3 (High Probability) therefore the site is considered to be medium risk of flooding. Flood Zone 1 is defined as land assessed as having less than a 0.1% annual probability of flooding from fluvial and tidal sources. Flood Zone 2 is defined as land assessed as having between 0.1 and 1% annual probability of flooding from fluvial and tidal sources. Flood Zone 3 is defined as land assessed as having more than 1% annual probability of flooding from fluvial and tidal sources.

Table 2 of the Planning Practice Guidance classifies land use. Under these classifications the proposed residential development is considered to be 'More Vulnerable' to the potential impacts of flooding.

Table 3 of the Planning Practice Guidance identifies that any development is considered appropriate within Flood Zone 1, 2 and 3.

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable
Flood Zone 1	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception test required	✓
Flood Zone 3a	Exception test required	✓	**x**	Exception test required
Flood Zone 3b	Exception test required	✓	**x**	**x**

1.5 OTHER RELEVANT POLICY AND GUIDANCE

Strategic Flood Risk Assessment

The South Yorkshire Strategic Flood Risk Assessment (SFRA) was prepared to review flood risks on a much wider scale to assess the potential for new development within the study area. The SFRA was used as an evidence base for Local Development Frameworks for each Local Planning Authority.

The SFRA therefore aims to bring together all available flood risk information for a variety of sources to provide a robust assessment. The SFRA therefore is useful for this site-specific FRA by highlighting available data and instances of known flooding in the area. Although written under the guidance of Planning Policy Statement 25, the SFRA is still considered to include relevant information.

2.0 POTENTIAL SOURCES OF FLOOD RISK

The table below identifies the potential sources of flood risk to the site, and the impacts which the development could have in the wider catchment prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within Section 3.0.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial	X	X	X		The site is located in flood zone 1, 2 and 3.
Tidal				X	There are no tidal influences effecting the site.
Canals				X	None present.
Groundwater			X		Ground conditions are not conducive to fluctuating groundwater levels.
Reservoirs and waterbodies				X	The site is shown to fall outside of the catchment for reservoir and waterbodies flooding.
Sewers			X		The site in question is higher than the surrounding sewers therefore there is a very low risk.
Pluvial runoff				X	No area of the site is within a low-risk area of surface water flooding.
Effect of Development on Wider Catchment	X				The impermeable area of the site is being altered and as such a suitable surface water drainage strategy will be required.

Table 2.1 - Pre-Mitigation Sources of Flood Risk

2.1 FLUVIAL FLOOD RISK

As previously mentioned, the site is shown to be within Flood Zone 1, and 3 and therefore poses a high risk to the proposed development.

Mitigation measures to address the residual risk posed by the watercourses surrounding the site are discussed within Section 3.0 of this report.

2.2 GROUNDWATER FLOOD RISK

Subject to completion of site investigation to confirm we would assume that natural ground water level is located well below the site surface and the nature of the strata means it is unlikely that there will be perched water above this level.

We therefore do not consider there is a risk of groundwater flooding affecting the development subject to final confirmation upon completion of suitable site investigation.

2.3 FLOOD RISK FROM RESERVOIRS & LARGE WATERBODIES

Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide. An extract from the mapping is included as Figure 2.1.

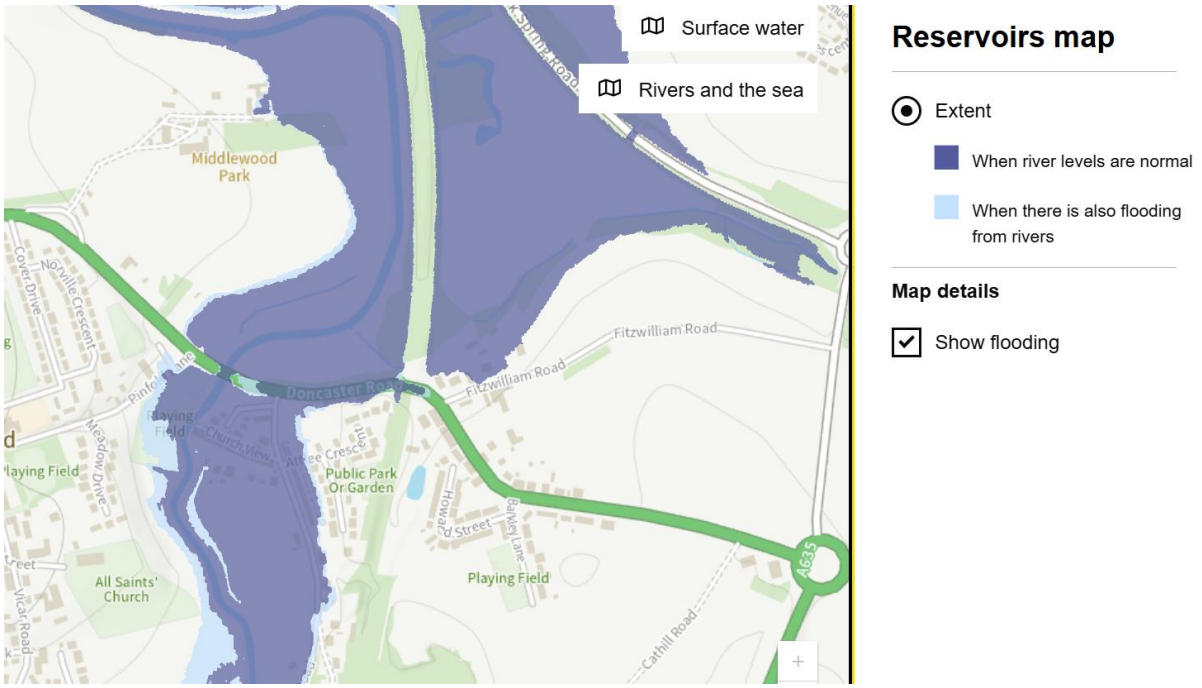


Figure 2.1 - Environment Agency Reservoir Failure Flood Risk Map

Mapping demonstrates the site and possible access routes are within an area of reservoir flooding wen river levels are normal. Reservoirs are managed waterbodies and as such it is assumed that water levels and flows will be managed from the reservoir accordingly.

As such, there is considered to be low risk from reservoir flooding.

2.4 FLOOD RISK FROM SEWERS

The site in question lies above any main roads which is potentially where any Yorkshire Water sewers will lie.

As such, it is considered that there is no risk of flooding from sewers.

2.5 PLUVIAL FLOOD RISK

Risk of flooding from surface water mapping has been prepared by the Environment Agency, this shows the potential flooding which could occur when rainwater does not

drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. An extract from the mapping is included as Figure 2.2

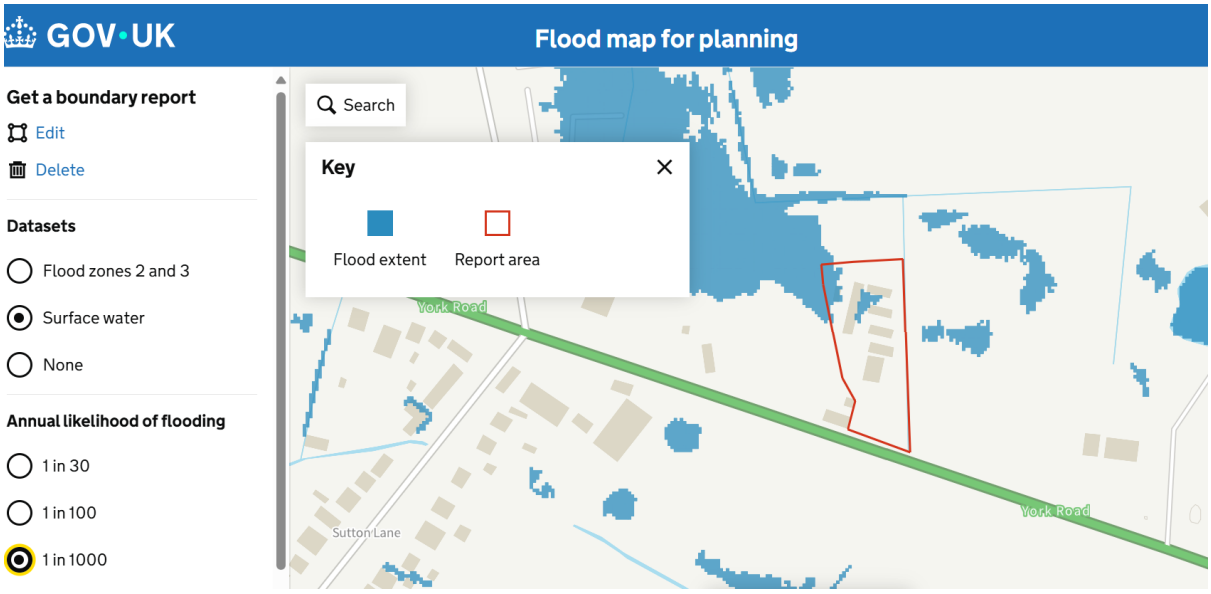


Figure 2.2 - Risk of Flooding from Surface Water Mapping

The mapping produced by the Environment Agency shows that there are no areas of the site that are at low risk of surface water flooding.

Therefore, the risk posed by this threat is considered low.

2.6 EFFECT OF DEVELOPMENT ON WIDER CATCHMENT

2.6.1 Development Drainage

The current site is considered to be greenfield. The amount of impermeable area will be altered. Therefore, a strategic surface water drainage strategy prepared for wider development will ensure a sustainable approach to surface water management.

3.0 FLOOD RISK MITIGATION

Section 2.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be considered within the proposed development detail design to address and reduce the risk of flooding to within acceptable levels.

3.1 SITE ARRANGEMENTS

3.1.1 Sequential Arrangement

The Flood Zone mapping shows the site to be located within flood zone 1,2 and 3.

EA Flood Data is contained in Appendix B, the data shows the key flood levels are as noted below for the site:

- Defence Removed Flood Level 1% AEP 24.92m AOD
- Defended plus climate change 1% AEP Plus 60% 25.32m AOD

As the site is partially in Flood Zone 2 and 3 it is proposed to mitigate this by raising site levels to be a minimum FFL of 25.470m AOD which is 550mm above the defences removed flood level and 150mm above the defended plus climate change flood level

Dart Engineers drawing 25195-DR-C-0100 in Appendix C shows that an assessment of site levels below the flood level of 25.32m AOD AOD equates to a volume of 258.2m3.

This is proposed to be mitigated by lowering levels to the west of site outside the development area but within the applicants ownership as shown on Dart Engineers drawing 25552-DR-C-100 to provide a flood compensation volume of 261.4m3.

The proposed units and access road will be set with a minimum level of 25.470m AOD to provide mitigation against the flood level plus 150mm worst case.

This will ensure the proposed development is out of the flood zone, however suitable mitigation is implemented to provide flood compensation to mitigate the risk of flooding to downstream properties.

It is proposed that flood resilient building techniques will be implemented for the proposed evelopment, flood proofing to the ground floor.

The proposed development will incorporate some of the following, details of which will be finalised by the Architect at detailed design stage:

· Electricity supply cables to enter building from above flood level and wired
· downwards; electric sockets to be positioned at least 600mm above floor level.
· Anti-flood valves on internal building drainage.
· Watertight external door construction to minimum of 600mm above proposed floor level.

In addition to the flood resilient techniques above a safe place of refuge should be provided for the development which will be on the first floor, the site is situated within an Environment Agency Flood Alert Area. It is recommended that the resident registers with this service. In the event of an extreme storm notification on the alert service the following Flood Management Plan should be put in place.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of PFPI Developments Ltd

This report demonstrates that the proposed development is not at significant flood risk, and simple mitigation measures have been recommended to address any residual risks that may remain. The identified risks and mitigation measures are summarised within Table 4.1.

Flood Source	Proposed Mitigation Measure
Fluvial	Site is shown to be in Flood Zone 1, 2 and 3.
Impact of the Development	Strategic surface water drainage strategy prepared for wider development will ensure a sustainable approach to surface water management.

Table 4.1 - Summary of Flood Risk Assessment

In compliance with the requirements of National Planning Policy Framework, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

5.0 APPENDICES

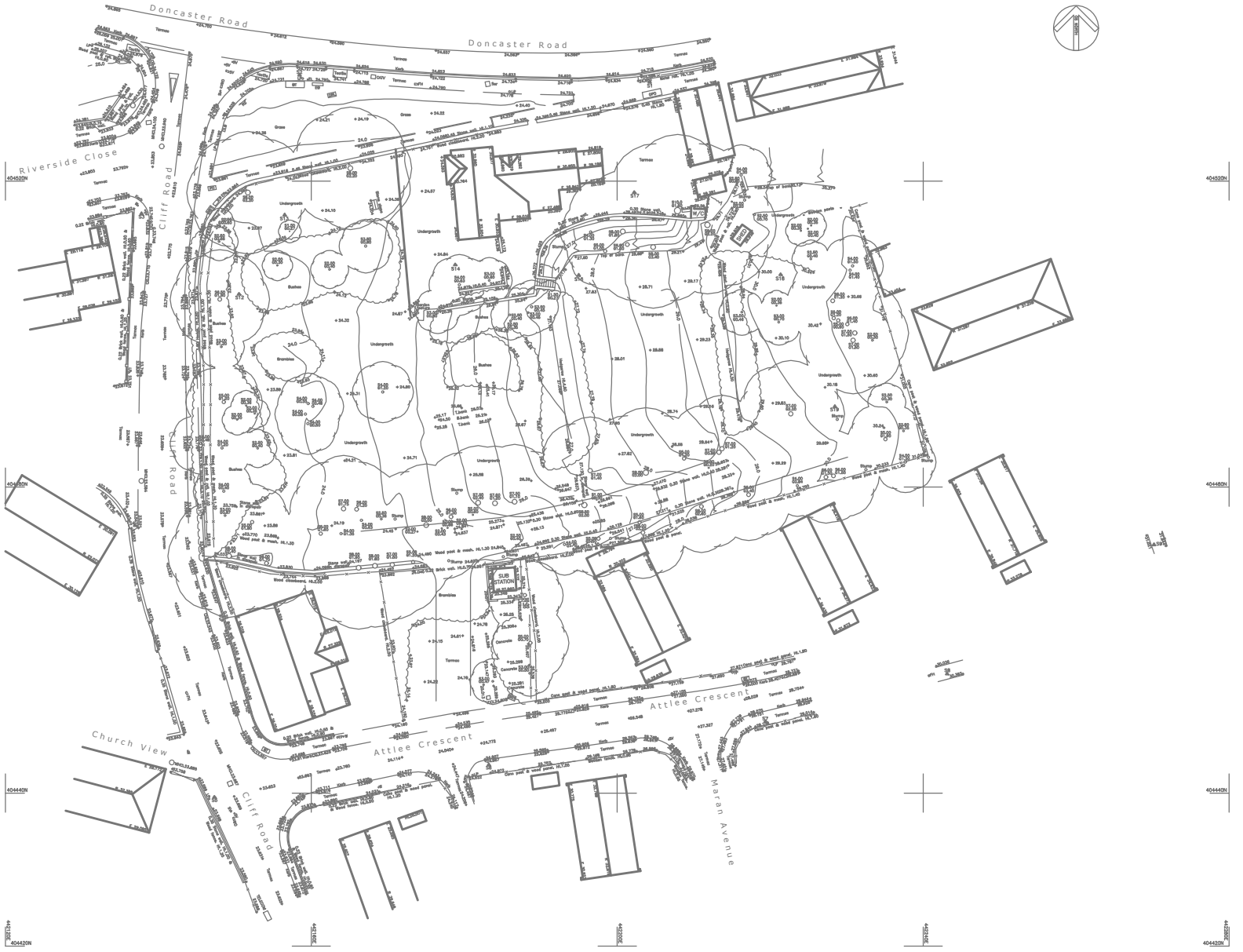
Appendix A – Topographical Survey

Appendix B – EA Flood Data

Appendix C – Flood Compensation Works

Appendix A

Topographical Survey


Doncaster Road
Doncaster Road
Riverside Close
Cliff Road
Cliff Road
Cliff Road
Church View
Attlee Crescent
Attlee Crescent
Maran Avenue
SUB STATION

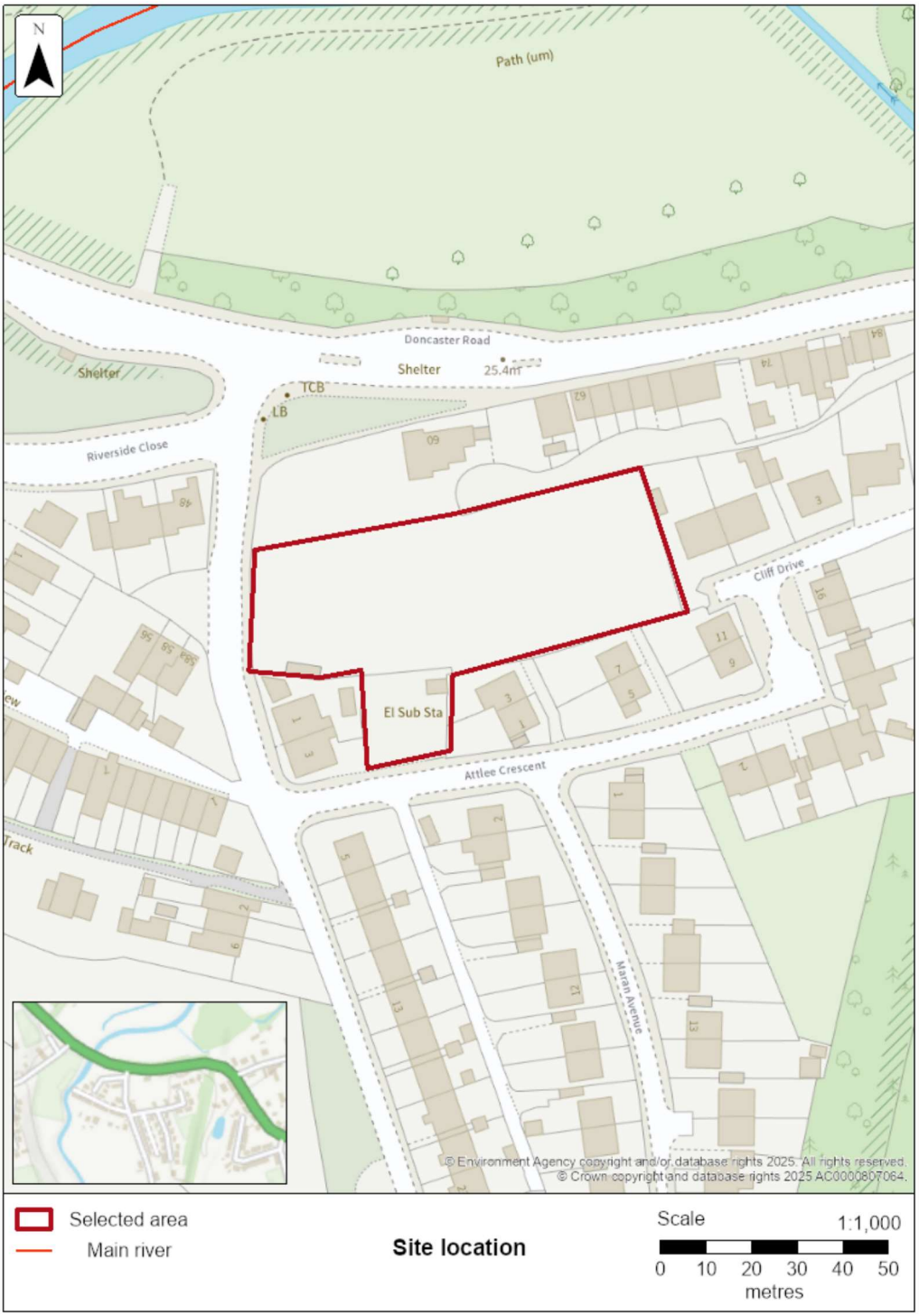
Appendix B

EA Flood Data

Flood risk assessment data

Location of site: 442191 / 404487 (shown as easting and northing coordinates)
Document created on: 7 October 2025
This information was previously known as a product 4.
Customer reference number: UFC7A44GCF36

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
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

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 Barnsley District.

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

About the models used

Model name: 2009 ASM River Dove
Scenario(s): Defended fluvial
Date: 1 October 2009

Model name: 2017 Low Valley ERR
Scenario(s): No defences exist fluvial, no defences exist climate change fluvial
Date: 31 January 2017

Model name: River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model
Scenario(s): Defended fluvial, defences removed fluvial, defended climate change fluvial
Date: 6 March 2024

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:

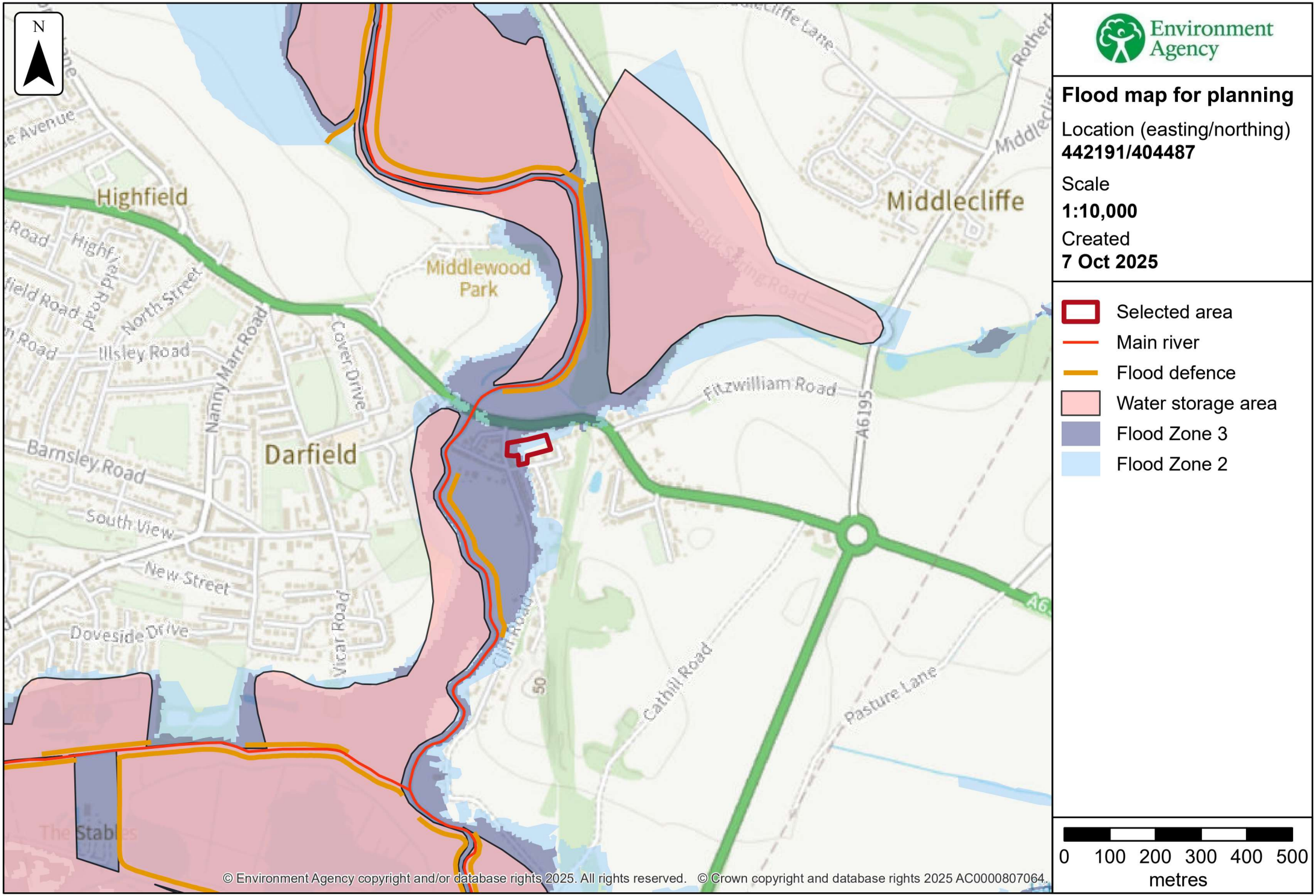
- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

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)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

- Selected area
- Main river
- Flood defence
- Water storage area
- 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

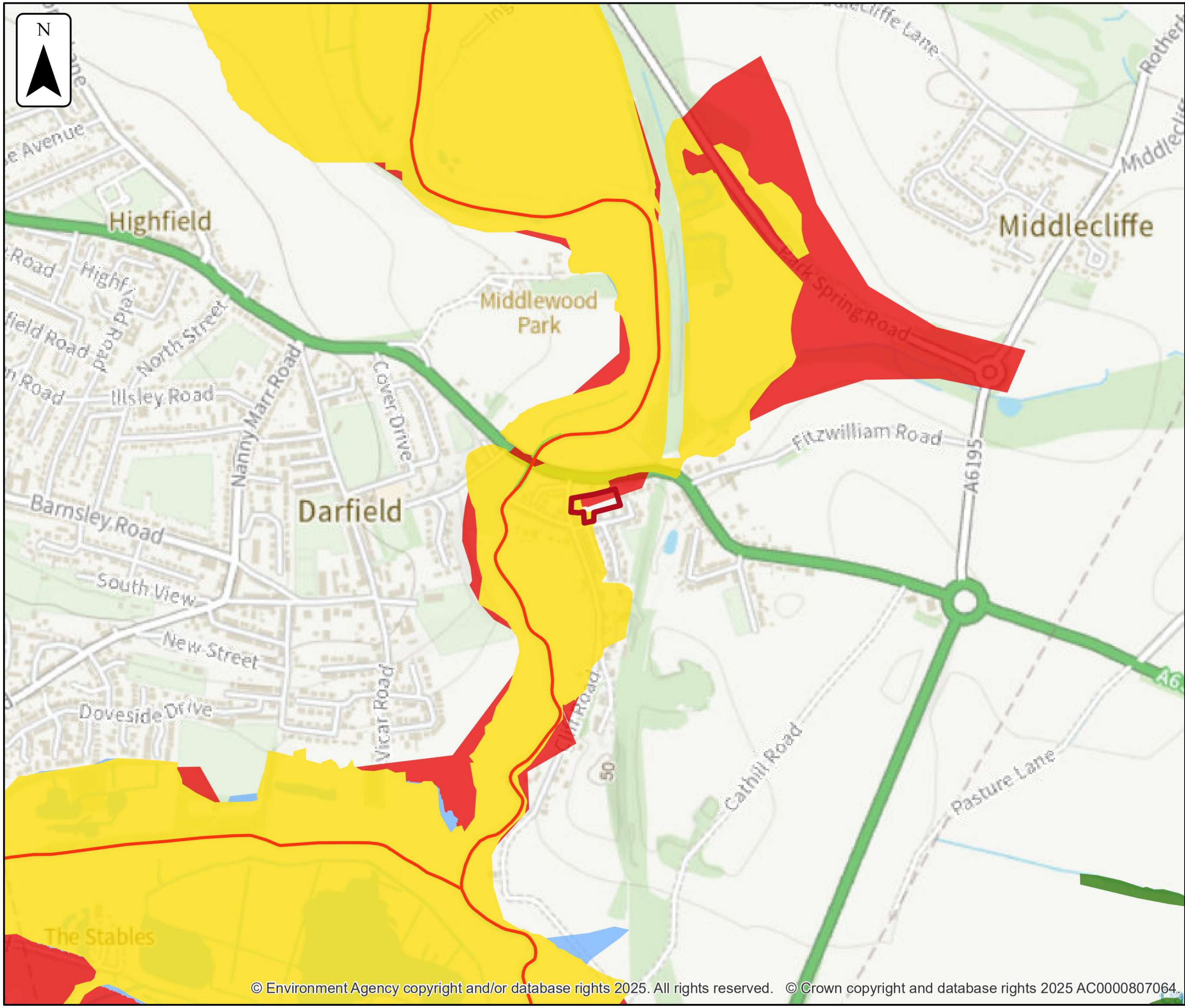
The recorded flood outlines are a geographical information system (GIS) data layer that show our verified records of areas that have flooded in the past from:

- 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 Barnsley District 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)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

- Selected area
- Main river

Date of flood event

- November, 2019
- June, 2007
- June, 2007
- November, 2000
- October, 2000
- March, 1947

0 100 200 300 400 500
metres

Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
7 November 2019	8 November 2019	main river	channel capacity exceeded (no raised defences)	No
26 June 2007	28 June 2007	main river	channel capacity exceeded (no raised defences)	No
25 June 2007	26 June 2007	unknown	unknown	Yes
6 November 2000	4 December 2000	main river	unknown	No
1 October 2000	30 November 2000	main river	unknown	No
19 March 1947	22 March 1947	main river	channel capacity exceeded (no raised defences)	Yes

Flood defences and attributes

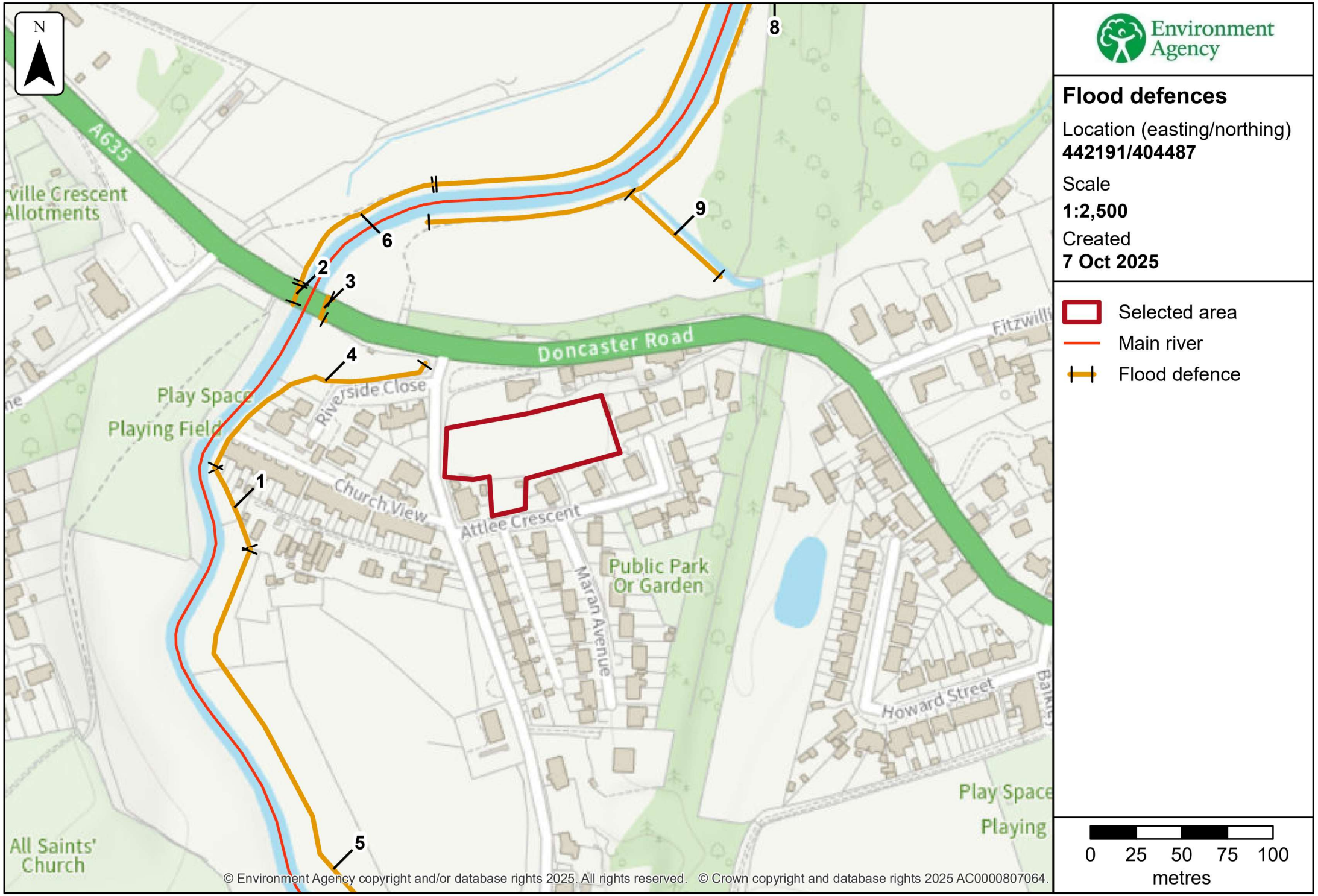
The flood defences map shows the location of the flood defences present.

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.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk



Environment Agency

Flood defences

Location (easting/northing)
442191/404487

Scale
1:2,500

Created
7 Oct 2025

- Selected area
- Main river
- Flood defence

0 25 50 75 100
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	449782	Wall		Good			
2	478959	Bridge Abutment		Good			
3	449780	Bridge Abutment					
4	449739	Wall		Fair			
5	48837	Embankment	30	Fair	23.47	23.99	
6	478978	Engineered High Ground		Fair			
7	478958	Engineered High Ground		Fair			
8	26042	Embankment	30	Poor	23.77	23.67	
9	568956	Embankment		Good			

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
- 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

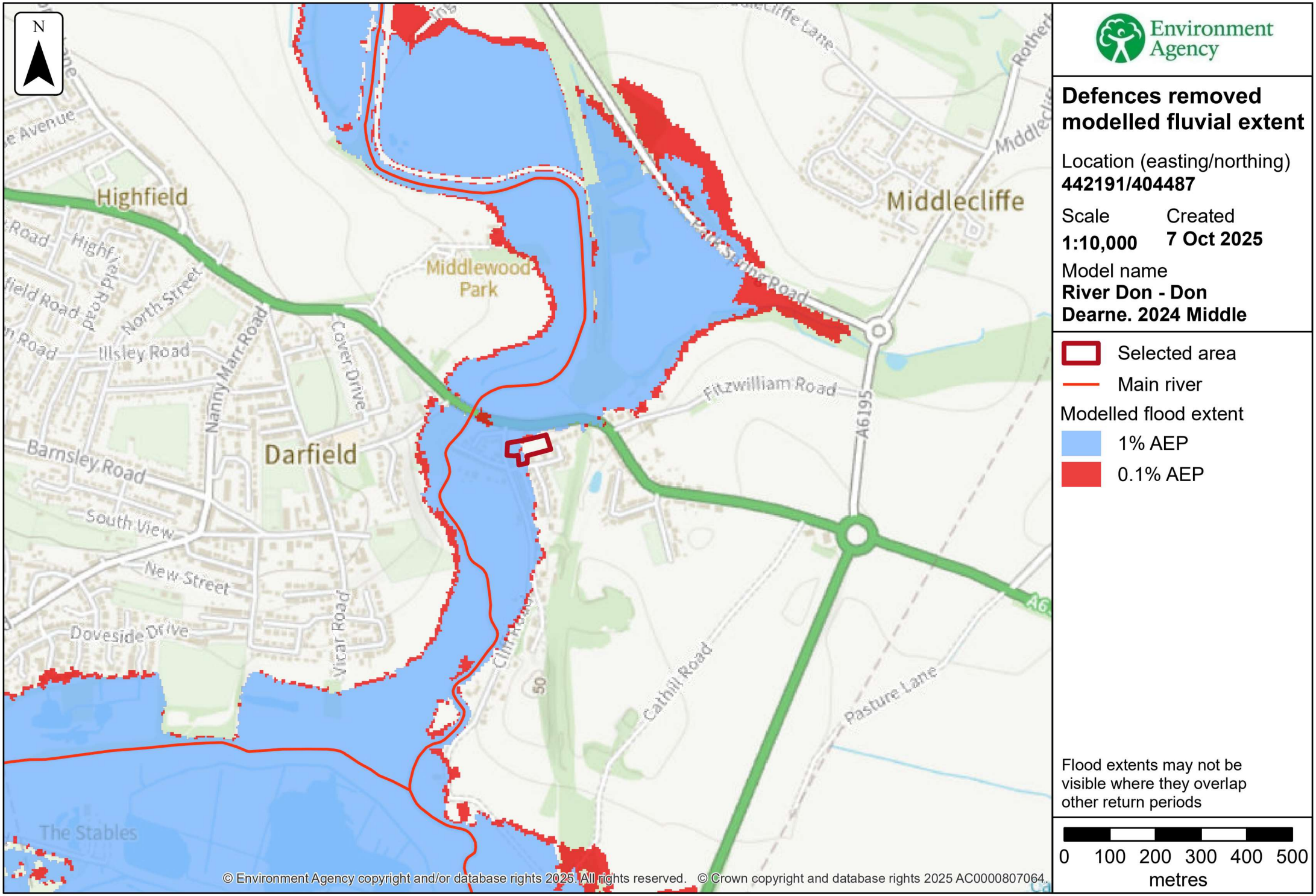
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

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
- 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 modelled fluvial extent

Location (easting/northing)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

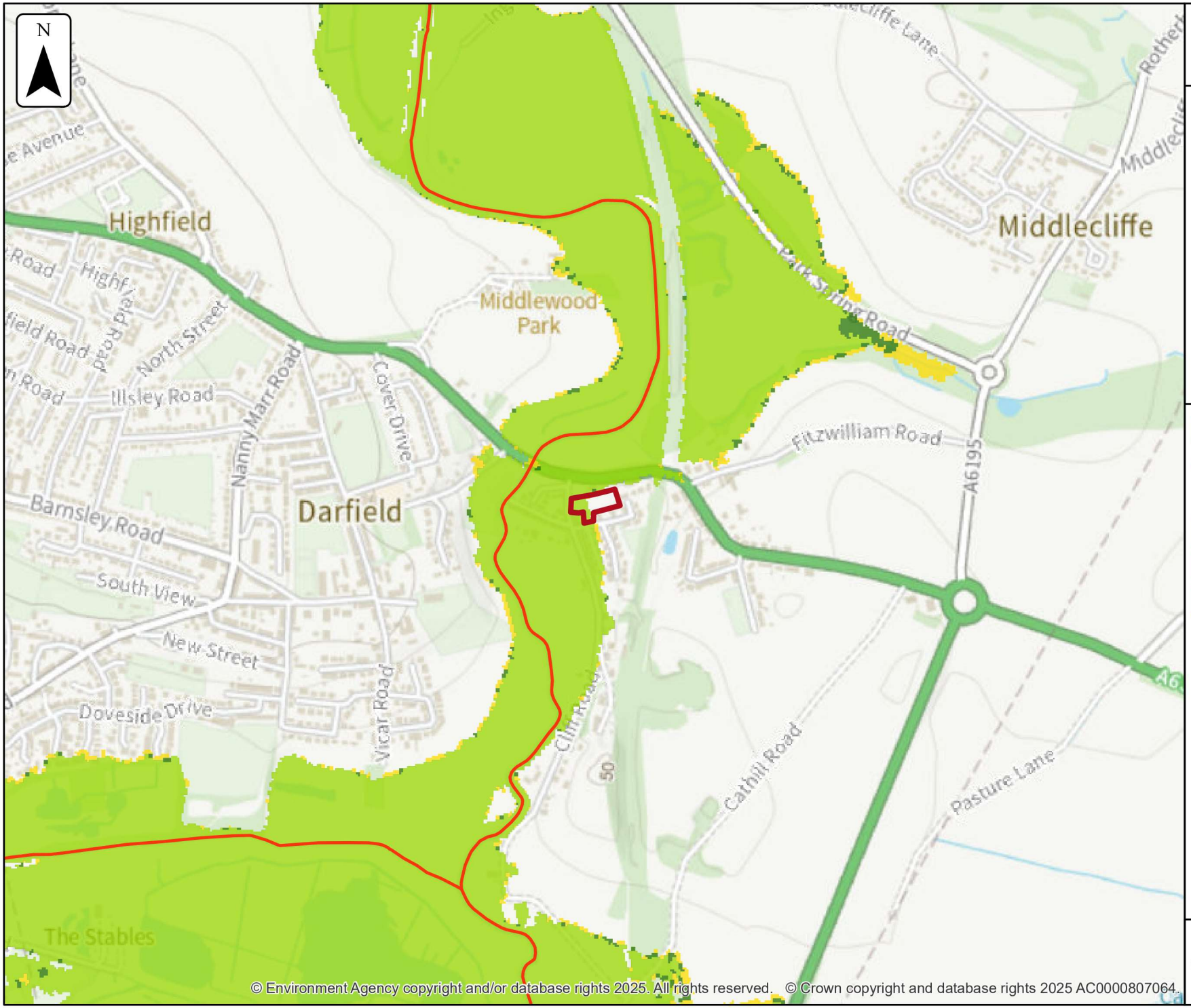
- Selected area
- Main river

Modelled flood extent

- 1% AEP
- 0.1% 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)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

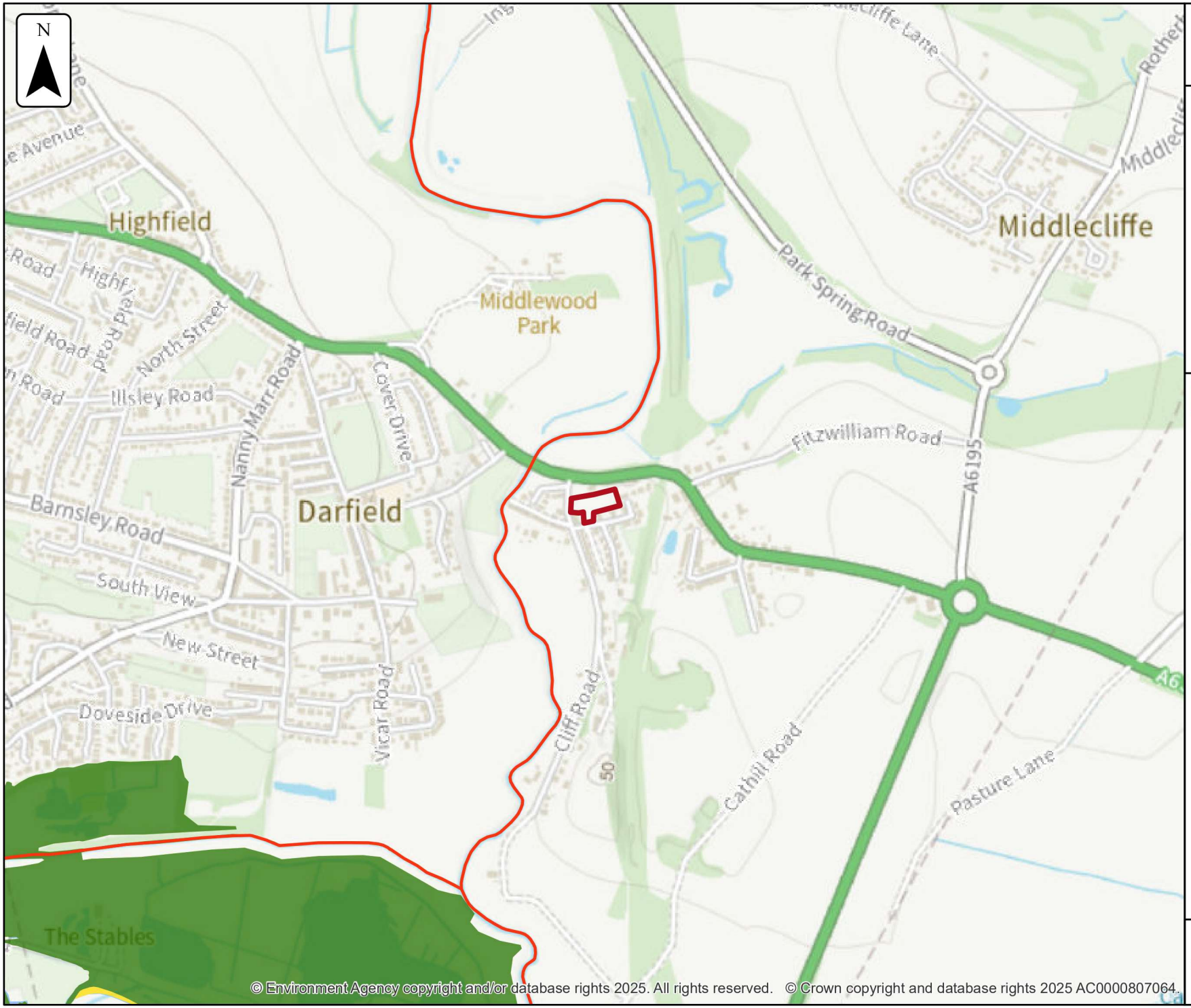
- Selected area
- Main river

Modelled flood extent

- 1% AEP (+28%)
- 1% AEP (+38%)
- 1% AEP (+60%)

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)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

Model name
2009 ASM River Dove

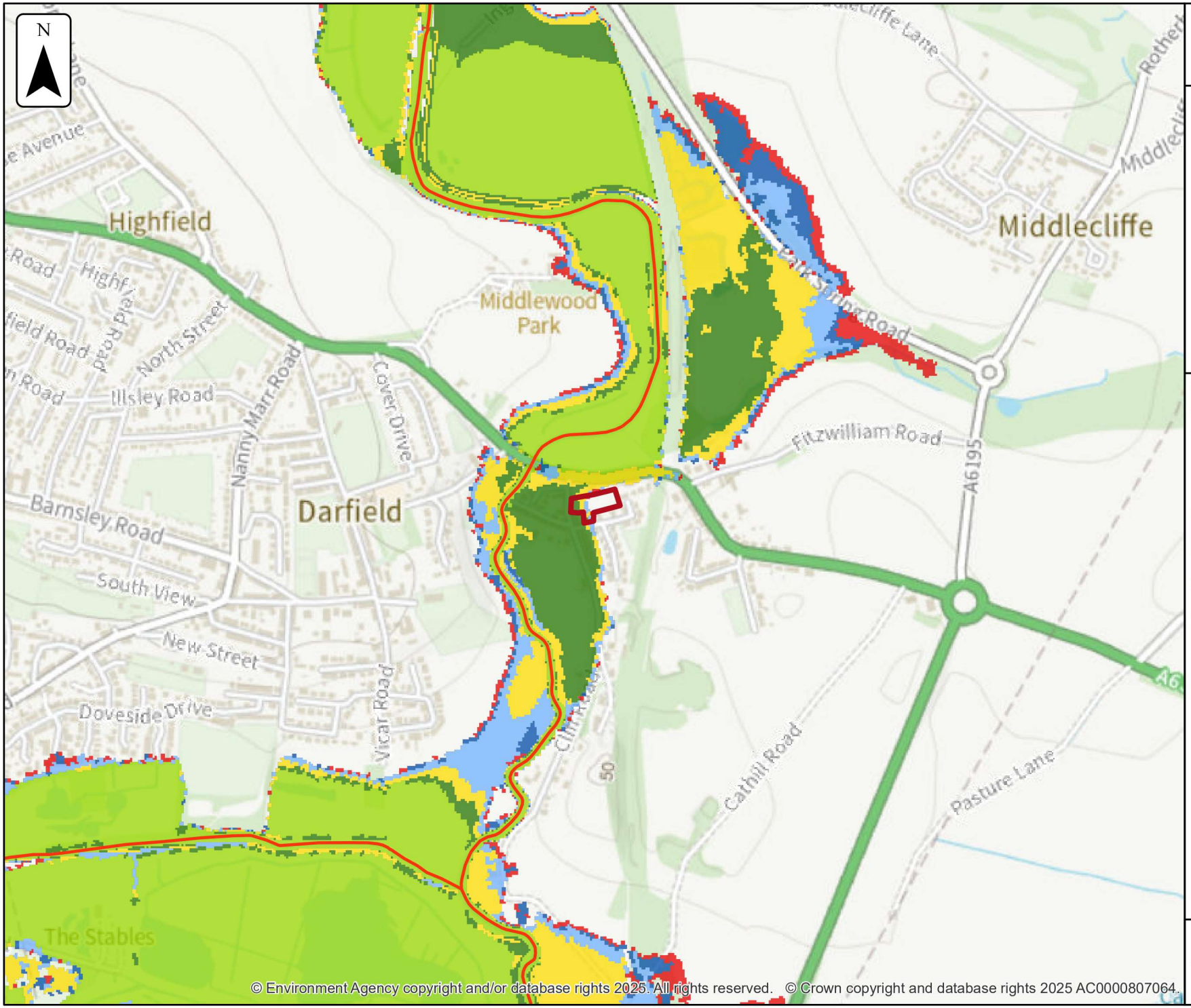
- Selected area
- Main river

Modelled flood extent

- 2% AEP
- 1.33% 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 modelled fluvial extent

Location (easting/northing)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

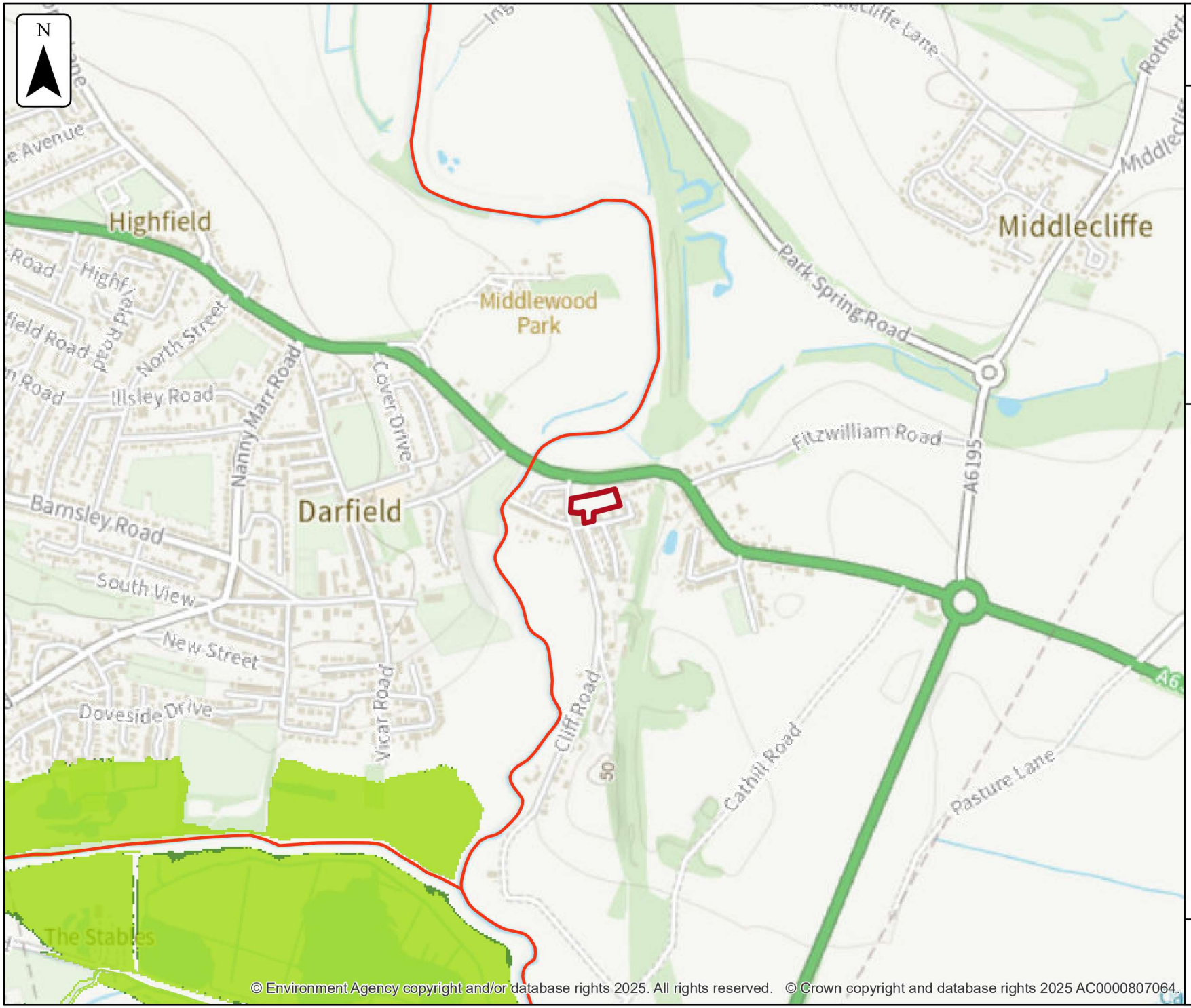
- Selected area
- Main river

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



Environment Agency

No defences exist climate change modelled fluvial extent

Location (easting/northing)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

Model name
2017 Low Valley ERR

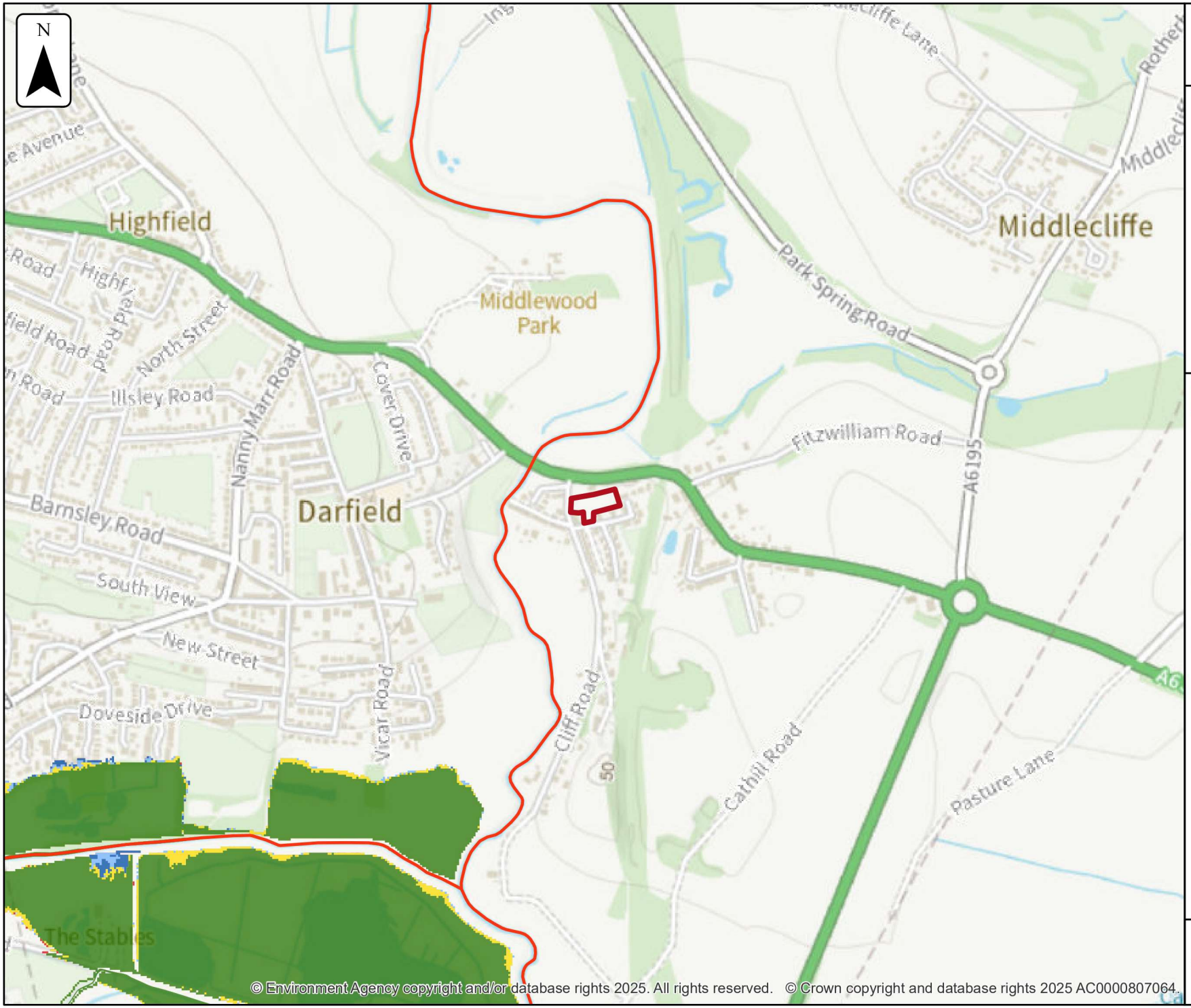
- Selected area
- Main river

Modelled flood extent

- 1% AEP (+30%)
- 1% AEP (+50%)

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)
442191/404487

Scale
1:10,000

Created
7 Oct 2025

Model name
2017 Low Valley ERR

- Selected area
- Main river

Modelled flood extent

- 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

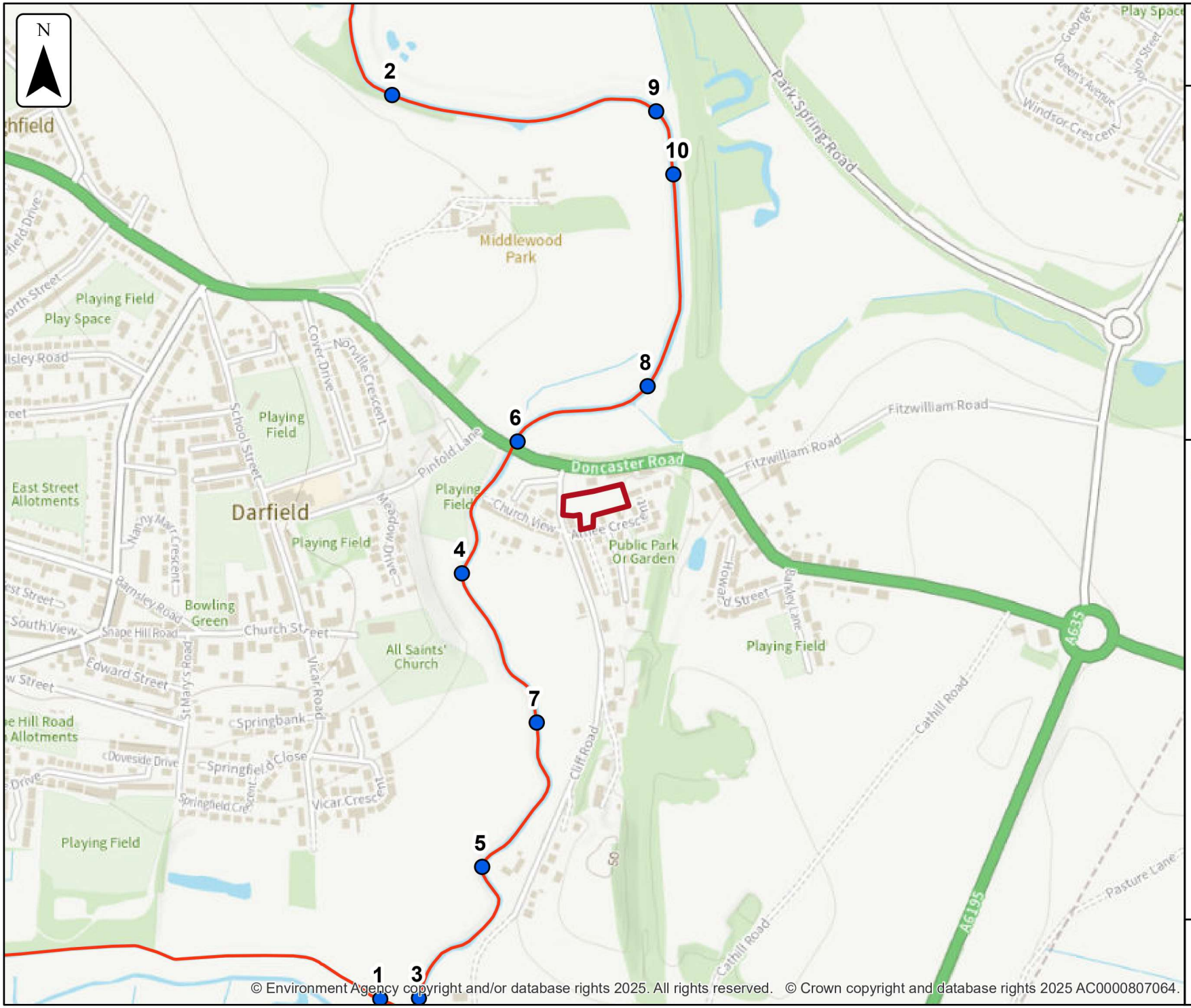
0 100 200 300 400 500
metres

Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	1% AEP	0.1% AEP	1% AEP	0.1% AEP
				Level	Level	Flow	Flow
1	1588935	441878	403764	23.78	24.16	7.14	10.05
2	1589009	441896	405084	25.66	26.29	48.42	60.91
3	1589029	441935	403765	23.71	24.18	154.17	190.87
4	1589032	441998	404385	24.87	25.47	105.10	136.99
5	1588906	442027	403957	24.09	24.33	176.98	249.58
6	1589039	442079	404578	25.06	25.82	131.39	141.26
7	1589270	442107	404167	24.73	25.39	85.68	106.18
8	1589274	442269	404659	25.47	26.10	41.48	38.64
9	1588899	442281	405060	25.62	26.23	54.54	75.49
10	1589151	442307	404968	25.55	26.17	84.18	107.42

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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)
442191/404487

Scale
1:7,500

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

- Selected area
- Modelled location
- Main river

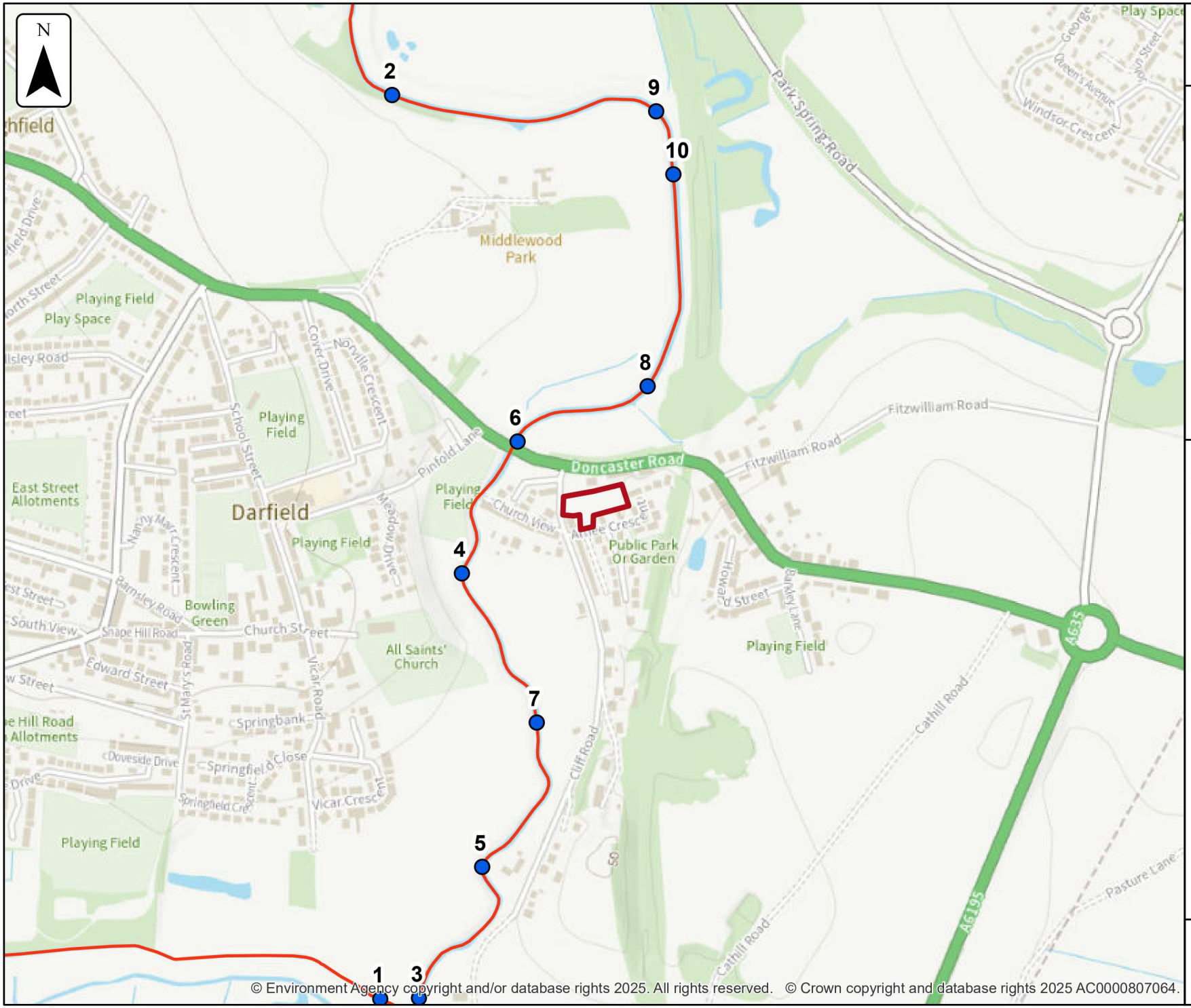
0 100 200 300
metres

Modelled node locations data

Defended climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)
				Level	Level	Level	Flow	Flow	Flow
1	1588935	441878	403764	24.05	24.11	24.28	15.40	16.01	16.92
2	1589009	441896	405084	26.24	26.37	26.65	201.64	218.55	255.20
3	1589029	441935	403765	24.05	24.11	24.27	144.02	154.76	173.53
4	1589032	441998	404385	25.32	25.41	25.63	107.33	113.63	130.34
5	1588906	442027	403957	24.14	24.21	24.38	213.71	226.15	252.98
6	1589039	442079	404578	25.51	25.62	25.91	129.53	135.57	141.31
7	1589270	442107	404167	24.96	25.10	25.40	138.07	136.01	135.16
8	1589274	442269	404659	25.81	25.91	26.18	38.71	46.23	66.61
9	1588899	442281	405060	25.95	26.06	26.32	158.15	171.21	199.29
10	1589151	442307	404968	25.91	26.01	26.26	153.57	166.67	196.71

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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 modelled fluvial node locations

Location (easting/northing)
442191/404487

Scale
1:7,500

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

- Selected area
- Modelled location
- Main river

0 100 200 300
metres

Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level	Level	Level	Level	Level
1	1588935	441878	403764	22.0	22.49	22.59	22.71	22.98	23.42	23.88	23.97	24.15
2	1589009	441896	405084	24.30	24.43	24.52	24.58	24.71	25.33	25.91	26.15	26.53
3	1589029	441935	403765	21.66	22.38	22.50	22.66	22.95	23.38	23.88	23.97	24.15
4	1589032	441998	404385	22.35	23.12	23.31	23.46	23.67	24.44	25.02	25.26	25.51
5	1588906	442027	403957	21.79	22.55	22.67	22.84	23.11	23.62	23.96	24.06	24.25
6	1589039	442079	404578	22.72	23.47	23.69	23.83	24.06	24.80	25.22	25.43	25.79
7	1589270	442107	404167	21.97	22.74	22.86	23.03	23.26	23.91	24.56	24.85	25.27
8	1589274	442269	404659	22.93	23.71	23.95	24.09	24.32	25.04	25.53	25.74	26.05
9	1588899	442281	405060	24.25	24.30	24.38	24.44	24.58	25.17	25.67	25.88	26.21
10	1589151	442307	404968	24.23	24.28	24.32	24.37	24.51	25.15	25.64	25.84	26.15

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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.

Defended

Label	Modelled location ID	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow	Flow
1	1588935	441878	403764	11.69	15.19	15.88	15.94	15.74	15.56	15.19	15.70	18.56
2	1589009	441896	405084	26.51	46.76	51.41	54.79	61.27	107.10	160.17	190.70	242.97
3	1589029	441935	403765	26.23	47.15	55.40	59.87	67.10	100.65	128.06	144.47	163.32
4	1589032	441998	404385	26.42	47.03	55.38	59.68	67.67	100.18	106.56	111.80	121.42
5	1588906	442027	403957	26.29	47.10	55.39	59.70	67.67	109.96	176.53	206.52	241.73
6	1589039	442079	404578	26.47	47.02	55.38	60.01	67.79	87.84	117.16	126.92	135.97
7	1589270	442107	404167	26.36	47.06	55.38	59.69	67.67	105.94	130.45	137.70	139.27
8	1589274	442269	404659	26.54	35.06	35.88	35.77	35.64	35.53	36.67	37.04	57.01
9	1588899	442281	405060	25.86	42.60	46.44	47.56	48.09	81.83	125.90	149.78	188.67
10	1589151	442307	404968	26.57	45.17	51.88	55.40	59.29	78.24	120.92	145.13	184.50

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
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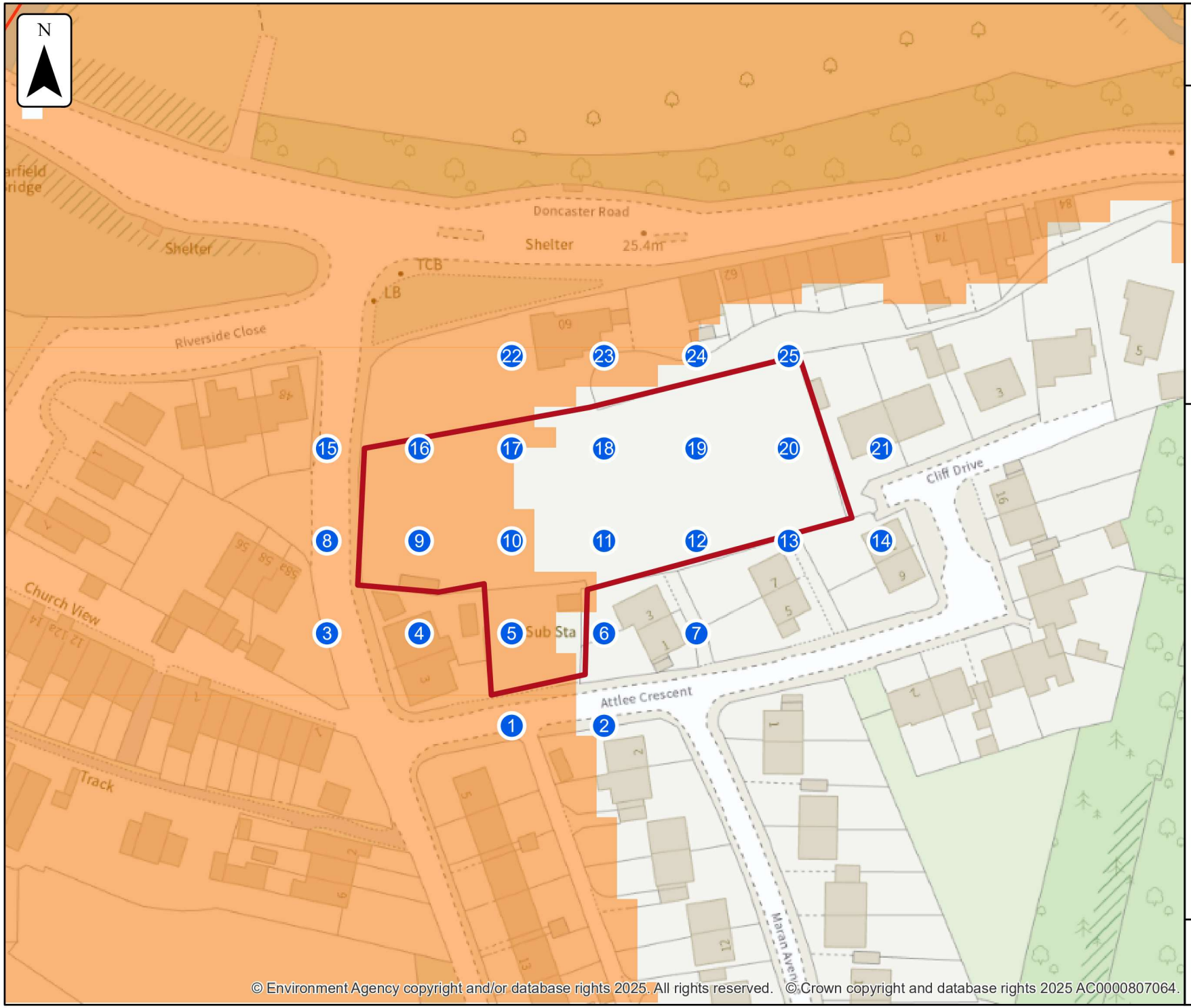


Environment Agency

Defended modelled fluvial extent and height

Location (easting/northing)
442191/404487

Scale
1:1,000

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 3.375
- 3.375 - 6.75
- 6.75 - 10.125
- 10.125 - 13.5
- 13.5 - 16.875
- 16.875 - 20.25
- 20.25 - 23.625
- 23.625 - 27.0
- 27.0 - 30.375

This map shows the 0.1% AEP height data

0 10 20 30 40
metres

Sample point data

Defended

Label	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height
1	442175	404443	NoData	NoData	NoData	NoData	NoData	24.70	25.08	25.24	25.52
2	442193	404443	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	442139	404461	NoData	NoData	NoData	23.43	23.90	24.71	25.12	25.29	25.59
4	442157	404461	NoData	NoData	NoData	NoData	23.90	24.71	25.12	25.29	25.59
5	442175	404461	NoData	NoData	NoData	NoData	23.90	24.70	25.09	25.25	25.54
6	442193	404461	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	442211	404461	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	442139	404479	NoData	NoData	NoData	23.45	23.90	24.72	25.14	25.31	25.62
9	442157	404479	NoData	NoData	NoData	NoData	23.90	24.71	25.11	25.27	25.56
10	442175	404479	NoData	NoData	NoData	NoData	NoData	NoData	25.09	25.25	25.54
11	442193	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	442211	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

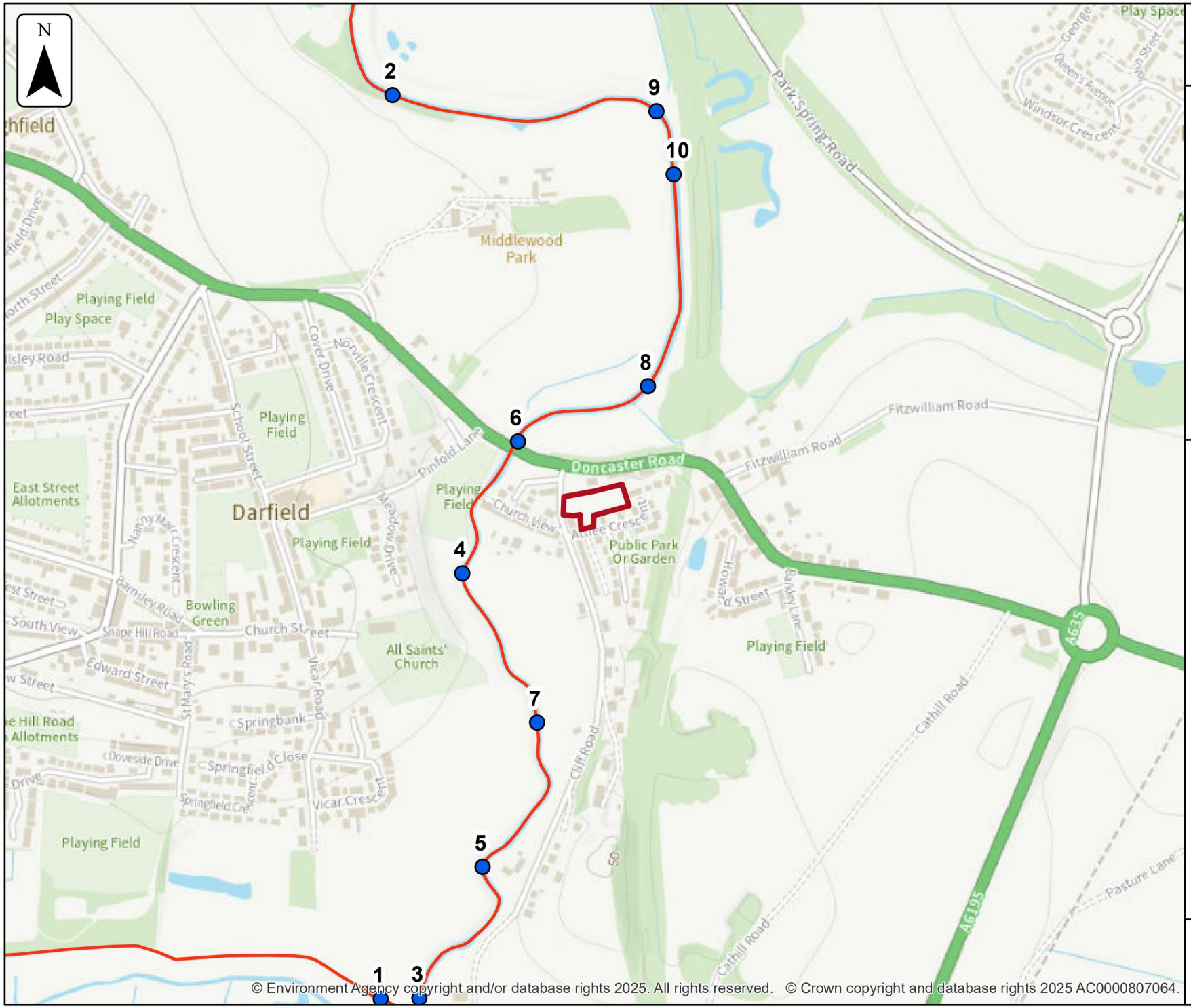
Label	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height
13	442229	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	442247	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	442139	404497	NoData	NoData	NoData	NoData	23.90	24.71	25.14	25.31	25.61
16	442157	404497	NoData	NoData	NoData	NoData	23.90	24.70	25.11	25.28	25.56
17	442175	404497	NoData	NoData	NoData	NoData	NoData	NoData	25.10	25.25	25.53
18	442193	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	442211	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	442229	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	442247	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	442175	404515	NoData	NoData	NoData	NoData	NoData	24.70	25.08	25.24	25.52
23	442193	404515	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	25.81
24	442211	404515	NoData	NoData	NoData	NoData	NoData	NoData	25.35	25.55	25.87

Label	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height
25	442229	404515	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	23.45	23.90	24.71	25.14	25.31	25.62

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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.

Defended

Label	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
1	442175	404443	NoData	NoData	NoData	NoData	NoData	0.63	1.01	1.16	1.45
2	442193	404443	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	442139	404461	NoData	NoData	NoData	0.17	0.64	1.44	1.86	2.03	2.33
4	442157	404461	NoData	NoData	NoData	NoData	0.42	1.23	1.67	1.85	2.16
5	442175	404461	NoData	NoData	NoData	NoData	NoData	0.65	1.03	1.20	1.48
6	442193	404461	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
7	442211	404461	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
8	442139	404479	NoData	NoData	NoData	0.17	0.62	1.43	1.85	2.03	2.33
9	442157	404479	NoData	NoData	NoData	NoData	0.28	1.09	1.50	1.66	1.95
10	442175	404479	NoData	NoData	NoData	NoData	NoData	NoData	0.28	0.36	0.59
11	442193	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	442211	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData



Environment Agency

Defences removed modelled fluvial node locations

Location (easting/northing)
442191/404487

Scale
1:7,500

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

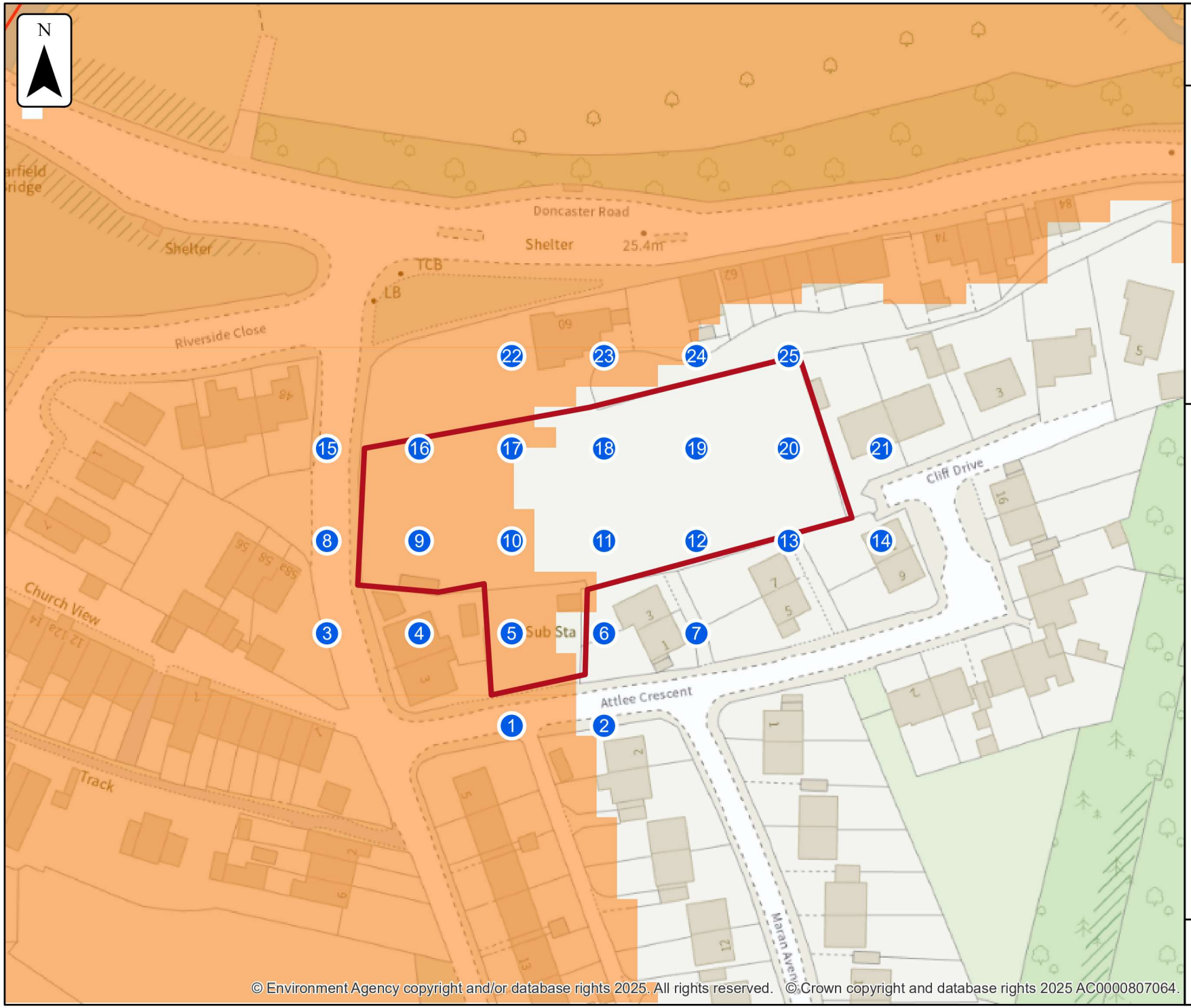
- Selected area
- Modelled location
- Main river

0 100 200 300
metres

Label	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
13	442229	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
14	442247	404479	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	442139	404497	NoData	NoData	NoData	NoData	0.43	1.24	1.67	1.85	2.15
16	442157	404497	NoData	NoData	NoData	NoData	0.14	0.94	1.35	1.52	1.81
17	442175	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.37
18	442193	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
19	442211	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
20	442229	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	442247	404497	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	442175	404515	NoData	NoData	NoData	NoData	NoData	0.27	0.63	0.79	1.07
23	442193	404515	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.48
24	442211	404515	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
25	442229	404515	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	0.40	1.20	1.62	1.79	2.09

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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

Defences removed modelled fluvial extent and height

Location (easting/northing)
442191/404487

Scale
1:1,000

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

- Selected area
- Main river

Modelled 2D grid
Water level in mAOD

- 0 - 3.375
- 3.375 - 6.75
- 6.75 - 10.125
- 10.125 - 13.5
- 13.5 - 16.875
- 16.875 - 20.25
- 20.25 - 23.625
- 23.625 - 27.0
- 27.0 - 30.375

This map shows the 0.1% AEP height data

0 10 20 30 40
metres

Sample point data

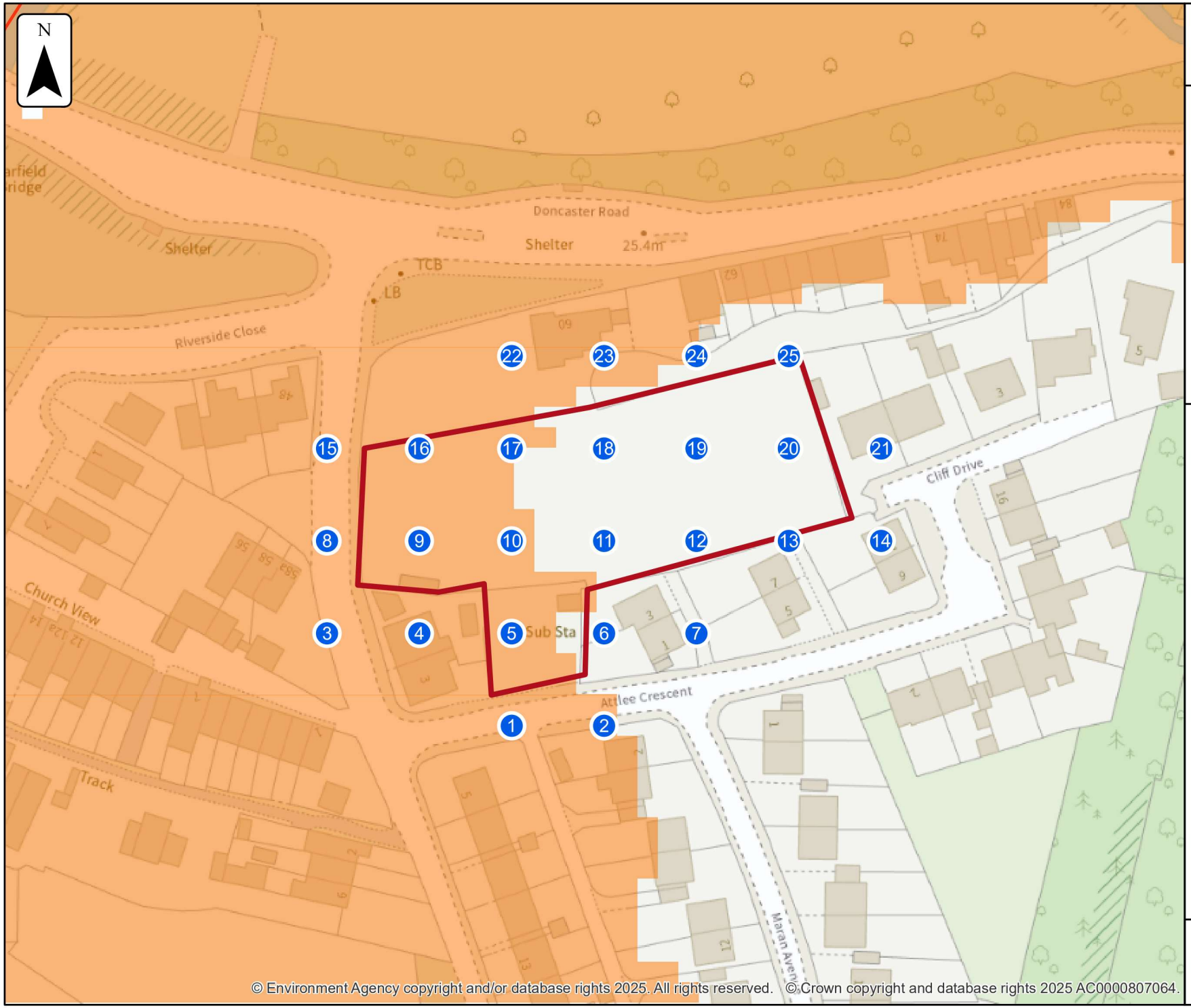
Defences removed

Label	Easting	Northing	1% AEP	0.1% AEP	1% AEP	0.1% AEP
			Height	Height	Depth	Depth
1	442175	404443	24.89	25.53	0.82	1.46
2	442193	404443	NoData	NoData	NoData	NoData
3	442139	404461	24.95	25.60	1.69	2.35
4	442157	404461	24.95	25.61	1.50	2.18
5	442175	404461	24.91	25.55	0.86	1.49
6	442193	404461	NoData	NoData	NoData	NoData
7	442211	404461	NoData	NoData	NoData	NoData
8	442139	404479	24.97	25.63	1.69	2.35
9	442157	404479	24.93	25.57	1.32	1.96
10	442175	404479	NoData	25.54	0.19	0.60
11	442193	404479	NoData	NoData	NoData	NoData
12	442211	404479	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP	0.1% AEP	1% AEP	0.1% AEP
			Height	Height	Depth	Depth
13	442229	404479	NoData	NoData	NoData	NoData
14	442247	404479	NoData	NoData	NoData	NoData
15	442139	404497	24.97	25.62	1.51	2.17
16	442157	404497	24.94	25.57	1.18	1.82
17	442175	404497	24.92	25.54	NoData	0.38
18	442193	404497	NoData	NoData	NoData	NoData
19	442211	404497	NoData	NoData	NoData	NoData
20	442229	404497	NoData	NoData	NoData	NoData
21	442247	404497	NoData	NoData	NoData	NoData
22	442175	404515	24.92	25.53	0.47	1.08
23	442193	404515	NoData	25.84	NoData	0.50
24	442211	404515	25.25	25.91	NoData	NoData

Label	Easting	Northing	1% AEP	0.1% AEP	1% AEP	0.1% AEP
			Height	Height	Depth	Depth
25	442229	404515	NoData	NoData	NoData	NoData
Max value in selected area:			24.97	25.63	1.45	2.11

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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

Defended climate change modelled fluvial extent and height

Location (easting/northing)
442191/404487

Scale
1:1,000

Created
7 Oct 2025

Model name
River Don - Don Dearne. 2024 Middle

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 3.375
- 3.375 - 6.75
- 6.75 - 10.125
- 10.125 - 13.5
- 13.5 - 16.875
- 16.875 - 20.25
- 20.25 - 23.625
- 23.625 - 27.0
- 27.0 - 30.375

This map shows the
1% AEP +60% height data

0 10 20 30 40
metres

Sample point data

Defended climate change

Label	Easting	Northing	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)
			Height	Height	Height	Depth	Depth	Depth
1	442175	404443	25.30	25.39	25.62	1.23	1.32	1.55
2	442193	404443	NoData	NoData	25.63	NoData	NoData	0.18
3	442139	404461	25.36	25.45	25.69	2.10	2.19	2.43
4	442157	404461	25.36	25.45	25.69	1.92	2.01	2.26
5	442175	404461	25.31	25.41	25.63	1.26	1.35	1.58
6	442193	404461	NoData	NoData	NoData	NoData	NoData	NoData
7	442211	404461	NoData	NoData	NoData	NoData	NoData	NoData
8	442139	404479	25.38	25.48	25.71	2.10	2.19	2.43
9	442157	404479	25.34	25.43	25.66	1.73	1.82	2.05
10	442175	404479	25.31	25.41	25.63	0.39	0.46	0.69
11	442193	404479	NoData	NoData	NoData	NoData	NoData	NoData
12	442211	404479	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)
			Height	Height	Height	Depth	Depth	Depth
13	442229	404479	NoData	NoData	NoData	NoData	NoData	NoData
14	442247	404479	NoData	NoData	NoData	NoData	NoData	NoData
15	442139	404497	25.37	25.47	25.70	1.91	2.01	2.25
16	442157	404497	25.34	25.43	25.66	1.58	1.67	1.90
17	442175	404497	25.32	25.41	25.62	NoData	NoData	0.46
18	442193	404497	NoData	NoData	NoData	NoData	NoData	NoData
19	442211	404497	NoData	NoData	NoData	NoData	NoData	NoData
20	442229	404497	NoData	NoData	NoData	NoData	NoData	NoData
21	442247	404497	NoData	NoData	NoData	NoData	NoData	NoData
22	442175	404515	25.30	25.38	25.61	0.84	0.93	1.16
23	442193	404515	NoData	25.71	25.87	NoData	0.38	0.54
24	442211	404515	25.63	25.73	25.96	NoData	NoData	NoData

Label	Easting	Northing	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)	1% AEP (+28%)	1% AEP (+38%)	1% AEP (+60%)
			Height	Height	Height	Depth	Depth	Depth
25	442229	404515	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			25.38	25.48	25.71	1.86	1.96	2.19

Data in this table comes from the River Don - Don Dearne. 2024 Middle and Lower Don Recalibrated Model 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 Barnsley District.

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

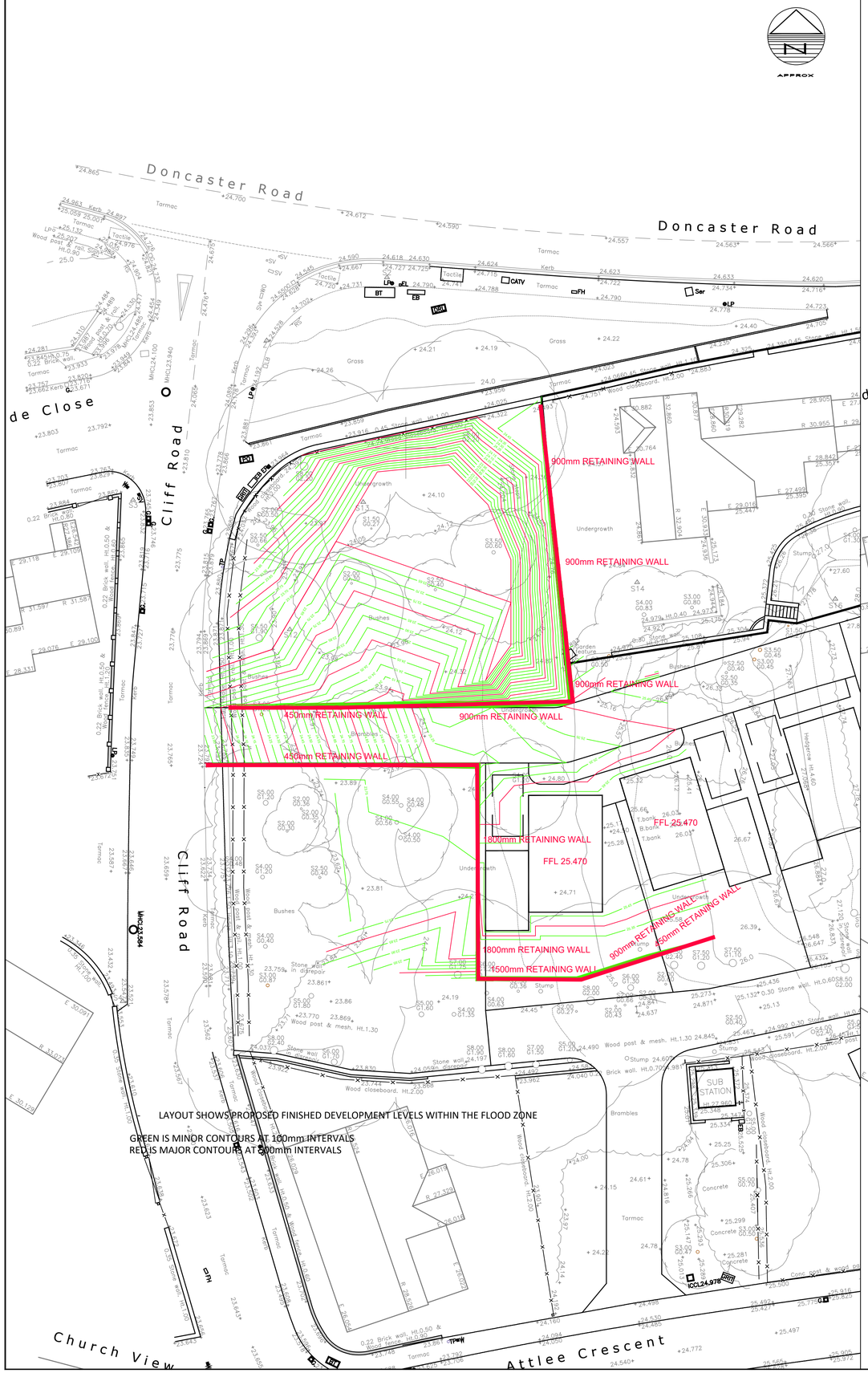
Help and advice

Contact the Yorkshire Environment Agency team at neyorkshire@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

Appendix C

Flood Compensation Works



LAYOUT SHOWS PROPOSED FINISHED DEVELOPMENT LEVELS WITHIN THE FLOOD ZONE

GREEN IS MINOR CONTOURS AT 100mm INTERVALS
RED IS MAJOR CONTOURS AT 500mm INTERVALS

LAYOUT SHOWS CUT AND FILL ISOPACHYTES FOR REMODELLED LEVELS WITHIN FLOOD ZONE UP TO THE FLOOD LEVEL OF 25.32 (1% AEP PLUS CLIMATE CHANGE)

- ORANGE AND YELLOW INDICATES AREAS OF FILL TO FORM PROPOSED DEVELOPMENT LEVELS EQUATING TO 258.2m3 FILL WITHIN THE FLOOD ZONE
- BLUE AND LIGHT BLUE INDICATES AREAS OF CUT TO PROVIDE FLOOD COMPENSATION WITHIN THE FLOOD ZONE TO COMPENSATE THE FILL ABOVE EQUATING TO 261.4m3
- THIS SHOWS A NET BETTERMENT OF 3.6m3 IN TERMS OF FLOOD COMPENSATION VOLUME AND THEREFORE FLOOD RISK WILL NOT BE INCREASED TO OTHER PROPERTIES

EA Flood Data is contained in Appendix B of Dart ENgineers FRA, the data shows the key flood levels are as noted below for the site:

- Defence Removed Flood Level 1% AEP 24.92m AOD
- Defended plus climate change 1% AEP Plus 60% 25.32m AOD

As the site is partially in Flood Zone 2 and 3 it is proposed to mitigate this by raising site levels to be a minimum FFL of 25.470m AOD which is 550mm above the defences removed flood level and 150mm above the defended plus climate change flood level

Dart Engineers drawing 25195-DR-C-0100 in Appendix C shows that an assessment of site levels below the flood level of 25.32m AOD equates to a volume of 258.2m3. This is proposed to be mitigated by lowering levels to the west side outside the development area but within the applicants ownership as shown on Dart Engineers drawing 25552-DR-C-100 to provide a flood compensation volume of 261.4m3, which is a net betterment of 3.6m3 shown in the cut and fill calculations to the right hand side of the drawing.

The proposed units and access road will be set to a minimum level of 25.470m AOD to provide mitigation against the flood level plus 150mm worst case.

Status: PRELIMINARY

No.	Revision	Date	Drwn

PGM2 surface (existing topo) relative to PGM1 surface (proposed levels)

	Cut	Fill
Total Gross:	261.4	258.2
Nett:	3.2	

DART ENGINEERS LTD
CIVIL AND STRUCTURAL ENGINEERING

CONTACT
e: andy@dart-engineers.com
e: rob@dart-engineers.com
t: 01837 339827
w: www.dart-engineers.com

CLIENT: PFPI Developments Ltd

PROJECT: Cliff Road, Darfield

DRAWING TITLE: Flood Compensation Works

Drawn	Chkd	Date	Scale
AD	RT	Apr 25	As Shown
Sheet Size	Drawing No.		Revision
A1	25195-DR-C-0100		P2