



PROPOSED CAR PARK EXTENSION  
SAFESTYLE UK LTD  
STATION ROAD INDUSTRIAL ESTATE  
VALLEY ROAD  
WOMBWELL  
BARNSELY  
S73 OBS

FLOOD RISK ASSESSMENT

Report 878/FRA1



## 1. INTRODUCTION

This Flood Risk Assessment (FRA) has been prepared to accompany a planning application for an extension to an existing car park and service area serving the Safetsyle Uk factory at Station Road Industrial Estate, Valley Road, Wombwell, Barnsley, S73 OBS.

The site is centred at national grid reference SE 40407 03389 (440407E, 403389N).

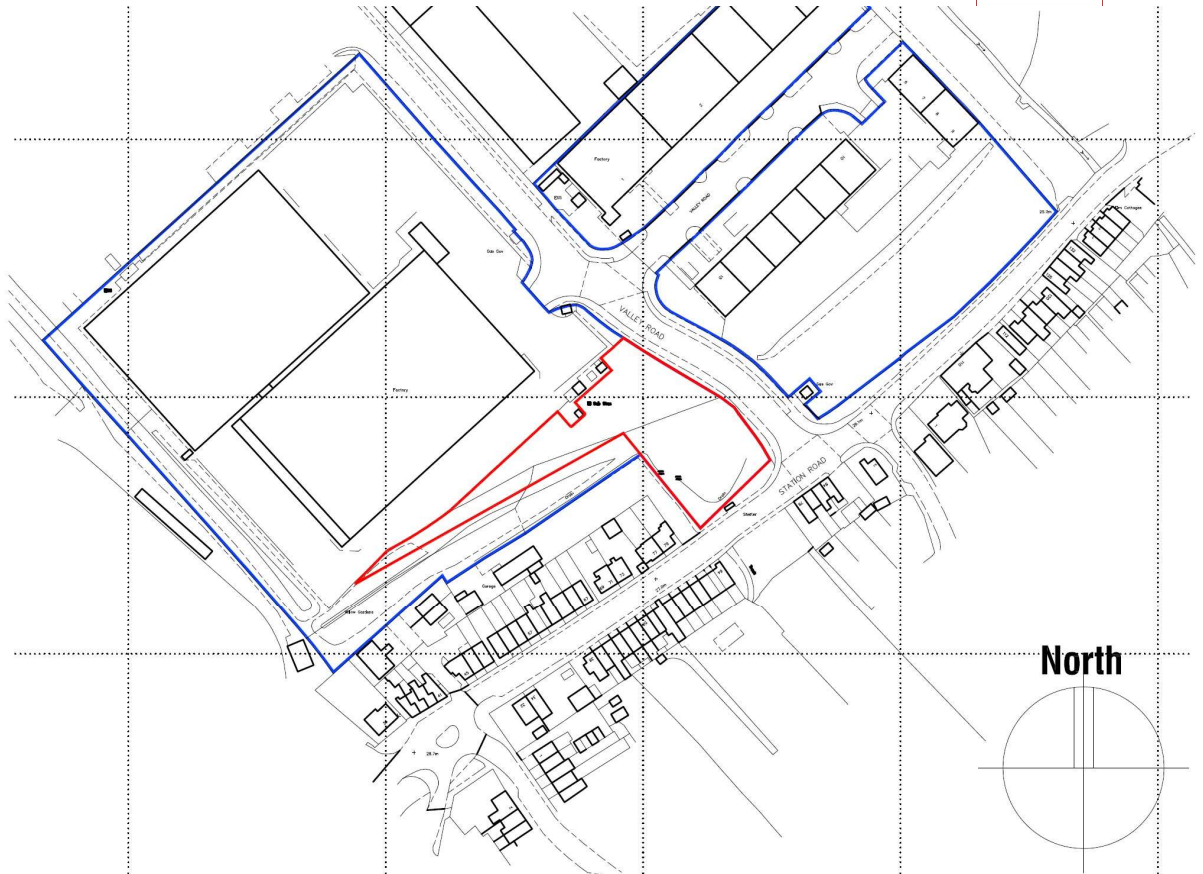
This report considers the likelihood that flooding may occur through all sources and assesses the flood risk for the proposed development.

## 2. PRE-DEVELOPMENT SITE

The pre-development site is a currently grassland that is adjacent to the Safetsyle Uk factory and is located to the north of Station Road and west of Valley Road, Wombwell.

The site extends to approximately 4300 sq m (0.43 Hectares) and is shown below in the location plan below with the site outlined red.

A full topographical survey, to OS levels has been undertaken on the development site. This survey shows that the site has existing levels varying from about 25.30m AOD to about 28.30m AOD.



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## LOCATION PLAN

## FLOOD RISK ASSESSMENT

### 3. FLOOD RISK

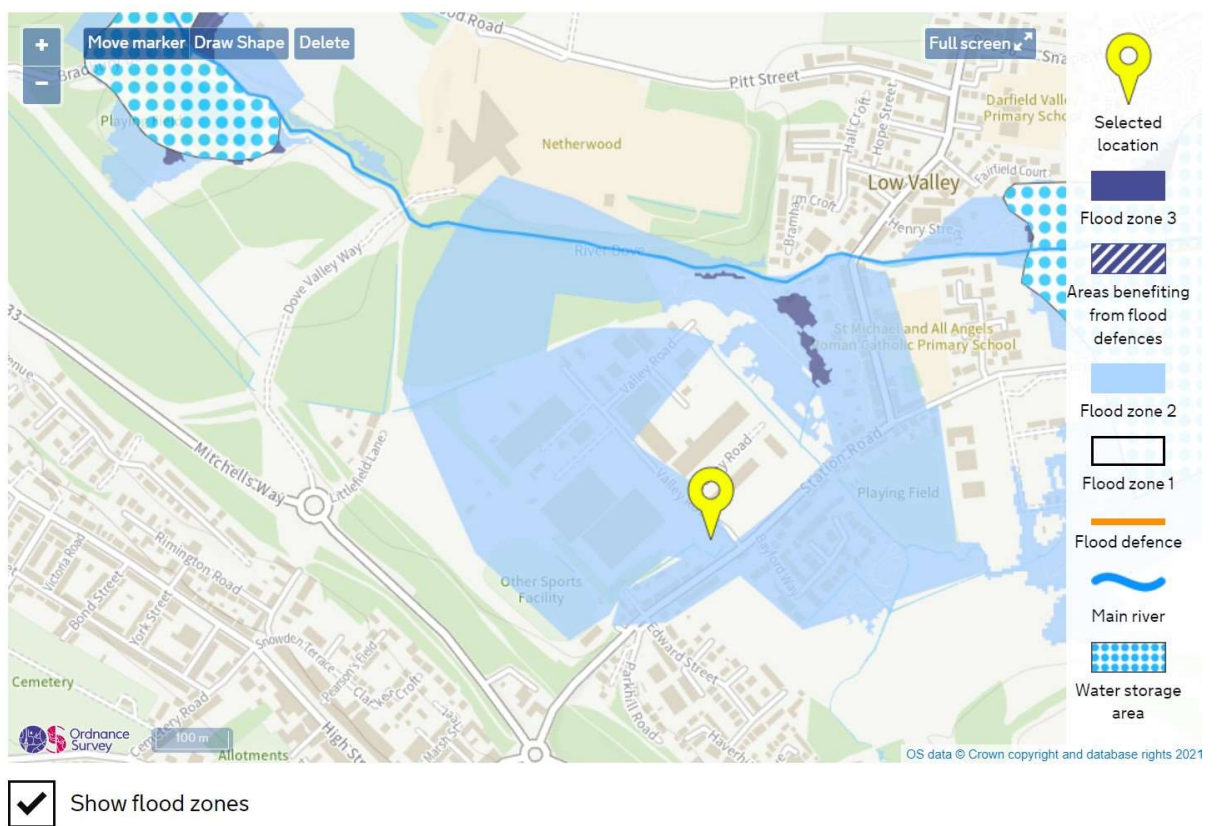
This Flood Risk Assessment has been prepared in accordance with the National Planning Policy Framework (NPPF).

This report is commensurate with the scale and type of development proposed and utilises information available to determine the flood risk at this site and considers, if necessary, a methodology to allow this site to be developed with minimum flood risk. It considers and assesses:-

- Whether the proposed development is likely to be affected by flooding.
- Determination of any sources of flood risk.
- Whether the proposals will increase the risk of flooding elsewhere.

- Details of how any flood risk will be managed so that the development remains safe.
- Any recommended mitigation measures.

The Environment Agency (EA) flood risk maps has been assessed through the Environment Agency website. The flood map shows that the development is located in flood zone 2. The flood map is shown below. As the site is within flood zone 2, consultation to obtain more detailed flood data has been undertaken with the EA.

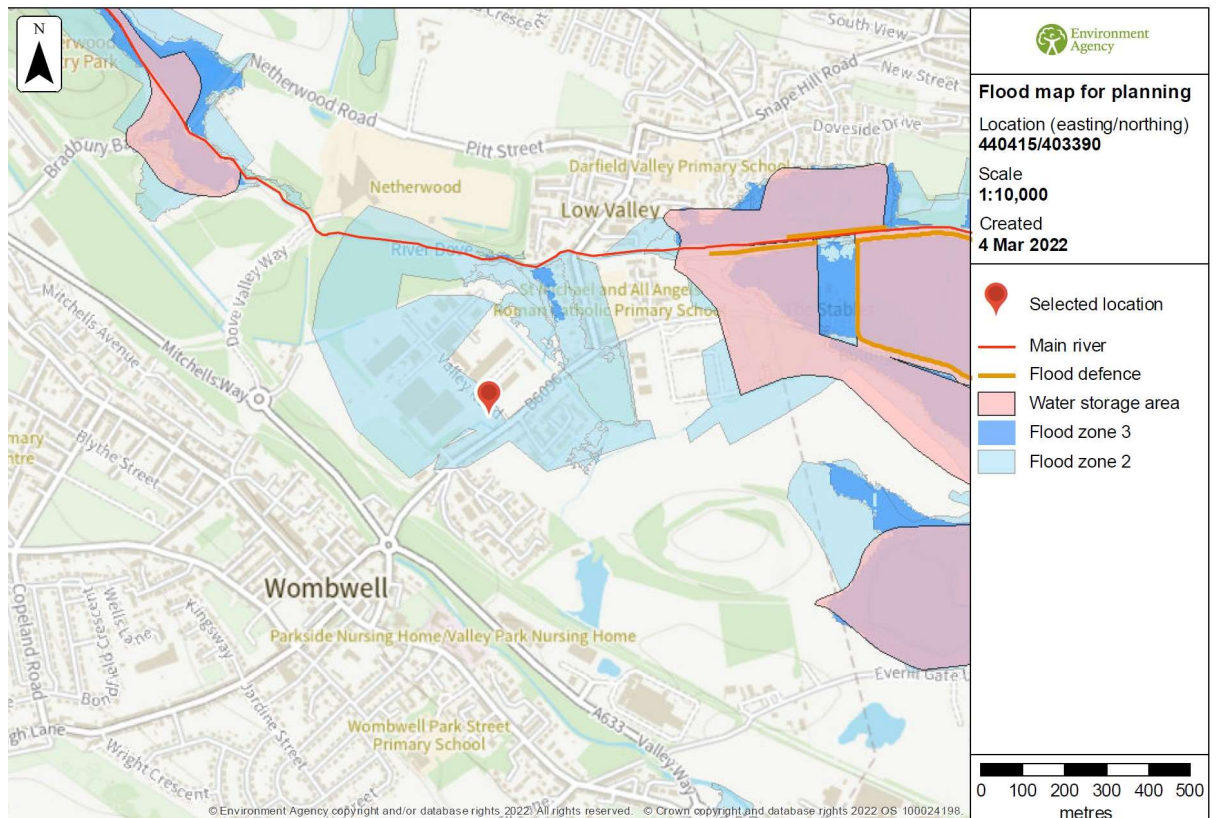


#### FLOOD MAP FOR PLANNING – WEB VERSION

The Barnsley Strategic Flood Risk Assessment (SFRA) and the Barnsley MBC Preliminary Flood Risk Assessment have also been reviewed in the preparation of the FRA and any pertinent information included within this FRA.

#### 4. FLOOD MAP

The Environment Agency (EA) have provided a more detailed flood map of the area and this is reproduced below.



**EA FLOOD MAP**

The proposed development is with flood zone 2 that has some risk of flooding from the adjacent River Dove.

**5. FLOOD RISK VULNERABILITY**

The proposed development is car parking and service areas. The EA class this type of development as less vulnerable. Using the EA flood risk vulnerability classification (shown below) determines that the type of development proposed is suitable for this location and flood zone.

The site is in flood zone 2 and the development is less vulnerable. Therefore, the type of development is appropriate for this location and no sequential test or exception test is required for this development site.

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

Key:

✓ Development is appropriate

✗ Development should not be permitted.

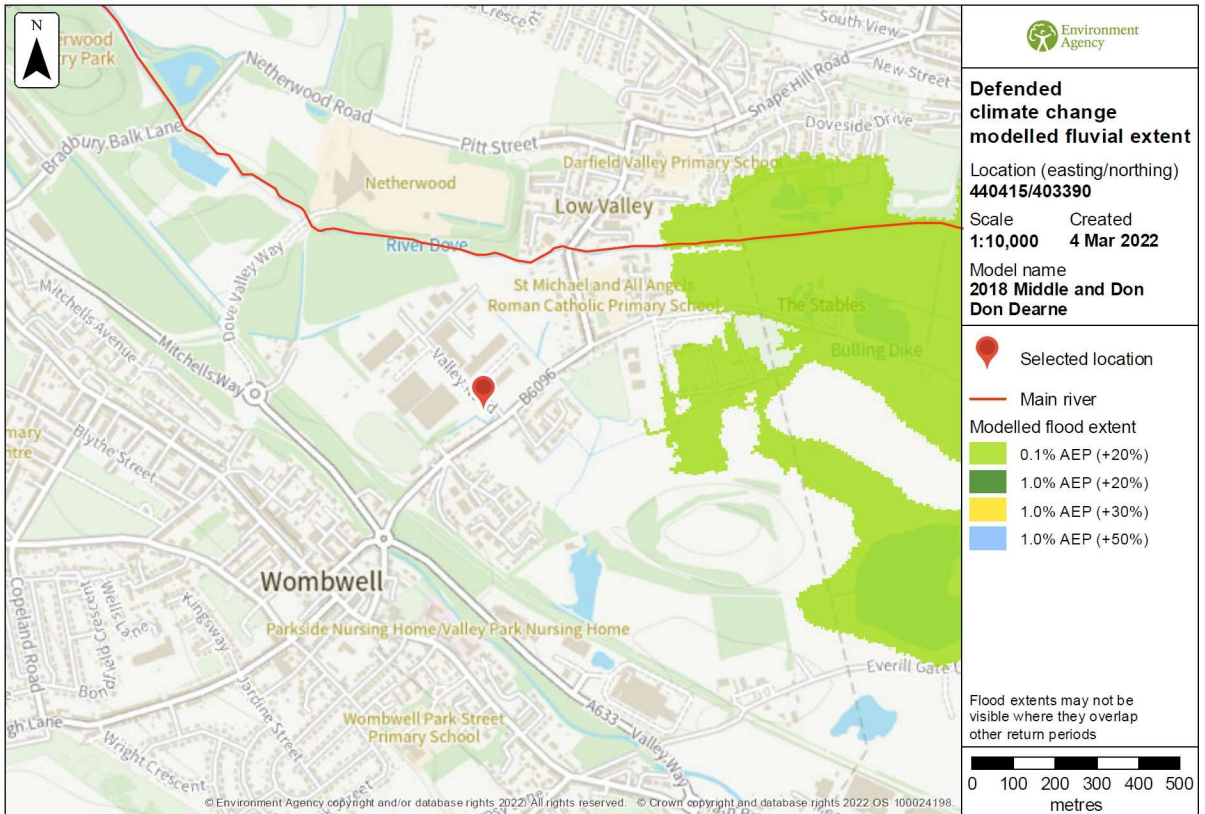
#### EA FLOOD RISK VULNERABILITY CLASSIFICATION

#### 6. RIVER FLOODING

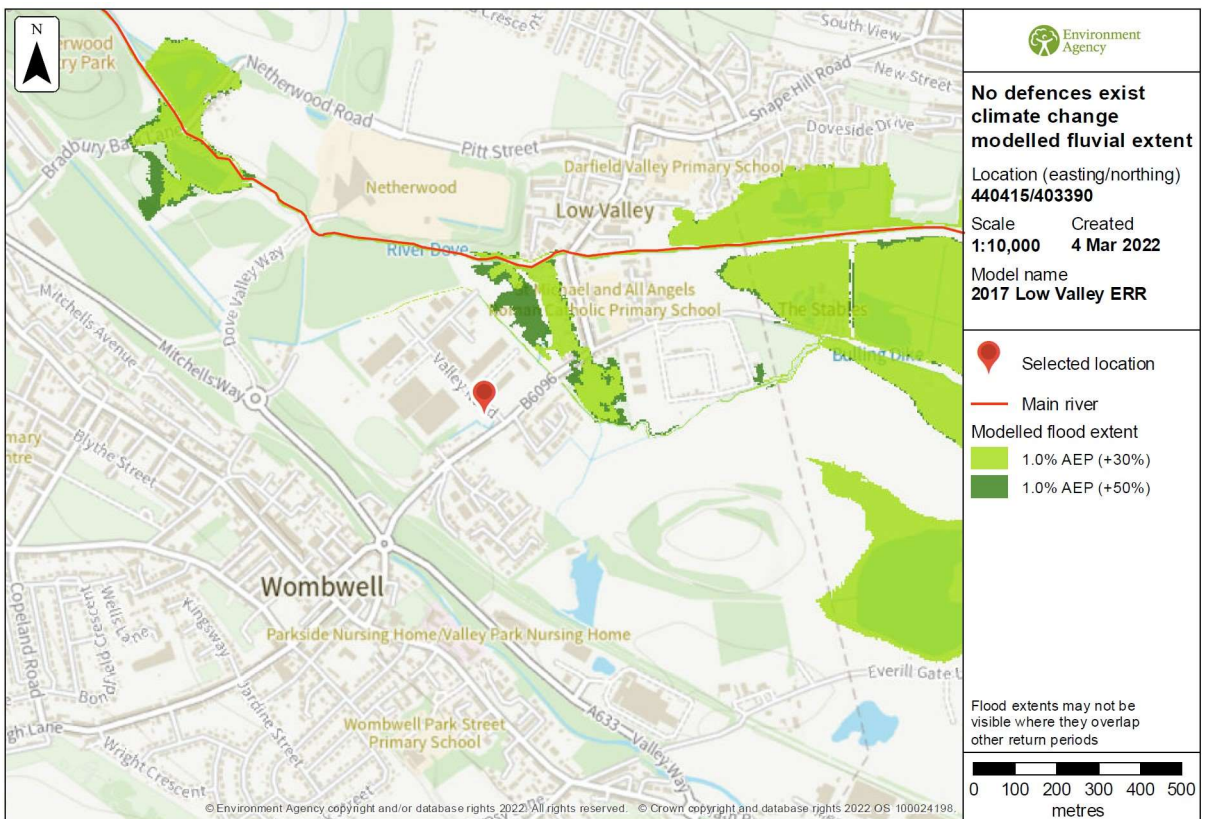
The EA have provided detailed flood modelling outputs for the area of the proposed developments. The full detail of all the EA information is attached to this report as Appendix A.

The design standard for flood risk to a proposed development is 1 in 100 year event plus climate change. The EA have provided modelled scenarios for both the defended flood risk and the undefended flood risk. Both of these scenarios provide climate change additions of up to 50%.

Both of the scenario's show that the development site is not at risk of flooding. Extracts form these two maps are shown below.



**100 YEAR FLOOD – UNDEFENDED SCENARIO**



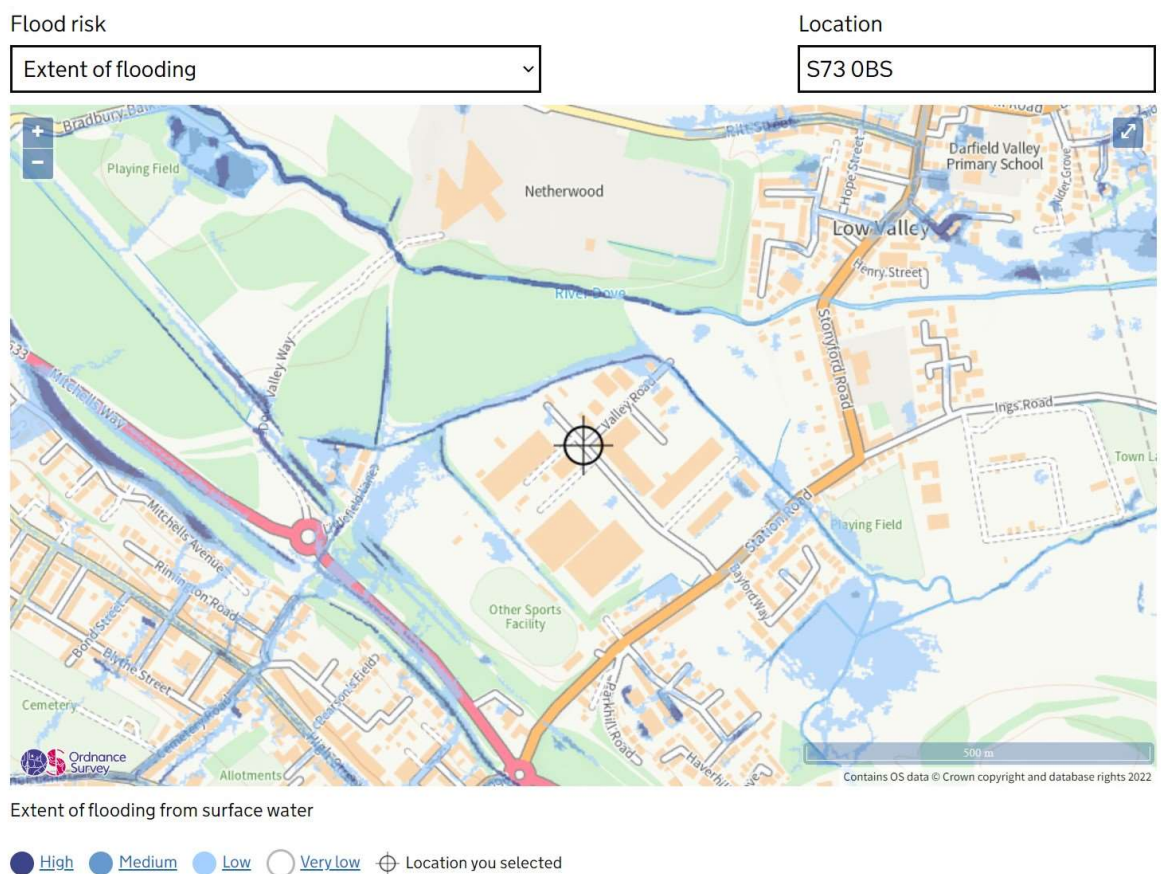
**100 YEAR FLOOD – UNDEFENDED SCENARIO**

## 7. FLOODING FROM SURFACE WATER

The Environment Agency publish on their website details of potential surface water flood areas. These are areas where intense rainfall or other events causes overland flow before water entering a watercourse or sewer.

The Surface Water flood map for the development site shows that there is generally no potential for surface water flooding. There is very minor (low probability) of a small extend of flooding, but as the proposal is a car park, should be considered as negligible risk.

The surface water flood map is shown below.

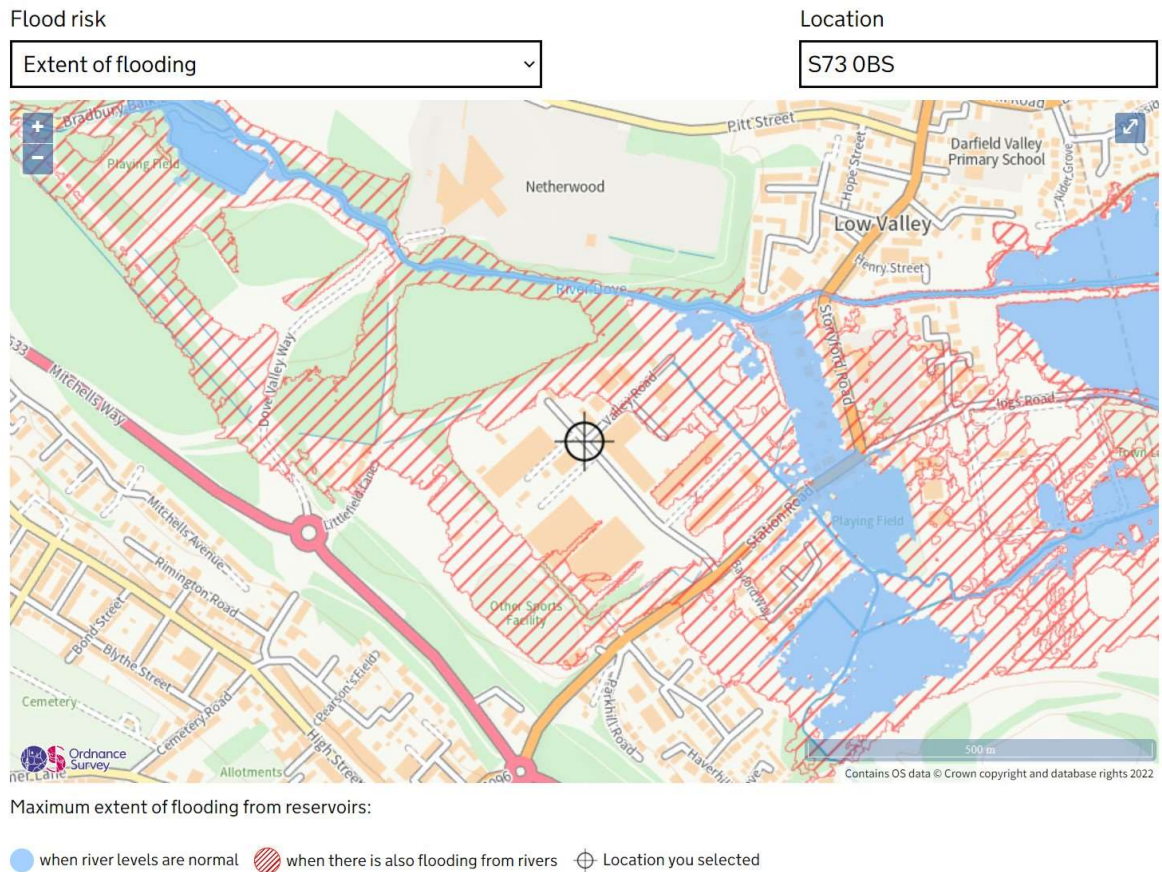


### EA SURFACE WATER FLOOD MAP

## 8. FLOODING FROM RESERVOIRS

The flood risk from reservoirs is very small and unlikely to happen. The EA publish flood risk maps for areas that may be affected by a reservoir failure. The risk from reservoir flooding is very low and the map is shown here for completeness only, but

does show the area is generally not affected by a possible reservoir failure. Some small areas of flooding may extend into the proposed car park, but this would be at the very edge of possible flooding and as this is a car park, should be considered as negligible risk.



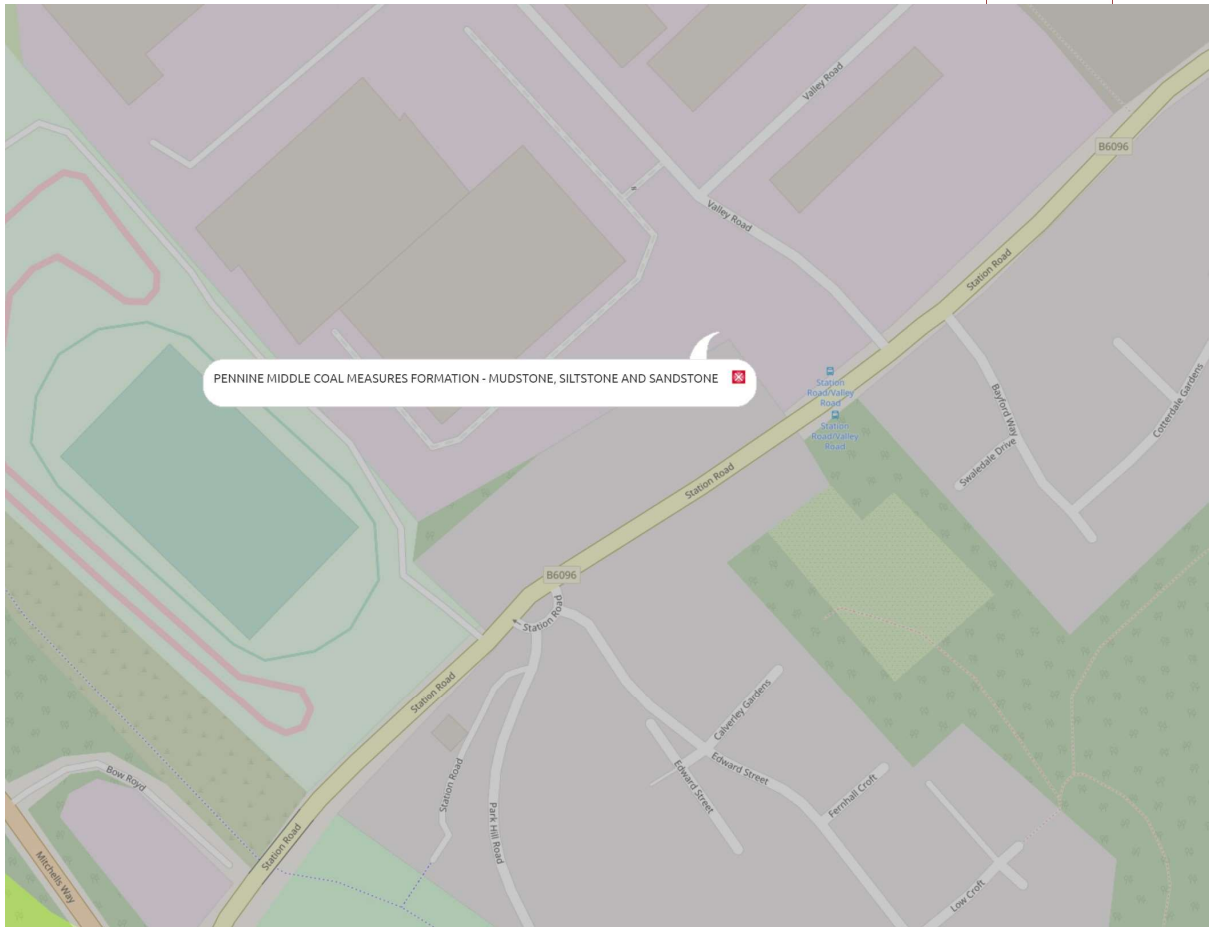
## EA RESERVOIR FLOODING MAP

### 9. GROUNDWATER FLOODING

Ground water flooding usually occurs in low lying areas underlain by permeable rock and aquifers that allow groundwater to rise to the surface through the permeable subsoil following long periods of wet weather. Low lying areas may be more prone to flooding because the water table is usually at a much shallower depth and groundwater paths tend to travel from high to low ground.

The site is not low lying. The underlying geology is Coal Formations – Mudstone, siltstone and sandstone and so not subject to potential ground water flooding.

A map of the geology of this area is shown below.

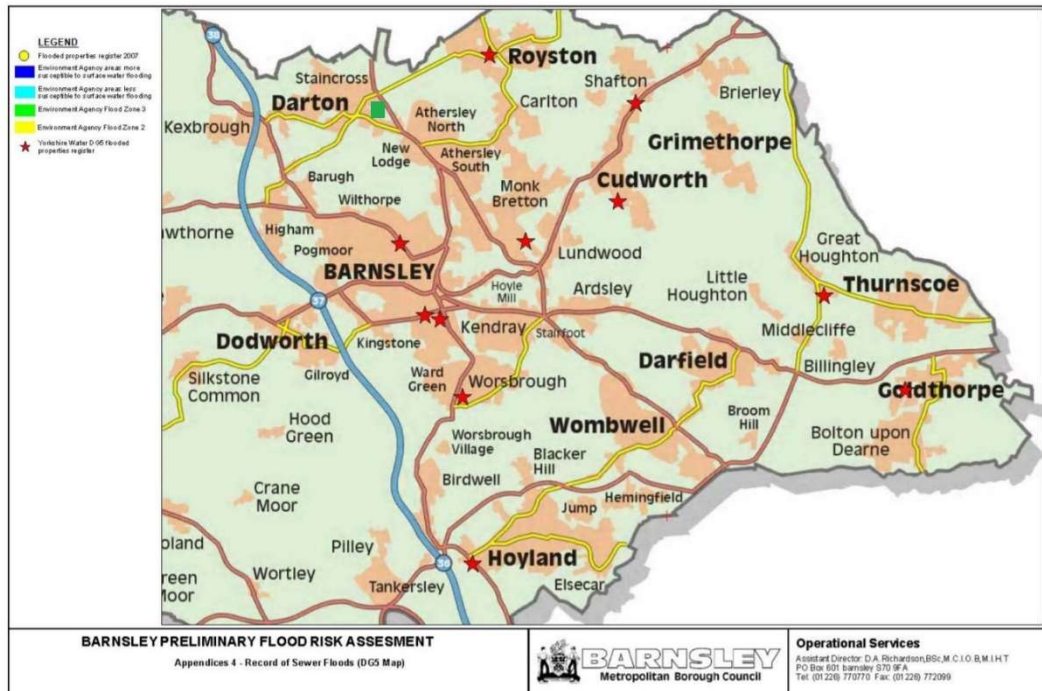


**MAP OF SITE GEOLOGY**

## 10. SEWER FLOODING

The Barnsley Preliminary Flood Risk Assessment has published locations of recorded sewer flood incidents that have affected housing. An extract from the map is shown below with the sewer flooding locations shown as red stars and the proposed development site shown a green square.

No flood incidents have been recorded on or close to the development site.



**Appendix 4**

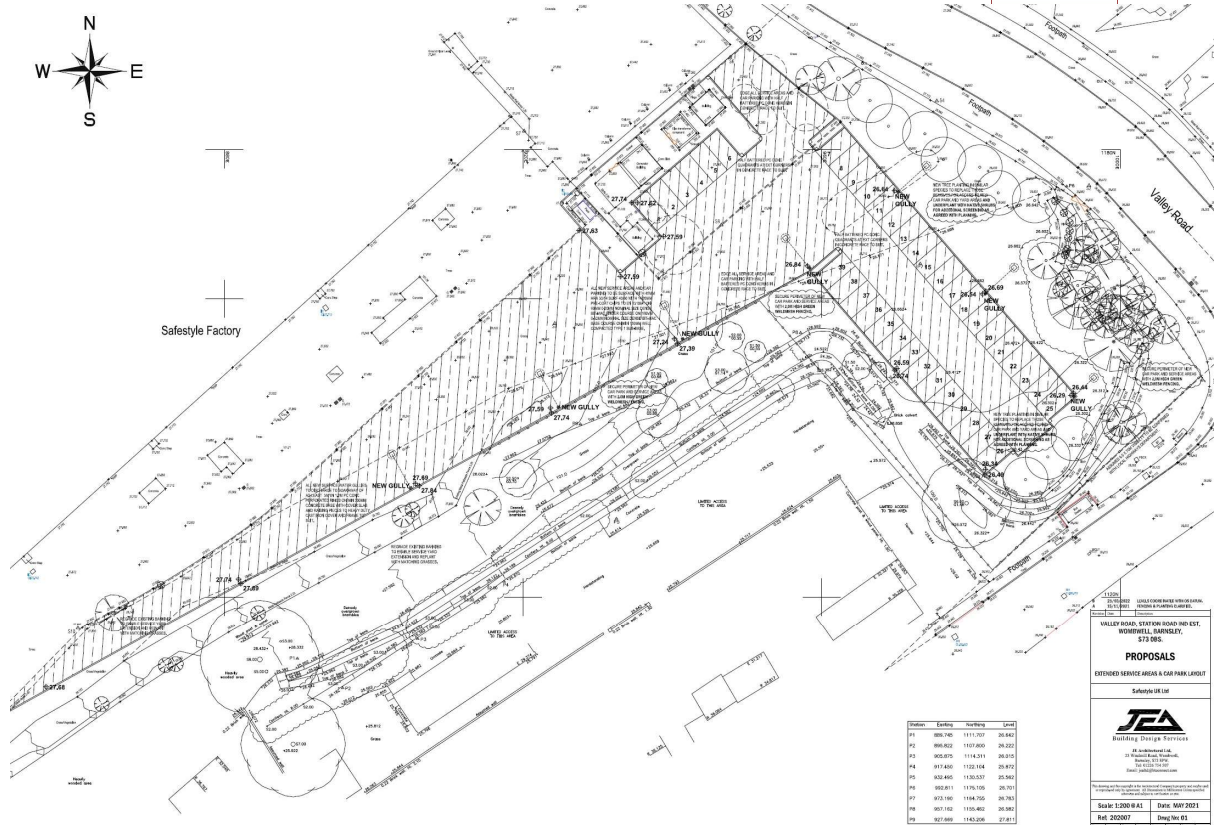
**MAP OF RECORDED SEWER FLOODING INCIDENTS**

There is a foul public sewer running through the site and to avoid any flood risk to this sewer, it has been requested that no surface water be connected to this foul sewer for the new development. This will be adhered to with a new and separate surface water system being used to drain the new development.

**11. SURFACE WATER RUN-OFF**

The pre-development site is a grassed area adjacent to the Safestyle Uk factory. The post development scheme will be surfaced to provide car park and service provision. This area will be drained to soakaways and so will not increase run-off from site.

A plan of the post-development site is shown below. This shows that the development is to have proposed finished levels of 26.34m AOD to 27.74m AOD, similar to existing ground levels.



## POST-DEVELOPMENT SITE PLAN

### 12. FLOOD RISK ELSEWHERE

The development site will dispose of surface water to soakaways and so not provide any additional surface water run-off from site. As such, this development will not increase flood risk either on or off-site.

### 13. CONCLUSIONS

- This proposed development site is in flood zone 2.
- The type of development proposed is suitable for this location.
- All sources of flood risk have been evaluated and all sources of flood risk should be considered as being LOW and so the proposed development is suitable for this site.
- This development will not increase flood risk on or off site.



Report by

A handwritten signature in blue ink, appearing to read 'Hugh Morris', is displayed on a light green rectangular background.

Hugh Morris

BSc CEng MICE

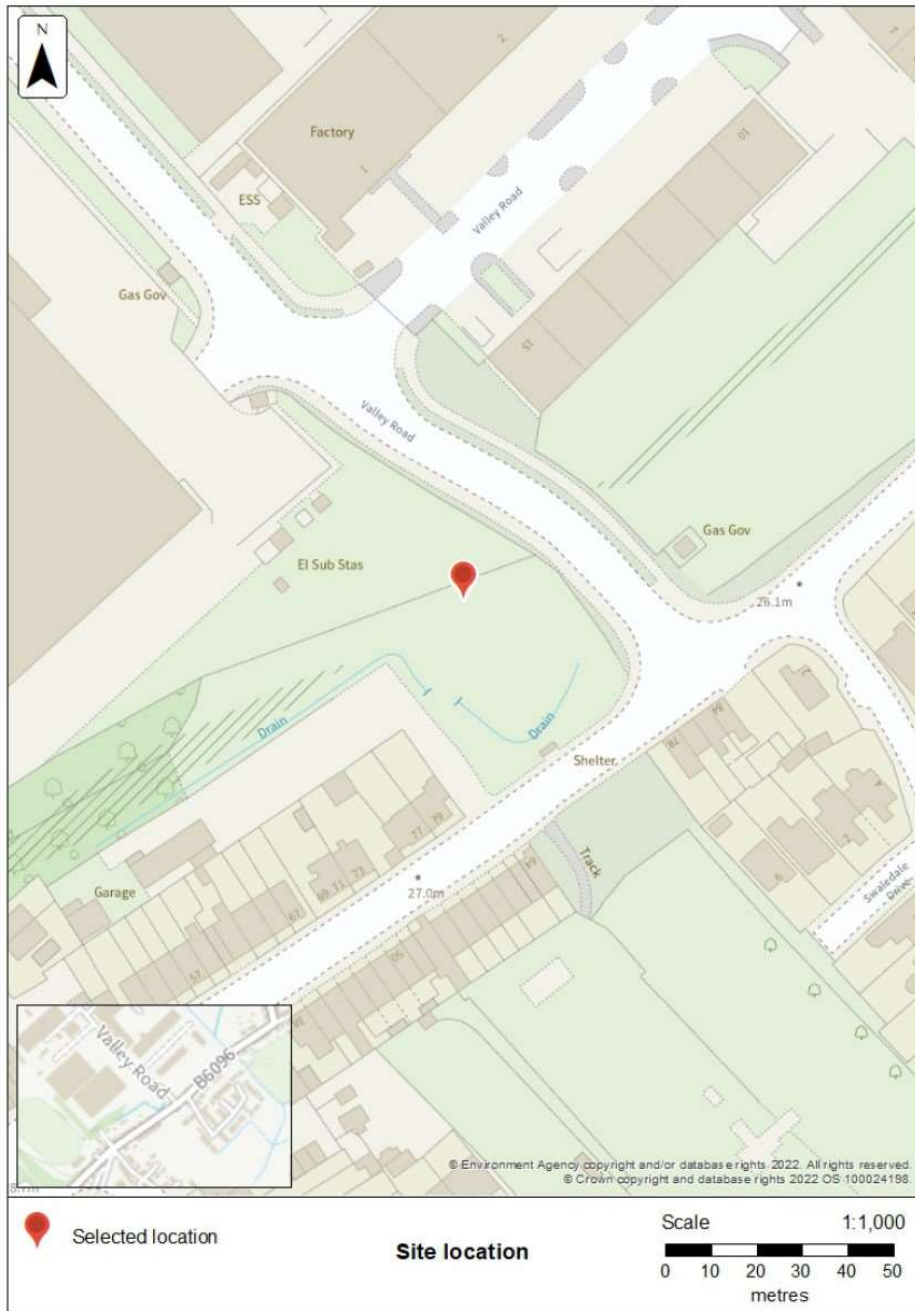
29<sup>th</sup> March 2022

## APPENDIX A – ENVIRONMENT AGENCY CONSULTATION DOCUMENTS

# Flood risk assessment data

**Location of site:** 440415 / 403390 (shown as easting and northing coordinates)  
**Document created on:** 4 March 2022  
**This information was previously known as a product 4.**  
**Customer reference number:** 6DV438XB2T86

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)
- historic flooding
- flood defences and attributes
- modelled data
- climate change 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

Use the [long term flood risk service](#) to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

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

## About the models used

Model name: 2017 Low Valley ERR

Scenario(s): No defences exist fluvial, no defences exist climate change fluvial

Date: 31 January 2017

Model name: 2018 Middle and Lower Don - Don Dearne

Scenario(s): Defended fluvial, defences removed fluvial, defended climate change fluvial

Date: 1 March 2020

Model name: EA12313 S105/2003 River Don Flood Model

Scenario(s): Defended fluvial

Date: 14 June 2004

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 2.

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

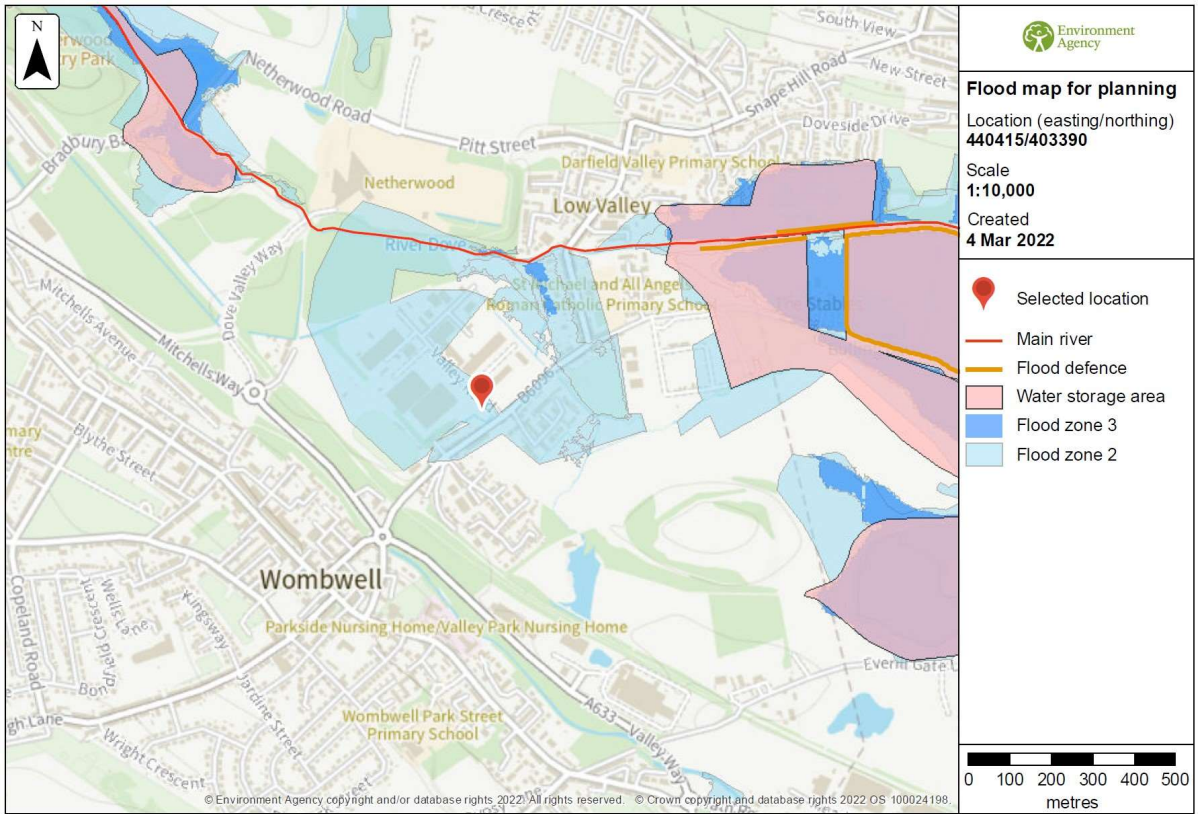
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- 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.



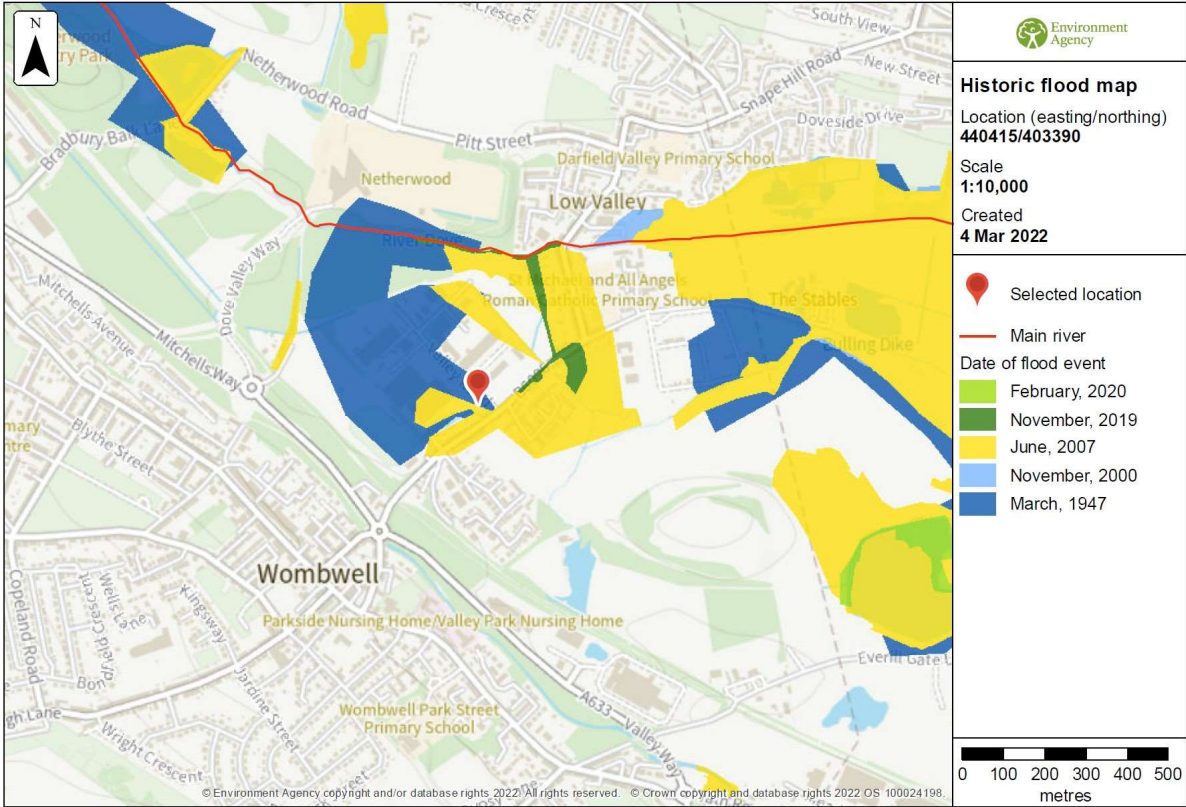
## Historic flooding

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](#)

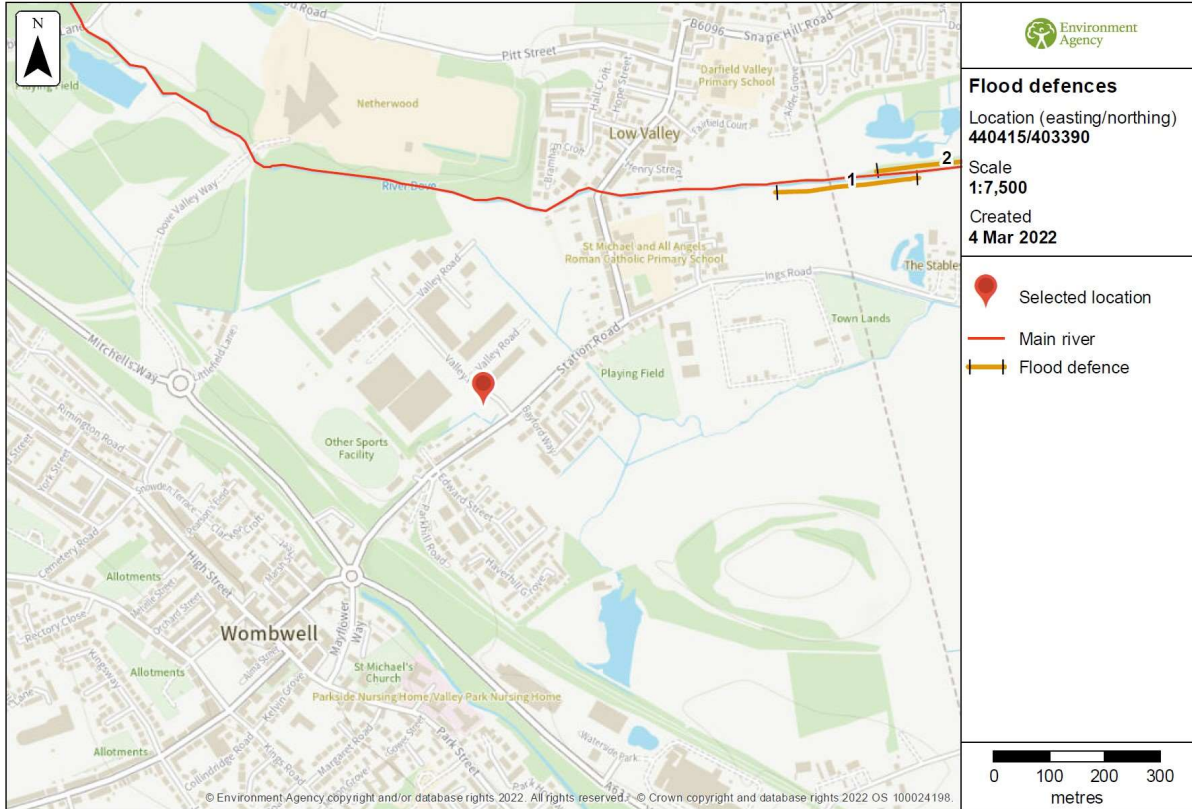


## **Flood defences and attributes**

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

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

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



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**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	25390	embankment	30	Fair	23.66	25.31	
2	51226	embankment	30		23.00	22.89	

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

## Modelled data

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

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

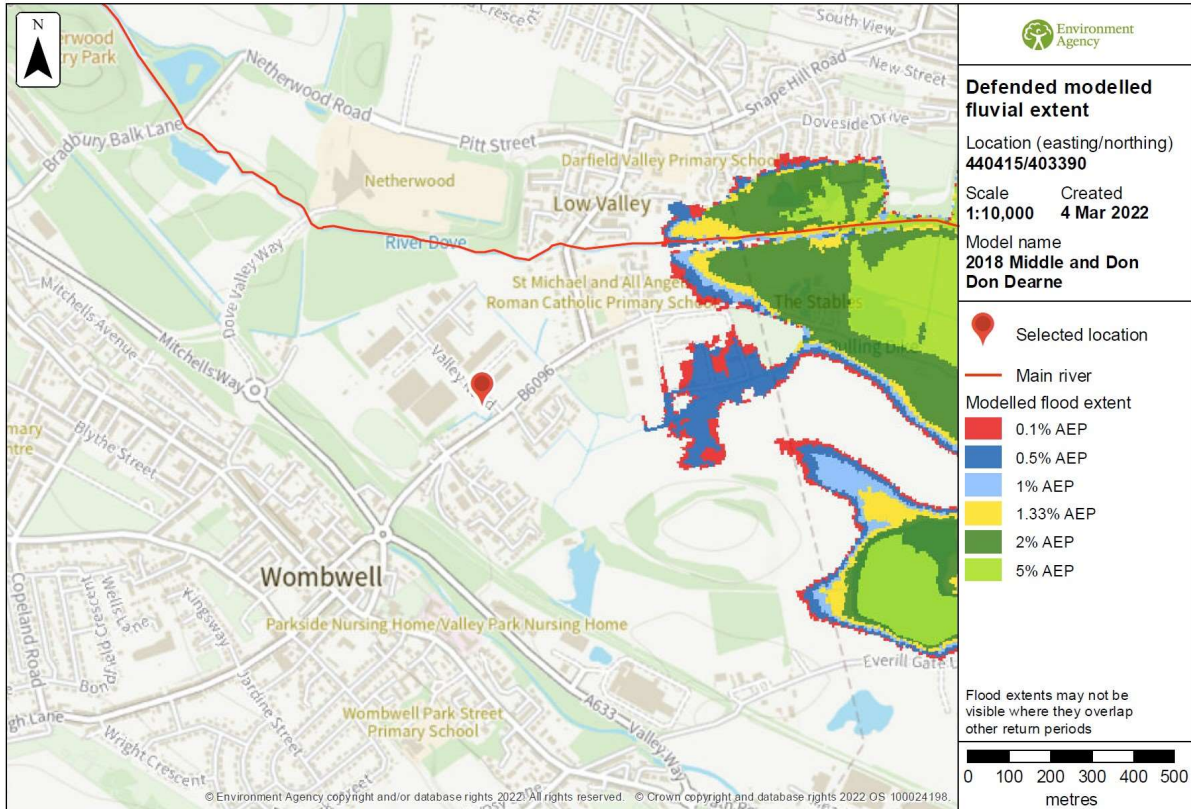
The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

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.

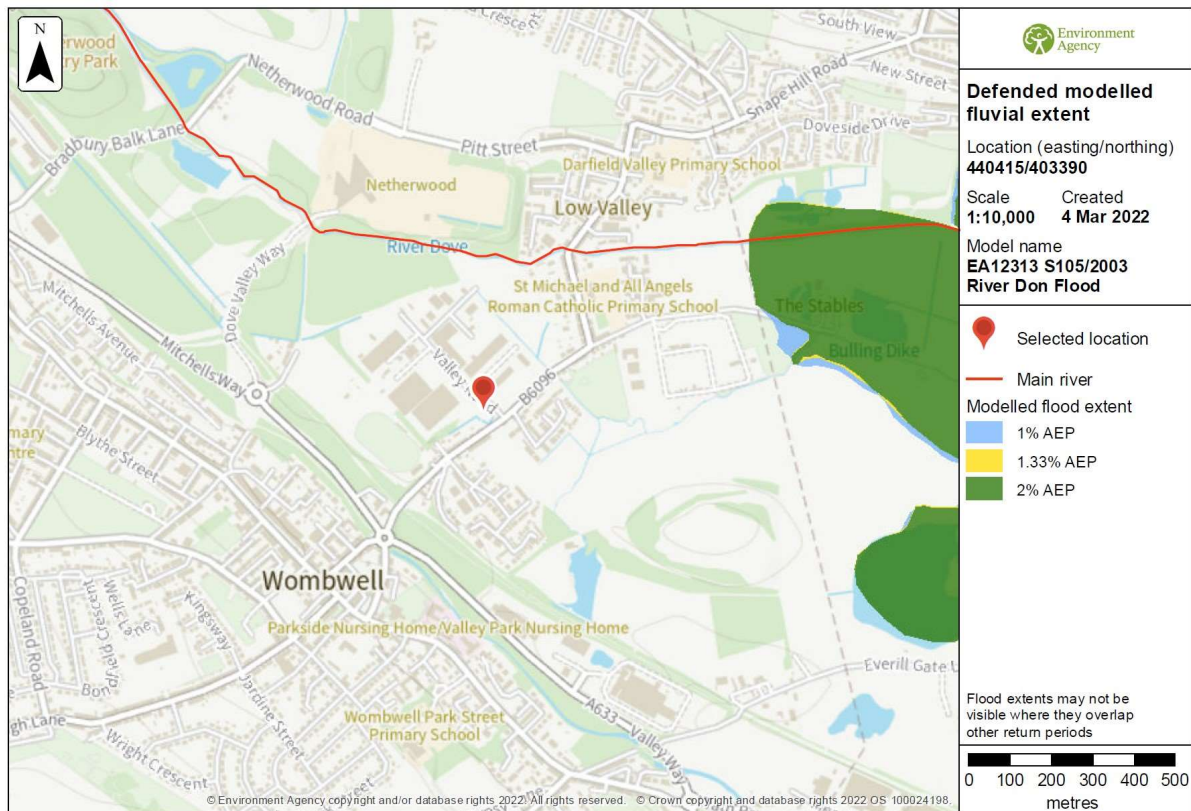
## Modelled scenarios

The following scenarios are included:

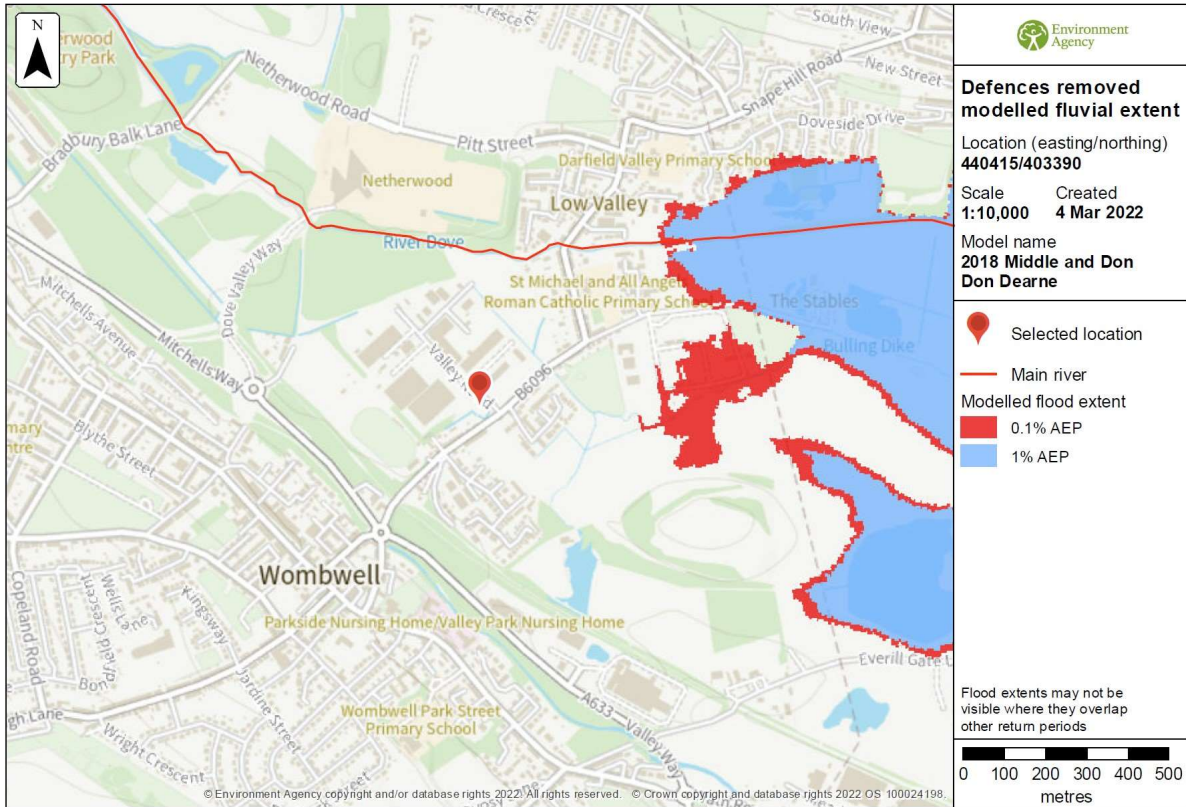
- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- No defences exist modelled fluvial: risk of flooding from rivers where there are no flood defences
- Defended 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



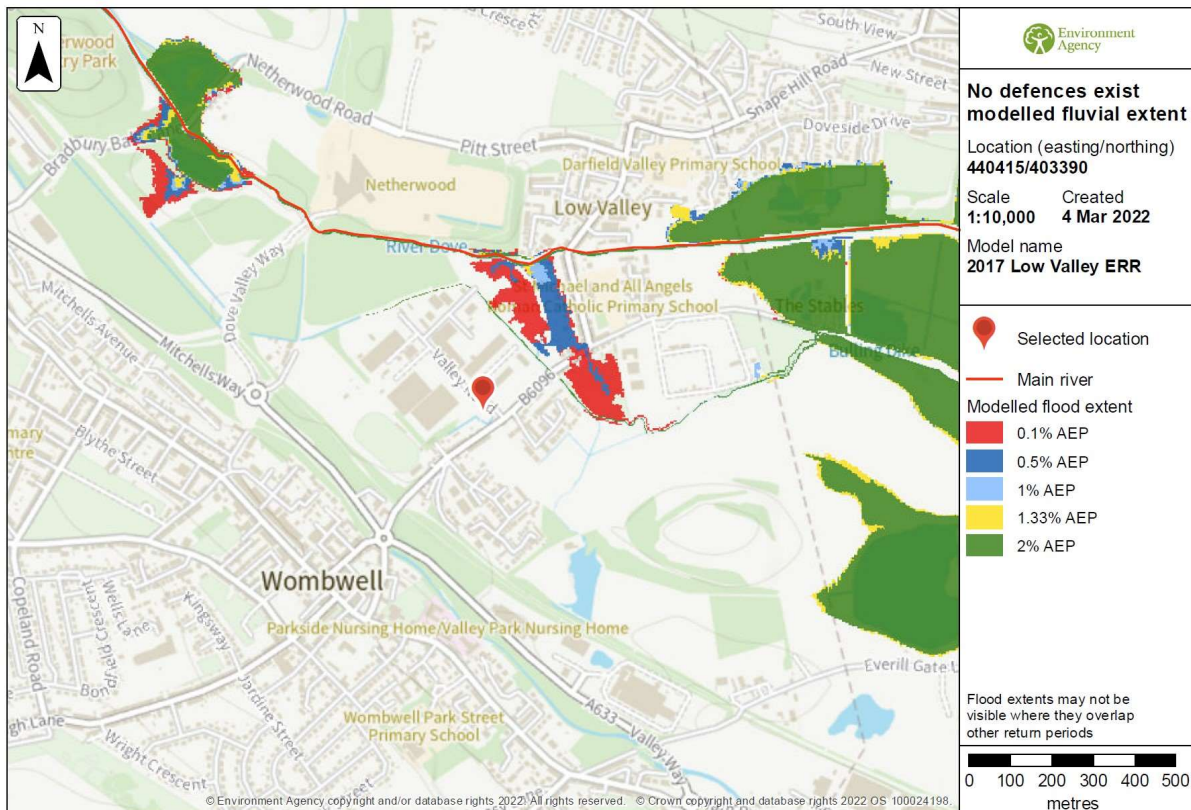
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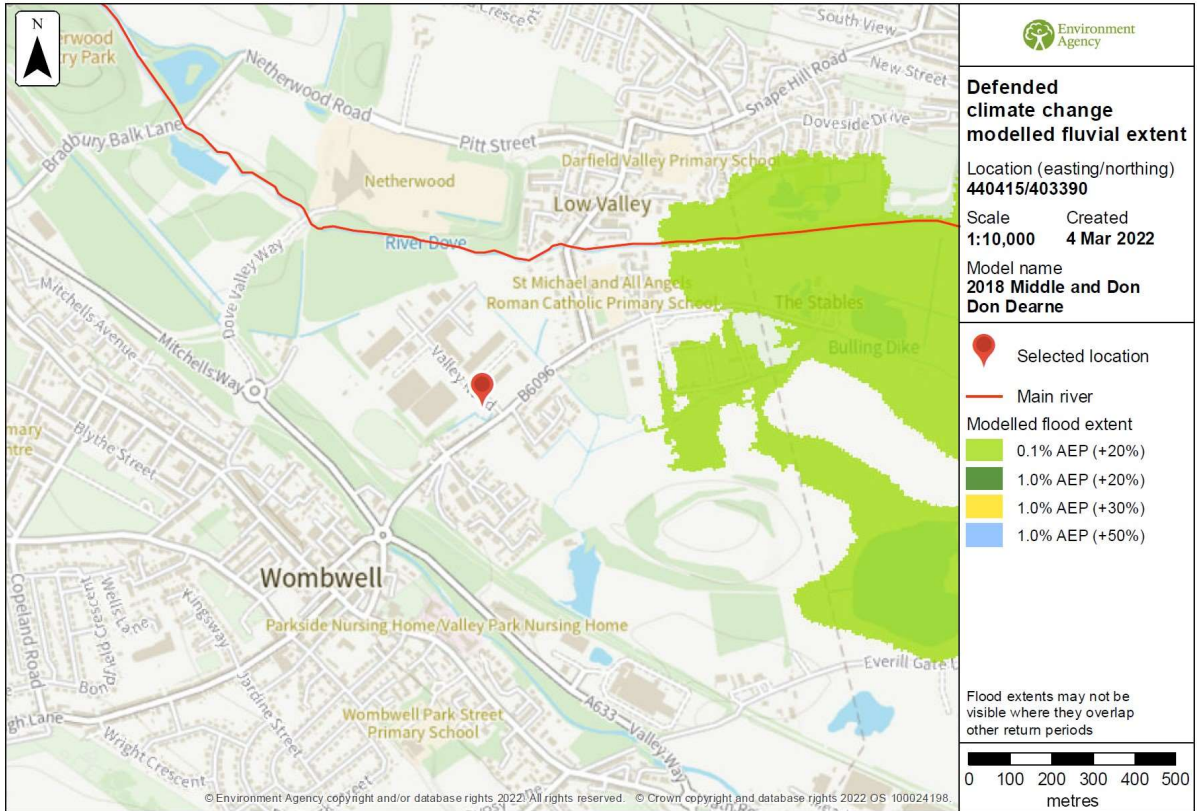
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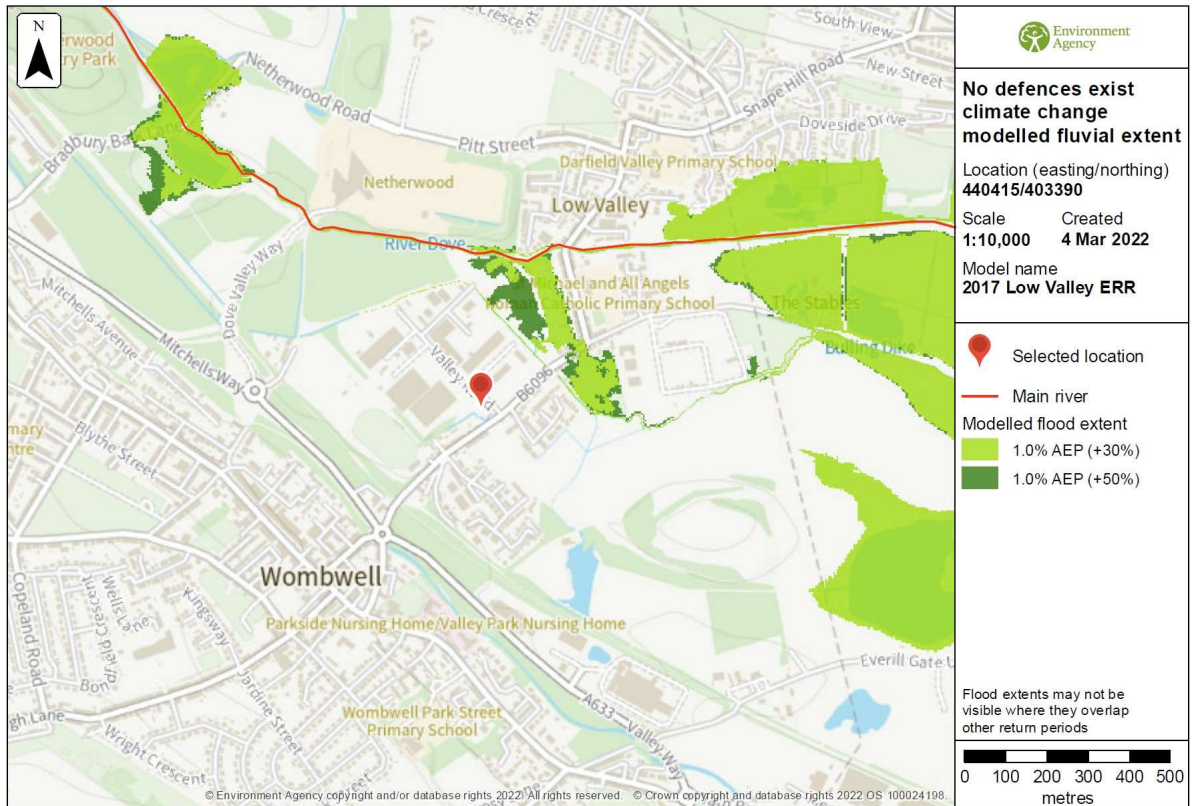
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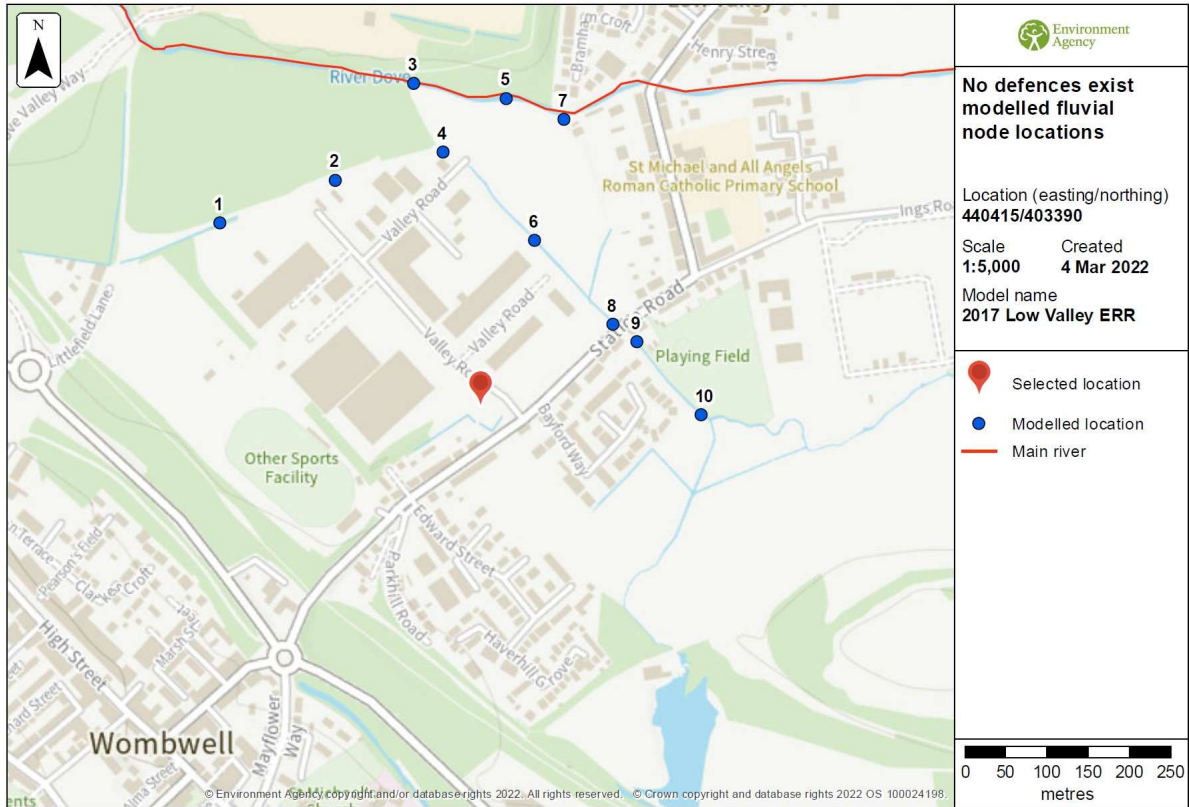
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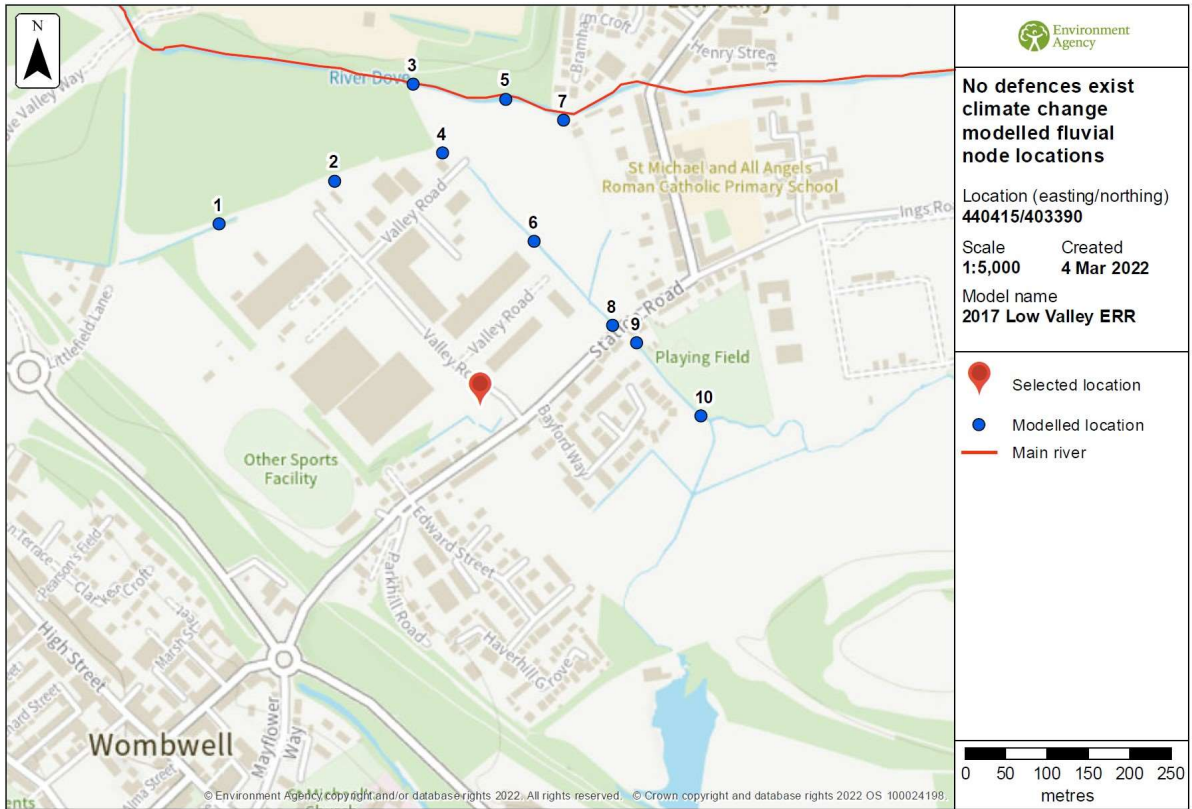


**Modelled node locations data**

**No defences exist**

Label	Modelled location ID	Easting	Northing	4% 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	1129061	440098	403611	24.85	0.63	25.02	0.93	25.10	1.09	25.16	1.21	25.31	1.50	25.73	2.41
2	1129085	440238	403663	24.74	0.64	24.90	0.93	24.98	1.09	25.04	1.21	25.20	1.50	25.64	2.40
3	1129063	440334	403780	26.61	12.39	26.62	12.58	26.71	14.02	26.78	14.93	26.92	17.48	27.12	22.22
4	1129044	440369	403697	24.54	1.15	24.67	1.58	24.74	1.84	24.79	2.02	24.90	2.48	25.17	3.94
5	1129072	440447	403763	26.26	12.31	26.27	12.55	26.37	13.58	26.44	14.44	26.58	16.43	26.76	19.38
6	1129048	440480	403589	24.44	1.15	24.57	1.58	24.64	1.84	24.69	2.02	24.80	2.48	25.06	3.94
7	1129059	440517	403737	25.94	12.36	25.95	12.56	26.06	13.93	26.12	14.84	26.27	16.95	26.46	19.65
8	1129070	440576	403488	24.18	1.15	24.28	1.58	24.34	1.83	24.37	2.02	24.47	2.47	24.79	3.94
9	1129034	440605	403467	24.08	1.15	24.20	1.58	24.26	1.84	24.30	2.02	24.39	2.48	24.65	3.94
10	1129046	440683	403378	23.13	1.15	23.25	1.58	23.32	1.84	23.36	2.02	23.46	2.47	23.76	3.94

Data in this table comes from the 2017 Low Valley ERR 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.



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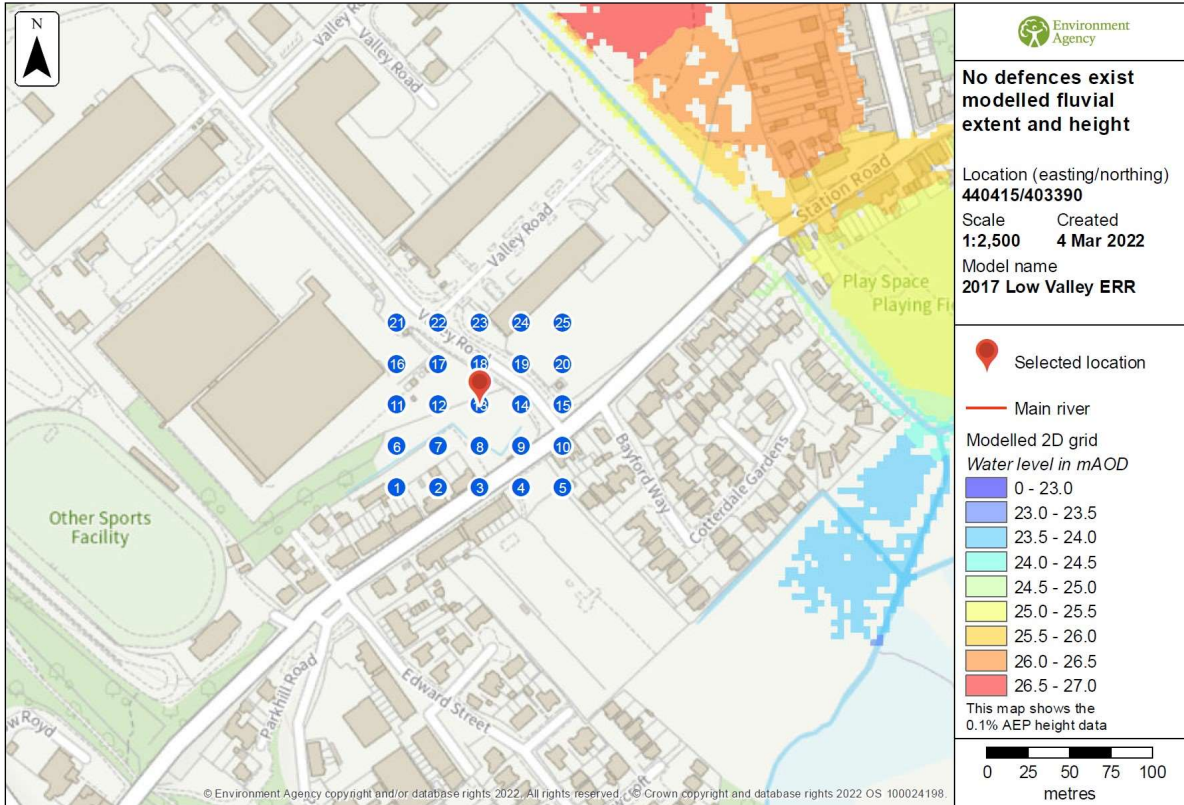
**Modelled node locations data**

**No defences exist climate change**

Label	Modelled location ID	Easting	Northing	1.0% AEP (+30%)		1.0% AEP (+50%)	
				Level	Flow	Level	Flow
1	1129061	440098	403611	25.35	1.57	25.47	1.81
2	1129085	440238	403663	25.24	1.57	25.37	1.80
3	1129063	440334	403780	26.98	18.42	27.14	22.84
4	1129044	440369	403697	24.92	2.62	25.0	3.02
5	1129072	440447	403763	26.65	17.16	26.77	19.93
6	1129048	440480	403589	24.82	2.62	24.96	3.02
7	1129059	440517	403737	26.34	17.86	26.47	20.15
8	1129070	440576	403488	24.50	2.62	24.68	3.10
9	1129034	440605	403467	24.42	2.62	24.60	3.10
10	1129046	440683	403378	23.48	2.62	23.71	3.48

Data in this table comes from the 2017 Low Valley ERR 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.

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**Sample point data**

**No defences exist**

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	440365	403340							NoData	NoData			NoData	NoData
2	440390	403340							NoData	NoData			NoData	NoData
3	440415	403340							NoData	NoData			NoData	NoData
4	440440	403340							NoData	NoData			NoData	NoData
5	440465	403340							NoData	NoData			NoData	NoData
6	440365	403365							NoData	NoData			NoData	NoData
7	440390	403365							NoData	NoData			NoData	NoData
8	440415	403365							NoData	NoData			NoData	NoData
9	440440	403365							NoData	NoData			NoData	NoData
10	440465	403365							NoData	NoData			NoData	NoData
11	440365	403390							NoData	NoData			NoData	NoData
12	440390	403390							NoData	NoData			NoData	NoData
13	440415	403390							NoData	NoData			NoData	NoData
14	440440	403390							NoData	NoData			NoData	NoData
15	440465	403390							NoData	NoData			NoData	NoData
16	440365	403415							NoData	NoData			NoData	NoData

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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	440390	403415							NoData	NoData			NoData	NoData
18	440415	403415							NoData	NoData			NoData	NoData
19	440440	403415							NoData	NoData			NoData	NoData
20	440465	403415							NoData	NoData			NoData	NoData
21	440365	403440							NoData	NoData			NoData	NoData
22	440390	403440							NoData	NoData			NoData	NoData
23	440415	403440							NoData	NoData			NoData	NoData
24	440440	403440							NoData	NoData			NoData	NoData
25	440465	403440							NoData	NoData			NoData	NoData

Data in this table comes from the 2017 Low Valley ERR 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 Yorkshire Environment Agency team at [neyorkshire@environment-agency.gov.uk](mailto: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