

Product 4 (Detailed Flood Risk) for Grundon Depot, Banbury

Our Ref: THM_31184

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

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

Product 4 includes the following information:

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

A table showing:

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

Please note:

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

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

This information is provided subject to the enclosed notice which you should read.

This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at

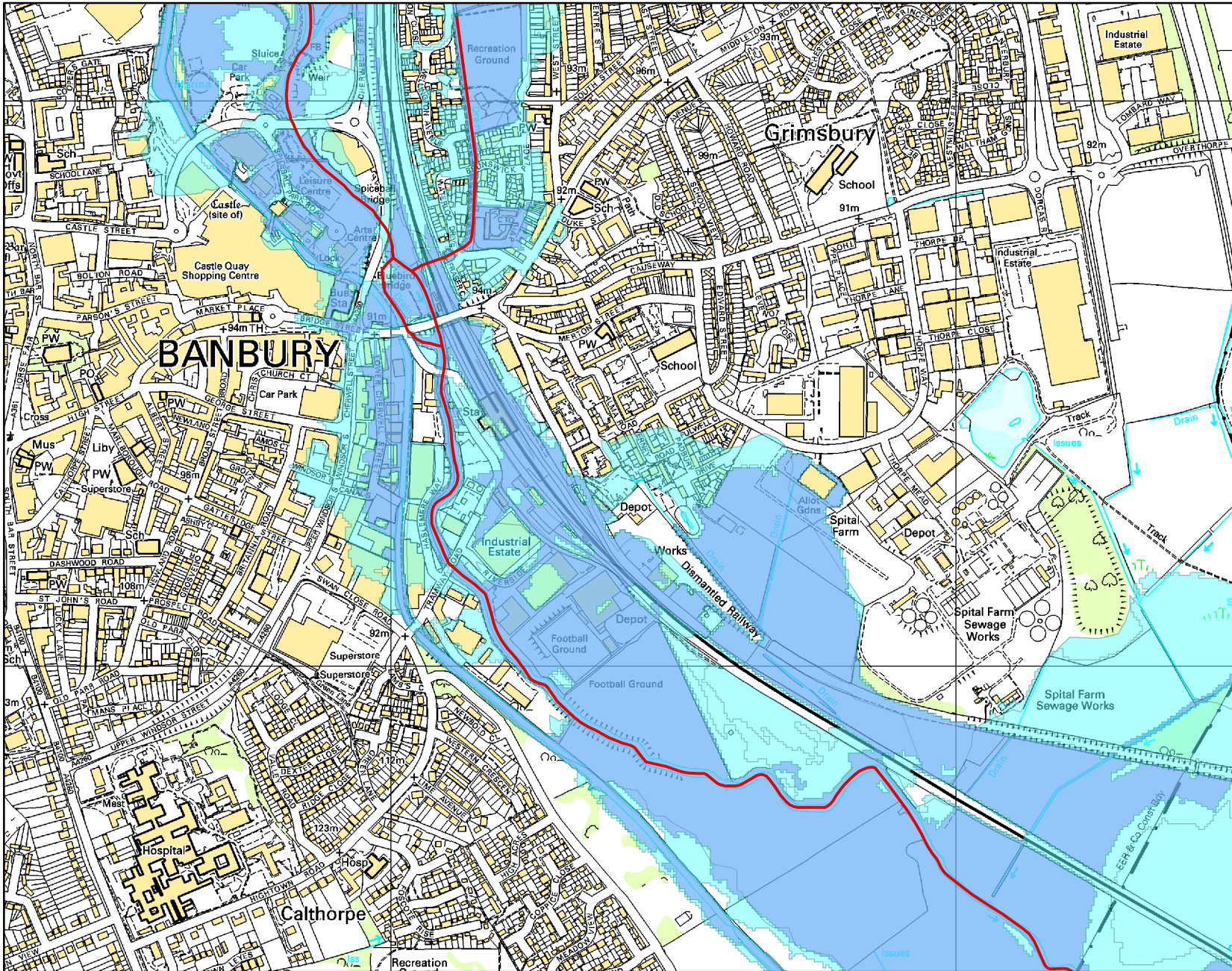
<http://www.environment-agency.gov.uk/research/planning/82584.aspx>

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

<http://www.environment-agency.gov.uk/research/planning/33580.aspx>

Flood Map for Planning centred on: Grundon Depot, Banbury

Created on 07/12/2016 REF: THM_31184



Kilometres
0 0.09 0.18

Legend

- Main River
- Flooding from rivers or sea (FZ3)
- Extent of extreme flood (FZ2)

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Defence information

Defence Location:

Description: This location is offered protection from the Banbury Flood Alleviation Scheme. This consists of a large flood storage area to the north west of the town, as well as various bunds and walls throughout the town. These are maintained by the Environment Agency and some private owners. The site will be offered up to 1 in 200 year protection (0.5% chance of occurring annually). There are no other planned defences in this area.

Model information

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Model: Cherwell (Banbury) 2015

Description: The information provided is taken from the River Cherwell modelling study completed in September 2015 for the Banbury Flood Alleviation Scheme As-Constructed investigations. The study was carried out using ISIS-TUFLOW software. The model covers the River Cherwell from Cropredy to Kings Sutton and the lower section of the Hanwell Brook in Banbury.

Model design runs:

Undefended: 1 in 5 / 20% AEP, 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; 1 in 100+20% / 1% AEP with climate change, 1 in 200 / 0.5% AEP and 1 in 1000 / 0.1% AEP

Defended: 1 in 5 / 20% AEP, 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; 1 in 100+20% / 1% AEP with climate change, 1 in 200 / 0.5% AEP and 1 in 1000 / 0.1% AEP

Mapped Outputs:

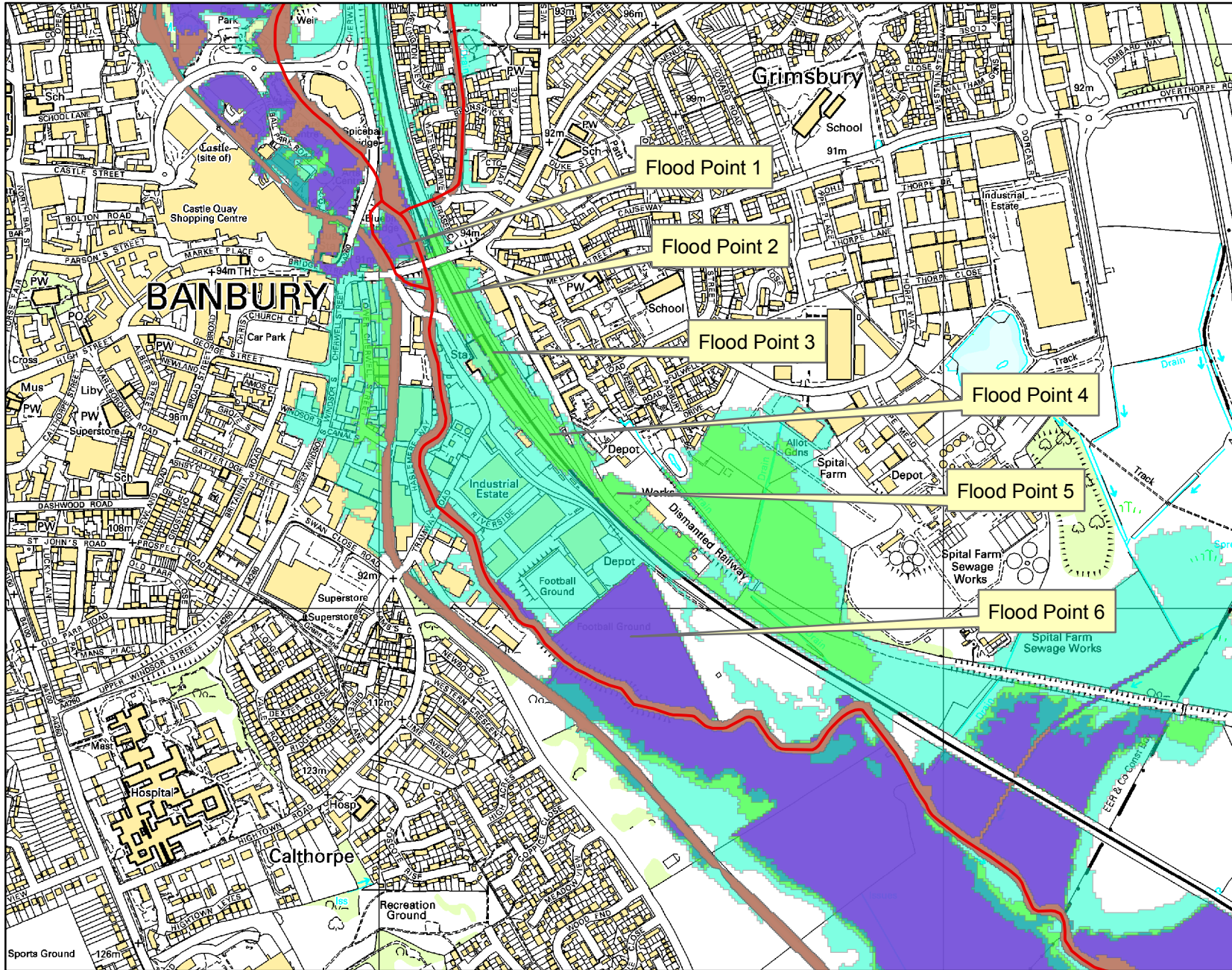
1 in 5 / 20% AEP, 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; 1 in 100+20% / 1% AEP with climate change, 1 in 200 / 0.5% AEP and 1 in 1000 / 0.1% AEP

Model accuracy:

Levels \pm 250mm

Defended Model FRA Map centred on: Grundon Depot, Banbury

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0 0.09 0.18

Legend

- Main River
- 20% AEP Modelled Extent
- 5% AEP Modelled Extent
- 1% AEP Modelled Extent
- 0.5% AEP Modelled Extent
- 0.1% AEP Modelled Extent

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year

1%CC = 1% Climate Change extent
This is the 1% AEP event with an allowance for climate change (+20% on river flows)

Defended modelled floodplain flood levels

THM_31184

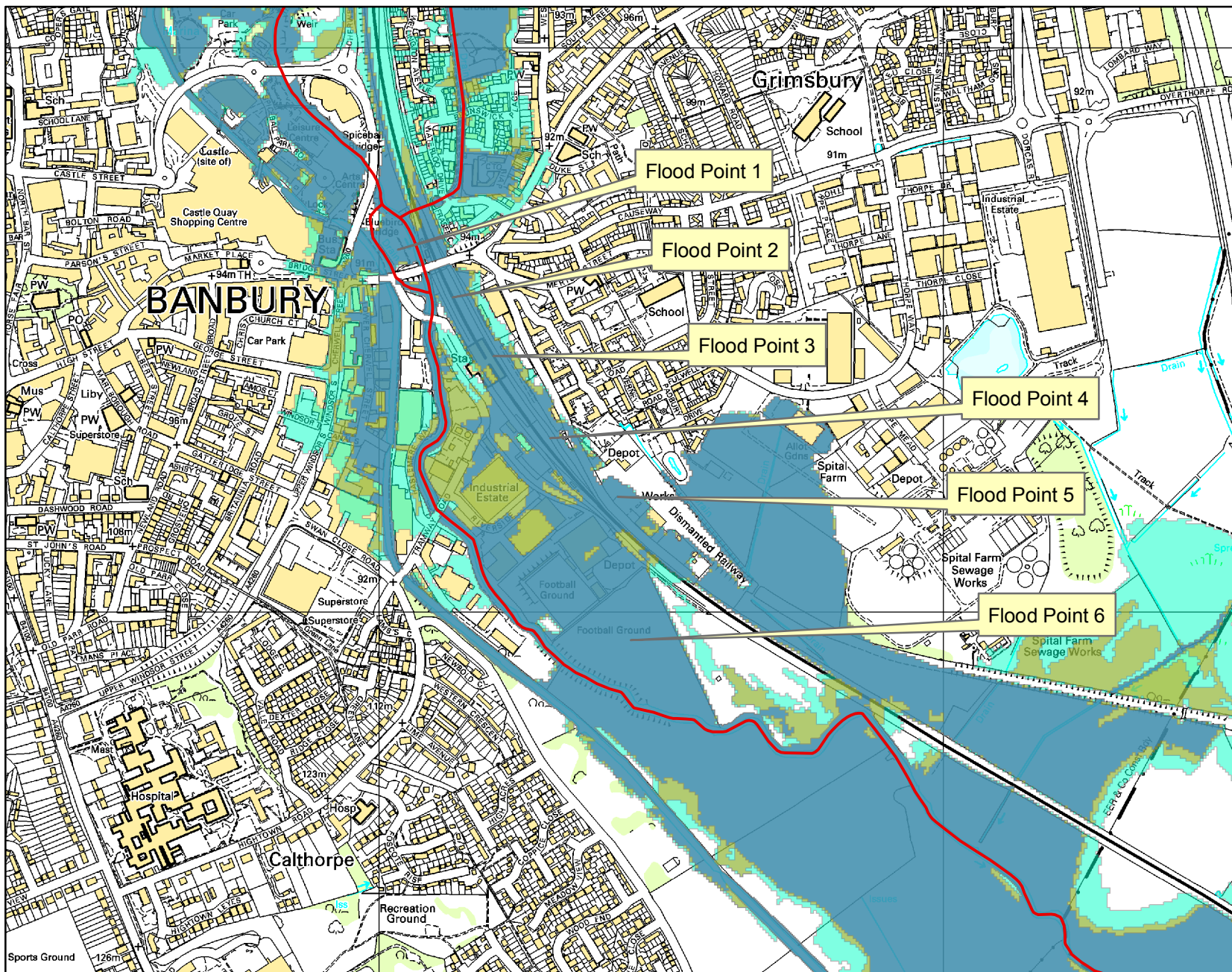
The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

2D grid cell reference	Model	Easting	Northing	Defended flood levels (mAOD)					
				20% AEP	5% AEP	1% AEP	1% AEP (+20% on river flows)	0.5%	0.1% AEP
Flood Point 1	Cherwell (Banbury) 2015	446,029	240,645	No data	90.09	90.27	90.52	90.60	91.45
Flood Point 2	Cherwell (Banbury) 2015	446,123	240,567	No data	No data	No data	90.39	90.50	90.33
Flood Point 3	Cherwell (Banbury) 2015	446,198	240,456	No data	No data	No data	No data	90.47	91.14
Flood Point 4	Cherwell (Banbury) 2015	446,299	240,306	No data	No data	No data	90.30	90.39	90.83
Flood Point 5	Cherwell (Banbury) 2015	446,423	240,202	No data	No data	No data	90.16	90.33	90.57
Flood Point 6	Cherwell (Banbury) 2015	446,439	239,945	No data	89.04	89.15	89.28	89.32	89.95

This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Undefended Model FRA Map centred on: Grundon Depot, Banbury

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Kilometres
0 0.09 0.18

Legend

- Main River
- 1% AEP Modelled Extent
- 0.5% AEP Modelled Extent
- 0.1% AEP Modelled Extent

AEP = Annual Exceedance Probability
The probability of a flood of a particular magnitude, or greater, occurring in any given year

1%CC = 1% Climate Change extent
This is the 1% AEP event with an allowance for climate change (+20% on river flows)

Modelled floodplain flood levels

THM_31184

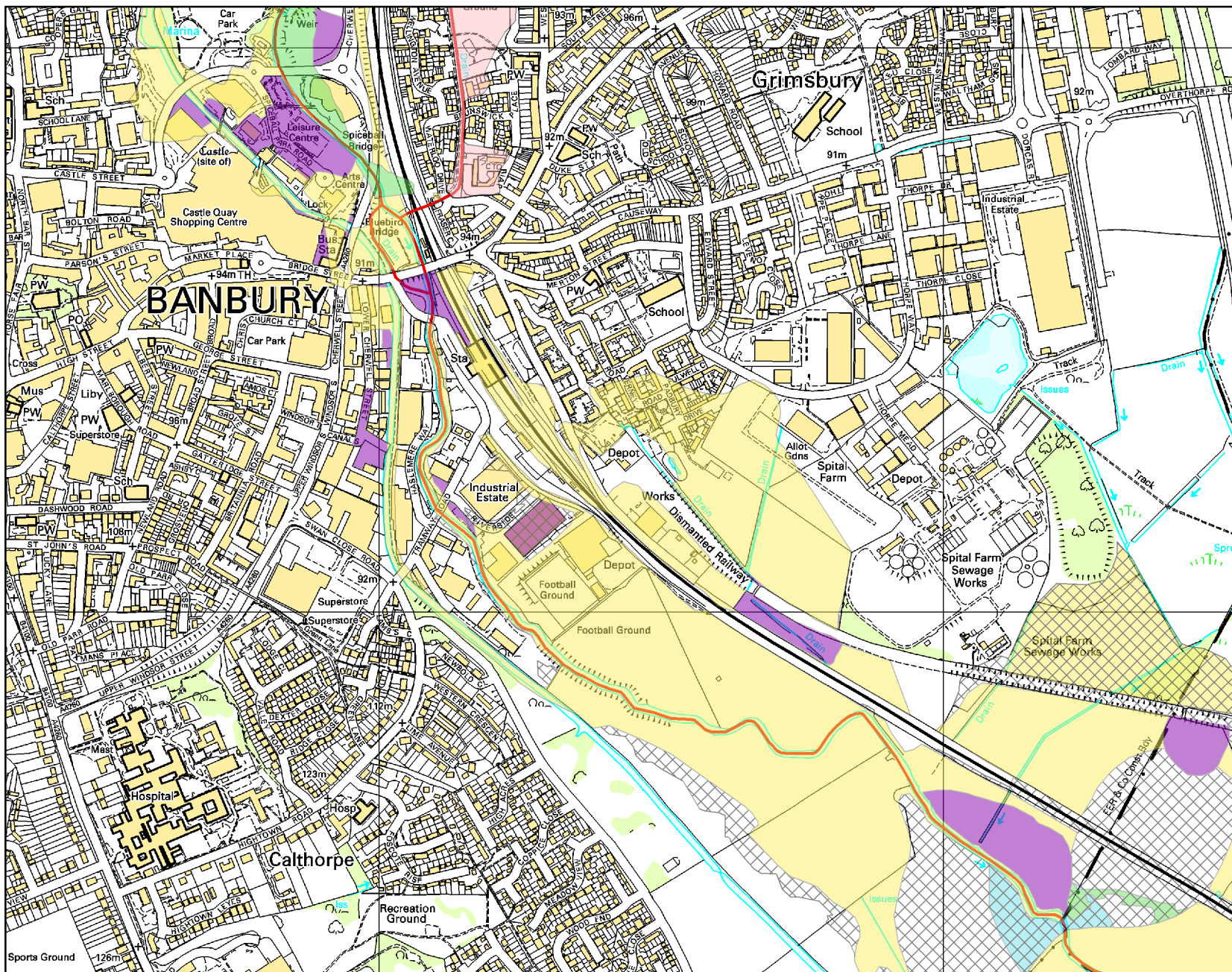
The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

2D grid cell reference	Model	Easting	Northing	Undefended flood levels (mAOD)					
				20% AEP	5% AEP	1% AEP	1% AEP (+20% on river flows)	0.5%	0.1% AEP
Flood Point 1	Cherwell (Banbury) 2015	446,029	240,645	No data	No data	90.85	No data	No data	91.58
Flood Point 2	Cherwell (Banbury) 2015	446,123	240,567	No data	No data	90.74	No data	No data	91.43
Flood Point 3	Cherwell (Banbury) 2015	446,198	240,456	No data	No data	90.69	No data	No data	91.22
Flood Point 4	Cherwell (Banbury) 2015	446,299	240,306	No data	No data	90.57	No data	No data	90.88
Flood Point 5	Cherwell (Banbury) 2015	446,423	240,202	No data	No data	90.46	No data	No data	90.6
Flood Point 6	Cherwell (Banbury) 2015	446,439	239,945	No data	No data	89.49	No data	No data	90.07

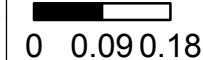
This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Historic Flood Map centred on: Grundon Depot, Banbury

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Kilometres



Legend

Flood Event Outlines

year

1947

1979

1992

1993

1998

2007

Main River

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Historic flood data

THM_31184

Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
EA0619470300444	06MarchSpring1947	01/01/1947	12/12/1947	main river	channel capacity exceeded (no raised defences)
EA0619790200111	06FebruaryWinter1979	01/01/1979	12/12/1979	main river	channel capacity exceeded (no raised defences)
EA0619920900281	06SeptemberAutumn1992	01/01/1992	12/12/1992	main river	channel capacity exceeded (no raised defences)
EA0619931000229	06OctoberAutumn1993	01/01/1993	12/12/1993	main river	channel capacity exceeded (no raised defences)
EA0619980400097	06AprilEaster1998	01/04/1998	30/04/1998	main river	channel capacity exceeded (no raised defences)
ea061142593	Banbury CP_Fluvial Water	19/07/2007	29/07/2007	main river	channel capacity exceeded (no raised defences)

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.