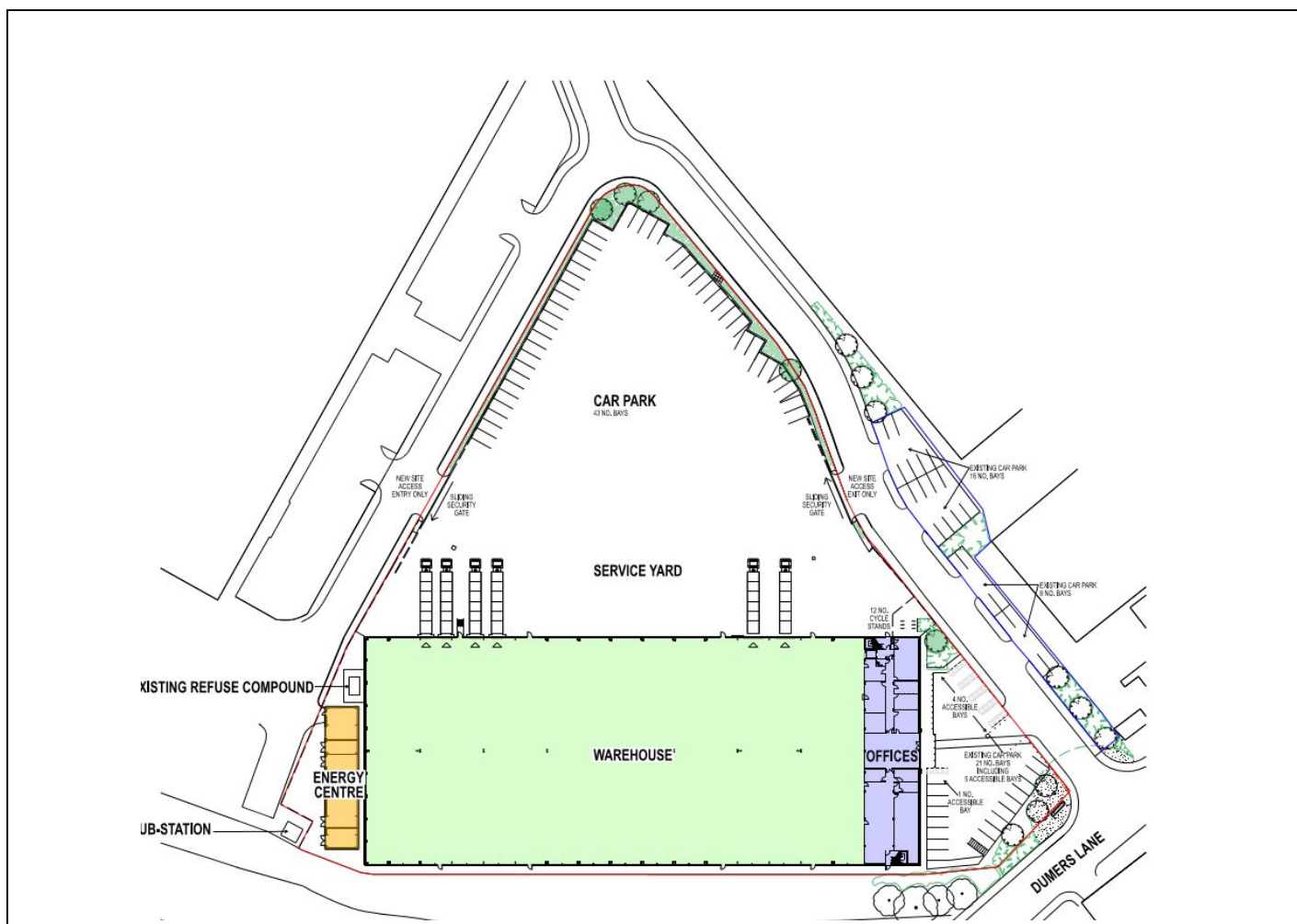




Flood Risk Assessment for development at Dumers Lane, Radcliffe

Contract Ref: FD0029

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Quality assurance record

Contributors for Townsend Water Engineering Limited:

Name	Role
Charles Townsend	Director

Document Status and Revision History:

Version	Date	Author	Reviewer	Authoriser	Status / Comment
1	21/07/2021	C. Townsend	C. Townsend	C. Townsend	1 st Issue

Limitation of liability and use

The work described in this report was undertaken for the party or parties stated; for the purpose or purposes stated; to the time and budget constraints stated. No liability is accepted for use by other parties or for other purposes, or unreasonably beyond the terms and parameters of its commission and its delivery to normal professional standards.

1. INTRODUCTION

1.1 Purpose of this Report

Townsend Water Engineering Ltd. has been appointed by Mr Michael Esfandi at Dumer Lane Ltd. for a Flood Risk Assessment (FRA) of a change of use of office back to original use as a warehouse and demolishing a multistorey car arpk. (Grid Ref: SD 80185 08473). This report has been prepared in support of the planning permission for the aforementioned development.

The report is based on the available flood risk information for the site detailed in Section 1.2 and prepared in accordance with the planning policy requirements set out in Section 1.3. The scope of the FRA is consistent with the 'Site Specific Flood Risk Assessment Checklist' from the National Planning Policy Framework (NPPF) and accompanying Planning Practice Guidance (PPG):

<https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section>

1.2 Sources of Information and Consultation

This Report has been informed by:

- Existing Site Plan drawings and respective topographic plan delivered by RGP Architects;
- EA Product 4 data;
- BGS website <http://mapapps.bgs.ac.uk/geologyofbritain/home.html?mode=boreholes>;
- Defra Magic Map <https://magic.defra.gov.uk/magicmap.aspx>;
- Cranfield University Soil Mapping <http://www.landis.org.uk/soilscapes/>;
- The EA online flood maps;
- <https://flood-map-for-planning.service.gov.uk/>;
- <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>.

1.3 Policy Context

This report has been prepared in accordance with the relevant national, regional and local planning policy and statutory guidance as follows:

- National policy contained within the National Planning Policy Framework (NPPF) dated July 2021, issued by Communities and Local Government with reference to Section 14 'Meeting the challenge of climate change, flooding and coastal change';
- The NPPF Planning Practice Guidance (PPG) released in March 2014 ('Flood Risk and Coastal Change' section) and updated in February 2016 to incorporate the EA 'Flood Risk Assessments: Climate Change Allowances' guidance; and,
- Radcliffe strategic Flood Risk Assessment Volume III- Level 2 SFRA November 2009.

1.4 Structure of this Report

The Report has been prepared based on the following structure:

- Section 2 refers to spatial planning considerations by reference to the proposed land use, flood zoning and NPPF vulnerability;
- Section 3 presents the assessment of existing flood risk at the site;
- Section 4 presents the proposed development and findings of flooding;
- Section 5 presents the drainage strategy

- Section 6 provides a summary of the assessments.

Additional Appendices are provided that deal with the following:

- Appendix A Topographical Survey;
- Appendix B Flood Data.
- Appendix C: Agreement for discharges for statutory bodies

2. SPATIAL PLANNING CONSIDERATION

2.1 Location and Background

The location of the proposed development site is shown in Figure 1 and Figure 2, with location details found in Table 1. The site is located on Dumers Lane, Radcliffe M26 2QL (Grid Ref: 380185, 408473). (Table 1: Site Details)

The development involves the conversion of an office to a warehouse. The existing building was originally a warehouse and is being changed back. Furthermore the multi-storage car ark is being demolished. The entire development site is approximately 1.6ha and is office with associated parking. With the exception of the demolition of the car park no other works are intended.

Dumers Lane is a commercial and warehouse area. The River Irwell is on the northwest, west and southern border of the site. To the north and east are more commercial and warehouse type development. Please see Figure 1 and Figure 2 indicating these features.

The site is defended by an Environment Agency flood defence that was recently completed (2021). The defence is up to and including the 1 in 100 year event plus climate change.

It should be noted that there will be no increase in footprint of the building and the flood risk will decrease because of change of use from an office to a warehouse.

Table 1: Site Details

Reference	Value
OS X (Eastings)	380185
OS Y (Northings)	408473
Nearest Post Code	ML9 9QL
Lat (WGS84)	53°34'21"N ,
Long (WGS84)	002°18'03"W
Nat. Grid	SD801084

Grid reference details taken from the site <https://www.streetmap.co.uk/>

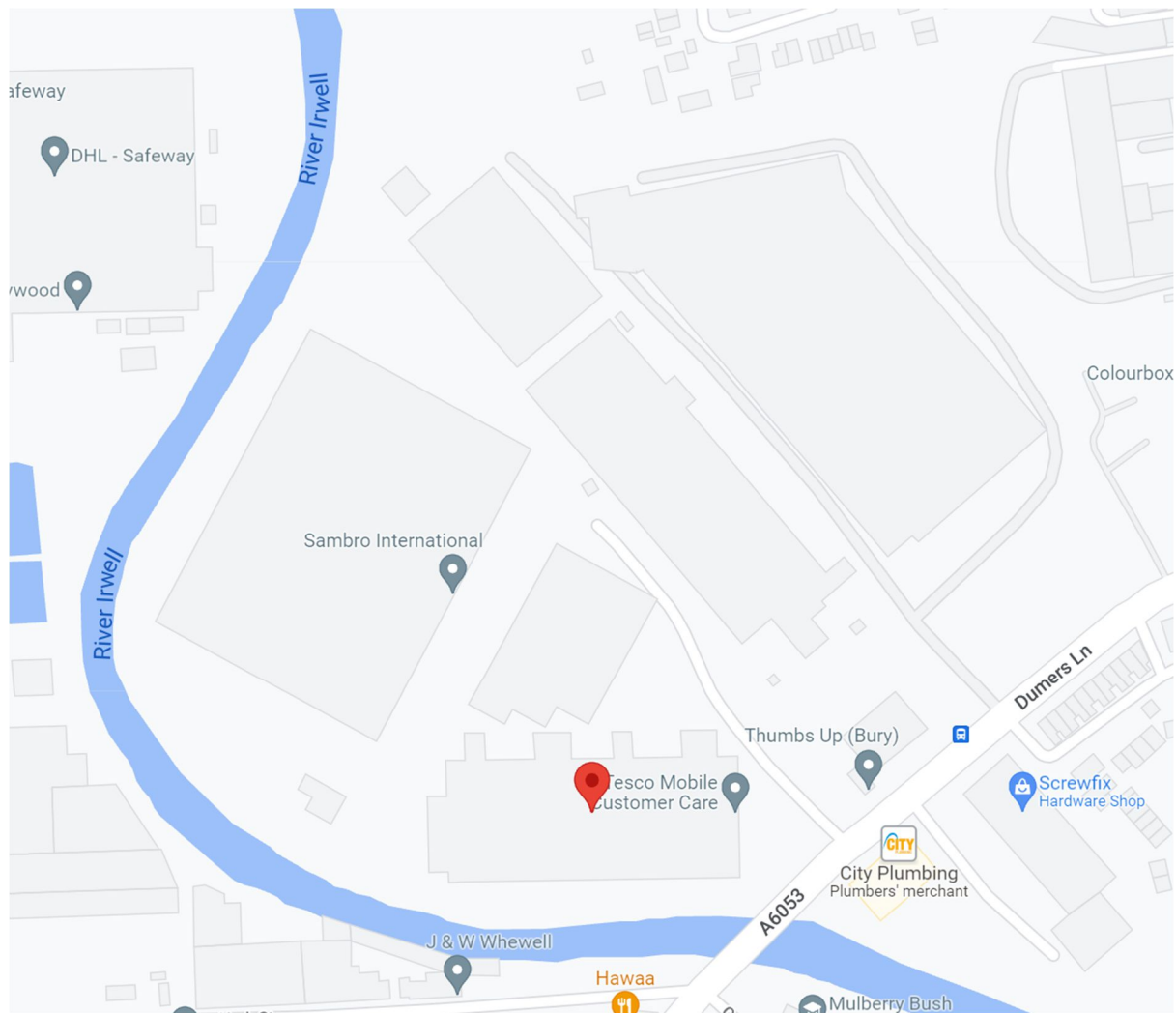


Figure 1: Site location (Source: Bing Map)



Figure 2: Aerial View of the site (Source: Google Maps)

2.2 Topography

The existing ground elevations on site is shown in the topographic drawing (Appendix A) They indicate that the site is uneven with high ground bounded to the south and low located to the north. Ground levels vary between 66.82mAOD and 68.28mAOD. The ground levels are being raised to the south. The existing flood defence is 70.04mAOD and the finished floor levels of the existing building are set at 68.125mAOD.

2.3 Geology and Soil

The geology at the site has been obtained from the British Geological Survey (BGS) website. The bedrock beneath the site is described as 'Pennine Middle Coal Measures Formation & South Wales Middle Coal Measures Formation (undifferentiated)' (Figure 3: Bedrock underneath the Site (Source: BGS Bedrock Geology Mapping)). Sedimentary Bedrock formed approximately 309 to 312 million years ago in the Carboniferous Period. Local environment previously dominated by swamps, estuaries and deltas.

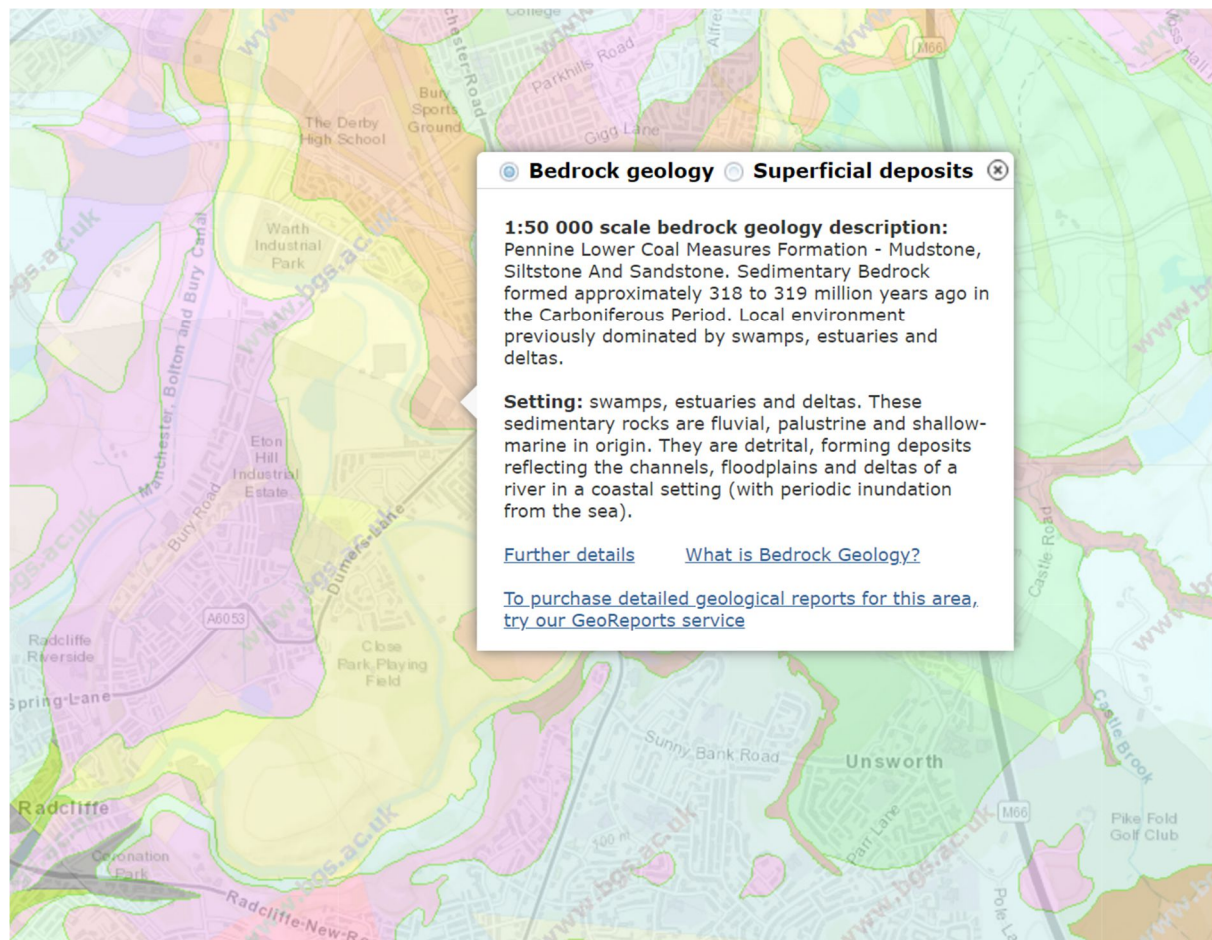


Figure 3: Bedrock underneath the Site (Source: BGS Bedrock Geology Mapping)

Environment Agency's Source Protection Zone shown in Magic Map indicates that our site is located 10000m away from any zone.

Soils at the site are described on the Cranfield University 'Soilscapes' website mostly as, 'Loamy and clayey floodplain soils with naturally high groundwater' (Figure 4). This suggest that the site is likely to be unsuitable for infiltration. This makes sense as the site is in close proximity of the River Irwell.

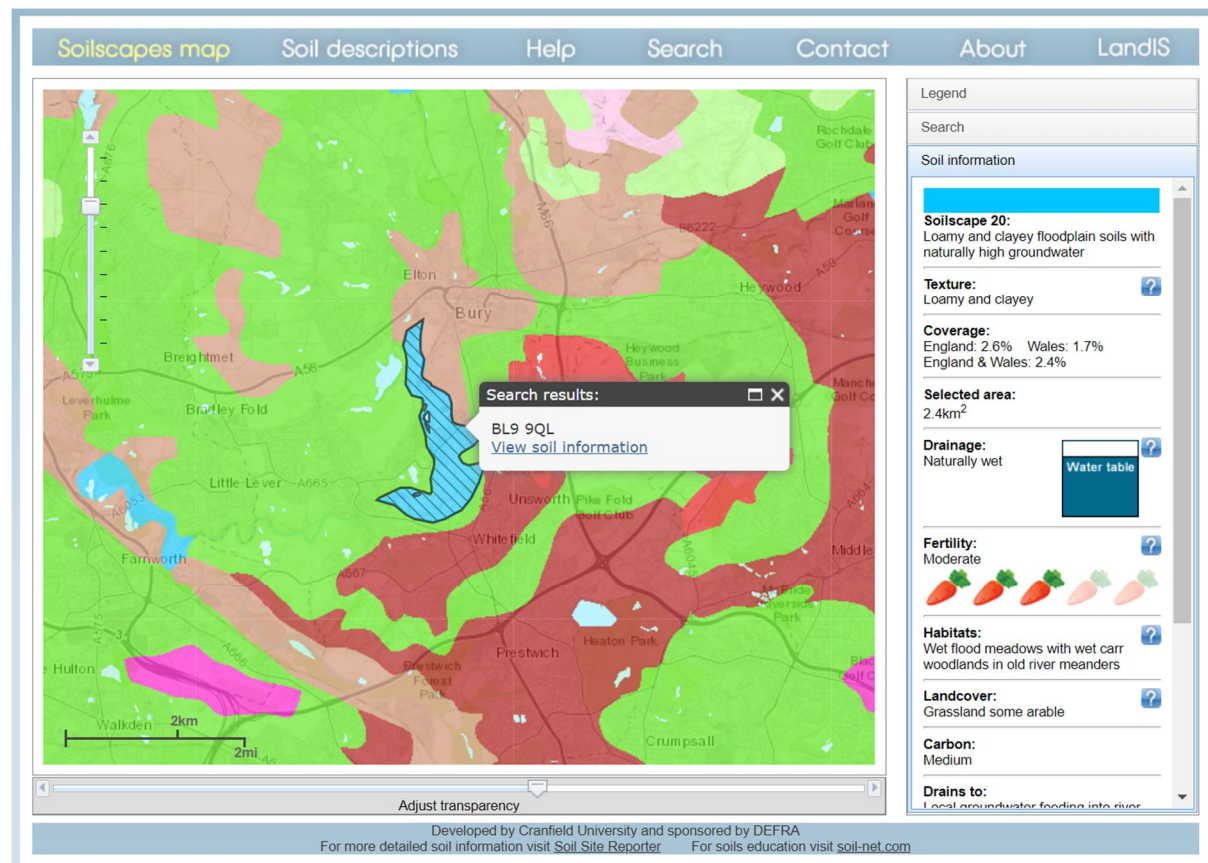


Figure 4: Soil Map of the Site (Source: Cranfield University Soil Mapping)

2.4 Flood Zone

The existing site is within a protected Flood Zone 3 please see Figure 5. An area at risk of flooding up to and including the 1 in 100 year event. However the site is protected by Environment Agency flood defences up to and including the 1 in 100 year event plus climate change and 1 in 1000 year event. The defence are set at 70.04mAOD. This is above the 1 in 100 years plus climate change level and 1 in 1000 year event.

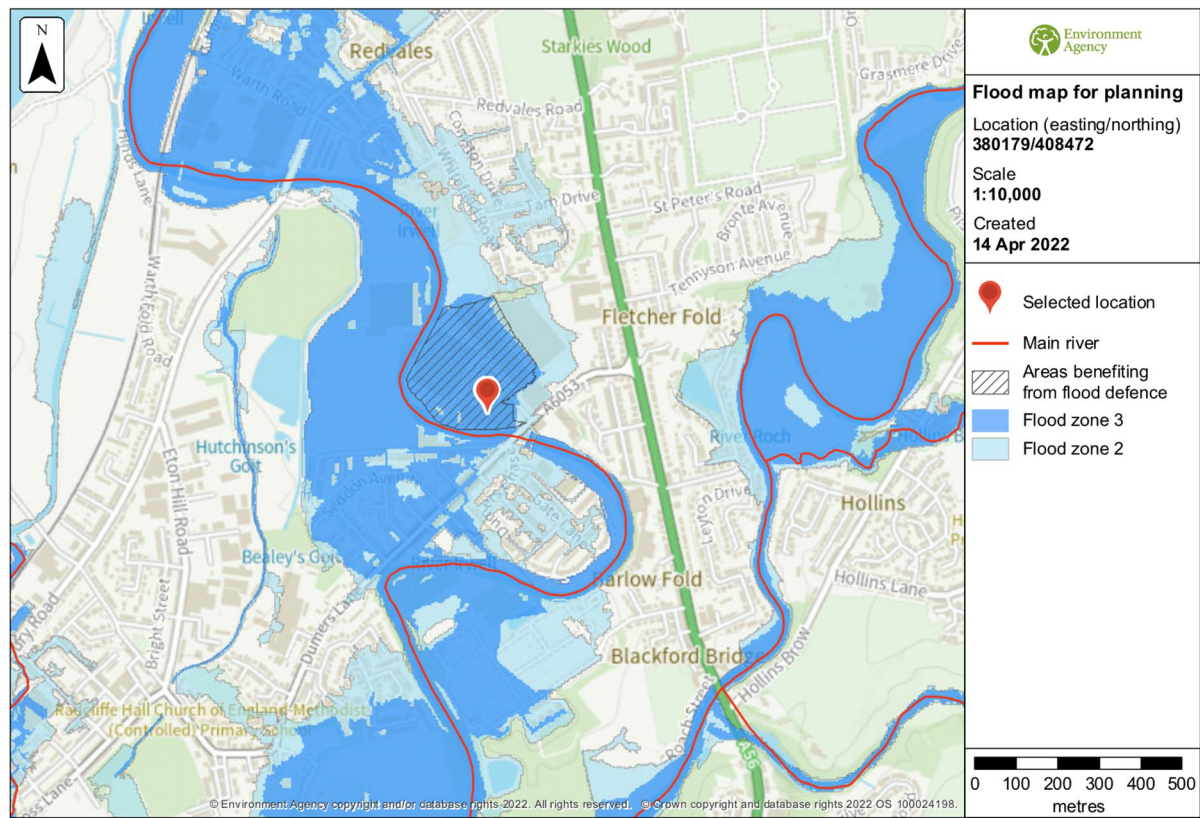


Figure 5: Flood Risk Maps

2.5 Flood Levels

According to the proposed amended Lower Irwell model the floods outlines, and flood levels are shown below in Figure 6 and Table 2.

Figure 6: Flood Nodes

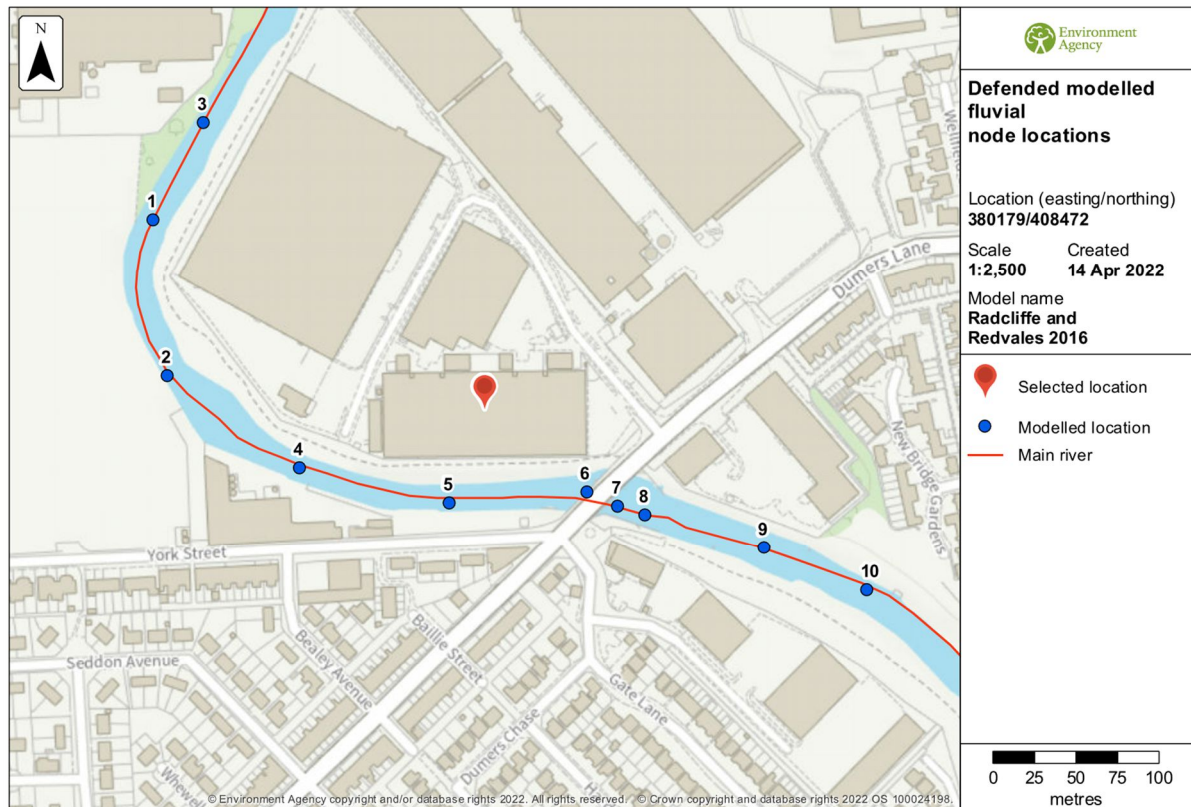


Table 2: Flood Levels

Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	977216	379978	408587	67.81	206.97	68.31	231.95	68.46	236.95	68.59	244.88	68.83	266.03	69.63	317.26
2	977093	379987	408492	67.61	206.89	68.14	234.87	68.29	246.33	68.41	256.48	68.65	280.89	69.50	334.02
3	977215	380009	408645	67.84	207.04	68.34	231.49	68.50	234.98	68.62	240.97	68.86	260.64	69.62	330.90
4	977114	380066	408436	67.19	206.86	67.76	235.58	67.91	246.74	68.03	256.72	68.25	279.97	69.0	345.24
5	977142	380157	408415	67.05	206.85	67.64	235.97	67.80	247.93	67.91	258.63	68.12	282.68	68.74	368.54
6	977141	380240	408422	67.17	206.83	67.77	235.53	67.93	246.26	68.05	255.10	68.29	272.43	69.04	324.76
7	977082	380259	408413	67.08	206.83	67.39	235.51	67.52	246.27	67.62	254.99	67.79	272.30	68.35	326.84
8	977147	380276	408408	67.03	206.82	67.33	235.56	67.46	246.28	67.56	254.79	67.74	272.11	68.28	328.50
9	977205	380348	408388	66.74	206.79	67.03	235.61	67.15	246.27	67.25	256.84	67.42	274.92	67.96	346.62
10	977163	380410	408362	66.67	206.75	66.96	235.62	67.09	247.06	67.20	257.28	67.35	274.16	67.93	351.06

Node 5 has been used and the highest level is 68.74mAOD in the 1 in 1000 year event. The flood defence is 70.04mAOD this was confirmed by Rob Van of the Environment Agency. Please see appendix C

2.6 NPPF Vulnerability

The development will be classed as 'less Vulnerable' under the NPPF vulnerability classification (Table 3). The flood risk vulnerability and flood zone compatibility are displayed in Table 4: Flood Risk Vulnerability and flood zone compatibility (Source: NPPF Technical Guide). As noted in Section 2.4, the site is within Flood Zone 3 protected according to the EA flood risk map for planning.

Table 3: Flood Risk Vulnerability Classification (Source: NPPF Technical Guide)

Less vulnerable (MV)
Police, ambulance and fire stations which are not required to be operational during flooding.
Buildings used for shops, financial, professional and other services, restaurants, cafes, and hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in the 'more vulnerable' class, and assembly and leisure.
Land and buildings used for agriculture and forestry
Waste treatment (except landfill and hazardous waste facilities)
Minerals working and processing (except for sand and gravel working).
Water treatment works which do not need to remain operational during times of flood.
Sewage treatment works, if adequate measures to control pollution and manage sewerage during flooding events are in place.
Car parks

Table 4: Flood Risk Vulnerability and flood zone compatibility (Source: NPPF Technical Guide)

Flood Zone	Definition	Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
1	$T > 1,000$	✓	✓	✓	✓	✓
2	$100 < T_{fluv} < 1,000$ $200 < T_{tidal} < 1,000$	✓	✓	Exc. Test	✓	✓
3a	$T_{fluv} < 100$ $T_{tidal} < 200$	Exc. Test	✓	✗	Exc. Test	✓
3b (functional floodplain)	$T_{fluv} < 20$	Exc. Test	✓	✗	✗	✗

As the site is within a Flood Zone 3 and is less vulnerable it passes the sequential test. Furthermore the development is a change of use from an office building to a warehouse and demolishing of a car park. The proposed use is a less risky development than the existing situation.

Therefore the site passes the sequential test.

2.7 Climate change allowances for peak rainfall intensity

The Environment Agency and NPPF require a consideration of the impacts of climate change in Flood Risk Assessments (FRA). In February 2016, the Environment Agency updated the climate change allowances required in Flood Risk Assessments (Environment Agency, 2016); this advice updates previous climate change allowances to support the NPPF (DCLG, 2012).

Table 5: Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline) shows anticipated changes in small catchments, recommending a progressive increase, reaching 45% for the 'Upper End' allowance by 2115. This allowance would be recommended for this proposed development, which is classified as 'More Vulnerable' and has been taken to have a 100-year design life. The 45% climate change allowance is based on the 90th percentile, meaning that there is a 90% chance that rainfall will not increase by more than the 40% increment.

Table 5: Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Allowance Category	Total potential change anticipated		
	'2020s' (2015 to 2039)	'2050s' (2040 to 2069)	'2080s' (2070 to 2115)
Upper end	10%	20%	45%
Central	5%	10%	20%

Source: Environment Agency (2018)

2.8 Climate change allowances for peak river flow

The Environment Agency recommends through its official guidance for site within Greater Manchester, Merseyside and Cheshire ('Flood risk assessments: Climate change allowances - Application of the allowances and local considerations: Greater Manchester, Merseyside & Cheshire', March 2016 - Appendix C) that for **less vulnerable** developments in **flood zone 3**, the 'central' climate change allowance should be taken into account for flood risk mitigation, and requires that they be contacted at the pre-planning application stage to confirm this on a case by case basis. This suggests using the 35% climate change values in the defended scenario provided by the Environment Agency.

3. FLOOD HAZARD FOR EXISTING SITE

3.1 Source of Flood Risk

Flood sources and their possibilities at the site is listed in Table 6, and further described below.

Table 6: Sources of Flooding

Key sources of flooding	Possibility at Site
Fluvial (Rivers) Defended / Undefended	<i>High Risk, Flood Zone 3 (confirmed by EA product 4 data) for both Figure 11 and Table 2: Flood Levels Figure 5: Flood Risk Maps Figure 6: Flood Nodes</i>
Tidal	<i>N/A</i>
Groundwater	<i>Low risk</i> Figure 9: Flood Risk from Groundwater (Source: Bury Preliminary Flood Risk Assessment)
Sewers	<i>Considered to be low.</i>
Surface water	<i>Low risk</i> Figure 7: 1% AEP Surface Water Depth (Source: EA Open Dataset)
Reservoirs / canals and other artificial sources	Figure 8: Extent of Flooding from Reservoirs (Source: EA Flood Warning Information Service)
Infrastructure failure	<i>No such occurred according to EA Product 4 data</i>

3.1.1 Flood Risk from Fluvial Sources

The change of use of the building from an office to a warehouse is behind defences that provide above 1 in 1000 year fluvial event protection.

If the defences do not collapse the site is protected up to and including the 1 in 1000 year event.

Therefore, the site is considered to be at low risk of fluvial flooding

3.1.2 Surface Water

The EA surface flood extents and flood depths (Figure 7: 1% AEP Surface Water Depth (Source: EA Open Dataset)) have been obtained from the EA open dataset. The majority of the development site is in the very low risk zone (i.e., less than 0.1% AEP). Part of the site are at low risk (0.1% ~ 1% AEP) with flood depths of 0.15m ~ 0.3m for 0.1% AEP and zero for 1% AEP (Figure 7: 1% AEP Surface Water Depth (Source: EA Open Dataset)). The actual building is outside of the surface water flooding area. The only parts of the site that are at risk is the car parks, which are already existing so there is no change in risk.

The change of use building is believed the surface flooding risk is low.

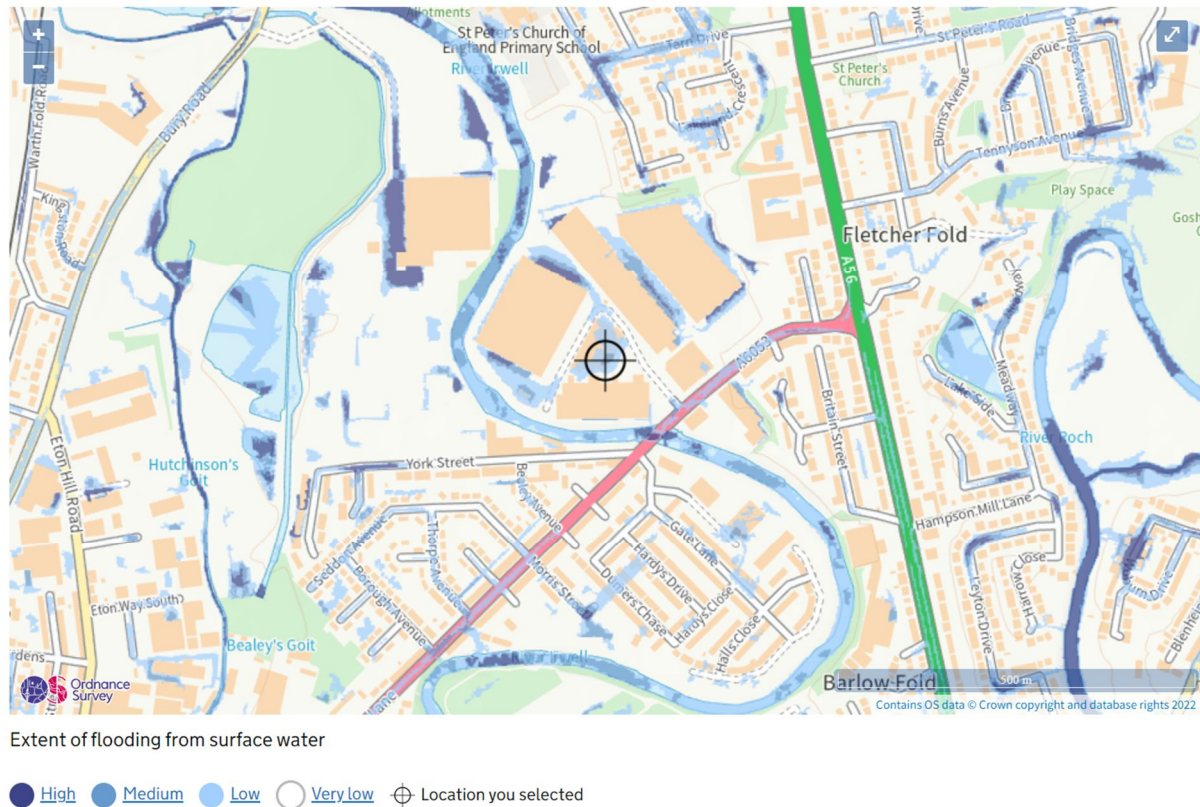
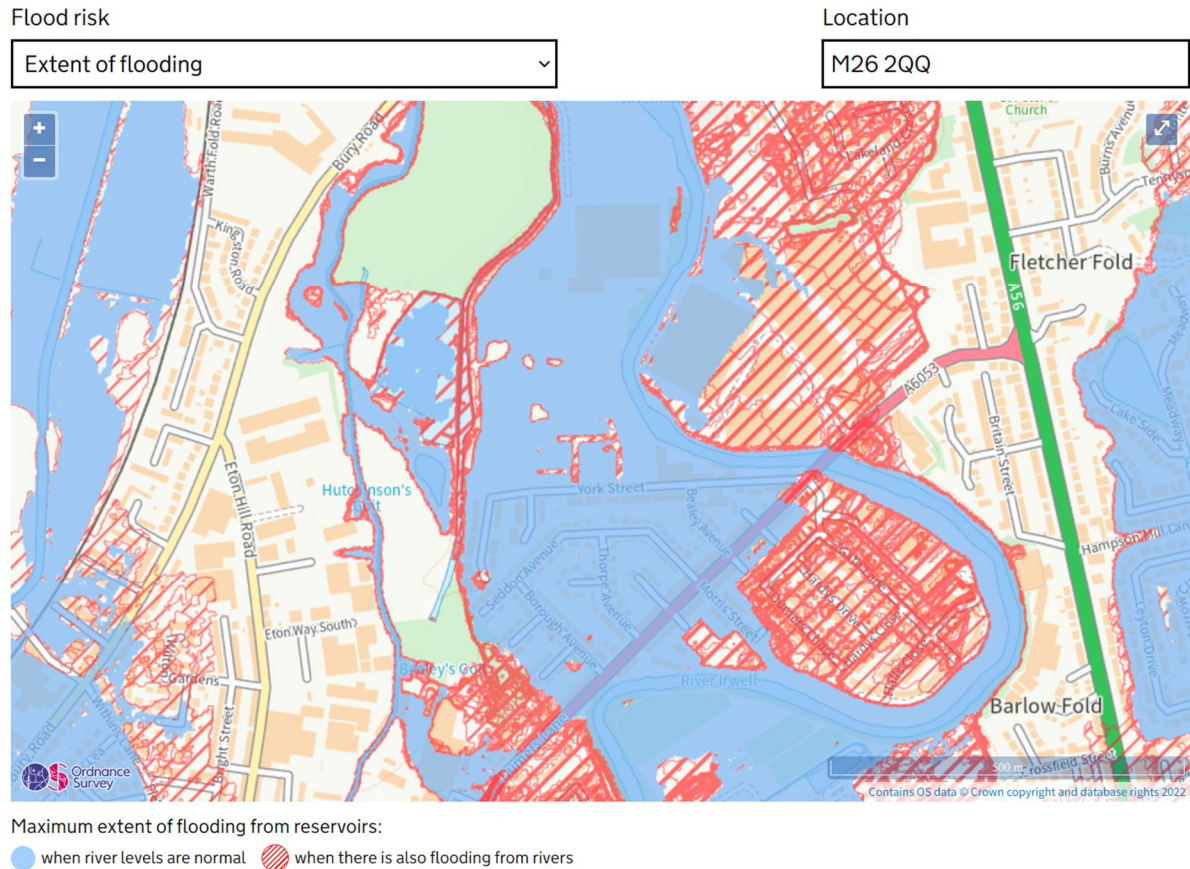


Figure 7: 1% AEP Surface Water Depth (Source: EA Open Dataset)

3.1.3 Flood Risk from Reservoir /Canals / Other Artificial Sources

The EA Extent of Flooding from Reservoirs map (Figure 8:Extent of Flooding from Reservoirs (Source: EA Flood Warning Information Service)), based only on large reservoirs (over 25,000 m³ of water), shows that majority of the site is within potential risk of flooding in the event of a breach from reservoirs. Flooding from reservoir is considered to be extremely unlikely and the risk of flooding to the site considered to be low.

There is no flood risk from canals or other artificial sources as there are no canals or artificial sources within the vicinity of the site.



3.1.4 Flood Risk from Groundwater

According to the Bury Flood Risk Assessment there are relatively few reported incidents of groundwater flooding in Bury, Rochdale and Oldham. The Environment Agency water resources team were consulted in the Greater Manchester sub-regional D+SFRA and stated that 'the risk posed by groundwater flooding is likely to remain remote within the sub-region; however, the impacts of increased development in Greater Manchester must be carefully assessed.

Therefore it is believed the risk of groundwater flooding is low for this site.

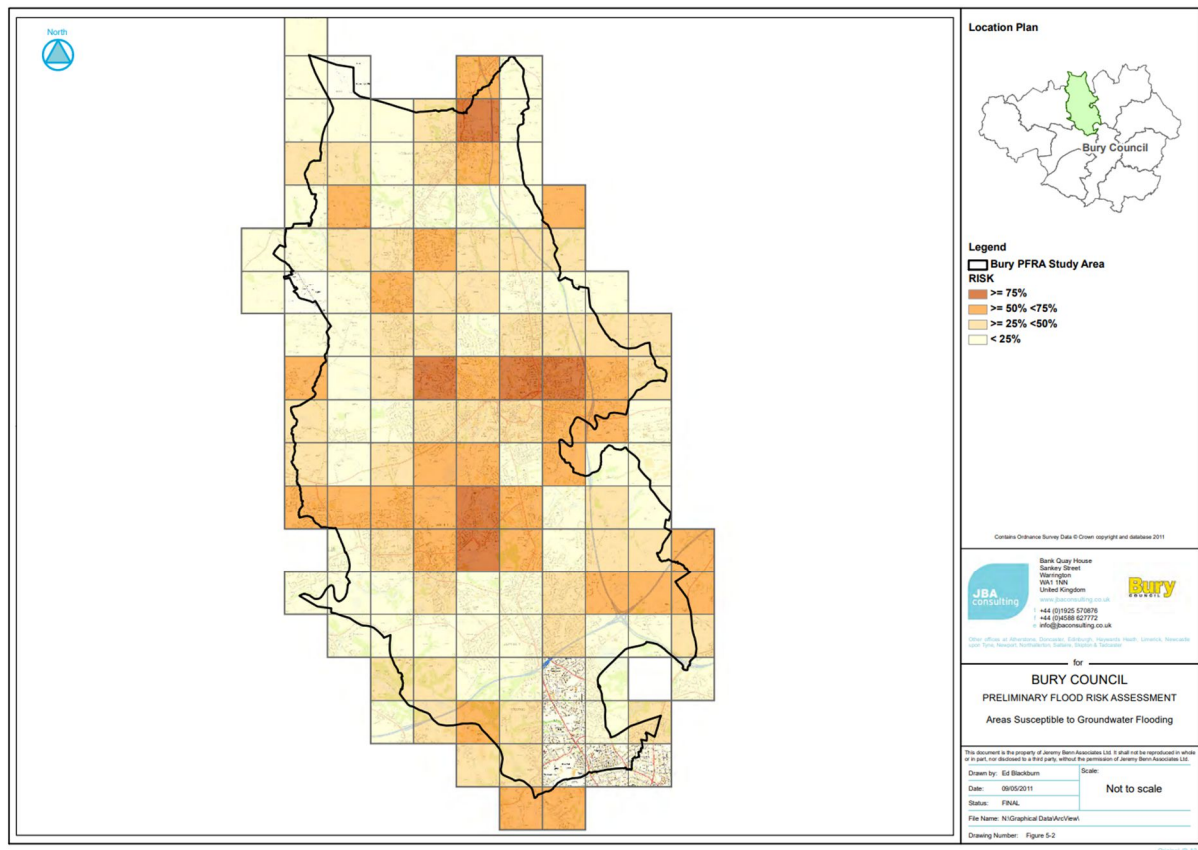


Figure 9: Flood Risk from Groundwater (Source: Bury Preliminary Flood Risk Assessment)

3.1.5 Flood Risk from Sewers

According to the SFRA they may be some risk of flooding from sewers in the area, but the proposed change of use is approximately 0.3m above the ground and therefore the risk of flooding is believed to be low. Furthermore there is no history of flooding of the building.

4. ASSESSMENT OF FLOOD RISK FOR PROPOSED DEVELOPMENT

4.1 Development Proposals

The proposed development is a change of use of the Capita Building and the demolishing of the building. The development will change from an office to a warehouse.

The impermeable area will not change from the existing situation.

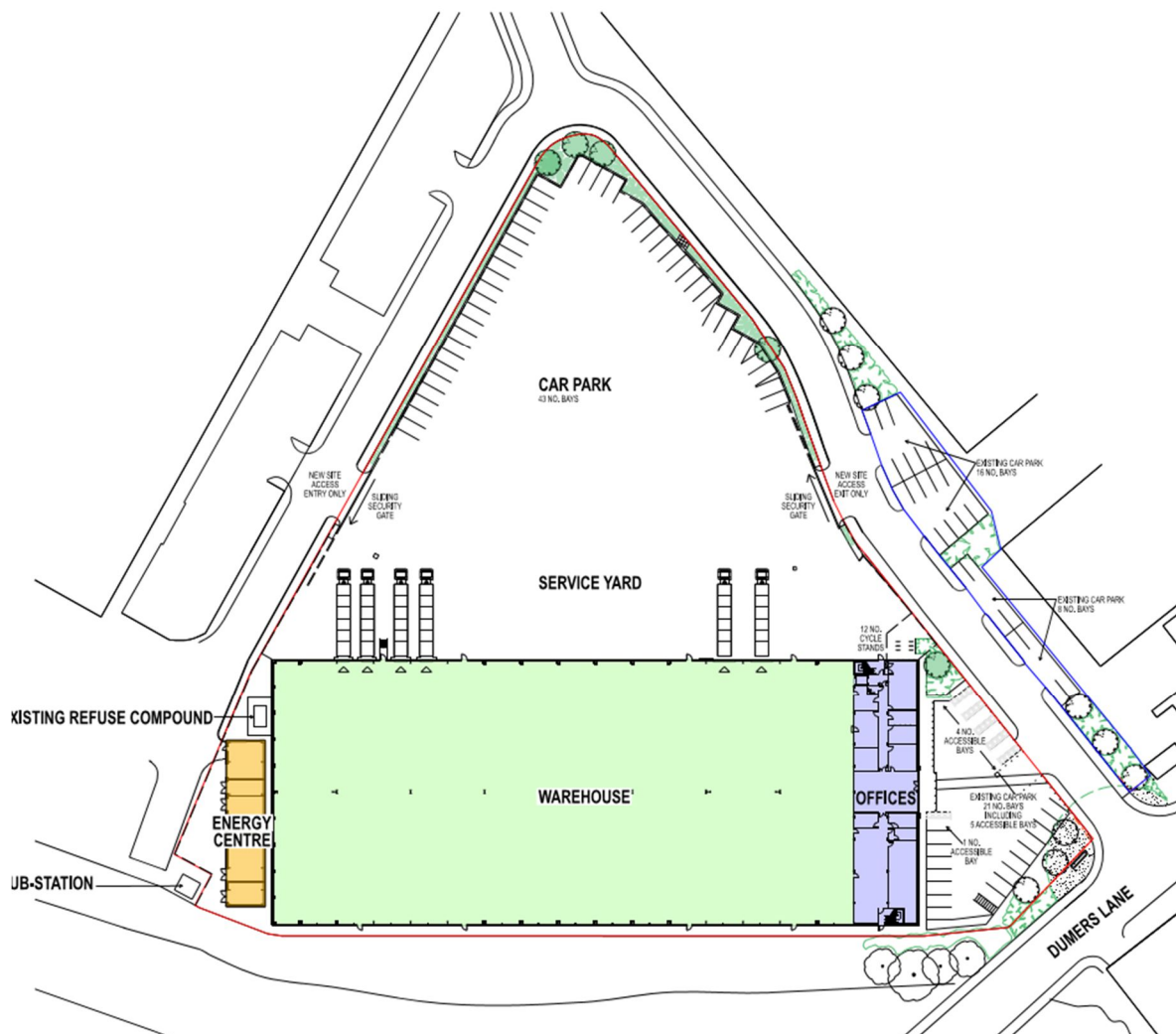


Figure 10: Proposed Site (Source: Client)

4.2 Fluvial Flood Management

The River Irwell model levels suggest the flood level for the 1 in 1000 year event is 68.74mAOD. The flood defence are a minimum of 70.04mAOD. For the site to flood in normal circumstances the river level would need to be much higher than the 1 in 1000 year event.

As there is no additional buildings being proposed and the site is behind defence no compensatory storage is required.

The existing finished floor levels are set at a minimum of 68.125mAOD, there is no change in levels.

A flood risk permit will be required for any works within 7m of the top of the bank of the River Irwell.

The risk is less than the existing development as the vulnerability of the proposed development is less than the existing. Thereby the risk of flooding has diminished.

4.2.1 Emergency Planning

The proposed development will be safe up to and including the 1 in 1000 year. Therefore, it should be dry in the majority of floods.

It is recommended that the proposed development joins the Environment Agency flood warning scheme. If a severe flood warning is given the site can be evacuated. Due to the River Irwell being a slow rising river, plenty of warning will be given to prepare for the flood and leave the site if the owner of the building wishes. The proposed site will need to evacuate to the east of the site and out of the flood zone.

5. DRAINAGE STRATEGY

5.1 Existing Drainage Arrangements

5.1.1 Surface Water

The proposed development is a change of use of building and demolishing a car park. There is no increase in impermeable areas as it will stay the same.

As there is no increase in impermeable area and thereby no increase in surface water no drainage strategy is required

This has been agreed with Andy Southgate, the Lead Local Authority Appendix C

6. SUMMARY & CONCLUSIONS

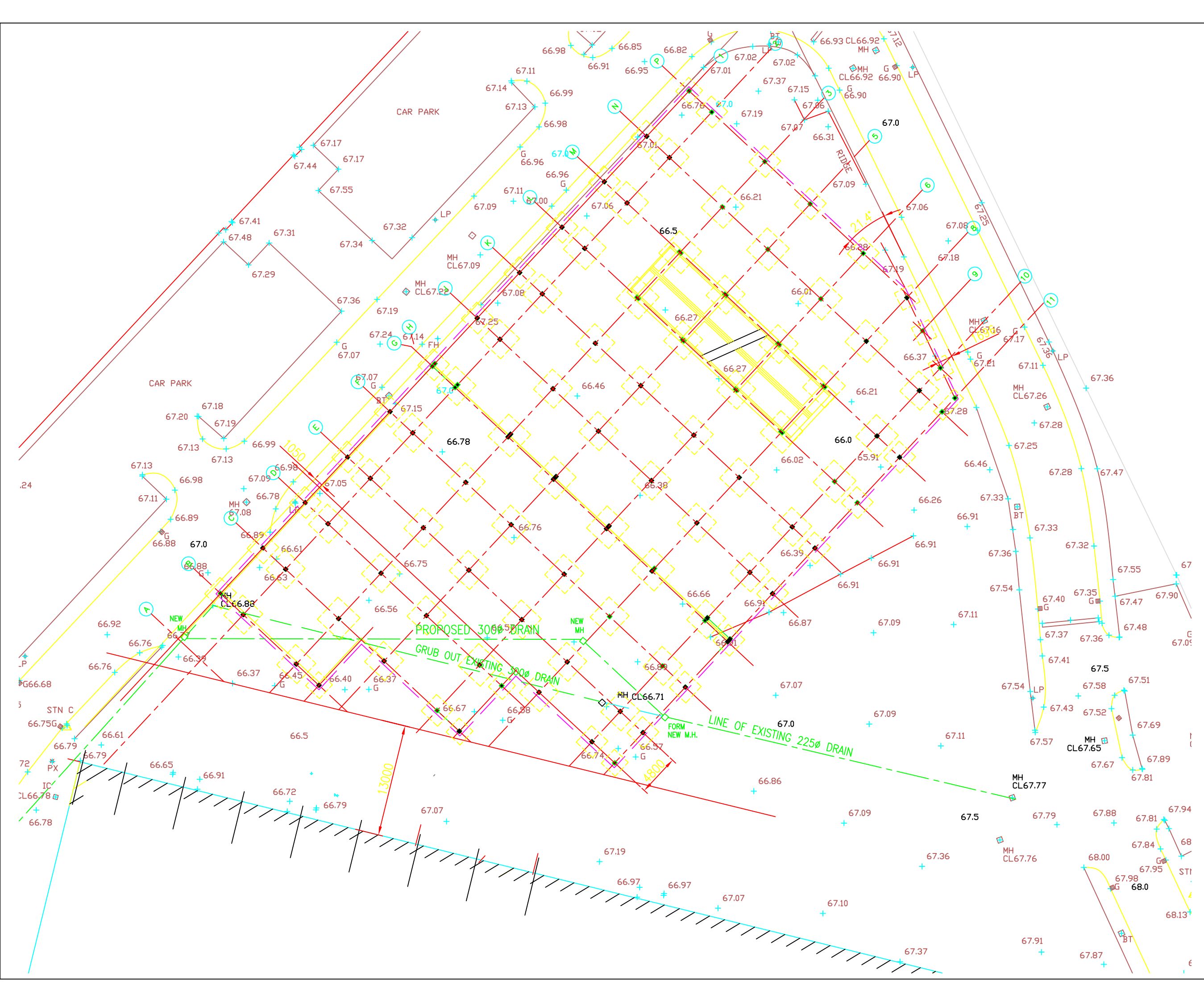
A summary of the main conclusions for the FRA is presented below:

- Development proposals are for a change of use from an office to a warehouse and demolishing of the car park;
- The change of use decreases the risk of flooding as it is less people in a warehouse than an office.
- The development site is approximately 1.6ha.
- The site north, west, south boundary is the River Irwell. This is a main river and any works within 7m of the top bank or toe defence will require flood risk permit.
- The site is within a defended Flood Zone 3.
- The proposed development passes the sequential test as it is a less vulnerable development in a Flood Zone 3.
- The flood defences are set at 70.04mAOD and the flood level in the 1 in 1000 year event is 68.74mAOD. The defences are maintained by the Environment Agency. The site is defended up to and including the 1 in 1000 year event.
- The existing floor levels are 68.125mAOD
- As the site is behind defence and no works are being undertaken compensatory storage is not required.
- As the site is for a change of use and demolition of a car park, the existing drainage will not be changed and therefore no drainage strategy will be required.

7. REFERENCES

Author	Date	Title/Description
Department for Communities and Local Government	Mar 2012	Technical Guidance to the National Planning Policy Framework
Ministry of Housing, Communities and Local Government.	Feb 2019	National Planning Policy Framework
Bury Council	Mar 2010	SFRA Volume III- Final Level 2 SFRA- Bury

Appendix A: Topographical Survey



NOTES

AS CONSTRUCTED

B	SCHEME REVISED	08.06.99	D.E.F.
A	SCHEME REVISED	27.5.99	D.E.F.
rev	description	date	by

Graham Schofield Associates

CONSULTING CIVIL AND STRUCTURAL ENGINEERS

72 Balcarres Road, Leyland PR15 2ED Tel: 01772 450383 Fax: 01772 450384

client

RON WOOD DEVELOPMENTS LTD

project

PROPOSED CAR PARK
DUMERS LANE, BURY

title

SITE LOCATION PLAN

drawn	DEF	checked	drawing number
date	MAY 99	date	99-48-S10 C
scale	1:200	rev	

Appendix B: Flood Data

Flood risk assessment data

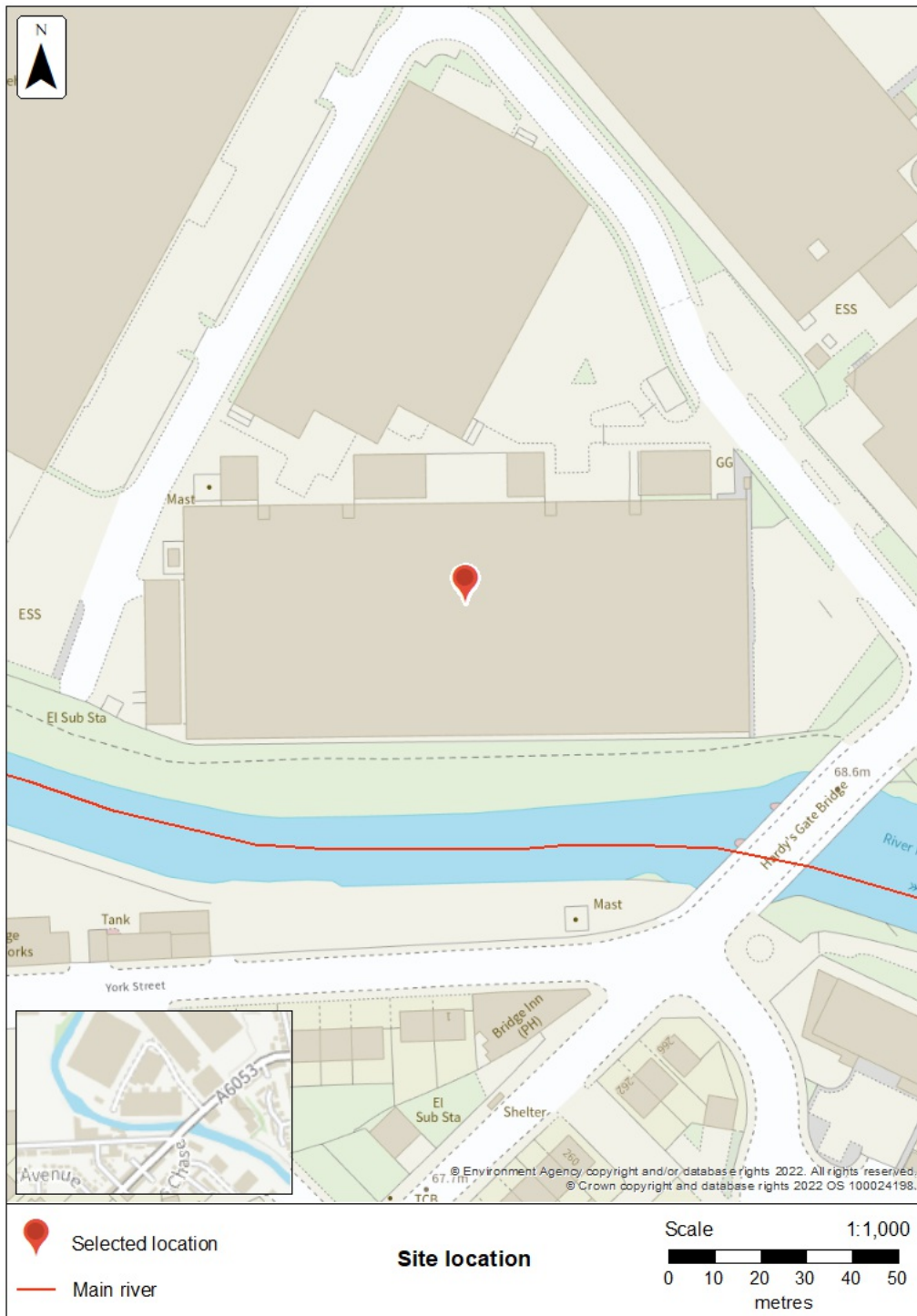
Location of site: 380179 / 408472 (shown as easting and northing coordinates)

Document created on: 14 April 2022

This information was previously known as a product 4.

Customer reference number: GMMC258363AB/HFV9T5PJ38R7

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)
- areas benefiting from defences
- 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

Not included in this document

This document does not include a Flood Defence Breach Hazard Map.

As your location benefits from flood defences, you need to request a Flood Defence Breach Hazard Map and information about the level of flood protection offered at your location from the Greater Manchester Merseyside and Cheshire Environment Agency team at inforequests.gmmc@environment-agency.gov.uk. This information will only be available if modelling has been carried out for breach scenarios.

Include a site location map in your request.

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 model used

Model name: Radcliffe and Redvales 2016

Scenario(s): Defended fluvial, defences removed fluvial

Date: 29 April 2019

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 occurring 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 development 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

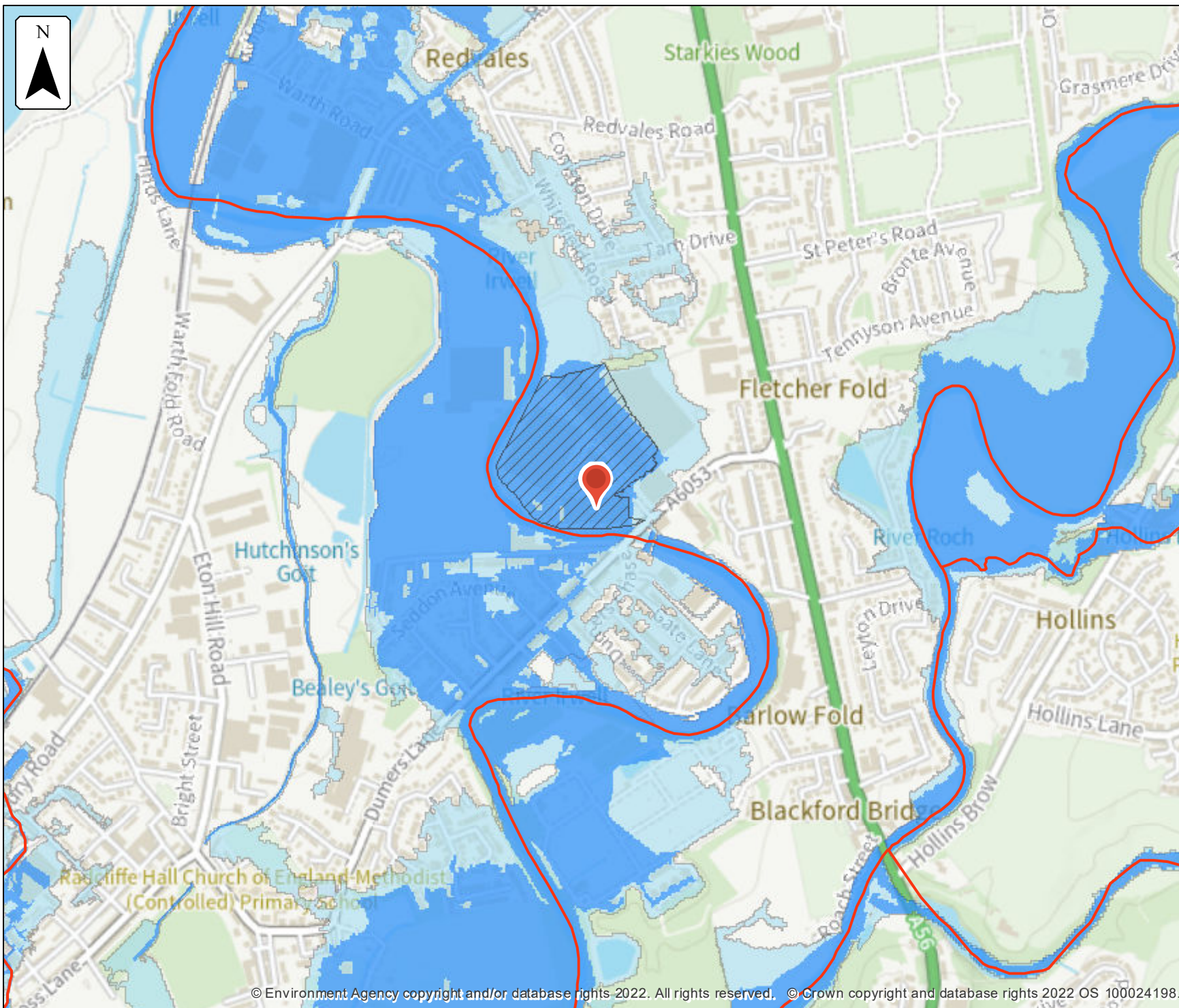
This data is updated on a quarterly basis as better data becomes available.

Areas benefiting from defences

This map shows the areas benefiting from defences for 2 possible events:

- fluvial (river flooding) event that has a 1% annual exceedance probability (AEP), this means a 1% chance of occurring in any one year
- tidal or coastal event that has a 0.5% annual exceedance probability (AEP), this means a 0.5% chance of occurring in any one year

[Download the GIS dataset for areas benefiting from defences](#)



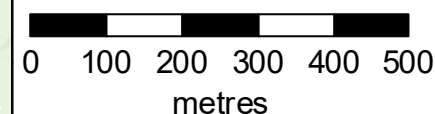
Flood map for planning

Location (easting/northing)
380179/408472

Scale
1:10,000

Created
14 Apr 2022

-  Selected location
-  Main river
-  Areas benefiting from flood defence
-  Flood zone 3
-  Flood zone 2



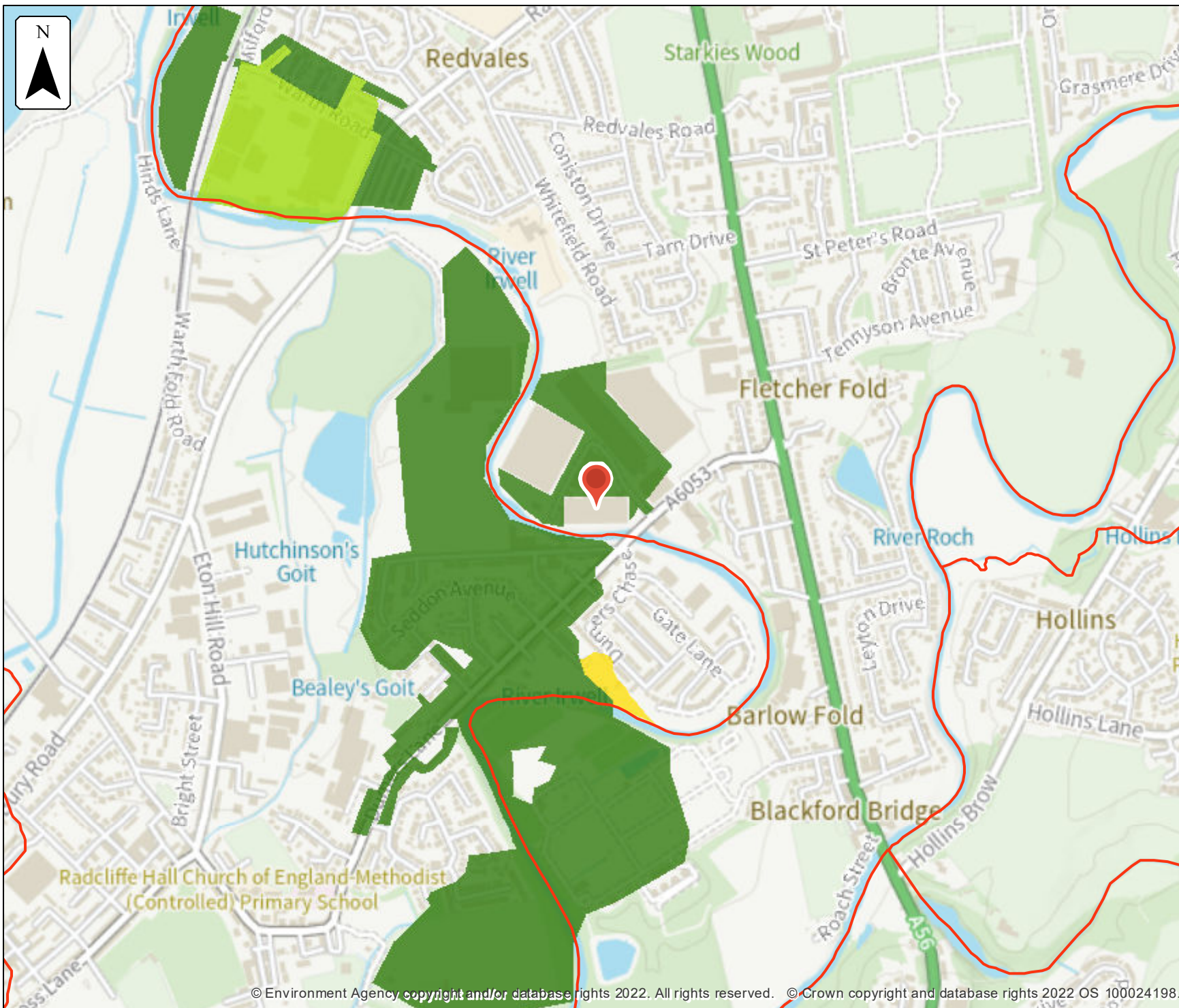
Historic flooding

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](#)



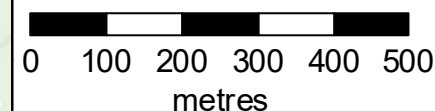
Historic flood map

Location (easting/northing)
380179/408472

Scale
1:10,000

Created
14 Apr 2022

-  Selected location
-  Main river
- Date of flood event
 -  February, 2020
 -  December, 2015
 -  June, 2012
 -  June, 2002



Historic flood event data

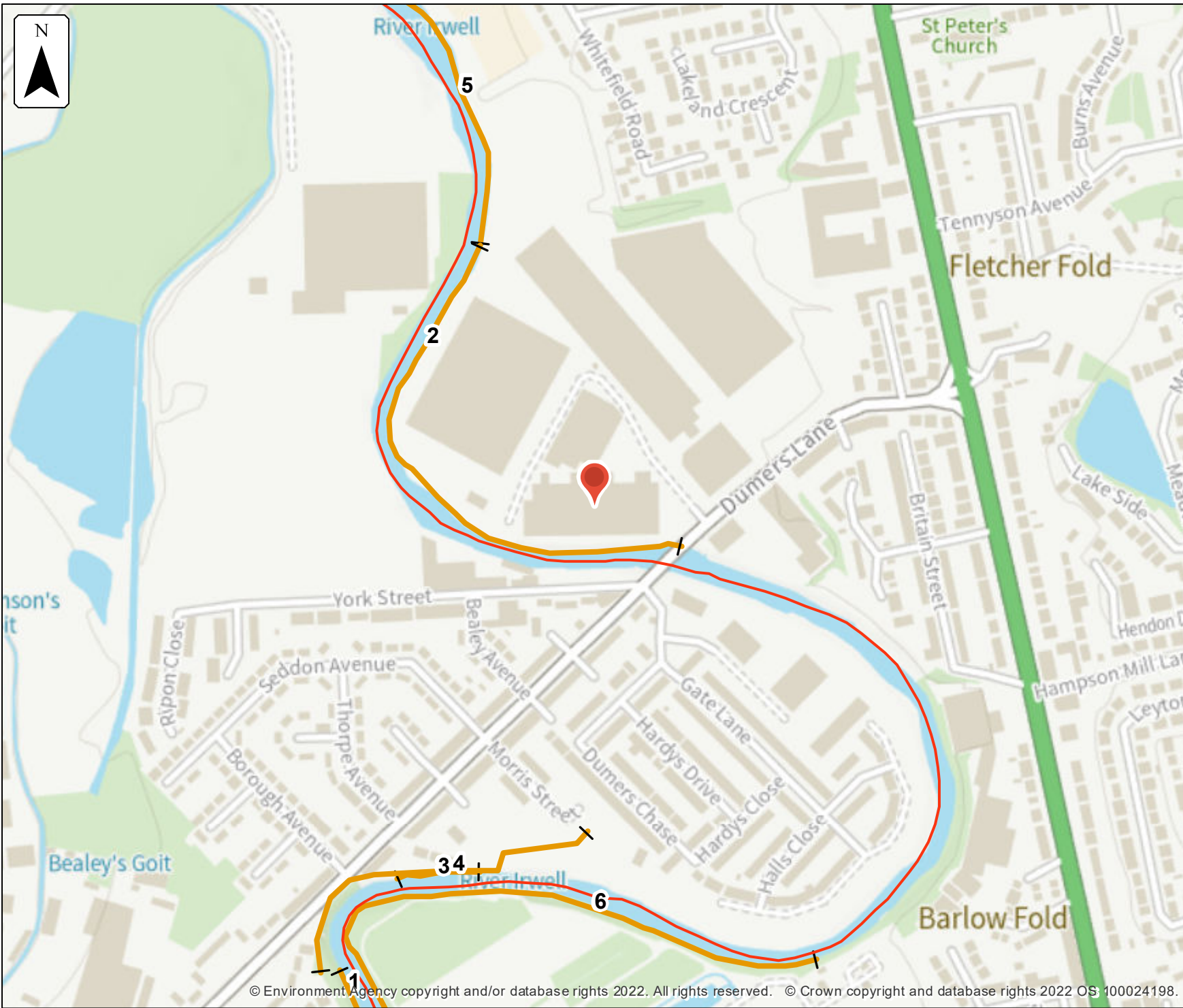
Start date	End date	Source of flood	Cause of flood	Affects location
9 February 2020	9 February 2020	main river	channel capacity exceeded (no raised defences)	No
26 December 2015	26 December 2015	main river	channel capacity exceeded (no raised defences)	No
22 June 2012	22 June 2012	main river	channel capacity exceeded (no raised defences)	No
14 June 2002	15 June 2002	main river	channel capacity exceeded (no raised defences)	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.



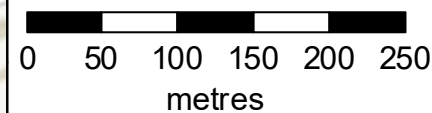
Flood defences

Location (easting/northing)
380179/408472

Scale
1:5,000

Created
14 Apr 2022

-  Selected location
-  Main river
-  Flood defence



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	65256	Embankment			67.65	67.27	
2	520252	Engineered High Ground			69.09	69.35	
3	520200	Engineered High Ground			66.34	64.95	
4	540842	Embankment		Very good	67.57	67.87	
5	520233	Engineered High Ground			69.35	68.62	
6	94107	Embankment			65.55	64.14	

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

Modelled data

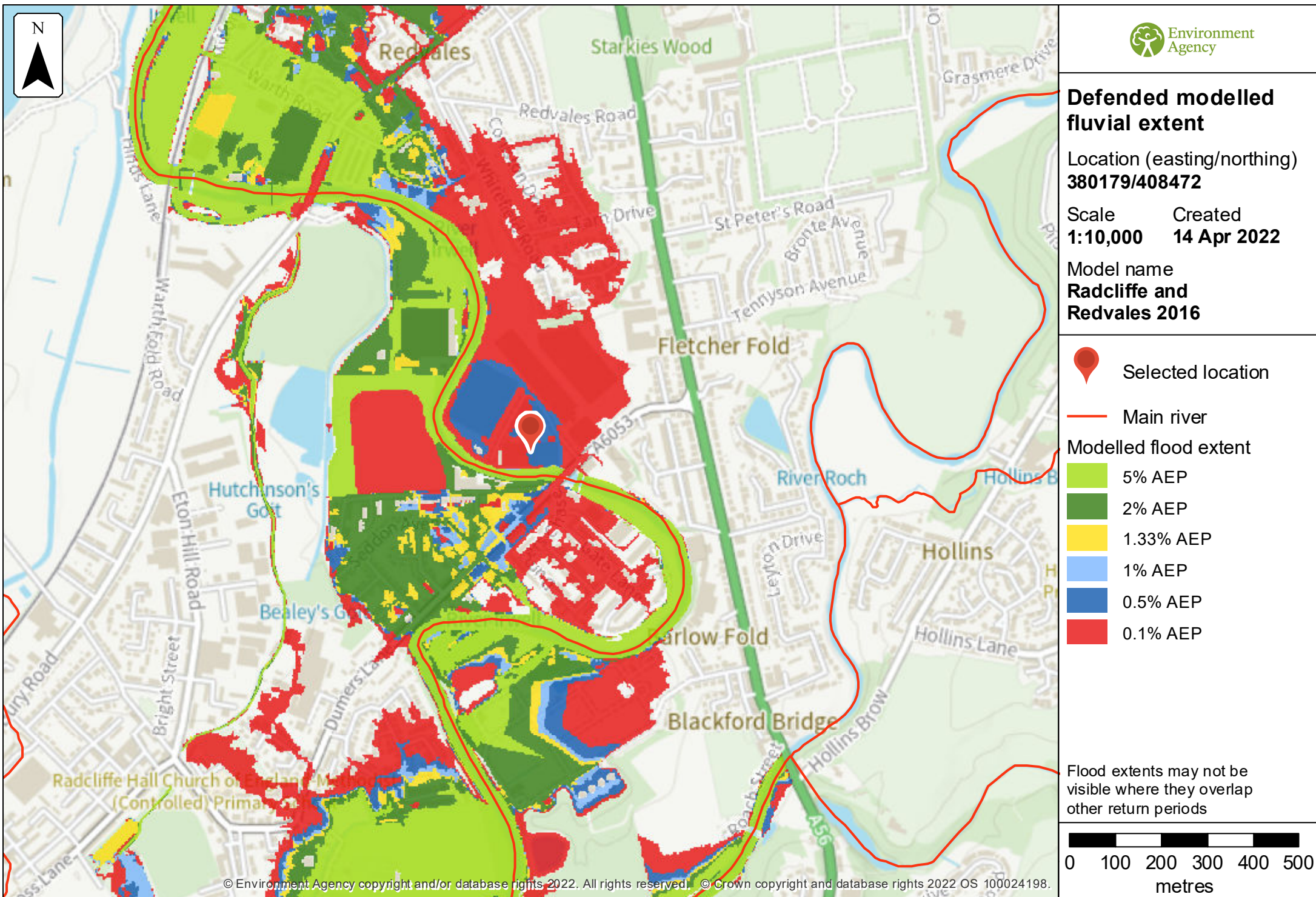
This section provides details of different scenarios we have modelled and includes the following (where available):

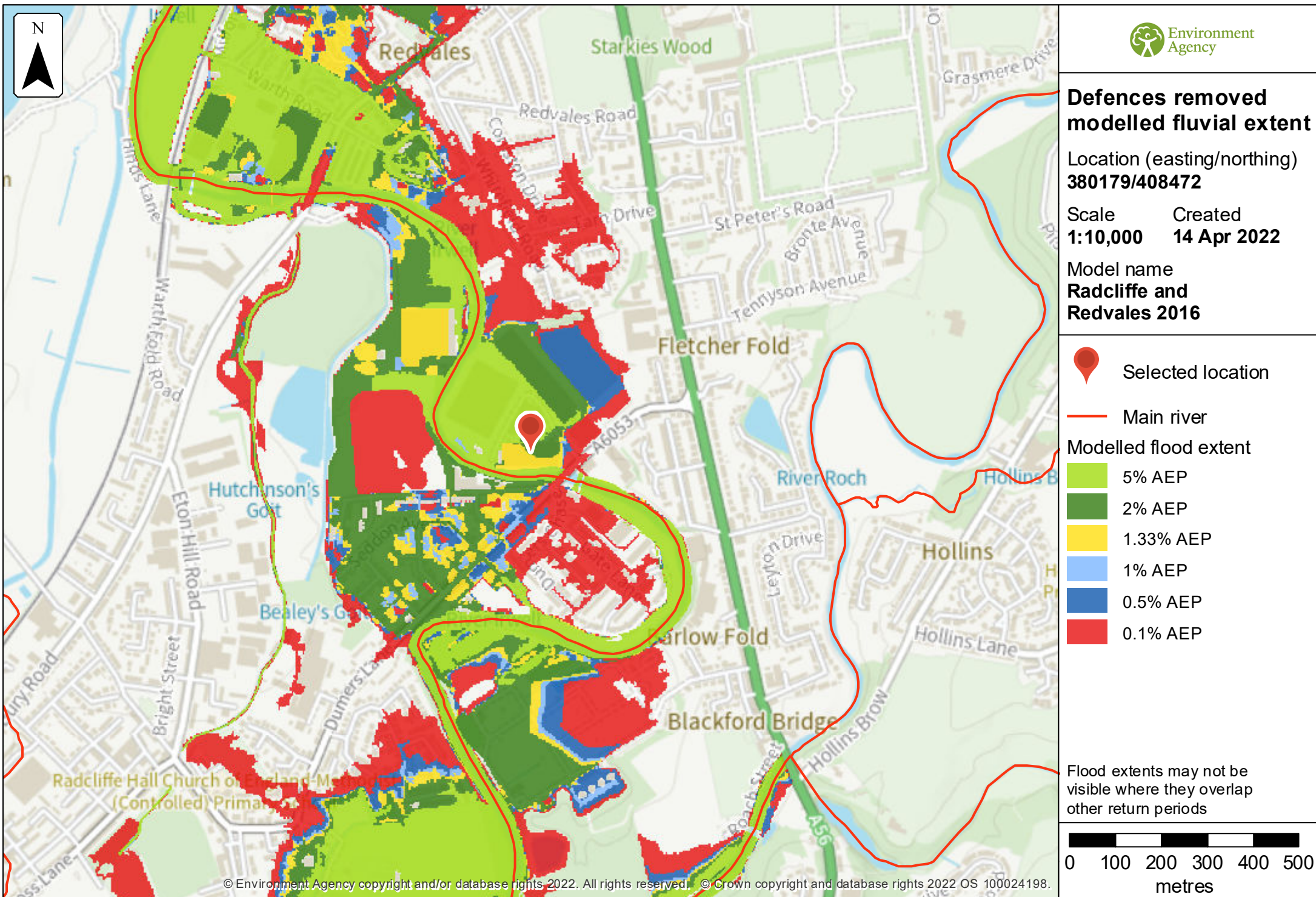
- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels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

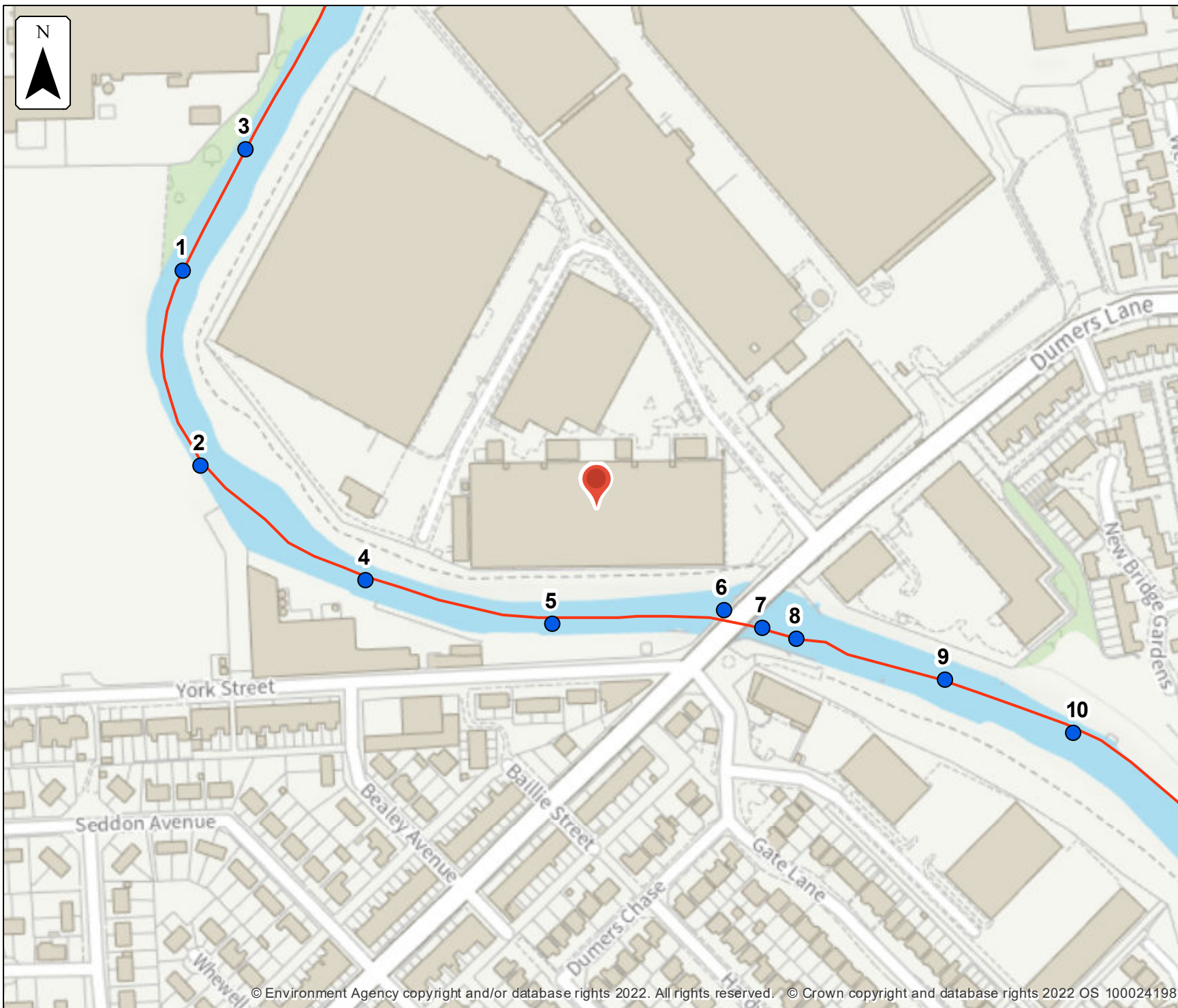
Modelled scenarios

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







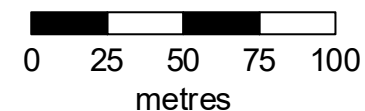
Defended modelled fluvial node locations

Location (easting/northing)
380179/408472

Scale Created
1:2,500 14 Apr 2022

Model name
**Radcliffe and
Redvales 2016**

-  Selected location
-  Modelled location
-  Main river



Modelled node locations data

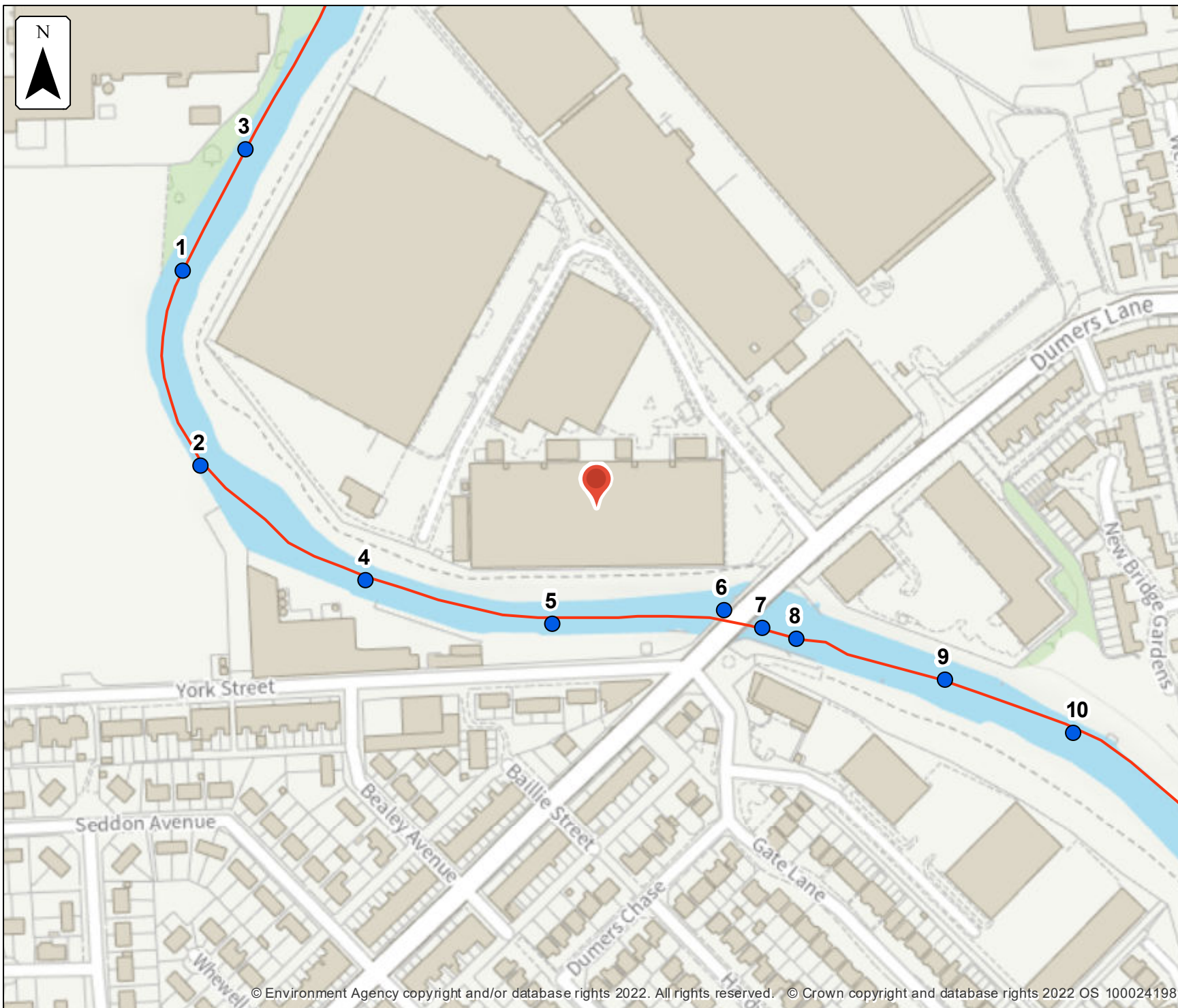
Defended

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	977216	379978	408587	67.81	206.97	68.31	231.95	68.46	236.95	68.59	244.88	68.83	266.03	69.63	317.26
2	977093	379987	408492	67.61	206.89	68.14	234.87	68.29	246.33	68.41	256.48	68.65	280.89	69.50	334.02
3	977215	380009	408645	67.84	207.04	68.34	231.49	68.50	234.98	68.62	240.97	68.86	260.64	69.62	330.90
4	977114	380066	408436	67.19	206.86	67.76	235.58	67.91	246.74	68.03	256.72	68.25	279.97	69.0	345.24
5	977142	380157	408415	67.05	206.85	67.64	235.97	67.80	247.93	67.91	258.63	68.12	282.68	68.74	368.54
6	977141	380240	408422	67.17	206.83	67.77	235.53	67.93	246.26	68.05	255.10	68.29	272.43	69.04	324.76
7	977082	380259	408413	67.08	206.83	67.39	235.51	67.52	246.27	67.62	254.99	67.79	272.30	68.35	326.84
8	977147	380276	408408	67.03	206.82	67.33	235.56	67.46	246.28	67.56	254.79	67.74	272.11	68.28	328.50
9	977205	380348	408388	66.74	206.79	67.03	235.61	67.15	246.27	67.25	256.84	67.42	274.92	67.96	346.62
10	977163	380410	408362	66.67	206.75	66.96	235.62	67.09	247.06	67.20	257.28	67.35	274.16	67.93	351.06

Data in this table comes from the Radcliffe and Redvales 2016 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.



Defences removed modelled fluvial node locations

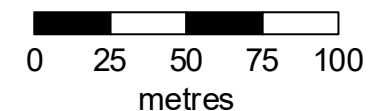
Location (easting/northing)
380179/408472

Scale
1:2,500

Created
14 Apr 2022

Model name
**Radcliffe and
Redvales 2016**

-  Selected location
-  Modelled location
-  Main river



Modelled node locations data

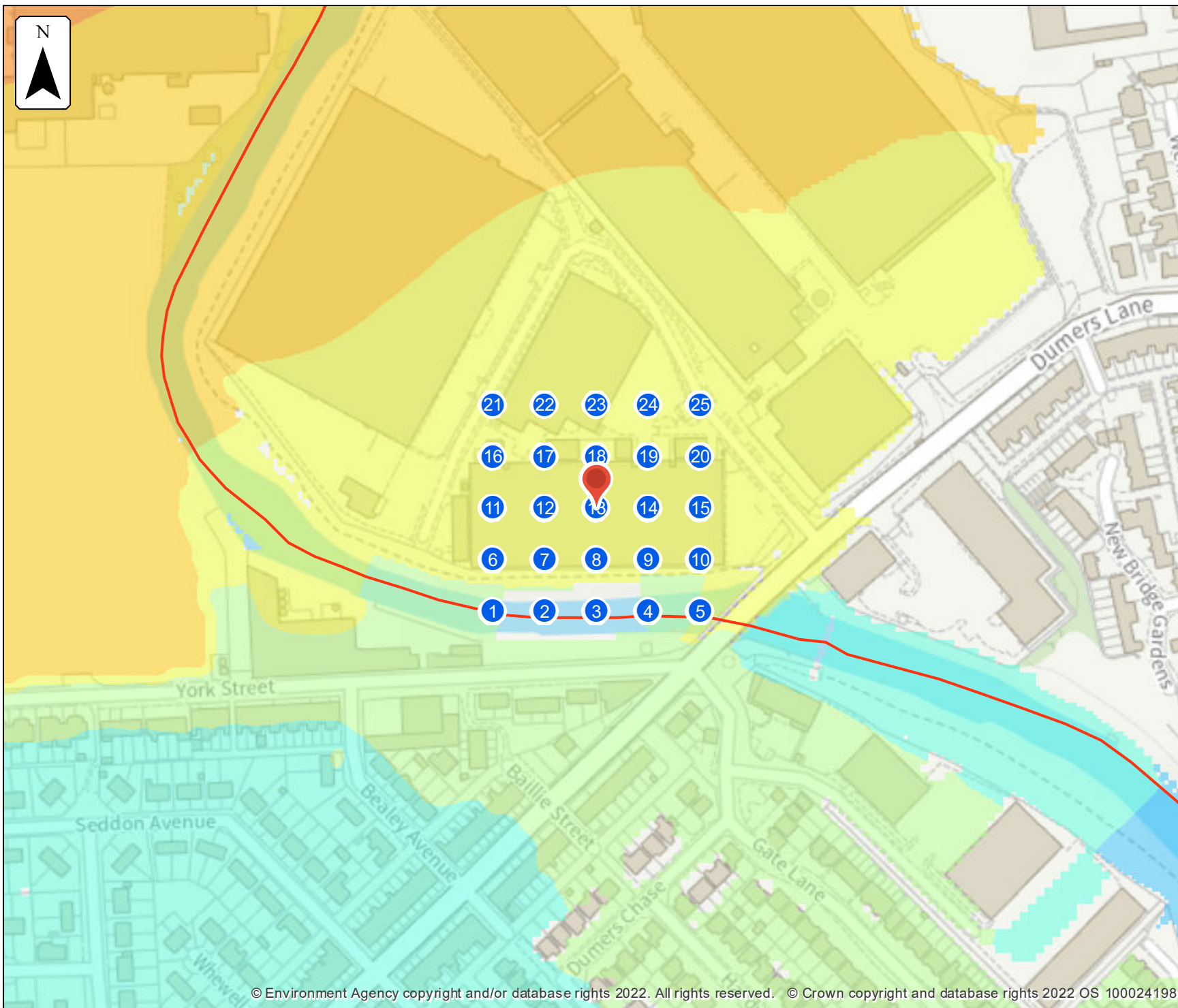
Defences removed

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	977216	379978	408587	67.74	189.19	68.26	214.78	68.43	219.26	68.54	222.47	68.78	234.78	69.52	308.34
2	977093	379987	408492	67.68	167.68	68.24	186.40	68.42	191.93	68.52	196.79	68.76	210.69	69.51	277.74
3	977215	380009	408645	67.76	190.57	68.27	216.28	68.45	220.90	68.56	223.25	68.80	232.72	69.55	298.93
4	977114	380066	408436	67.18	200.17	67.84	223.24	68.04	225.28	68.16	229.72	68.41	242.40	69.26	282.25
5	977142	380157	408415	67.01	203.12	67.63	234.96	67.80	248.87	67.91	257.37	68.13	277.80	68.71	370.53
6	977141	380240	408422	67.13	203.11	67.76	234.68	67.93	247.76	68.05	255.44	68.28	272.82	69.03	322.50
7	977082	380259	408413	67.05	203.10	67.38	234.67	67.51	247.74	67.60	255.41	67.77	272.86	68.31	324.40
8	977147	380276	408408	67.0	203.10	67.32	234.67	67.46	247.72	67.54	255.49	67.71	272.91	68.24	326.83
9	977205	380348	408388	66.71	203.07	67.01	234.68	67.14	247.73	67.22	256.05	67.38	273.08	67.90	332.74
10	977163	380410	408362	66.64	203.05	66.95	234.67	67.08	247.95	67.16	256.41	67.32	273.15	67.84	335.74

Data in this table comes from the Radcliffe and Redvales 2016 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 modelled fluvial extent and height

Location (easting/northing)
380179/408472

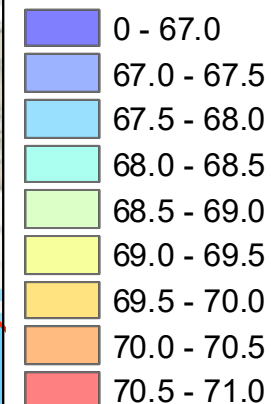
Scale Created
1:2,500 14 Apr 2022

Model name
**Radcliffe and
Redvales 2016**

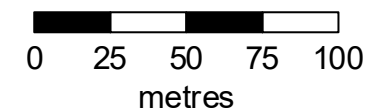
 Selected location

 Main river

Modelled 2D grid
Water level in mAOD



This map shows the
0.1% AEP height data



Sample point data

Defended

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	380129	408422					5.31	68.01	5.39	68.08	5.58	68.28	6.25	68.94
2	380154	408422					NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
3	380179	408422					NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
4	380204	408422					6.19	67.95	6.27	68.03	6.48	68.23	7.12	68.87
5	380229	408422					6.95	68.02	7.03	68.11	7.25	68.32	7.94	69.02
6	380129	408447					NoData	NoData	NoData	NoData	NoData	NoData	1.78	69.42
7	380154	408447					NoData	NoData	NoData	NoData	NoData	NoData	1.68	69.32
8	380179	408447					NoData	NoData	NoData	NoData	NoData	NoData	1.67	69.31
9	380204	408447					NoData	NoData	NoData	NoData	NoData	NoData	1.66	69.30
10	380229	408447					NoData	NoData	NoData	NoData	NoData	NoData	1.34	69.15
11	380129	408472					NoData	NoData	NoData	NoData	NoData	NoData	1.81	69.45
12	380154	408472					NoData	NoData	NoData	NoData	NoData	NoData	1.79	69.43
13	380179	408472					NoData	NoData	NoData	NoData	NoData	NoData	1.77	69.41
14	380204	408472					NoData	NoData	NoData	NoData	NoData	NoData	1.74	69.38
15	380229	408472					NoData	NoData	NoData	NoData	NoData	NoData	1.71	69.35
16	380129	408497					NoData	NoData	NoData	NoData	NoData	NoData	2.41	69.48

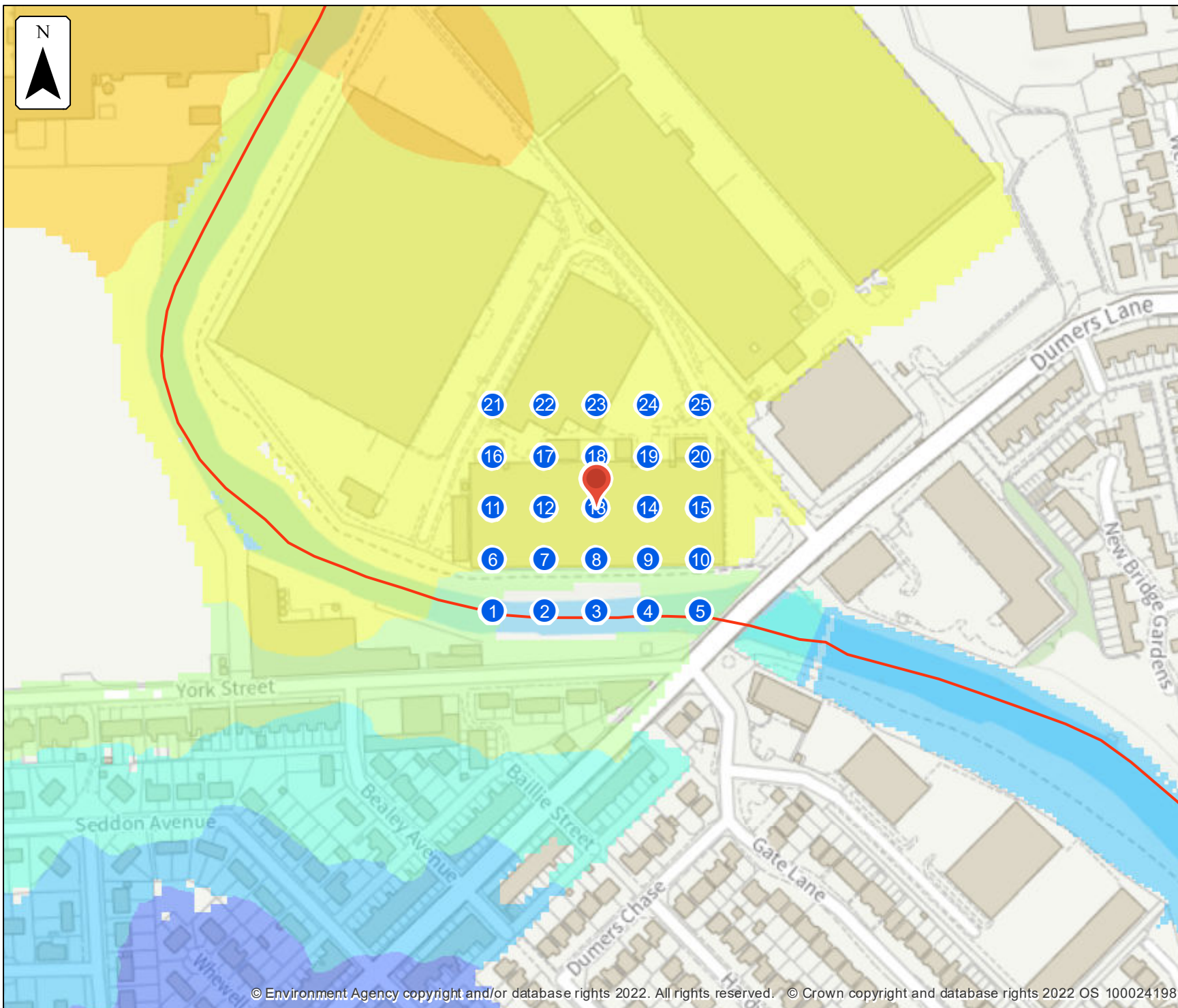
Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	380154	408497					NoData	NoData	NoData	NoData	NoData	NoData	2.37	69.48
18	380179	408497					NoData	NoData	NoData	NoData	NoData	NoData	2.51	69.48
19	380204	408497					NoData	NoData	NoData	NoData	NoData	NoData	1.78	69.48
20	380229	408497					NoData	NoData	NoData	NoData	NoData	NoData	1.35	69.43
21	380129	408522					NoData	NoData	NoData	NoData	NoData	NoData	2.46	69.48
22	380154	408522					NoData	NoData	NoData	NoData	NoData	NoData	2.64	69.48
23	380179	408522					NoData	NoData	NoData	NoData	NoData	NoData	2.67	69.48
24	380204	408522					NoData	NoData	NoData	NoData	NoData	NoData	2.31	69.48
25	380229	408522					NoData	NoData	NoData	NoData	NoData	NoData	1.82	69.47

Data in this table comes from the Radcliffe and Redvales 2016 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.



Defences removed modelled fluvial extent and height

Location (easting/northing)
380179/408472

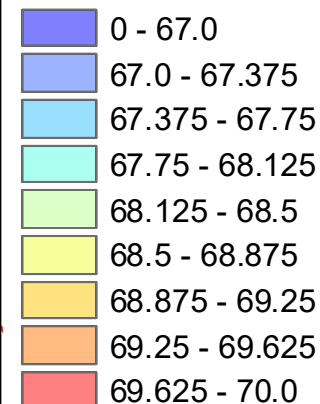
Scale Created
1:2,500 14 Apr 2022

Model name
**Radcliffe and
Redvales 2016**

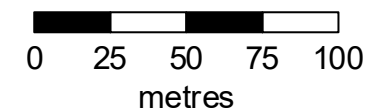
 Selected location

 Main river

Modelled 2D grid
Water level in mAOD



This map shows the
0.5% AEP height data



Sample point data

Defences removed

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	380129	408422					5.39	68.08	5.49	68.18	5.68	68.38		
2	380154	408422					NoData	NoData	NoData	NoData	NoData	NoData		
3	380179	408422					NoData	NoData	NoData	NoData	NoData	NoData		
4	380204	408422					6.23	67.99	6.34	68.09	6.53	68.29		
5	380229	408422					6.99	68.06	7.10	68.17	7.30	68.37		
6	380129	408447					0.61	68.40	0.69	68.48	0.85	68.64		
7	380154	408447					0.65	68.43	0.73	68.51	0.87	68.66		
8	380179	408447					0.66	68.44	0.74	68.52	0.88	68.67		
9	380204	408447					0.66	68.45	0.74	68.52	0.88	68.67		
10	380229	408447					0.63	68.41	0.68	68.46	0.78	68.57		
11	380129	408472					0.80	68.44	0.89	68.53	1.08	68.72		
12	380154	408472					0.83	68.47	0.92	68.56	1.11	68.75		
13	380179	408472					0.84	68.48	0.93	68.57	1.12	68.76		
14	380204	408472					0.84	68.48	0.94	68.58	1.13	68.77		
15	380229	408472					0.84	68.49	0.94	68.58	1.14	68.78		
16	380129	408497					1.41	68.47	1.51	68.57	1.71	68.77		

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	380154	408497					1.39	68.49	1.49	68.59	1.69	68.79		
18	380179	408497					1.53	68.50	1.63	68.60	1.84	68.81		
19	380204	408497					0.81	68.50	0.91	68.60	1.11	68.81		
20	380229	408497					0.42	68.50	0.52	68.60	0.72	68.80		
21	380129	408522					1.47	68.49	1.57	68.59	1.77	68.79		
22	380154	408522					1.65	68.50	1.76	68.60	1.96	68.80		
23	380179	408522					1.69	68.50	1.80	68.60	2.00	68.81		
24	380204	408522					1.33	68.50	1.44	68.60	1.64	68.81		
25	380229	408522					0.85	68.50	0.95	68.61	1.15	68.81		

Data in this table comes from the Radcliffe and Redvales 2016 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.

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

Appendix C: Consultations from statutory bodies

Charles Townsend

From: Charles Townsend
Sent: 10 May 2022 13:52
To: Van, Rob
Cc: Michael Esfandi
Subject: RE: Dumers Lane, Bury BL9 9QL

Thanks Rob, that a very quick response.

Cheers
Charles

Charles Townsend BSc (Hons) CIWEM CSci
Townsend Water Engineering
charles@townsendwaterengineering.co.uk
Tel: 07786912617

From: Van, Rob <Rob.Van@environment-agency.gov.uk>
Sent: 10 May 2022 13:50
To: Charles Townsend <charles@townsendwaterengineering.co.uk>
Cc: Michael Esfandi <michael@dwyerproperty.com>
Subject: RE: Dumers Lane, Bury BL9 9QL

Charles,

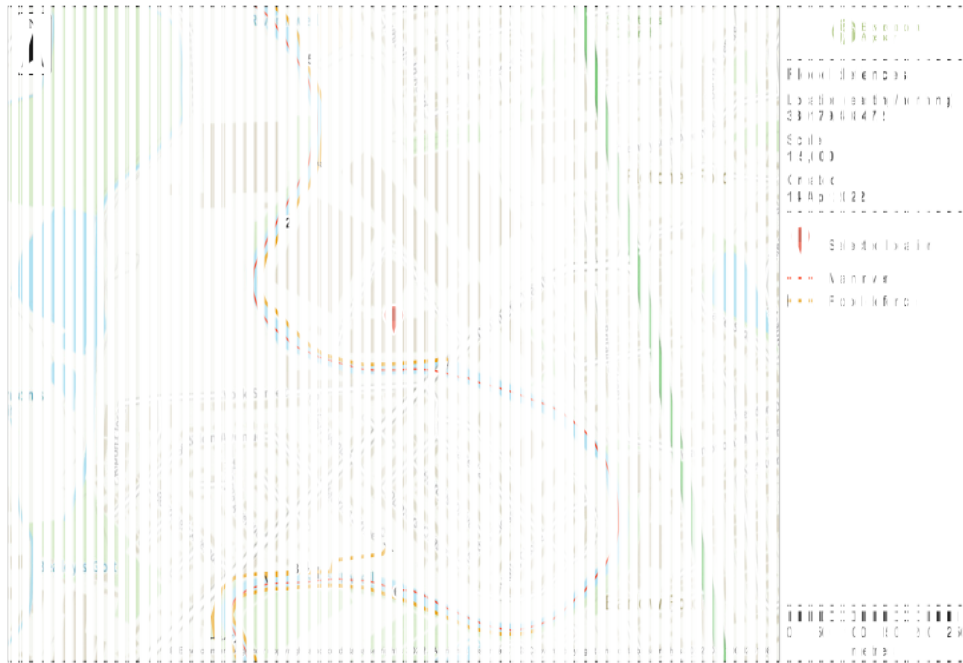
It appears the system hasn't been updated with the actual defences. This isn't surprising as we still have some remaining works on site and haven't officially change the flood maps. For the purposes of the FRA you can use 70.04 mAOD – they are definitely in at that height (see attached photo)!

Thanks, Rob.

From: Charles Townsend <charles@townsendwaterengineering.co.uk>
Sent: 10 May 2022 10:45
To: Van, Rob <Rob.Van@environment-agency.gov.uk>
Cc: Michael Esfandi <michael@dwyerproperty.com>
Subject: Dumers Lane, Bury BL9 9QL

Dear Rob, good to talk to you couple of days ago.

I have received the product 4 EA data for the above site. I have reviewed the defence levels and compared to the flood defence levels in planning applications. The defence levels stated in the product 4 (see below) indicate a downstream crest level of 69.09mAOD.



Результаты

№	Адрес	Адрес	Адрес	Адрес	Адрес	Адрес	Адрес
1	288	Евросоюз			DE	172	
2	285	Евросоюз			DE	183	
3	280	Евросоюз			DE	183	
4	484	Евросоюз			DE	178	
5	283	Евросоюз			DE	183	
6	417	Евросоюз			DE	183	

Адреса: 288, 285, 280, 484, 283, 417

The topographical survey appears to indicate a proposed defence level of around 70.04m AOD (please see attached)

I was just wondering which one was correct.

If you have any queries please do not hesitate to contact me.

Kind regards

Charles

Charles Townsend BSc (Hons) CIWEM CSci

Townsend Water Engineering

charles@townsendwaterengineering.co.uk

Tel: 07786912617

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Charles Townsend

From: Southgate, Andrew <A.M.Southgate@bury.gov.uk>
Sent: 16 May 2022 07:17
To: Charles Townsend
Subject: RE: Dumers Lane Radcliffe, drainage strategy.

Morning Charles

In principle I wouldn't have an issue with that. I don't think it needs a detailed strategy, but it would be the planners who would decide that. If they deem that one is required I wouldn't expect anything major. The caveat would be around the demolition works and whether this will mean completely re-constructing the existing drainage. If this is the case, I'd expect you to look at whether you can get any improvements from a sustainability angle as part of the reinstatement works.

Maybe give me a call when you're further on to discuss

From: Charles Townsend <charles@townsendwaterengineering.co.uk>
Sent: 13 May 2022 16:31
To: Southgate, Andrew <A.M.Southgate@bury.gov.uk>
Subject: RE: Dumers Lane Radcliffe, drainage strategy.

Hello andy,

Just wondering if you could review the email from the 26th April.

If you have any queries please do not hesitate to contact me.

Kind regards
Charles

Charles Townsend BSc (Hons) CIWEM CSci
Townsend Water Engineering
charles@townsendwaterengineering.co.uk
Tel: 07786912617

From: Charles Townsend
Sent: 28 April 2022 16:52
To: a.m.southgate@bury.gov.uk
Subject: RE: Dumers Lane Radcliffe, drainage strategy.

Hi Andy, hope you are well.

Have you had chance to review this email?

Kind regards
Charles

Charles Townsend BSc (Hons) CIWEM CSci
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From: Charles Townsend
Sent: 26 April 2022 10:48
To: a.m.southgate@bury.gov.uk
Subject: Dumers Lane Radcliffe, drainage strategy.

Dear Andy, hope you are well and good to talk to you couple of weeks ago.

I have been approached for another site in Radcliffe on the opposite side of the Irwell from York Street. It is the former capita site. Please find it location below.





The proposed development is a change of use from offices to a warehouse. Basically, the building was an existing warehouse and then changed to an office space, my client wants to change it back to a warehouse. There is also a multistorey car park outside which will be demolished and changed back into a service yard. There will be no additional buildings and there will be no increase in hardstanding.

So my question to you is, do we need to undertake a drainage strategy as the development is minor. I was hoping we can use the existing drainage so we don't need to rid it out and start again.

Would this be acceptable, as we are not increasing the impermeable area.

Whats your thoughts.

If you have any queires please do not hesitate to contact me.

Kind regards
Charles

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