Flood Risk Assessment

Whitehaven Community Hub

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Billinghurst George & Partners
Civil & Structural Engineers, Building Surveyors
Wellington House, Wellington Court, Preston Farm, Stockton-on-Tees, TS18 3TA
T: 01642 876 470 E: consulting@bgp-teesside.co.uk @BGPconsulting

Flood Risk Assessment

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Document Checking:

Prepared By: L. Frost – Civil Engineer MEng

Checked By: J. Conway – Consultant BSc CEng MICE

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1. Introduction

1.1. This Flood Risk Assessment has been prepared in accordance with the requirements of The National Planning Policy Framework (Ministry of Housing, Communities and Local Government – December 2024) [The Framework] and the Planning Practice Guidance to the National Planning Policy Framework Website (Launched 6th March 2014 – last update for Flood Risk and Coastal Change August 2022) [The Technical Guidance].

1.2. This report has been prepared to supplement the planning application for the proposed redevelopment of 40-41 King Street. Whitehaven, Cumbria.

1.3. The existing site is a three story building serving Halifax bank. The proposals are to repurpose the building into a community mental health hub. The works are predominantly internal and the building footprint is to remain as existing, with no structural alterations. The existing floor plans are included in Appendix B, with the proposed floor plans included in Appendix C.

2. Development Description and Location

2.1. Site Location

2.1.1. Site Name: Whitehaven Community Hub

2.1.2. Site Address: 40 – 41 King Street, Whitehaven, Cumbria, CA28 7JN

2.1.3. OS Grid Reference: E: 297220, N: 518079

2.1.4. National Grid Reference: NX972180

2.2. Site Description

2.2.1. Site Area: 0.021 Ha

2.2.2. Existing Land Use: Financial

2.2.3. Proposed Land Use: Healthcare

2.2.4. Local Planning Authority: Cumberland Council

2.2.5. Sewer Undertaker: United Utilities (UU)

2.2.6. The site is located on the corner of King Street and Roper Street in Whitehaven. Whitehaven is a historic coastal town located in Cumberland, in the county of Cumbria, North West England.

2.2.7. The site is bound by King Street and shops to the north, Farplace Animal Rescue charity shop adjoining to the east, Roper Street to the south and west.

2.3. Flood Zone (Table 1 NPPF)

2.3.1. The Environment Agency Flood Map for Planning has been reviewed. This shows that the existing Halifax bank lies within Flood Zone 3. This is defined as land which has a high probability of flooding, see Figure 1.

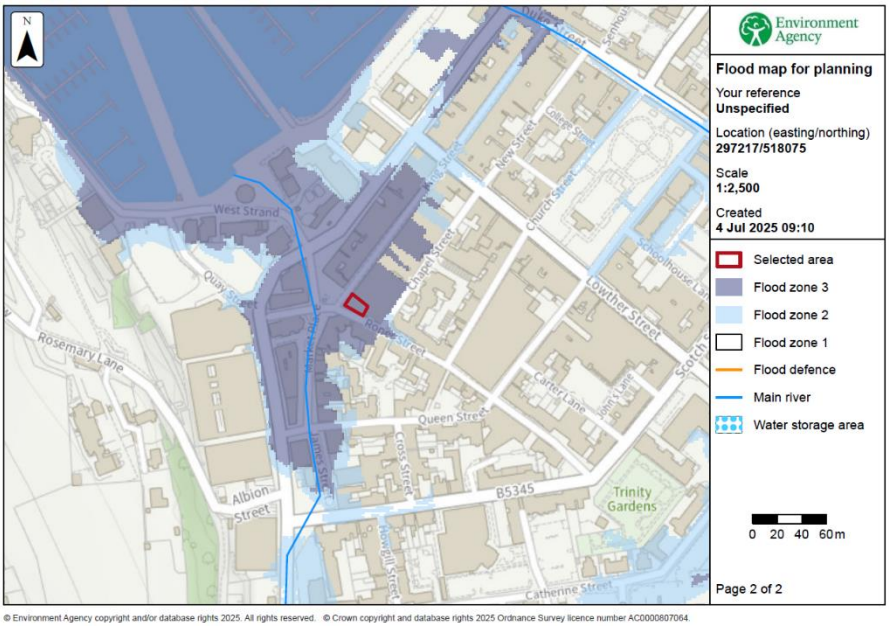


Figure 1: Environment Agency Flood Map for Planning

2.3.2. Land defined as being in Flood Zone 3 can either be Flood Zone 3a or Flood Zone 3b. The Copeland Borough Council Level 1 Strategic Flood Risk Assessment SFRA (October 2021) outlines the delineation between Flood Zone 3a and Flood Zone 3b within Whitehaven. Appendix B of the Level 1 SFRA shows the maps for the area, with map 16 covering Whitehaven. This is shown in Figure 2 and demonstrates that the proposed development lies within Flood Zone 3a. This map is also included within Appendix F.

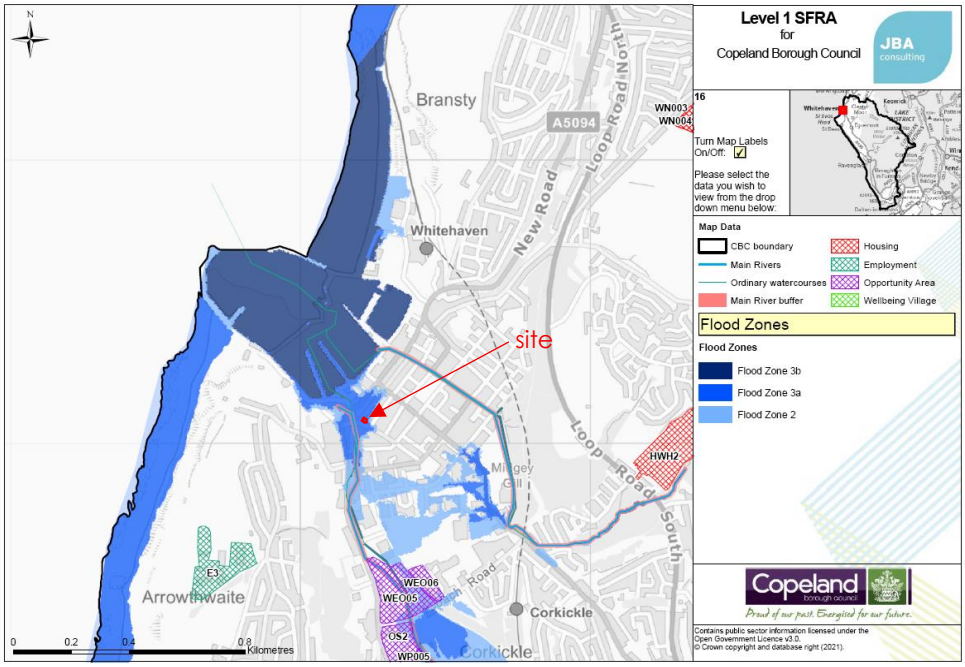


Figure 2: Copeland Borough Council Level 1 SFRA GeoPDF Map 16

2.3.3. The flood zone definitions are included within Table 1 of Paragraph 078 (Reference ID: 7-078-20220825) within the National Planning Policy Framework Planning Practice Guidance. Flood Zone 3a is defined as "*Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea flooding*".

2.3.4. The Environment Agency (EA) Product 4 data has been received and reviewed. This includes information relating to previous flood events in the area, and shows a flood in November 1999 and one in August 2006. Figure 3 demonstrates the past flood data from the EA. This demonstrates there are no past floods within the site boundary, or within close proximity to the site. See section 3.2 for further information relating to the EA nodal data.

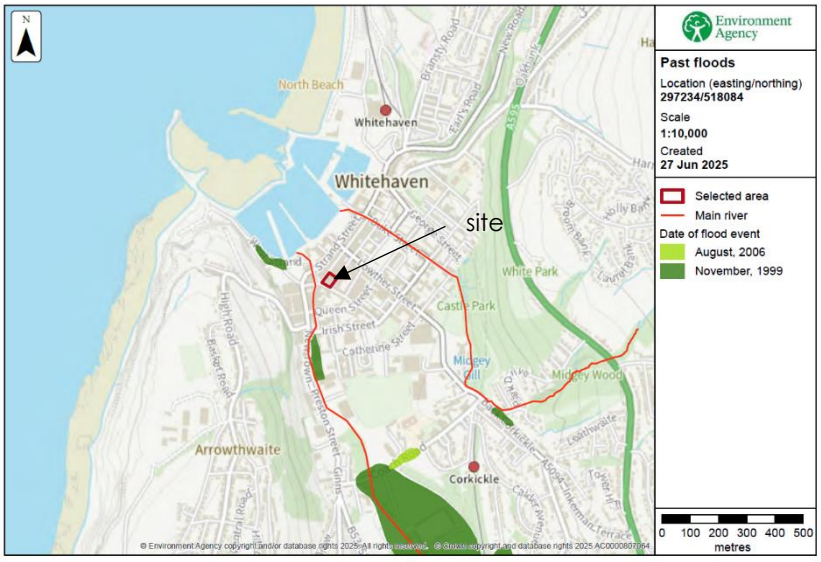


Figure 3: EA Product 4 Past Flood Events

2.4. NPPF Site Classification (Annex 3 of the NPPF)

2.4.1. Based on Annex 3 of the National Planning Policy Framework, the vulnerability classification for 'Non-residential uses for health services' is "More Vulnerable".

2.5. Flood Zone "Compatibility" (Table 2 of Paragraph 079 NPPF planning practice guidance)

Table 1: Flood Zone Compatibility

	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	Yes	Yes	Yes	Yes	Yes
Flood Zone 2	Yes	Exception test required	Yes	Yes	Yes
Flood Zone 3a	Exception test required	No	Exception test required	Yes	Yes
Flood Zone 3b	Exception test required	No	No	No	Yes

2.5.1. The proposal to repurpose the existing Halifax bank building into a community mental health hub requires an exception test in accordance with Table 2 of Paragraph 079 (Reference ID: 7-079-20220825) of the NPPF planning practice guidance.

2.5.2. However, given the proposals include repurposing an existing building, with no amendments to the existing surface water drainage strategy, the flood risk to the surrounding area will not be affected. Additionally, the building has a further two floors above ground level, which would provide higher level safety for users in a flood event, allowing rescue services the time to safely evacuate the building.

2.6. Sequential Testing

2.6.1. The Sequential Test aims to direct development to areas of lowest flood risk, while the Exception Test ensures that, where development must be located in flood risk areas, it provides wider sustainability benefits and is made safe for its lifetime without increasing flood risk elsewhere.

2.6.2. As the proposals are to repurpose an existing building, without constructing a new building, the development cannot be allocated to an area of lower flood risk. Additionally, there is a requirement for a community health hub in this location to serve the local community. Therefore, the sequential test cannot be applied.

3. Definition of the Flood Hazard

3.1. Tidal Flood Risk

3.1.1. The site is approximately 400m from the sea and located at an elevation of approximately 5.386m AOD to 5.229m AOD. These levels are taken from Lidar data, as topographic survey information is not currently available.

3.1.2. Given the proximity of the site from the sea, the risk associated with tidal flooding is assessed.

3.1.3. Figure 4 demonstrates the site boundary with the associated nearby ground levels based on Lidar data obtained through the Defra Survey Data Download.

Figure 4: Lidar data around site boundary

3.1.4. Defence strategies are currently in place at Whitehaven Harbour to protect against tidal flows. Figure 5 demonstrates the defended modelled tidal extent. This shows how there is no flooding to the site during the following flood events: 1 in 20 year (5% AEP); 1 in 75 year (1.33% AEP); 1 in 100 year (1% AEP); and 1 in 200 year (0.5% AEP). However, there is a small area indicated for the 1 in 1000 year (0.1% AEP) event.

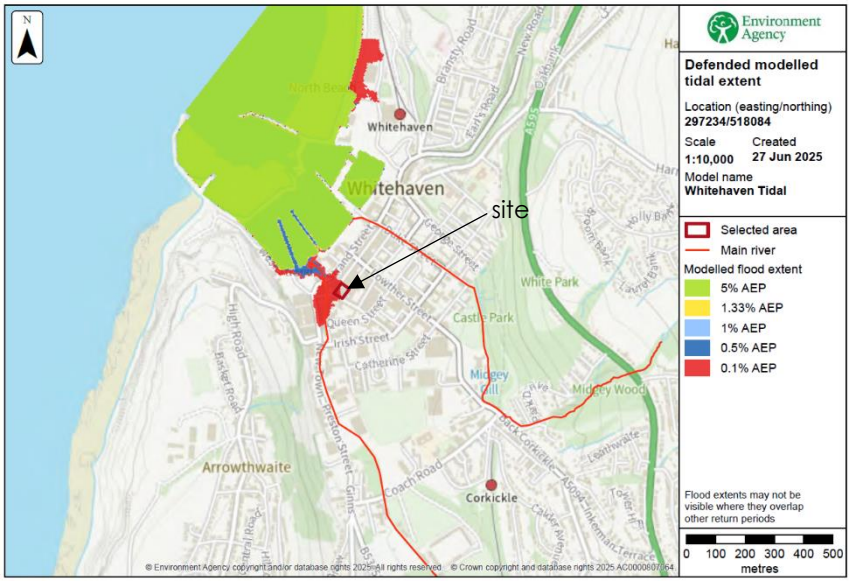


Figure 5: EA Product 4 Data - Defended modelled tidal extent

3.1.5. This highlights how the current flood defences provide suitable protection to Whitehaven to reduce the risk of flooding by tidal sources.

3.1.6. The EA Product 4 data also includes information relating to the defended climate change modelled extent. Figure 6 demonstrates that the site is expected to flood for the 0.5% AEP (+600mm). This relates to the 1 in 200 year flood event, and there is no reference to more frequent flood events.

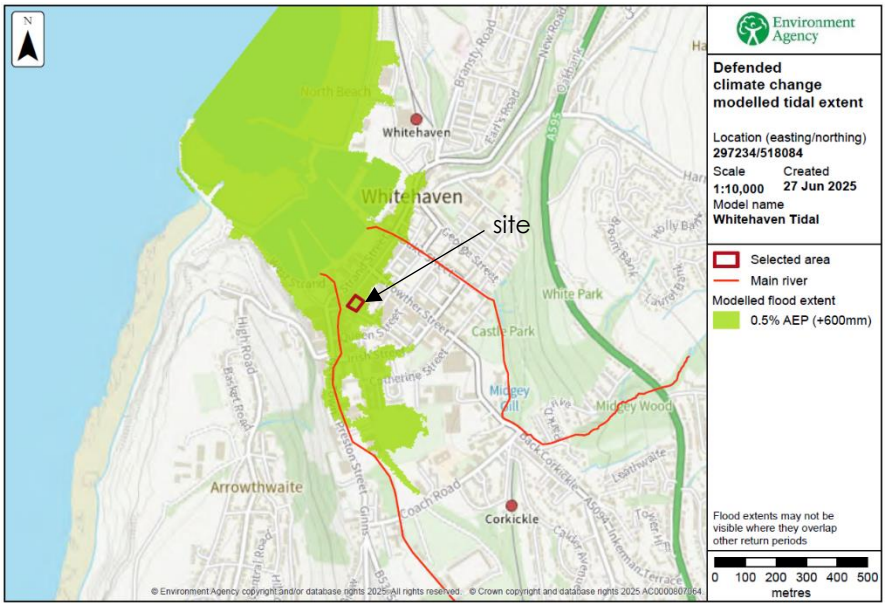


Figure 6: EA Product 4 Data - Defended climate change modelled tidal extent

3.1.7. However, although this demonstrates the site lies within the flooding extents, this is a prediction based on climate change. This would result in a large proportion of Whitehaven being affected, and thus the existing flood defences would require upgrades to provide protection that takes account of increased flood levels as a result of climate change.

3.1.8. Additionally, as the proposals are to repurpose an existing building, providing no changes to the surface water strategy, the proposed development will have no impact on the current flood risk.

3.1.9. The Government website for checking the long term flood risk has also been reviewed for flooding from rivers and the sea. This demonstrates that the yearly chance of flooding is classified as very low, and the yearly chance of flooding between 2036 and 2069 is low.

3.1.10. Based on the findings within the EA Product 4 data, and the Government website, it is considered that the risk of flooding from the sea is categorised as **LOW**.

3.2. Fluvial Flood Risk

3.2.1. The nearest named watercourse is the Pow Beck. This watercourse is mainly culverted through Whitehaven, with the nearest open channel location being approximately 710m south of the site. The nearest section to the site is located approximately 22m west, and is culverted in this location. From here flows travel north and discharge into Whitehaven Harbour.

3.2.2. The Pow Beck has a high point approximately 1km south of Whitehaven, where flows then continue in a south western direction where it passes near St Bees village and flows into the Irish Sea from St Bees beach.

3.2.3. The Midgey Gill also travels through Whitehaven and discharges to Whitehaven Harbour. Similar to the Pow Beck, this is culverted through Whitehaven. The nearest culverted section is located approximately 266m north east of the site, beneath Duke Street. The nearest open channel is located approximately 875m south east of the site.

3.2.4. Another named watercourse is the Bransty Beck. This flows from the Bransty suburb, passing through the residential areas. The beck enters an underground culvert beneath Bransty Row. The culvert outlets into Queens Dock, which is part of Whitehaven Marina. This outfall it located approximately 460m north to north east from the proposed site.

3.2.5. The Environment Agency 'Flood Map for Planning' shows that the proposed site is entirely within Flood Zone 3, which can be defined as land which has a high probability of flooding. See Figure 1 within Section 2.3 of this report.

3.2.6. The EA Statutory Main River Map shows the main rivers across the country. An extract from the website is included in Figure 7.

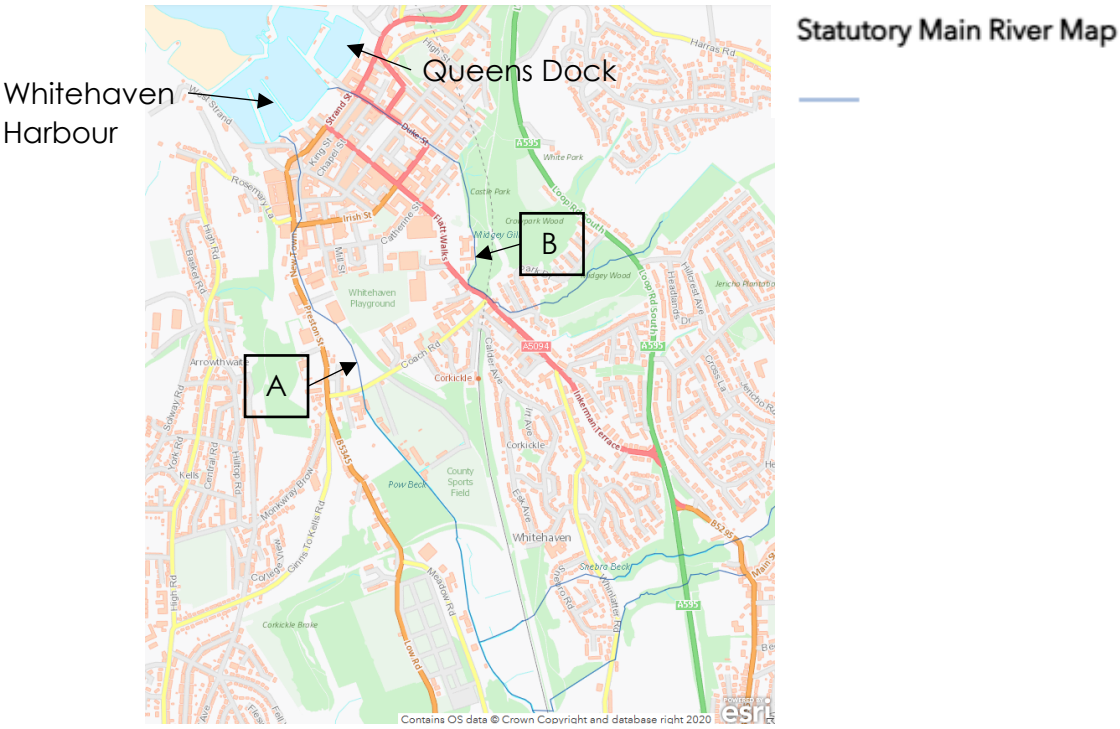


Figure 7: Environment Agency Statutory Main River Map

3.2.7. The main river noted 'A' on Figure 7 is the Pow Beck, and the main river noted 'B' is the Midgey Gill.

3.2.8. It is also known that the Bransty Beck discharges into Queen Dock, which is noted on Figure 7.

3.2.9. The EA Flood Maps for Planning also demonstrate the likelihood of flooding from rivers and the sea with and without defences, for a range of return periods. Figure 8 demonstrates the likelihood of flooding from rivers and the sea without defences for the 1 in 1000 year flood event, whilst Figure 9 demonstrates with defences for the 1 in 1000 year flood event. This highlights that the current defences mitigate the risk of flooding from rivers or the sea.

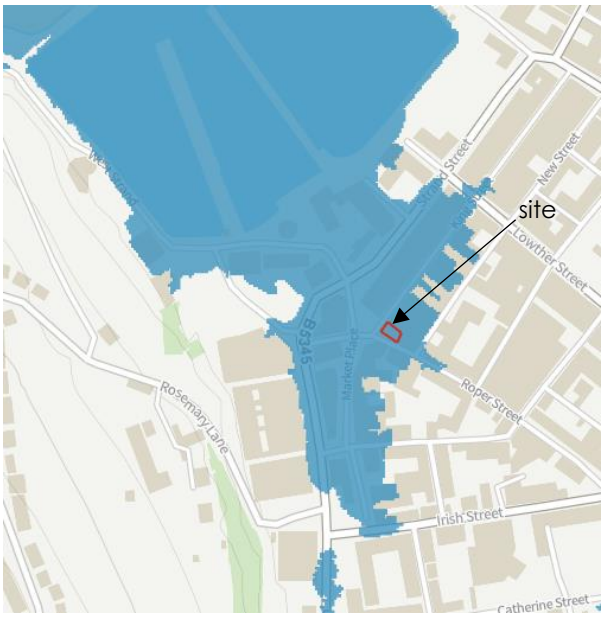


Figure 8: EA Flood Map for Planning - River and sea without defences - 1 in 1000 year event

Figure 9: EA Flood Map for Planning - River and sea with defences - 1 in 1000 year event

3.2.10. The EA Technical Maps show further detail, including depths for the yearly chance of flooding. Figure 10 demonstrates this is at a very low chance (less than 0.1% chance each year) of flooding from rivers or the sea. All depths (ranging 20cm to 90cm) remain as very low chance.

Figure 10: EA Technical Map - Rivers and the sea map - Yearly chance of flooding

3.2.11. The EA Technical Map also shows the yearly chance of flooding between 2036 and 2069. Figure 11 shows the extent of flooding for this time period, which in areas increases from very low chance (less than 0.1% chance each year) to low chance (between 0.1% and 1% chance each year). However, the depths all remain as very low chance.

Figure 11: EA Technical Map - Rivers and the sea map - Yearly chance of flooding 2036-2069

3.2.12. The Government website for checking the long term flood risk has also been reviewed. This demonstrates that the risk of flooding from rivers and the sea is very low for the current yearly chance, and low for the yearly chance of flooding between 2036 and 2069.

3.2.13. The EA Product 4 data for fluvial flooding has also been obtained and reviewed.

3.2.14. As outlined in Section 2.3 and Figure 3, there are no historic flood events identified within the site boundary.

3.2.15. The EA Product 4 data includes information for the defended modelled fluvial extent and height. Figure 12 shows the area with a range of nodal points, this is also shown on page 29 of the EA Product 4 data included in Appendix E. The red boundary within Figure 12 exceeds the site boundary, which is indicated in green.

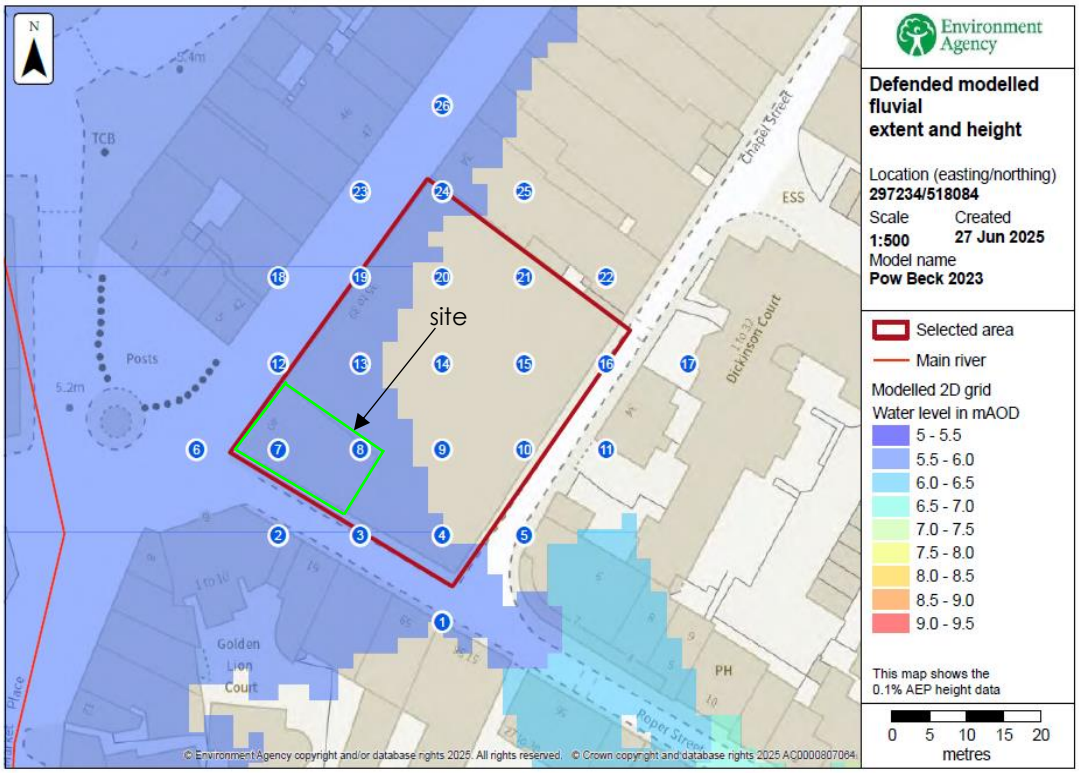


Figure 12: EA Product 4 - Defended modelled fluvial extent and height

3.2.16. Points 6, 7 and 8 lie closest to the proposed site. The depth data for each node location is included in Figure 13.

Label	Easting	Northing	50% AEP	20% 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	Depth
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.04	0.17
2	297213	518065	NoData	0.17	0.33	0.40	0.42	0.43	0.44	0.46	0.51	0.67
3	297224	518065	NoData	0.10	0.26	0.33	0.35	0.36	0.37	0.39	0.44	0.60
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.09
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	0.26	0.42	0.49	0.50	0.51	0.52	0.54	0.59	0.75
7	297213	518076	NoData	0.04	0.20	0.26	0.28	0.29	0.31	0.32	0.37	0.53
8	297224	518076	NoData	NoData	0.03	0.10	0.12	0.13	0.14	0.16	0.21	0.37
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	0.16	0.32	0.38	0.40	0.41	0.43	0.44	0.49	0.65

Figure 13: EA Product 4 - Fluvial flood depths for varying return periods

3.2.17. Figure 13 demonstrates a depth of 0.04m for point 7 in the 1 in 5 year event (20% AEP). Point 6 shows a depth of 0.26m, however Lidar data shows that ground levels are typically lower in this location than the proposed site. As a result of this, it is expected that any water would collect at the low point of the external hardstanding area.

3.2.18. Although the EA Product 4 data shows some flooding from fluvial sources during the 1 in 5 year event, this contradicts the past flood data. This also contradicts the EA Flood Maps for Planning and EA Technical Map which show the risk of flooding from rivers of the sea to be low to very low.

3.2.19. Additionally, conversations with the Lead Local Flood Authority have advised no known flood events in this location.

3.2.20. As the proposals do not alter the existing building function, but simply change its use, it is suggested that the proposed site will not provide any increase to the existing flood risk. Additionally, given there are no flood records in this location, and in line with the EA Flood Maps for Planning, the risk of flooding from fluvial sources is considered to be **LOW**.

3.3. Overland Flood Risk

3.3.1. Intensive rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in localised flooding.

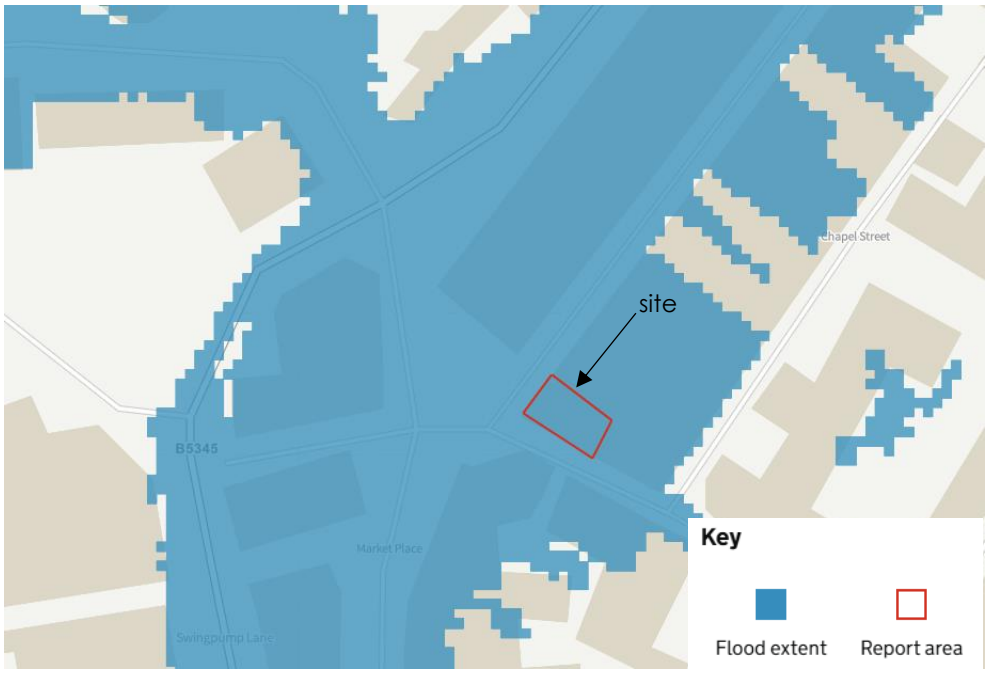


Figure 14: EA Flood Maps for Planning - Surface water flooding - 1 in 100 year

3.3.2. Figure 14 shows that the proposed development lies within an area at risk of overland surface water flood risk. This demonstrates the 1 in 100 year extent of flooding, additional maps are included within Appendix D to demonstrate the 1 in 30 year, 1 in 100 year and 1 in 1000 year extents.

3.3.3. The EA Technical Map shows further information relating to the yearly chance of flooding and depths.

3.3.4. Figure 15 demonstrates the yearly chance of flooding from surface water up to 30cm is high.

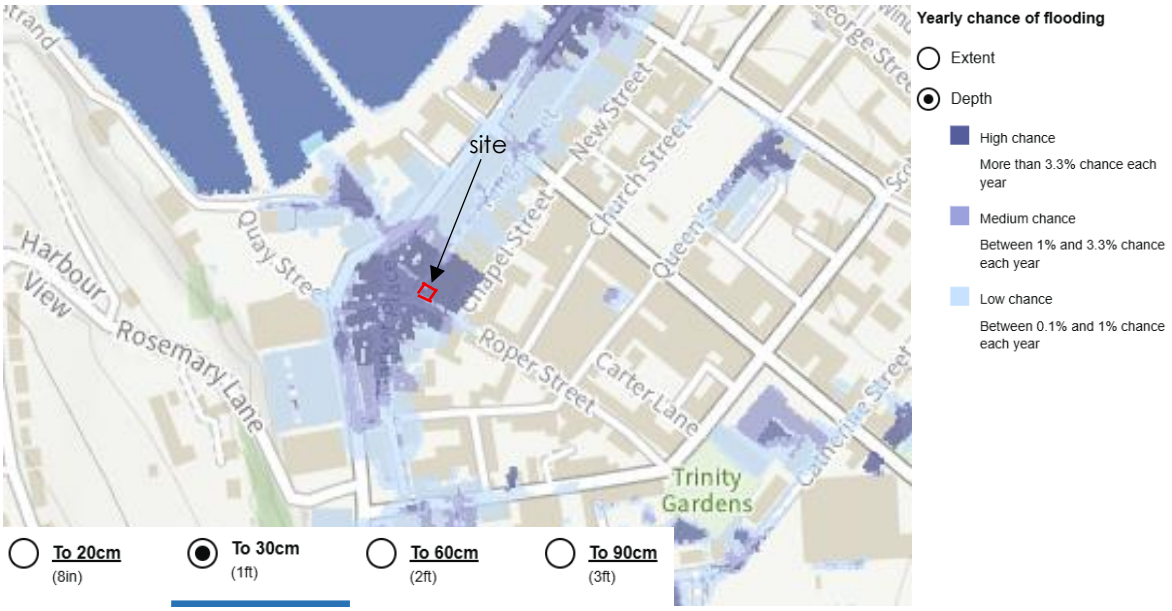


Figure 15: EA Technical Map - Surface water yearly chance of flooding up to 30cm

3.3.5. Figure 16 demonstrates that the yearly chance of flooding from surface water up to 60cm is low to medium.

Figure 16: EA Technical Map - Surface water yearly change of flooding up to 60cm

3.3.6. It is believed that the issue of surface water flooding in Whitehaven is caused by the drainage networks being overwhelmed in heavy rainfall events, and high tides causing blockage of the drainage network outfalls, allowing it to back up and prevent gullies from draining the external hard paved areas.

3.3.7. The EA Technical Map shows the current yearly chance of flooding from surface water up to 90cm is low, whilst the yearly chance of flooding from surface water up to 90cm between 2040 and 2060 is low to medium.

3.3.8. Lidar data has been obtained as topographic survey information is not currently available. Figure 17 demonstrates the site boundary with the associated nearby ground levels based on Lidar data obtained through the Defra Survey Data Download. This shows that the surrounding levels fall away from the building, to a low point towards Market Place. As levels typically fall away from the building, surface flows should also be routed away from the site.

Figure 17: Lidar data around site boundary

3.3.9. The proposals are to repurpose the building for an alternative use, and there are no proposed amendments to the surrounding external works and levels. Therefore, the existing flood risk will not be affected by the proposals. Any measures that are currently in place to protect the existing Halifax bank should be maintained.

3.3.10. A series of existing linear drains are present in the hardstanding areas adjacent to the proposals which will provide drainage to these locations.

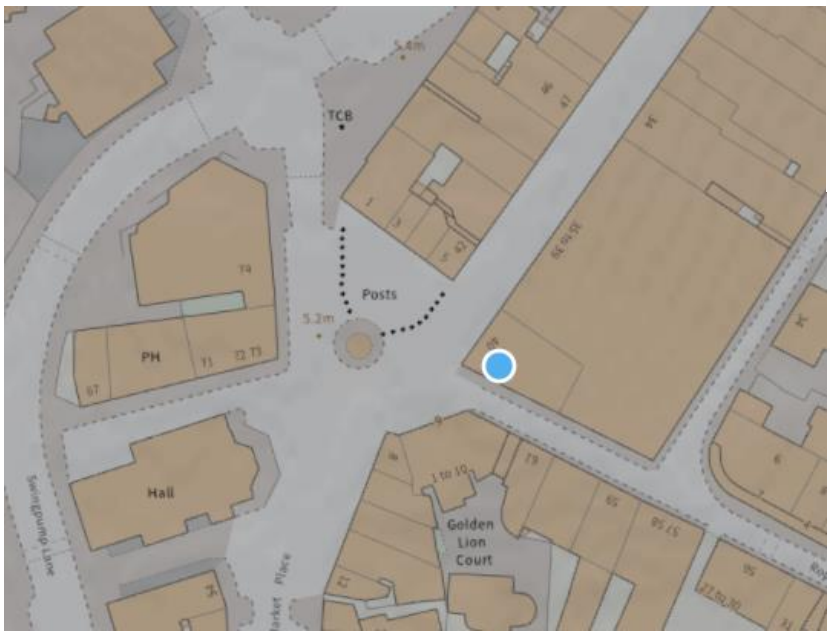
3.3.11. Additionally, conversations with the Lead Local Flood Authority have advised no known flood events in this location. Therefore, although this is considered to be high risk, there have been no previous events.

3.3.12. Based on the Environment Agency's Surface Water Flood Map for, the risk of flooding from overland sources is categorised as **HIGH** . However, as positive drainage is present adjacent to the site, with levels falling away from the proposed building, it is considered that the risk to the site is **MEDIUM**.

3.4. Groundwater Flood Risk

3.4.1. Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in low lying areas underlain by permeable rocks.

3.4.2. At the time of writing, there have been no site investigation reports conducted on the site. Therefore, BGS geological data has been reviewed to determine the groundwater susceptibility of the existing ground. See Figure 18.



Bedrock Geology – Pennine Middle Coal Measures Formation – Mudstone, siltstone and sandstone. Sedimentary bedrock formed between 318 and 309.5 million years ago during the Carboniferous period.

Superficial Deposits – Alluvium – Clay, silt, sand and gravel. Sedimentary superficial deposit formed between 11.8 thousand years ago and the present during the Quaternary period.

Figure 18: Extract from the British Geological Survey viewer

3.4.3. Figure 18 shows that the site is underlain by bedrock geology of Pennine Middle Coal Measures Formation. The sedimentary superficial deposits are typically Alluvium which comprises of clays, silts, sands, and gravels.

3.4.4. A further review of the Pennine Middle Coal Measures formation within the BGS lexicon provides the following lithological description:

Interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams, with a bed of mudstone containing marine fossils at the base, and several such marine fossil-bearing mudstones in the upper half of the unit.

3.4.5. As, at the time of writing, there is no intrusive site investigation information to review, the British Geological Survey GeoIndex Onshore map has been consulted to identify any historic boreholes in the local vicinity. Figure 19 demonstrates there are two historic borehole logs within very close proximity to the site.

Figure 19: Extract from British Geological Survey GeoIndex Onshore Map

3.4.6. Both borehole logs within close proximity to the site have been reviewed. Borehole NX91NE361 is the closest to the site and was completed in April 1980. This borehole found made ground to 2m below ground level, consisting of brick rubble. This was underlain by loose brown medium sand and coarse gravel. Water was struck at 2.7m below ground level.

3.4.7. Borehole NX91NE362 was also completed in April 1980. This borehole found made ground to 2.8m below ground level, consisting of brick rubble. This was underlain by medium dense sand and coarse gravel to 6m below ground level. Water was struck at 2.6m below ground level.

3.4.8. The Government website for checking the long term flood risk has also been reviewed. This demonstrates that the risk of flooding from groundwater is unlikely in this area.

3.4.9. Based on the above it is unlikely that the site would be at risk due to flooding from groundwater. Therefore, the risk of flooding from groundwater is categorised as **LOW.**

3.5. Flooding From Sewers

3.5.1. Existing United Utilities (UU) sewer records have been reviewed to identify the drainage infrastructure present in the vicinity of the site. A plan of the existing UU drainage records is included in Appendix G.

3.5.2. There are a large number of combined sewers present in Whitehaven. A 600x800 network runs along King Street from north east to south west. This connects to a chamber to the west of the site, which also has a 600x800 connection from the adjacent Roper Street. From here flows travel in a north western direction away from the site.

3.5.3. Combined drainage is also present within Chapel Street, to the south east of the site. This is also 600x800 and connects to the sewer in Roper Street.

3.5.4. The UU sewer records also show two surface water runs in locations identified as main rivers within the EA Statutory Main Rivers Map and EA Product 4 information. One is shown as 1150x1600 and located approximately 22m west of the site at the closest point. The other is located within Duke Street and shown as 600x800 to 650x900 in size. This is located approximately 265m north east of the site.

3.5.5. There is also an existing internal manhole within the existing Halifax bank. This is located in the lobby between the stairwell and riser. The position of this chamber in relation to the proposed site plans remains in the lobby to first floor, and therefore outside of the main circulation area. It is assumed that this serves the first floor WC's and second floor kitchen. The proposed floor plans maintain these facilities. The existing flood plans can be found in Appendix B, with the proposed floor plans in Appendix C.

3.5.6. The Cumbria County Council Flood Risk Management Strategy 2022 Action Plan outlines the actions to alleviate exceedance flow problems with the culvert within Duke Street. This outlines the agreement in place with Whitehaven Harbour Commission to monitor harbour water levels and minimise upstream flooding during weather events. Additionally, the required maintenance has been highlighted and is to be rectified.

3.5.7. The development proposals provide no changes to the existing sewers surrounding the site, with the building footprint remaining as existing, and surface water flows discharging as they currently do.

3.5.8. Additionally, all existing external hardstanding levels fall away from the building, as demonstrated by the Lidar data included in Figure 17 of Section 3.3. Therefore, any flooding from sewers would be diverted away from the site.

3.5.9. Based on the above analysis, and the it is considered that the risk of flooding from sewers is categorised as **LOW**.

3.6. Flooding from Artificial Sources

3.6.1. Based on the Environment Agency map 'Flood Risk from Reservoirs' the site is not at risk from any artificial sources such as reservoirs.

3.6.2. The risk of flooding from artificial sources is categorised as **LOW**.

4. Probability of Flooding

4.1. The Environment Agency maps have been reviewed and are included within Appendix D. The EA Flood Maps for Planning show that the entirety of the site is located in Flood Zone 3 as categorised by the National Planning Policy Framework (NPPF) and Technical Guidance. The Copeland Borough Council Level 1 SFRA GeoPDF maps demonstrate that the site is situated within Flood Zone 3a.

4.2. Flood Zone 3a is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any given year.

4.3. Section 3 describes other flood hazards and the risk they pose to this project. A summary of the existing flood risk and the mitigation required is provided within Table 2.

4.4. Based on the findings within Section 3, all sources of flood risk are categorised as **LOW** apart from the overland flow risk which is **HIGH**. This classification is prior to any review of the risk category. Following on from a full risk review and potential mitigation measures, the overall assessment of the probability of flooding to the existing site is **MEDIUM.**

Table 2: Summary of flood risk and potential mitigation strategies

Flood Risk Source	Current Risk Level	Mitigation Requirement during detailed design	Risk Level following Mitigation
Tidal or Fluvial Flooding	LOW	Development is located in Flood Zone 3a. However, upon review of the EA Flood Maps for Planning, the EA Technical Maps and the Government website for checking the long term flood risk, the risk to the proposed site is considered to be low. This is due to the current flood defences in place at Whitehaven Harbour and the lack of previous flood events in this location.	LOW
Overland Flow	HIGH	According to the Environment Agency Flood Maps, the site is at high risk of overland flooding. Mitigation measures to be implemented: • Safe Access and Egress: Providing upper floors to the property ensures safe means of escape during flooding scenarios, bettering the existing arrangement. • Flood Resilient Construction Materials: Water resistant material should be specified at the ground floor level. This includes water resistant insulation, non-porous wall finishes etc • Raised Services & Utilities: As the ground floor may be subjected to some surface water flooding, all services should be positioned above predicted flood levels. The exact potential flood height is unknown, however given the EA Flood Maps for Planning shows up to 90cm being low to medium chance in the climate change event, services should be raised above this level. The risk to the proposed developments can be mitigated by: • A positive sewage network that will direct flows from low lying areas into positive drainage infrastructure. • All immediate hardstanding to perimeter to fall away from building.	MEDIUM
Groundwater	LOW	The proposed site is not at risk from groundwater flooding. No mitigation required.	LOW
Sewer Flooding	LOW	Existing drains to be maintained as part of the proposals. No history of sewer flooding in this location, risk considered to be low.	LOW
Artificial Sources	LOW	The site is not at risk from any artificial sources according to the EA map 'Flood Risk from Reservoirs'.	LOW

5. Climate Change

5.1. The National Planning Policy Framework (NPPF) Planning Practice Guidance outlines the anticipated impacts of climate change on flood risk in the UK. These include projected sea level rise, an increased frequency of flash flooding in rivers, and more frequent high-intensity, short-duration rainfall events. These projections are underpinned by current guidance from the Environment Agency, which informs the climate change allowances used in flood modelling and risk assessment.

5.2. As detailed in Sections 3 and 4 of this report, the EA Technical Map has been reviewed. This demonstrates the current yearly chance of flooding, alongside a future yearly chance of flooding. This has been incorporated into the analysis of flood risk.

6. Detailed Development Proposals

6.1. The existing site is a three story building serving Halifax bank. The proposals are to repurpose the building into a community mental health hub. The works are predominantly internal and the building footprint is to remain as existing, with no structural alterations.

6.2. The existing finished floor level is maintained, along with the existing surface water drainage strategy. This ensures that the development does not increase flood risk to adjacent land or elsewhere, aligning with the principles of the National Planning Policy Framework (NPPF) and current Environment Agency guidance.

7. Off Site Impacts and Residual Risks

7.1. The proposals for this site should not increase the flood risk elsewhere off site for the following reasons:

- There are no changes to the existing surface water strategy, and no changes in building footprint. The building will drain and operate in the same way as the existing scenario.
- The existing flooding arrangement will be maintained within the proposals.

8. Flood Risk Management Measures

8.1. The scheme benefits from existing flood defences. These defences are owned and maintained by the Environment Agency as part of their wider flood risk management infrastructure for Whitehaven.

8.2. The existing flood defences provide a layer of protection for the site with regards to flooding from tidal sources; however, the risk of flooding from overland sources is considered high. As a result of this, additional site-specific mitigation measures, outlined within Section 4 Table 2, are necessary. These measures build upon the protection afforded by the Environment Agency-maintained flood measures to enhance the overall flood resilience of the proposed development.

- Safe Access and Egress

  The existing and proposed development includes the provision of upper floors, which provide safe refuge and means of escape in the event of a flood. With the building having upper floors, users are able to safely relocate above predicted flood levels during a flood event, significantly reducing risk to life and allowing time for emergency services to respond if necessary. This approach is particularly important given the potential predicted flood depths on-site, which could exceed internal ground floor levels during more extreme events.

- Flood Resilient Construction Materials

  Given that the site is considered high risk of overland flooding, and although there are no historic flood events, it is suggested that the ground floor be constructed using flood-resilient materials. These materials are specifically designed to resist water ingress, limit damage, and enable rapid reinstatement following a flood event.

  The use of water-resistant insulation is recommended as these materials do not absorb water and retain their insulating properties even when submerged. It is recommended for internal walls to be finished with non-porous materials, such as cement-based render, tiled surfaces, or water-resistant plasterboard systems, which are capable of withstanding floodwater exposure and can be easily cleaned and dried with minimal deterioration.

- Raised Services & Utilities

  To reduce the risk of electrical hazards and minimise recovery times, it is also advised that all electrical sockets, consumer units, and service points be raised above predicted flood levels. The exact potential flood height is unknown, however given the EA Flood Maps for Planning shows up to 90cm being low to medium chance in the climate change event, services should be raised above this level. Fixtures and fittings at ground level, such as skirting boards units, should be specified in moisture-resistant or uPVC materials to limit water damage and facilitate post-flood cleaning.

8.3. Incorporating these construction measures ensures the building is more robust in the face of flooding, significantly reducing both the vulnerability of the property and the potential cost and time required for post-flood repairs. These measures form a key part of the site's wider flood mitigation and resilience strategy.

9. Conclusions

9.1. This Flood Risk Assessment has considered the potential flood risks associated with the repurposing of the existing Halifax bank in Whitehaven to a community mental health hub. The works are predominantly internal and the building footprint is to remain as existing, with no structural alterations.

9.2. The Environment Agency Flood Maps for Planning demonstrate that the site lies within flood zone 3. The Copeland Borough Council Level 1 Strategic Flood Risk Assessment provides confirmation that the site is situated within Flood Zone 3a.

9.3. The Environment Agency Product 4 data has been obtained and reviewed. The past flood data shows no flooding within the proposed site boundary, or within close proximity to the site.

9.4. The site is protected by Environment Agency-maintained flood defences within Whitehaven Harbour, which are shown to provide protection to the town of Whitehaven.

9.5. Additional mitigation includes the use of flood-resilient construction methods and improved surface water drainage, helping to minimise potential damage, reduce recovery costs, and enhance the long-term sustainability of the building.

9.6. In summary, while a degree of residual flood risk will remain, the proposed site is to repurpose an existing building, and therefore the existing finished floor level and external ground levels are to remain as existing. The proposals will not increase the flood risk elsewhere, aligning with the principles of the National Planning Policy Framework (NPPF) and current Environment Agency guidance.

9.7. Additionally, through conversations with the Lead Local Flood Authority, there is no known history of flood events in the location of the proposed site. Additionally, given that the building has upper floors, users are able to safely relocate above any potential future flood levels during a flood event, significantly reducing risk to life and allowing time for emergency services to respond if necessary.

9.8. Given the presence of the existing Halifax bank, the proposed repurposing of this building to a new community mental health hub is considered acceptable in flood risk terms. The development does not increase the existing flood risk, and includes a number of mitigation measures that consider the safety and resilience of the unit — including first and second floor refuge, and flood-resilient construction.

9.9. On this basis, we deem the application acceptable from a flood risk perspective. However, the applicant should remain aware that residual risk remains due to climate change and the limits of existing flood defences.

Report No: 256075 / FRA_RevP01
Report Title: Flood Risk Assessment

Lucy Frost – Civil Engineer (MEng)
Date: 18/07/2025

Jim Conway – Consultant (BSc CEng MICE)
Date: 18/07/2025

For and on behalf of Billinghurst George & Partners

Appendix A

Site Location Plan

Revisions

OS PLAN

PH Partnership

PH Partnership Architects

A: 10 Lumley Court, Chester-le-Street, DH2 1AN

W: www.phparchitects.co.uk
T: 0191 410 9838

Client

NTW Solutions

A: Arran House, St Nicholas Hospital, Jubilee Road, Gosforth, Newcastle Upon Tyne, NE3 3XT

Drawing Scale
1 : 500 @ A3

Do not scale drawing
Check all dimensions on site

Project Name
Whitehaven Community Hub

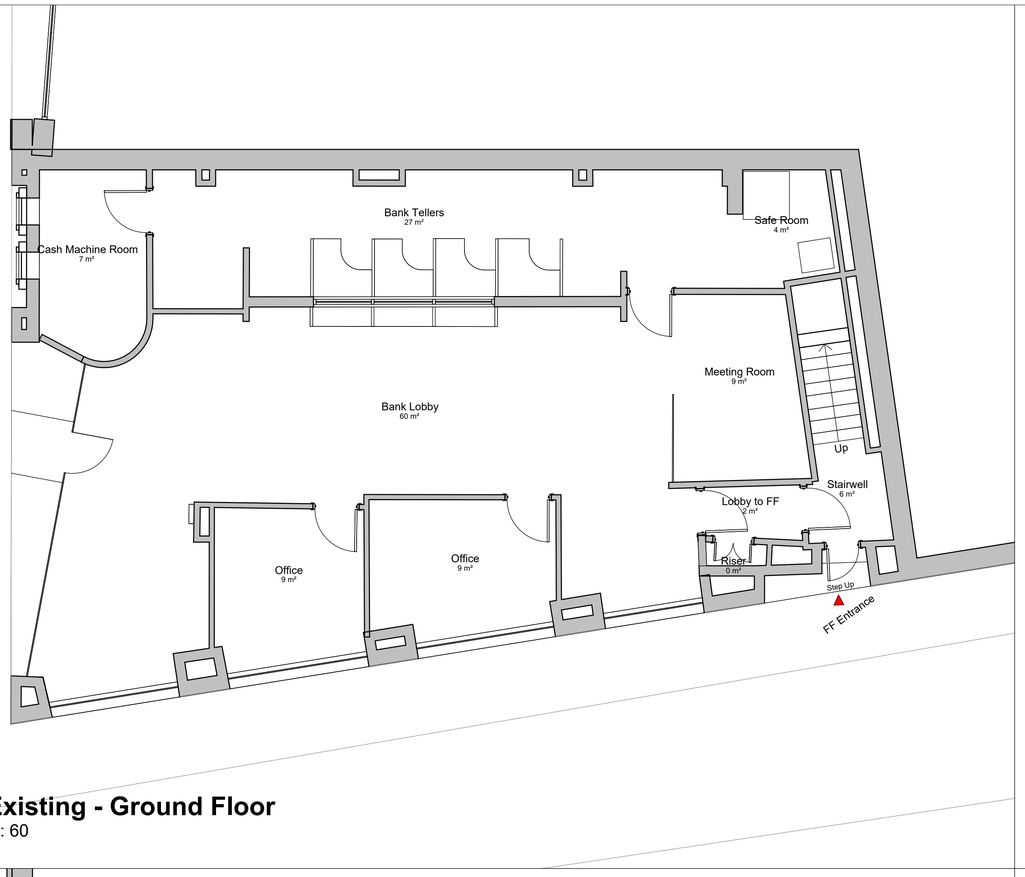
Project Address
40, 41 King St, Cumbria CA28 7JN

Drawing Name
Location Plan

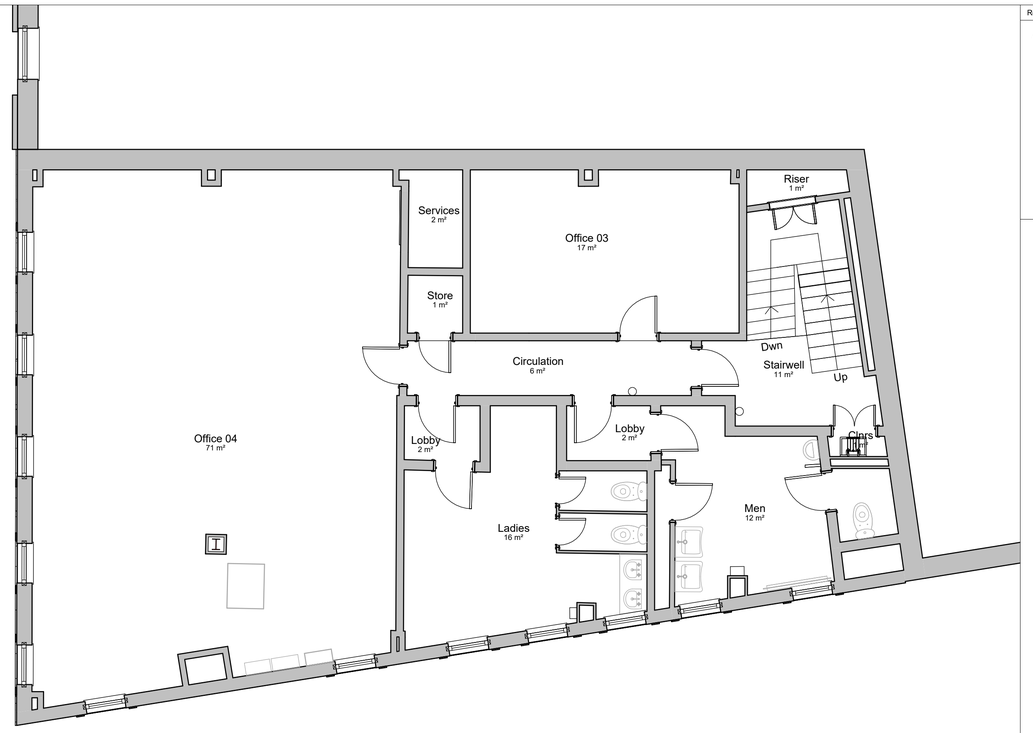
Drawing Number & Revision
9840-PHP-0000

Appendix B

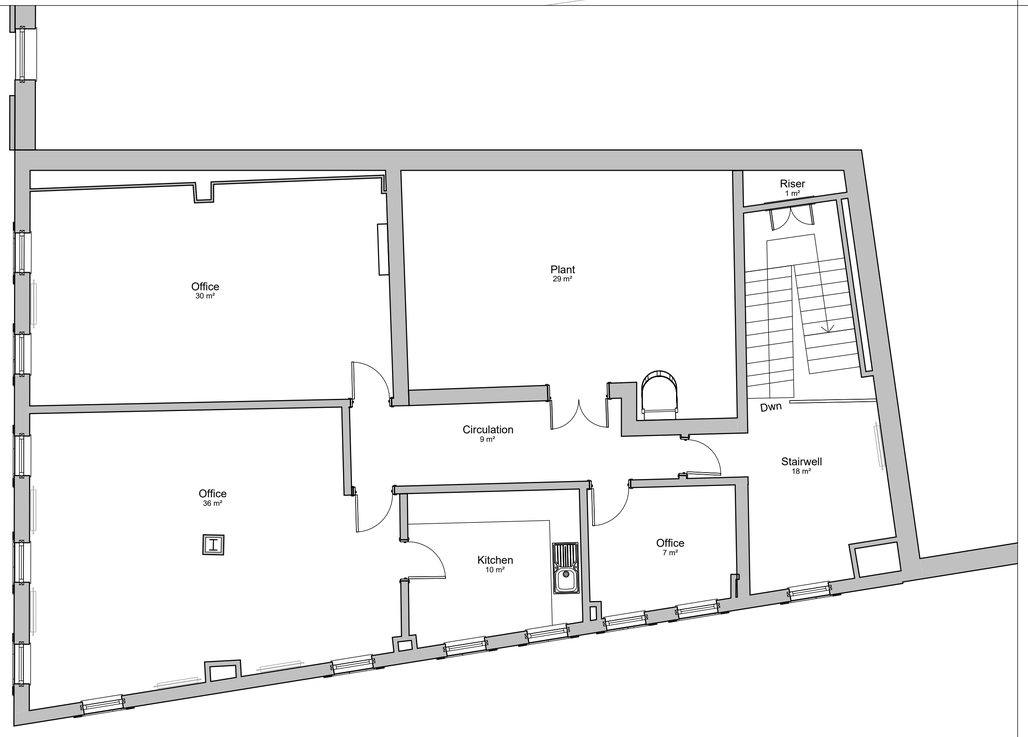
Existing Site Layout



1 Existing - Ground Floor
1 : 60



2 Existing - First Floor
1 : 60



3 Existing - Second Floor
1 : 60

Revisions

A 02/06/2025 Planning Issue

PLANNING

PH Partnership

PH Partnership Architects
A: 10 Lumley Court, Chester-le-Street, DH2 1AN
W: www.phparchitects.co.uk
T: 0191 410 9838

Client
Whitehaven Community Trust
A: 13-14 Market Place, Whitehaven, CA28 7JB

Drawing Scale
1 : 60 @ A1

Do not scale drawing
Check all dimensions on site

Project Name
Whitehaven Hope Haven

Project Address
40, 41 King St, Cumbria CA28 7JN

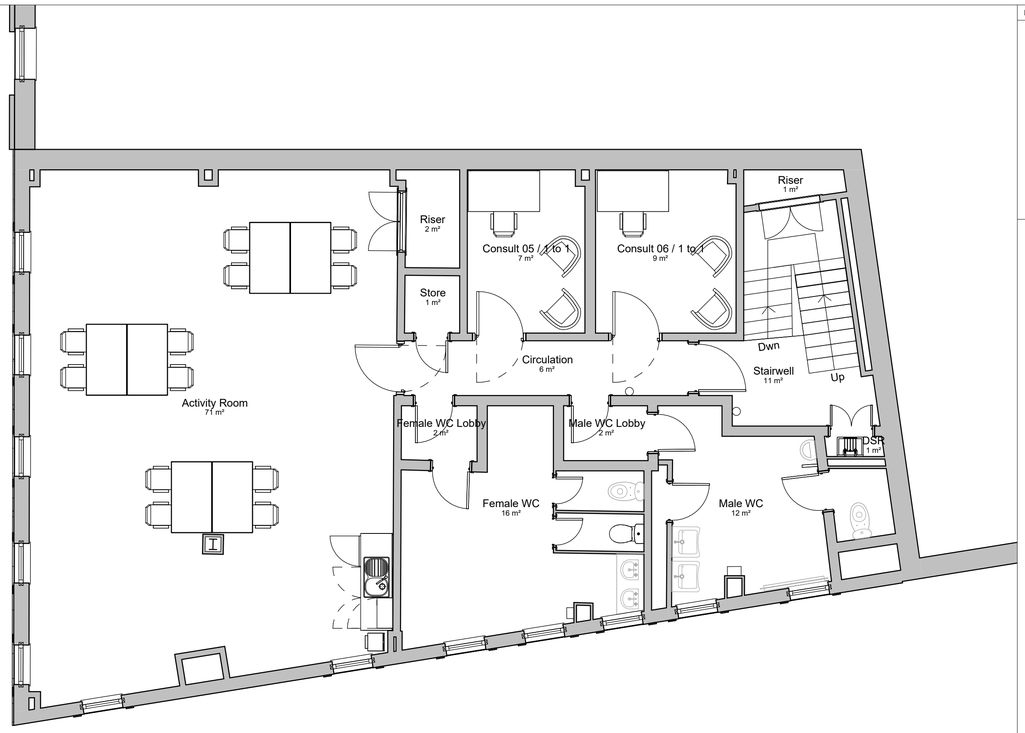
Drawing Name
Planning - Existing GAs

Drawing Number & Revision
9840-PHP-01-ZZ-DR-A-8001_A

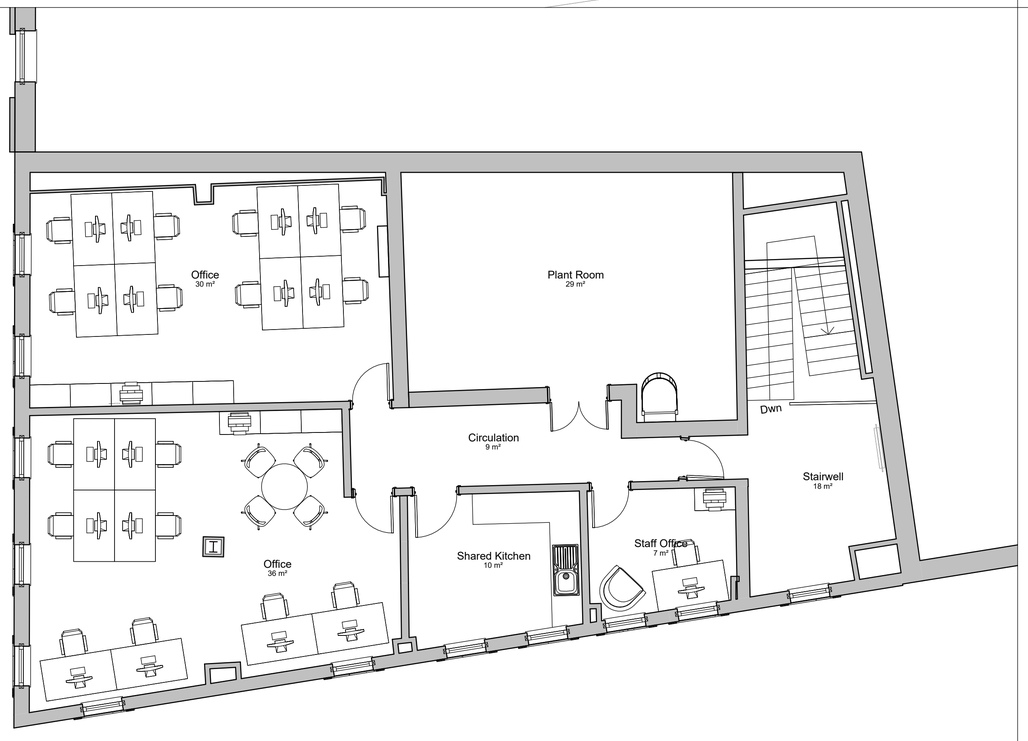
Appendix C

Proposed Site Layout

1 Proposed - Ground Floor
1 : 60



2 Proposed - First Floor
1 : 60



3 Proposed - Second Floor
1 : 60

Revisions

A 02/06/2025 Planning Issue

PLANNING

PH Partnership

PH Partnership Architects
A: 10 Lumley Court, Chester-le-Street, DH2 1AN
W: www.phparchitects.co.uk
T: 0191 410 9838

Client
Whitehaven Community Trust
A: 13-14 Market Place, Whitehaven, CA28 7JB

Drawing Scale
1 : 60 @ A1

Do not scale drawing
Check all dimensions on site

Project Name
Whitehaven Hope Haven

Project Address
40, 41 King St, Cumbria CA28 7JN

Drawing Name
Planning - Proposed GAs

Drawing Number & Revision
9840-PHP-01-ZZ-DR-A-8002_A

1 **Proposed Ground Floor Plan**
1 : 50

1m 5m

Revisions

A	07/11/2024	Issue for Review and Comment
B	14/05/2025	Revised layout following NTW review.
C	19/05/2025	Revised following Centurion/WGC review.
D	22/05/2025	revised safe room layout
E	23/05/2025	Riser added to GF
F	27/05/2025	Tender Issue

By Department Legend

- Circulation
- Out Patient
- Staff

Provisional Sums – Tender Return Requirements

Any Provisional Sums included by the tenderer must be clearly itemised and quantified within the tender return. The tenderer shall specify the scope of works each Provisional Sum relates to, along with the corresponding value.

All Provisional Sums must include an elemental breakdown detailing the inclusions, associated costs, and any assumptions made. This information is required to allow for proper assessment, comparison, and review as part of the tender evaluation process.

FOR REVIEW

PH Partnership

PH Partnership Architects
A: 10 Lumley Court, Chester-le-Street, DH2 1AN
W: www.phparchitects.co.uk
T: 0191 410 9838

Client
Whitehaven Community Trust
A: 13-14 Market Place, Whitehaven, CA28 7JB

Drawing Scale
1 : 50 @ A1

Do not scale drawing
Check all dimensions on site

Project Name
Whitehaven Hope Haven

Project Address
40, 41 King St, Cumbria CA28 7JN

Drawing Name
Proposed - Ground Floor Plan

Drawing Number & Revision
9840-PHP-01-00-DR-A-0102_F

Appendix D

Environment Agency Flood Maps

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	**297217/518075**	**4 July 2025 09:10**

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

This means:

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

Notes

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

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

Environment Agency

Flood map for planning

Your reference
Unspecified

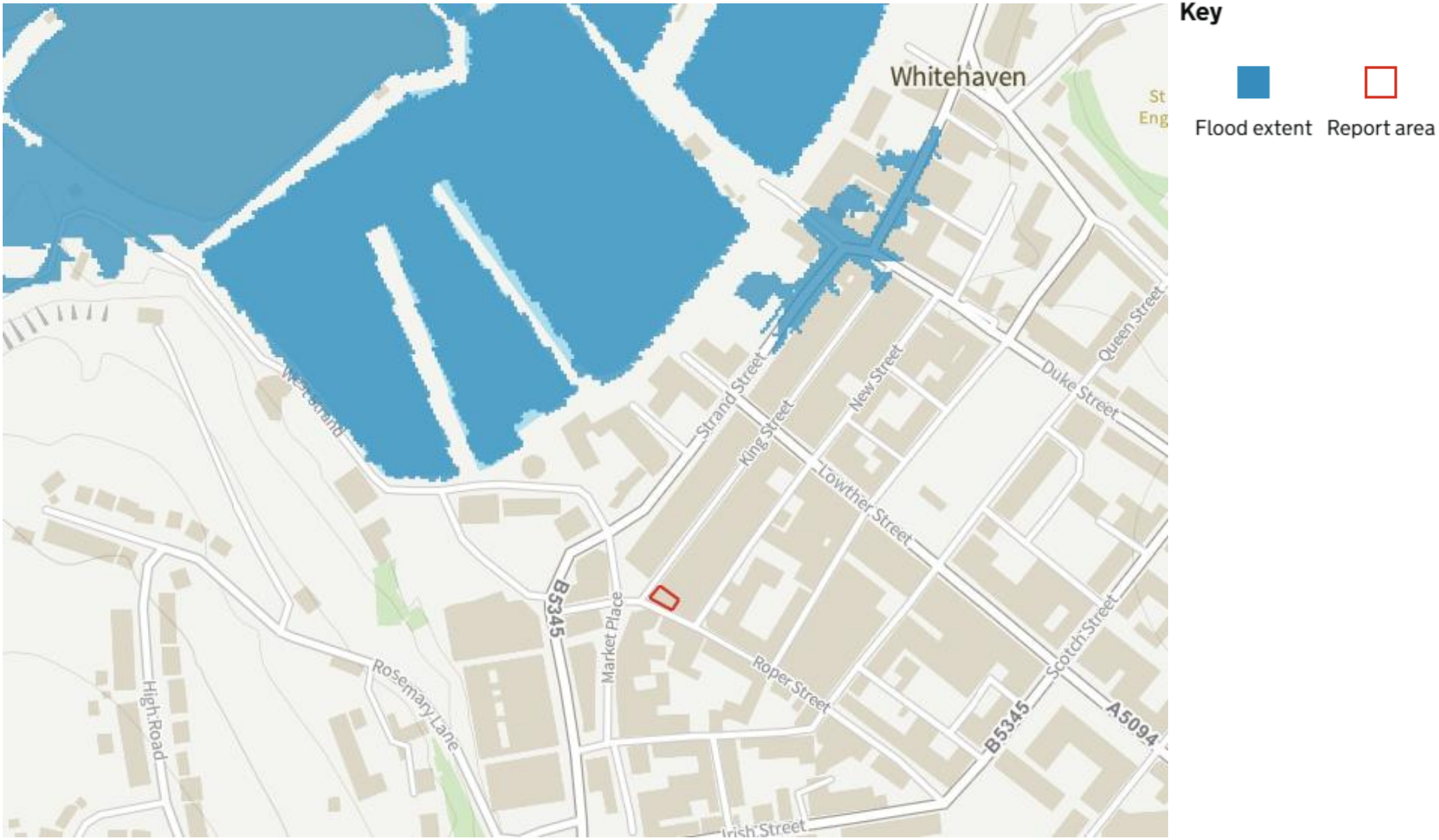
Location (easting/northing)
297217/518075

Scale
1:2,500

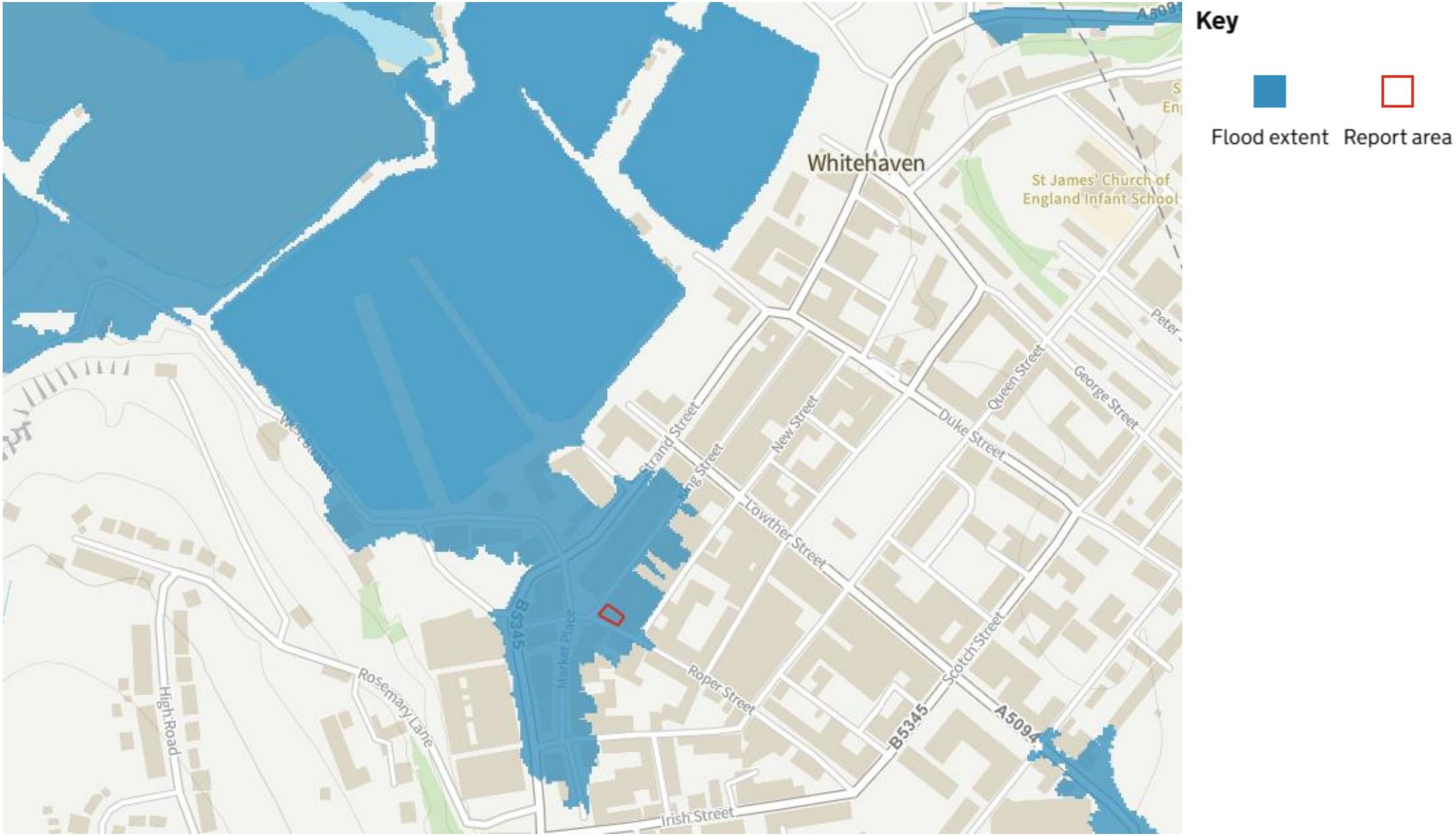
Created
4 Jul 2025 09:10

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60 m

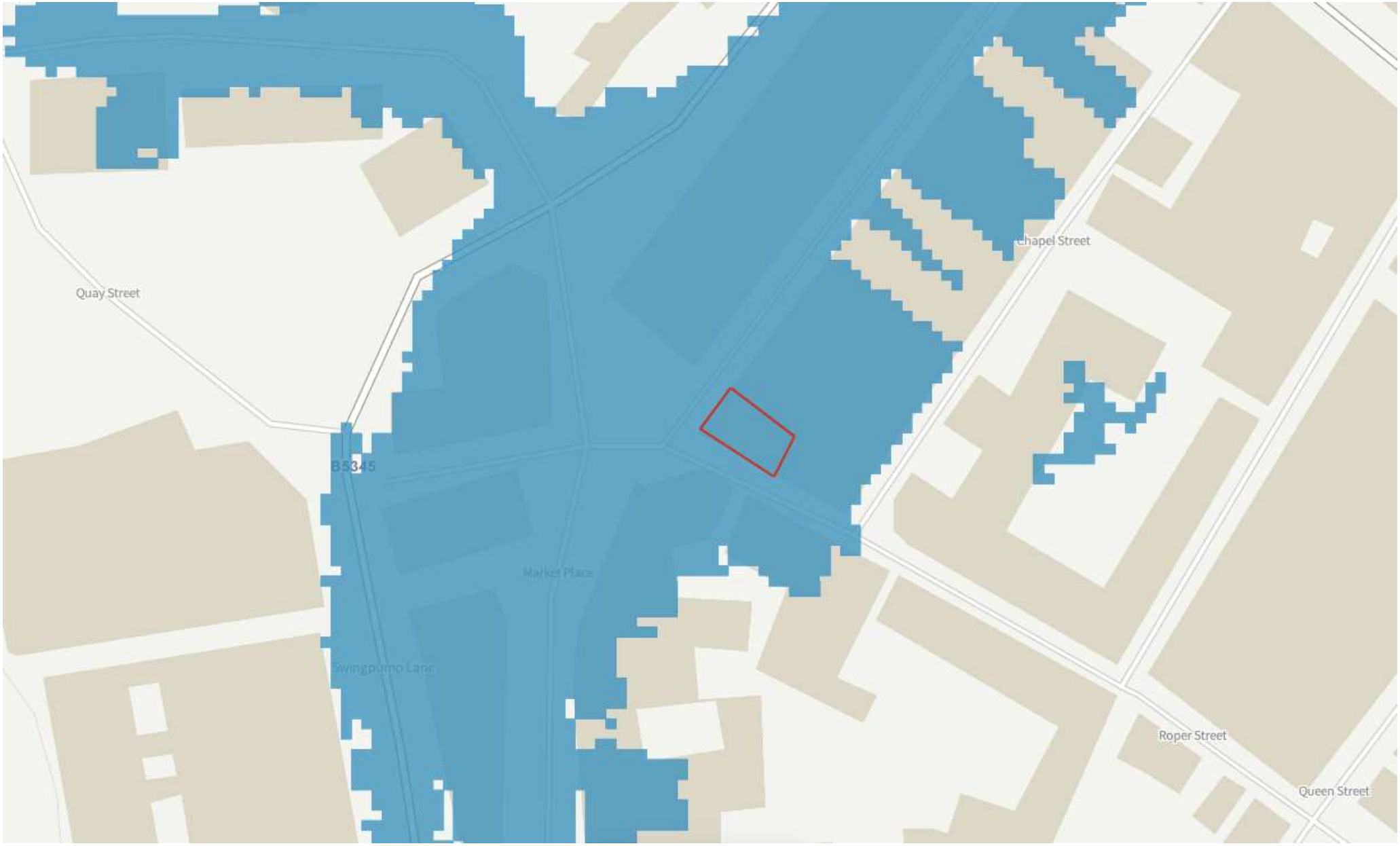


Risk of Flooding from Rivers and the Sea with Defences



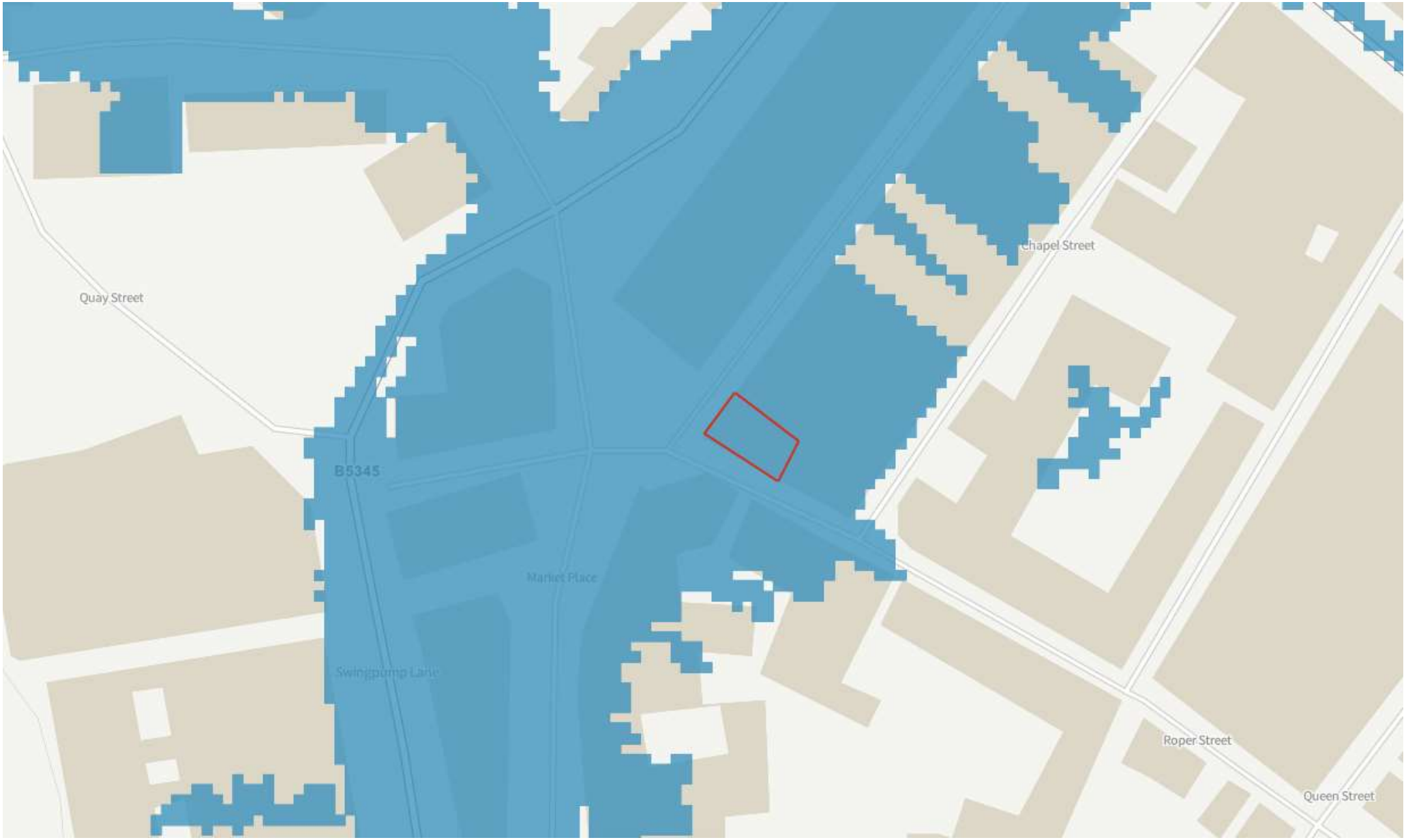
Risk of Flooding from Rivers and the Sea without Defences

Risk of Flooding from Reservoirs



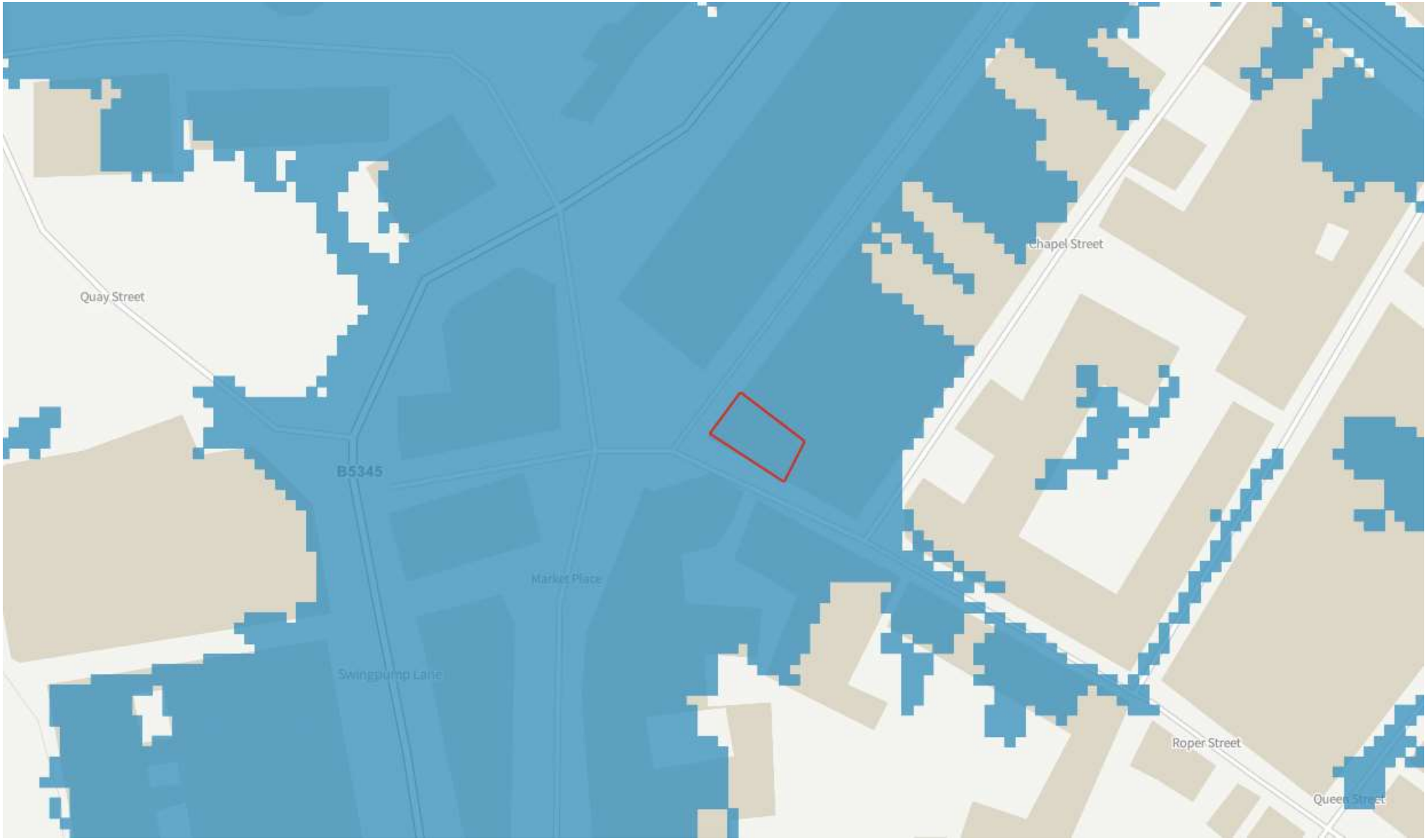
Risk of Flooding from Surface Water

1 in 30 year



Risk of Flooding from Surface Water

1 in 100 year



Risk of Flooding from Surface Water

1 in 1000 year

Appendix E

Environnent Agency Product 4 Information

Flood risk assessment data

Location of site: 297234 / 518084 (shown as easting and northing coordinates)
Document created on: 27 June 2025
This information was previously known as a product 4.
Customer reference number: M87BY3ECBYFP

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 Cumberland.

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

About the models used

Model name: Pow Beck 2023
Scenario(s): Defended fluvial, defences removed fluvial, defended climate change fluvial
Date: 19 December 2023

Model name: Whitehaven_Tidal 2012
Scenario(s): Defended tidal, defences removed tidal, defended climate change tidal, defences removed climate change tidal
Date: 1 July 2013

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)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

Selected area
Main river
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

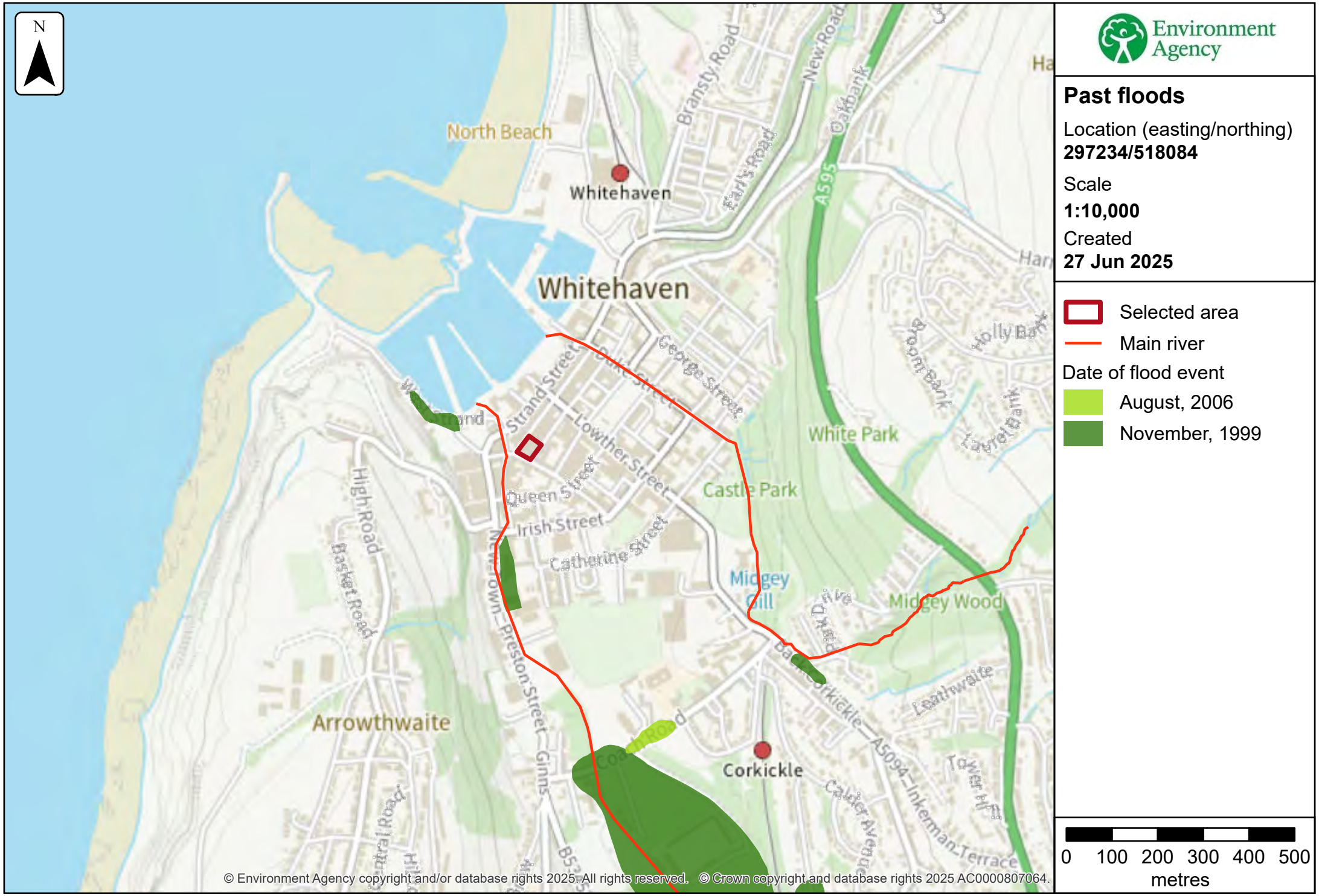
The recorded flood outlines are a geographical information system (GIS) data layer that show our verified records of areas that have flooded in the past from:

- 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 Cumberland 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)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

- Selected area
- Main river

Date of flood event

- August, 2006
- November, 1999

0 100 200 300 400 500
metres

Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
11 August 2006	11 August 2006	main river	unknown	No
5 November 1999	5 November 1999	main river	channel capacity exceeded (no raised defences)	No

Flood defences and attributes

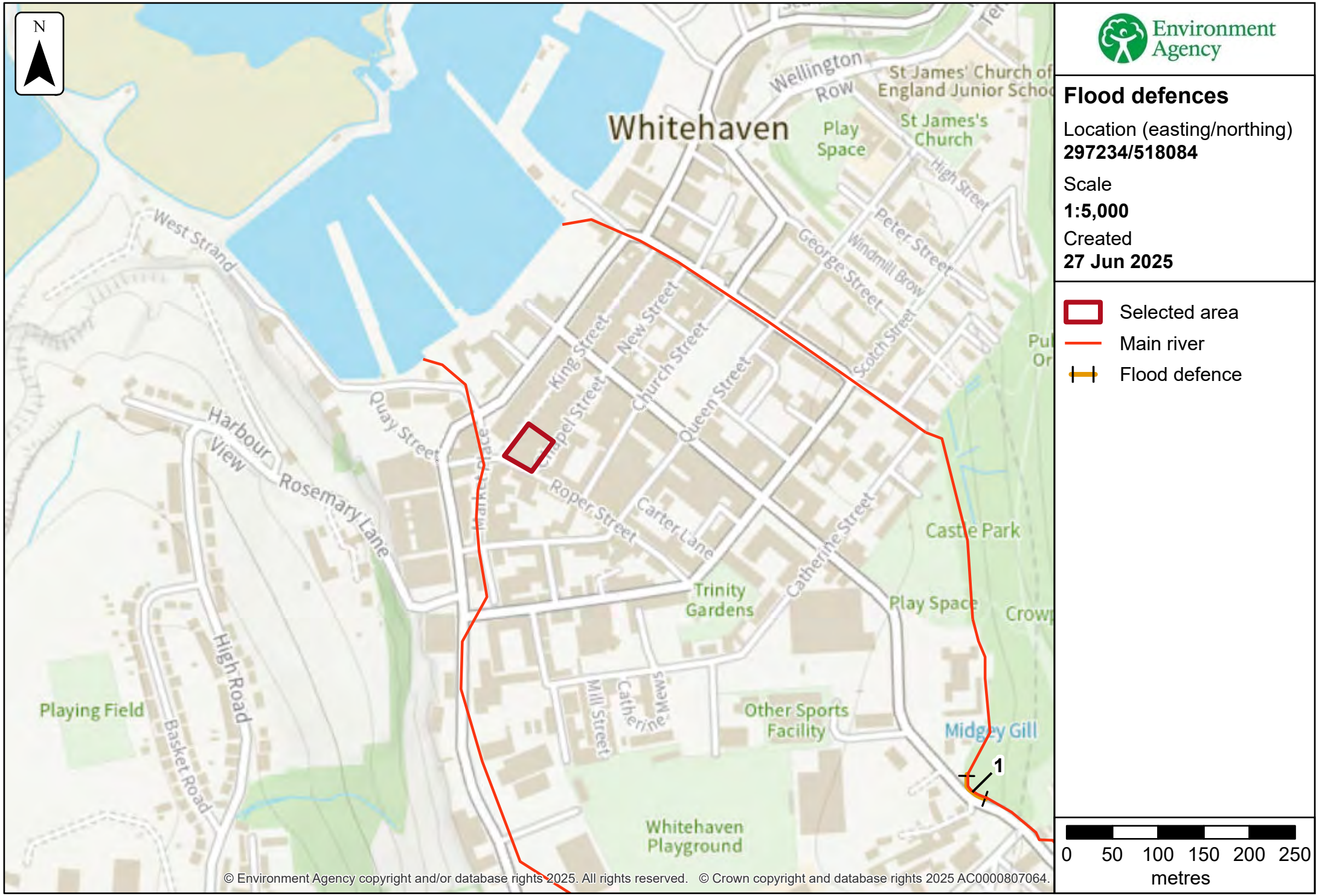
The flood defences map shows the location of the flood defences present.

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.

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)
297234/518084

Scale
1:5,000

Created
27 Jun 2025

- Selected area
- Main river
- Flood defence

0 50 100 150 200 250
metres

Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	94578	Wall	20	Fair	17.58	18.54	17.58

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
- Defended modelled tidal: risk of flooding from the sea where there are flood defences
- Defences removed modelled tidal: risk of flooding from the sea where flood defences have been removed
- Defended climate change modelled fluvial: risk of flooding from rivers where there are flood defences, including estimated impact of climate change
- Defended climate change modelled tidal: risk of flooding from the sea where there are flood defences, including estimated impact of climate change
- Defences removed climate change modelled tidal: risk of flooding from the sea where flood defences have been removed, including estimated impact of climate change

Environment Agency

Defences removed climate change modelled tidal extent

Location (easting/northing)
297234/518084

Scale **1:10,000**

Created **27 Jun 2025**

Model name
Whitehaven Tidal

Selected area

Main river

Modelled flood extent

0.5% AEP (+600mm)

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

0 100 200 300 400 500
metres

Environment Agency

Defences removed modelled fluvial extent

Location (easting/northing)
297234/518084

Scale **1:10,000**

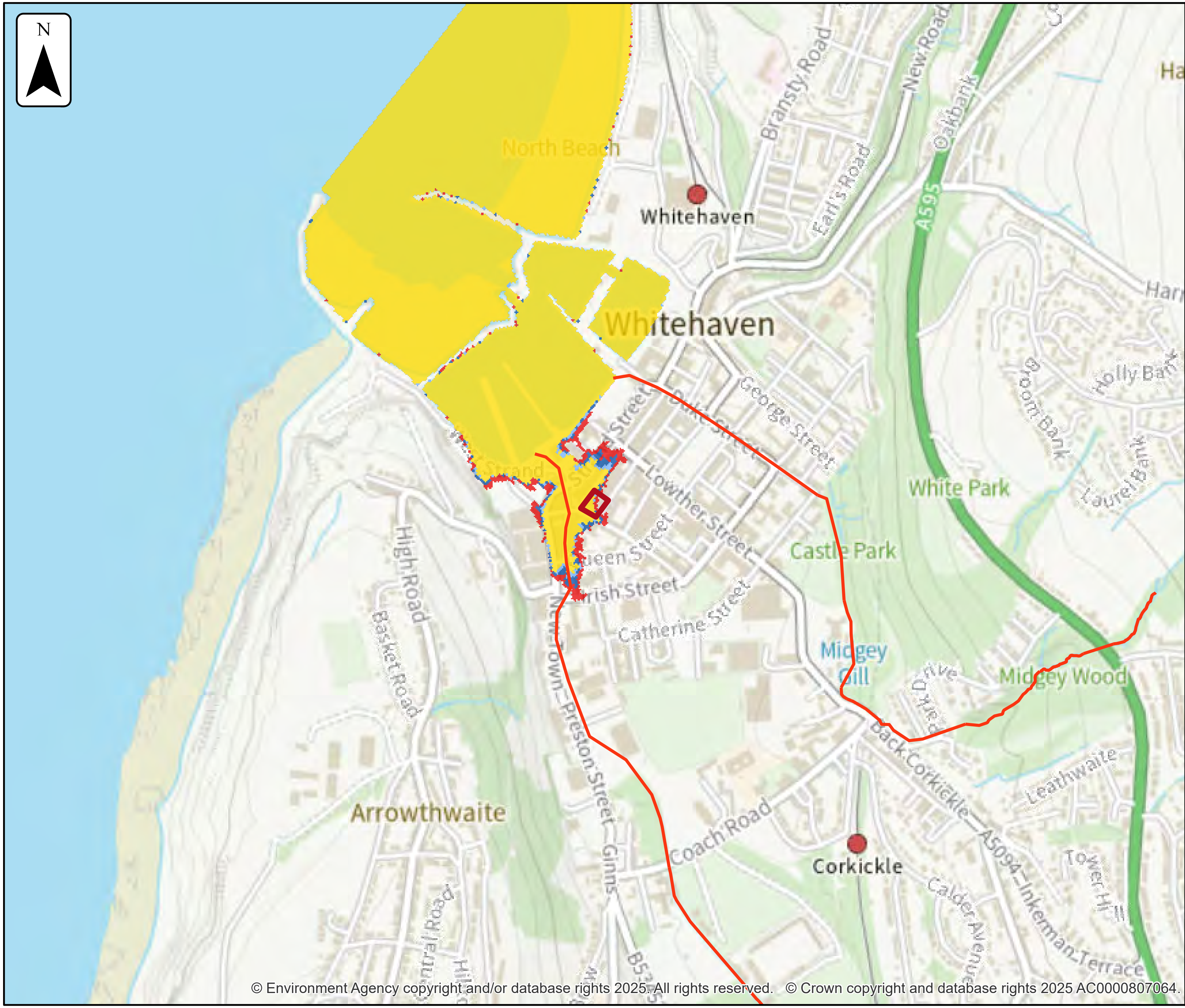
Created **27 Jun 2025**

Model name
Pow Beck 2023

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

Defences removed modelled tidal extent

Location (easting/northing)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

Model name
Whitehaven Tidal

Selected area

Main river

Modelled flood extent

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

Defended climate change modelled fluvial extent

Location (easting/northing)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

Model name
Pow Beck 2023

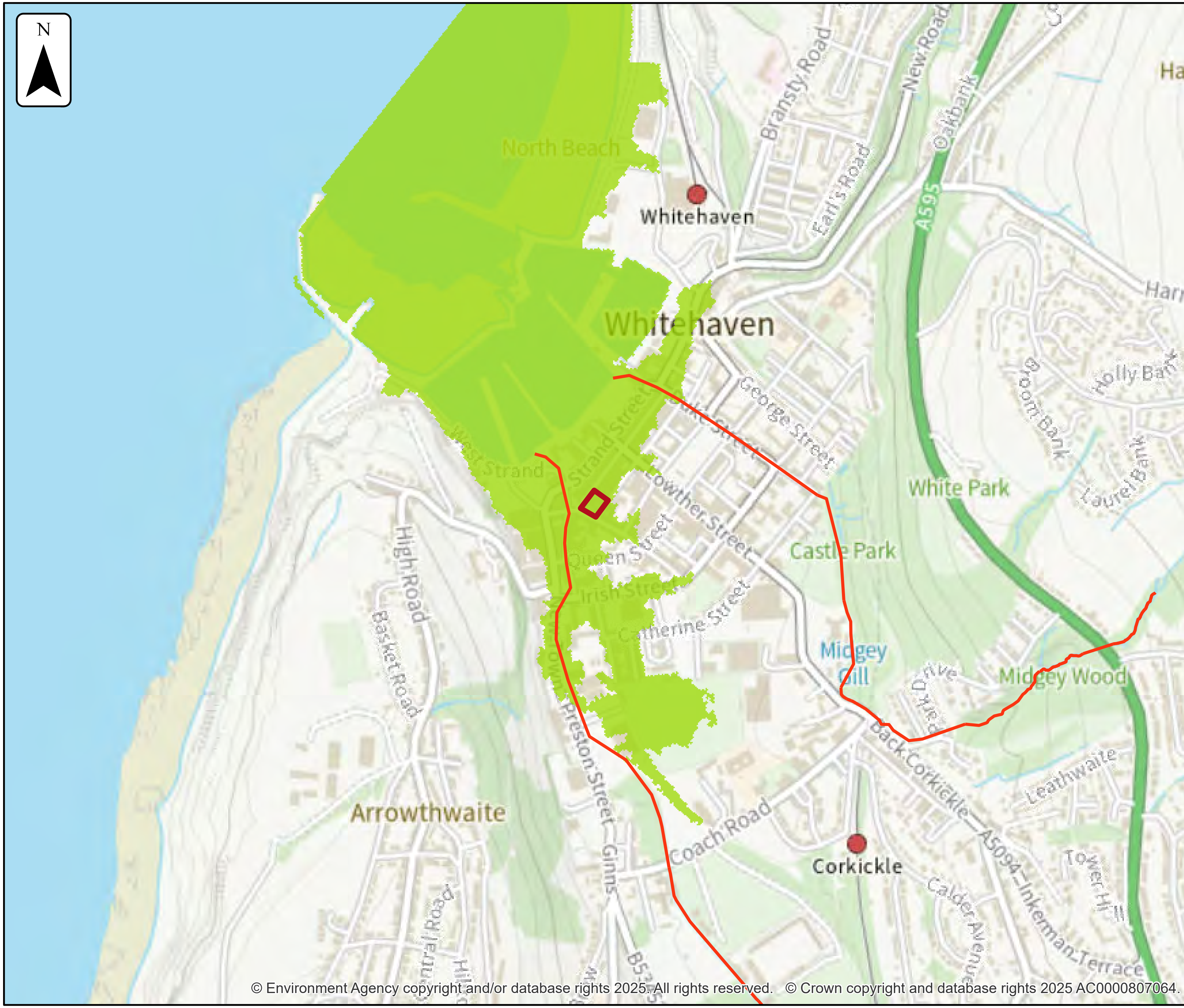
- Selected area
- Main river

Modelled flood extent

- 1% AEP (+30%)
- 1% AEP (+39%)
- 1% AEP (+63%)

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 tidal extent

Location (easting/northing)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

Model name
Whitehaven Tidal

Selected area

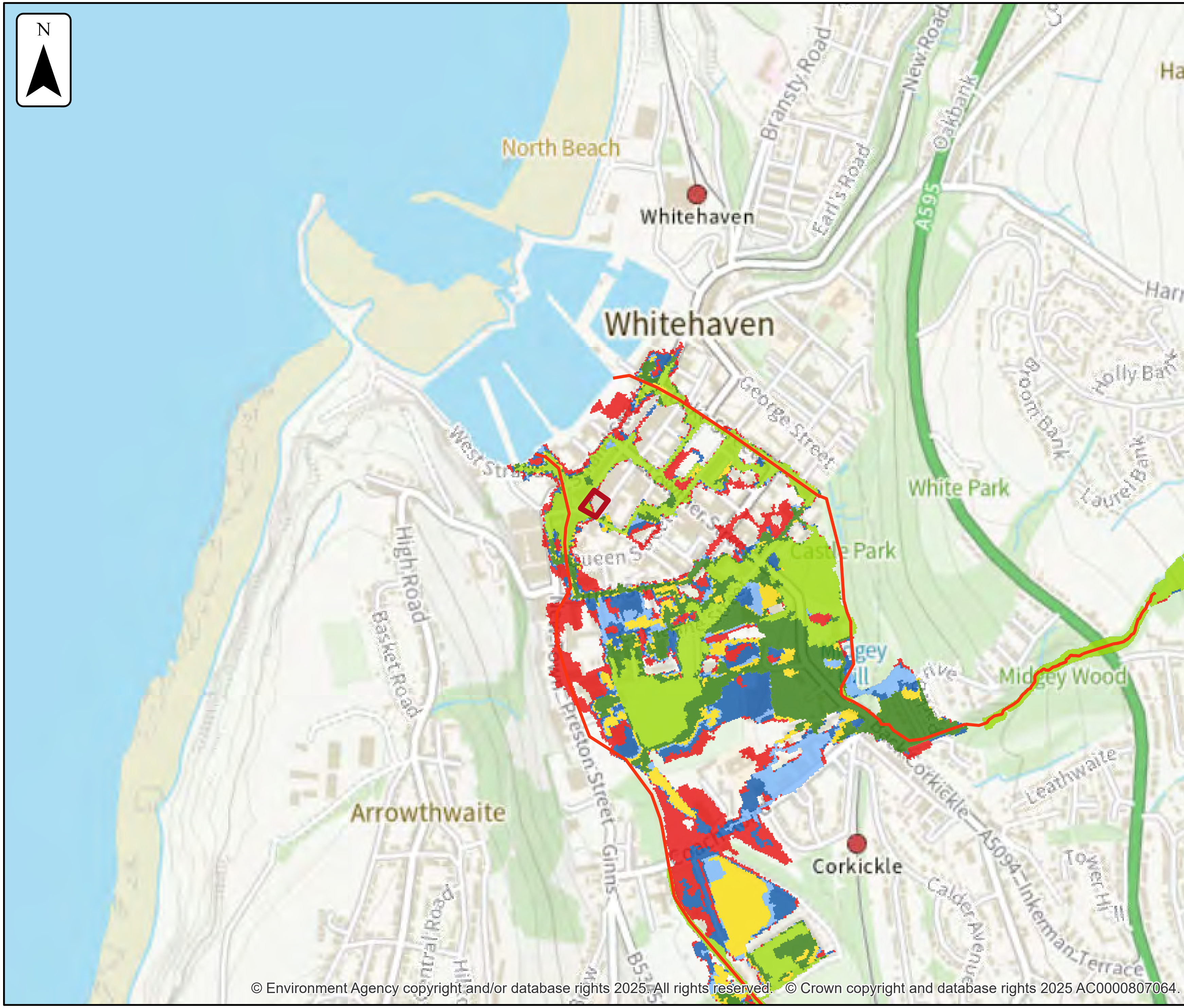
Main river

Modelled flood extent

0.5% AEP (+600mm)

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)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

Model name
Pow Beck 2023

Selected area

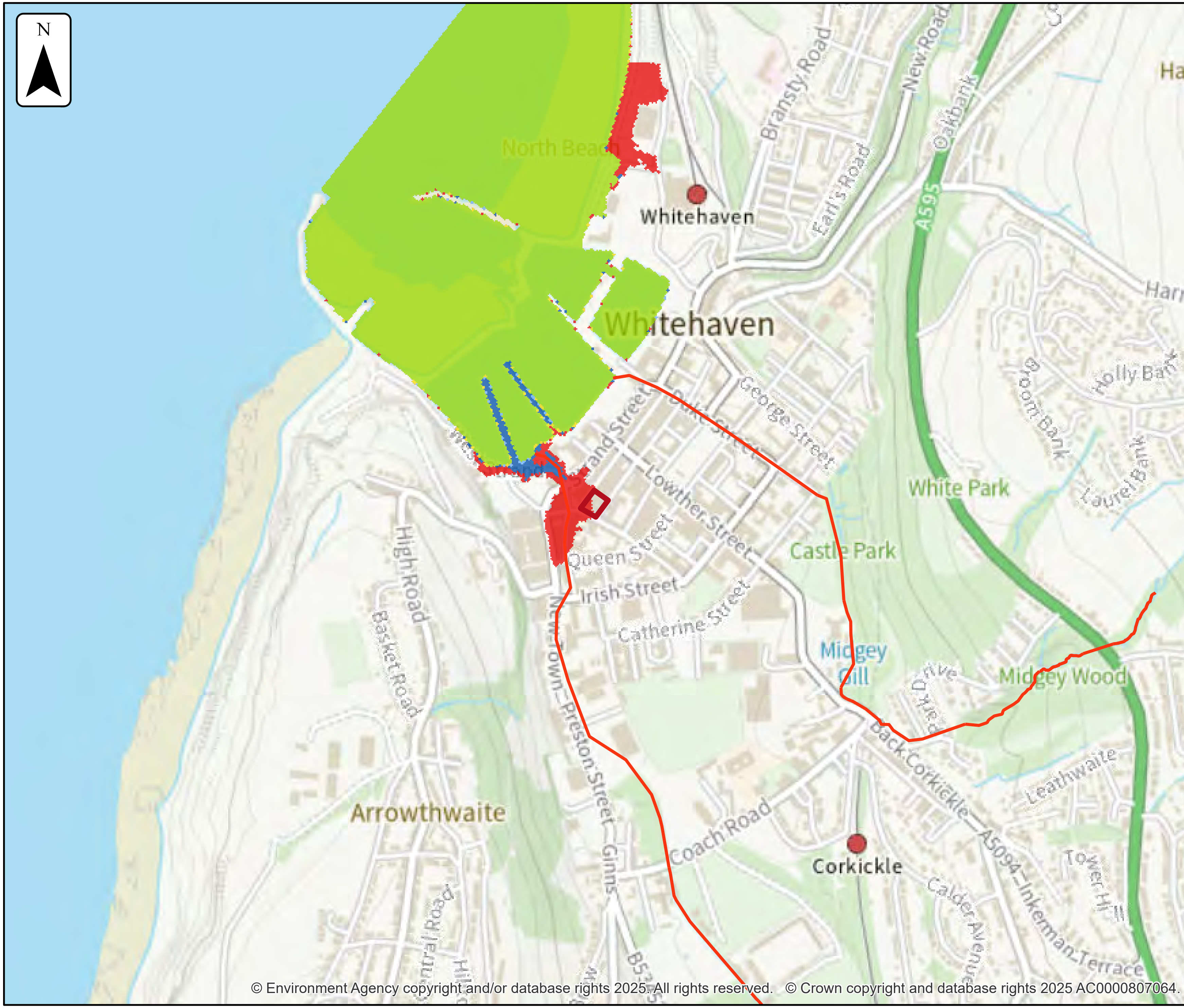
Main river

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

Defended modelled tidal extent

Location (easting/northing)
297234/518084

Scale
1:10,000

Created
27 Jun 2025

Model name
Whitehaven Tidal

Selected area

Main river

Modelled flood extent

5% AEP

1.33% AEP

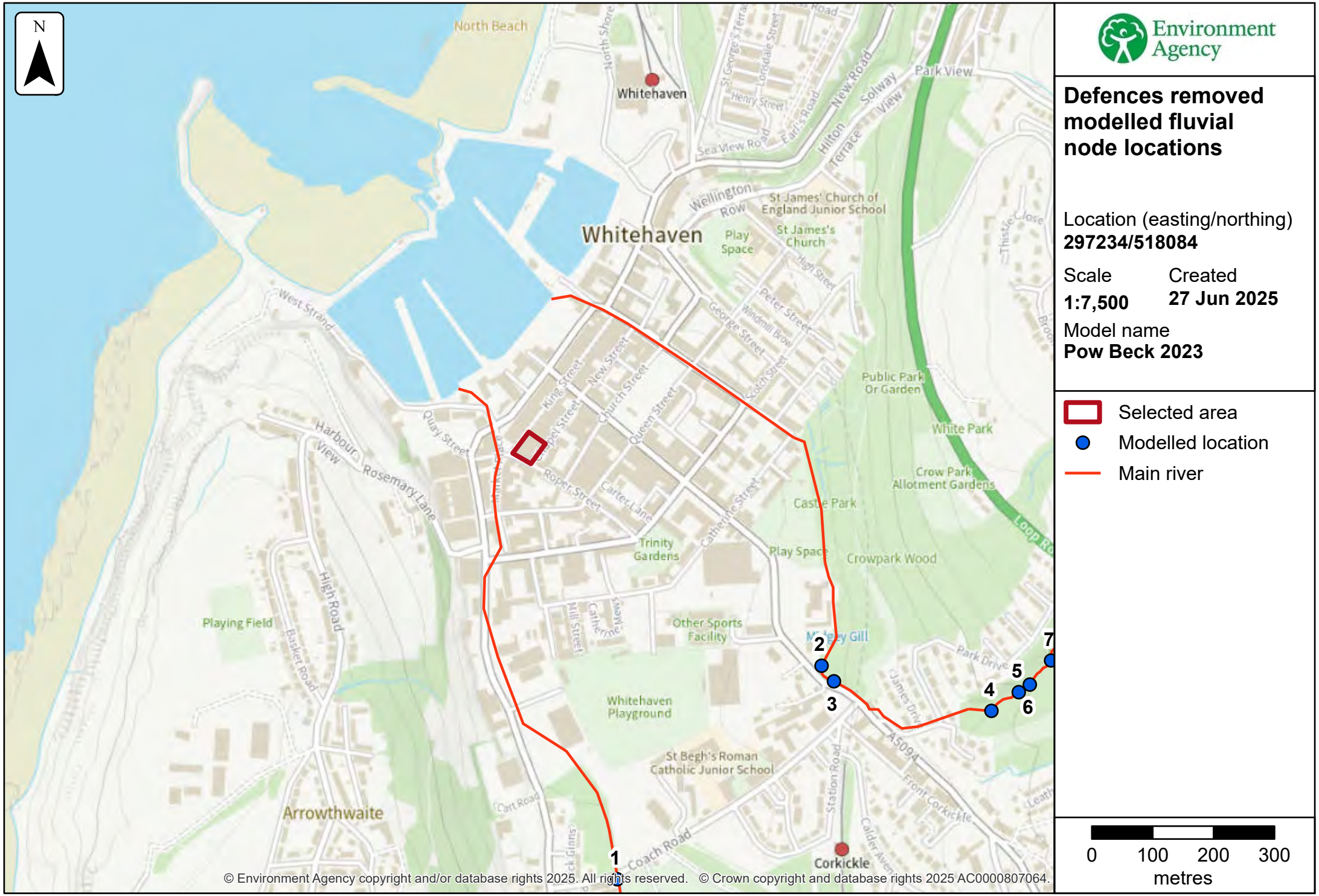
1% AEP

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

Defences removed modelled fluvial node locations

Location (easting/northing)
297234/518084

Scale
1:7,500

Created
27 Jun 2025

Model name
Pow Beck 2023

- Selected area
- Modelled location
- Main river

0 100 200 300
metres

Modelled node locations data

Defences removed

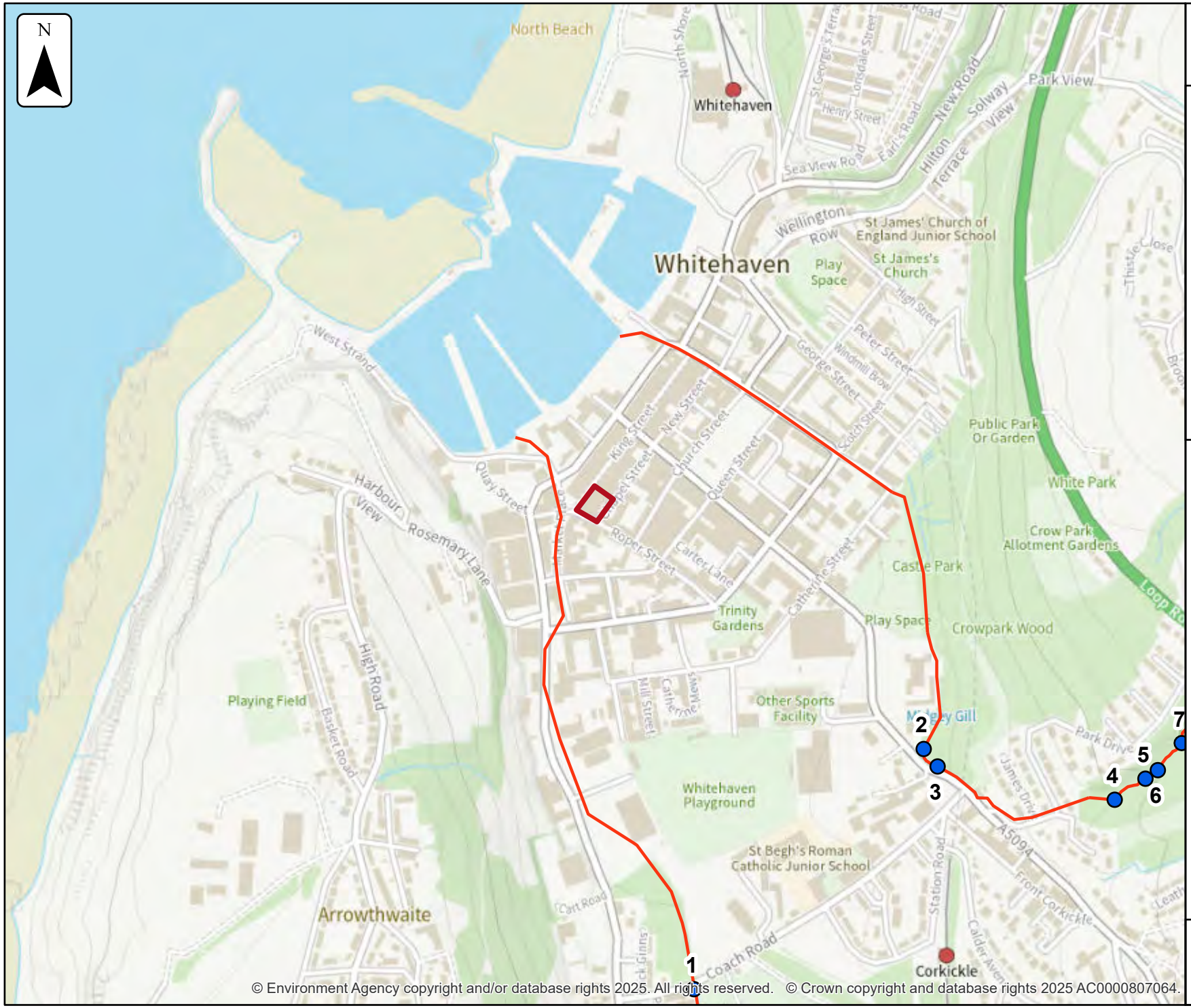
Label	Modelled location ID	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
1	1598642	297378	517375	6.74	6.89	6.99	7.09	7.14	7.18	7.28	7.39	7.61	7.75
2	1598566	297714	517726	16.75	16.80	16.82	16.83	16.83	16.85	16.87	16.89	16.92	17.10
3	1598608	297734	517701	17.50	17.55	17.58	17.61	17.64	17.66	17.69	17.71	17.75	17.78
4	1598645	297993	517652	37.72	37.89	37.99	38.11	38.18	38.27	38.34	38.40	38.56	39.06
5	1598557	298038	517683	39.90	39.94	39.96	39.99	40.01	40.03	40.06	40.07	40.11	40.20
6	1598620	298056	517695	42.52	42.55	42.58	42.60	42.62	42.64	42.66	42.67	42.71	42.78
7	1598596	298091	517735	50.38	50.40	50.42	50.44	50.45	50.46	50.47	50.48	50.52	50.60

Data in this table comes from the Pow Beck 2023 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

Label	Modelled location ID	Easting	Northing	50% AEP	20% 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	Flow
1	1598642	297378	517375	2.39	3.08	3.61	4.14	4.37	4.61	4.83	4.98	5.34	5.74
2	1598566	297714	517726	0.61	0.66	0.71	0.72	0.72	0.77	0.81	0.82	1.09	1.13
3	1598608	297734	517701	0.36	0.47	0.55	0.64	0.71	0.80	0.88	0.95	1.09	1.19
4	1598645	297993	517652	5.72	5.72	5.72	5.72	5.71	5.71	5.71	5.71	5.71	5.70
5	1598557	298038	517683	0.40	0.51	0.60	0.70	0.78	0.87	0.96	1.03	1.25	1.90
6	1598620	298056	517695	0.40	0.51	0.60	0.70	0.78	0.87	0.96	1.03	1.25	1.90
7	1598596	298091	517735	0.40	0.51	0.60	0.70	0.78	0.87	0.96	1.04	1.25	1.90

Data in this table comes from the Pow Beck 2023 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)
297234/518084

Scale
1:7,500

Created
27 Jun 2025

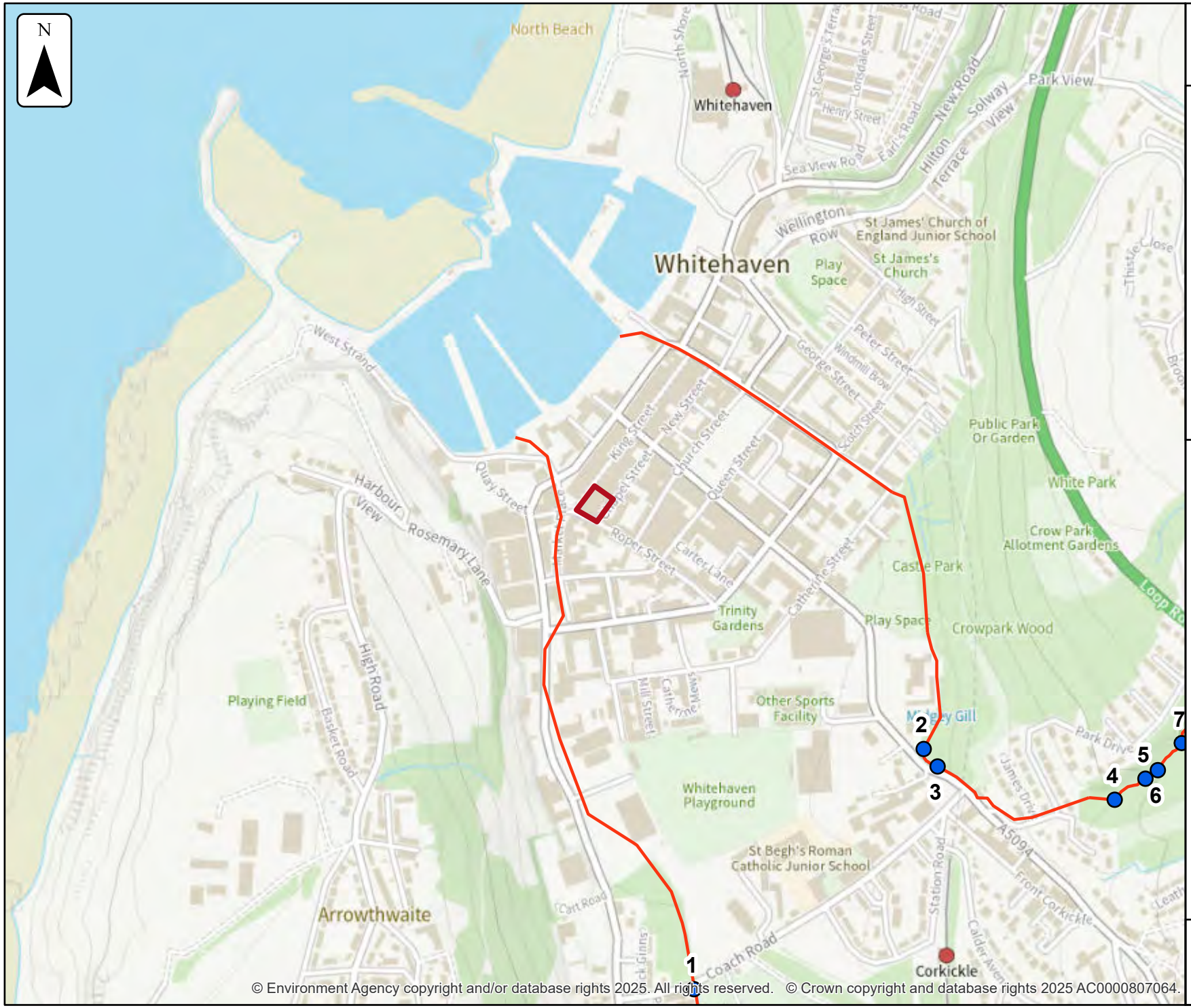
Model name
Pow Beck 2023

Modelled node locations data

Defended climate change

Label	Modelled location ID	Easting	Northing	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)
				Level	Level	Level	Flow	Flow	Flow
1	1598642	297378	517375	7.54	7.60	7.68	5.44	5.49	5.63
2	1598566	297714	517726	17.72	17.73	17.76	1.72	1.72	1.73
3	1598608	297734	517701	17.83	17.84	17.85	0.94	0.96	1.0
4	1598645	297993	517652	38.38	38.40	38.43	1.34	1.44	1.70
5	1598557	298038	517683	40.13	40.14	40.18	1.35	1.45	1.70
6	1598620	298056	517695	42.72	42.73	42.76	1.35	1.45	1.70
7	1598596	298091	517735	50.53	50.54	50.57	1.35	1.45	1.70

Data in this table comes from the Pow Beck 2023 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)
297234/518084

Scale
1:7,500

Created
27 Jun 2025

Model name
Pow Beck 2023

- Selected area
- Modelled location
- Main river

0 100 200 300
metres

Modelled node locations data

Defended

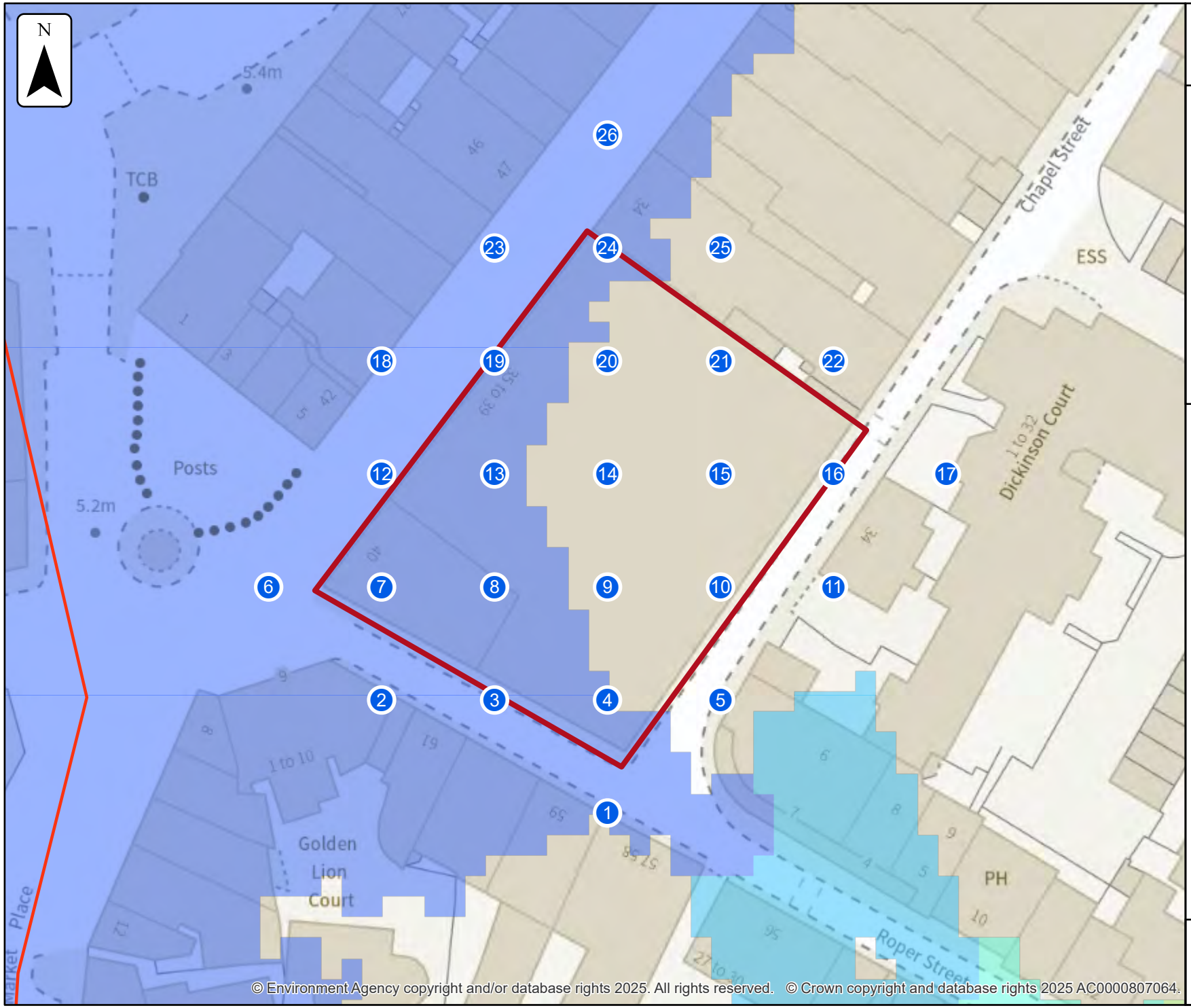
Label	Modelled location ID	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	2% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
				Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
1	1598642	297378	517375	6.74	6.89	7.0	7.10	7.14	7.18	7.22	7.24	7.46	7.72
2	1598566	297714	517726	16.94	17.08	17.17	17.23	17.60	17.64	17.66	17.67	17.71	17.78
3	1598608	297734	517701	17.51	17.57	17.61	17.66	17.73	17.76	17.78	17.79	17.82	17.86
4	1598645	297993	517652	37.73	37.90	38.01	38.12	38.19	38.25	38.29	38.32	38.37	38.45
5	1598557	298038	517683	39.90	39.94	39.96	40.0	40.01	40.03	40.06	40.07	40.11	40.20
6	1598620	298056	517695	42.52	42.55	42.58	42.61	42.62	42.64	42.66	42.67	42.71	42.78
7	1598596	298091	517735	50.38	50.40	50.42	50.44	50.45	50.46	50.47	50.48	50.52	50.60

Data in this table comes from the Pow Beck 2023 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	20% 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	Flow
1	1598642	297378	517375	2.40	3.11	3.63	4.15	4.38	4.63	4.83	4.94	5.37	5.73
2	1598566	297714	517726	0.90	1.16	1.36	1.59	1.71	1.71	1.71	1.72	1.72	1.74
3	1598608	297734	517701	0.37	0.48	0.56	0.65	0.71	0.78	0.82	0.85	0.92	1.03
4	1598645	297993	517652	0.37	0.48	0.56	0.65	0.73	0.86	0.93	1.01	1.24	1.90
5	1598557	298038	517683	0.40	0.51	0.60	0.74	0.77	0.87	0.96	1.03	1.25	1.90
6	1598620	298056	517695	0.40	0.51	0.60	0.74	0.78	0.87	0.96	1.03	1.25	1.90
7	1598596	298091	517735	0.40	0.51	0.60	0.75	0.78	0.87	0.96	1.03	1.25	1.90

Data in this table comes from the Pow Beck 2023 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 extent and height

Location (easting/northing)
297234/518084

Scale
1:500

Created
27 Jun 2025

Model name
Pow Beck 2023

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 5 - 5.5
- 5.5 - 6.0
- 6.0 - 6.5
- 6.5 - 7.0
- 7.0 - 7.5
- 7.5 - 8.0
- 8.0 - 8.5
- 8.5 - 9.0
- 9.0 - 9.5

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defended

Label	Easting	Northing	50% AEP	20% 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	Height
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.67	5.80
2	297213	518065	NoData	5.31	5.47	5.53	5.55	5.56	5.58	5.59	5.64	5.80
3	297224	518065	NoData	5.31	5.47	5.54	5.55	5.56	5.58	5.59	5.64	5.80
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.80
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	5.31	5.47	5.54	5.55	5.56	5.58	5.59	5.64	5.80
7	297213	518076	NoData	5.31	5.47	5.53	5.55	5.56	5.58	5.59	5.64	5.80
8	297224	518076	NoData	NoData	5.47	5.54	5.55	5.56	5.58	5.59	5.64	5.80
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	5.31	5.47	5.54	5.55	5.56	5.58	5.59	5.64	5.80

Label	Easting	Northing	50% AEP	20% 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	Height
13	297224	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.64	5.80
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	NoData	5.32	5.47	5.54	5.56	5.57	5.58	5.60	5.65	5.80
19	297224	518098	NoData	NoData	5.47	5.55	5.56	5.57	5.59	5.61	5.65	5.81
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	NoData	5.47	5.50	5.56	5.58	5.59	5.60	5.63	5.67	5.82
24	297235	518109	NoData	NoData	NoData	5.61	5.62	5.62	5.63	5.65	5.70	5.83

Label	Easting	Northing	50% AEP	20% 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	Height
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	NoData	5.61	5.64	5.66	5.67	5.69	5.70	5.71	5.73	5.85
Max value in selected area:			NoData	5.47	5.50	5.61	5.62	5.70	5.70	5.71	5.73	5.83

Data in this table comes from the Pow Beck 2023 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.

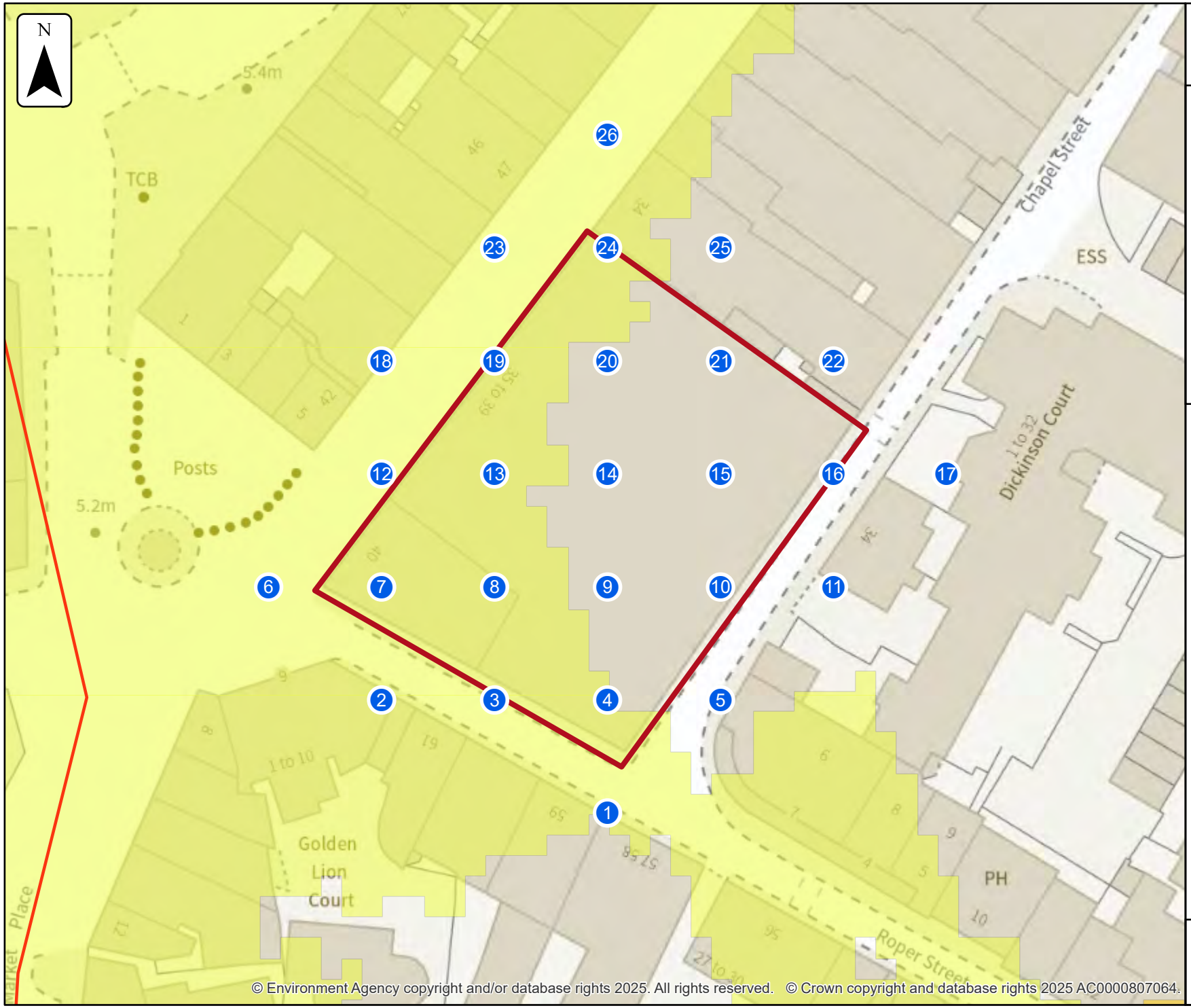
Defended

Label	Easting	Northing	50% AEP	20% 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	Depth
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.04	0.17
2	297213	518065	NoData	0.17	0.33	0.40	0.42	0.43	0.44	0.46	0.51	0.67
3	297224	518065	NoData	0.10	0.26	0.33	0.35	0.36	0.37	0.39	0.44	0.60
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.09
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	0.26	0.42	0.49	0.50	0.51	0.52	0.54	0.59	0.75
7	297213	518076	NoData	0.04	0.20	0.26	0.28	0.29	0.31	0.32	0.37	0.53
8	297224	518076	NoData	NoData	0.03	0.10	0.12	0.13	0.14	0.16	0.21	0.37
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	0.16	0.32	0.38	0.40	0.41	0.43	0.44	0.49	0.65

Label	Easting	Northing	50% AEP	20% 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	Depth
13	297224	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.09	0.25
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	NoData	0.00	0.13	0.20	0.22	0.23	0.25	0.26	0.31	0.47
19	297224	518098	NoData	NoData	0.06	0.14	0.15	0.17	0.18	0.20	0.24	0.40
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	NoData	0.09	0.12	0.17	0.19	0.21	0.22	0.24	0.29	0.43
24	297235	518109	NoData	NoData	NoData	0.00	0.01	0.01	0.02	0.03	0.05	0.18

Label	Easting	Northing	50% AEP	20% 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	Depth
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	NoData	0.08	0.11	0.14	0.14	0.17	0.17	0.19	0.21	0.33
Max value in selected area:			NoData	0.21	0.37	0.44	0.45	0.46	0.48	0.49	0.54	0.70

Data in this table comes from the Pow Beck 2023 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)
297234/518084

Scale
1:500

Created
27 Jun 2025

Model name
Pow Beck 2023

- Selected area
- Main river

Modelled 2D grid
Water level in mAOD

- 0 - 1.125
- 1.125 - 2.25
- 2.25 - 3.375
- 3.375 - 4.5
- 4.5 - 5.625
- 5.625 - 6.75
- 6.75 - 7.875
- 7.875 - 9.0
- 9.0 - 10.125

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defences removed

Label	Easting	Northing	50% AEP	20% 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	Height
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.68	5.82
2	297213	518065	NoData	NoData	5.31	5.47	5.52	5.54	5.56	5.58	5.66	5.82
3	297224	518065	NoData	NoData	5.31	5.47	5.52	5.54	5.56	5.58	5.66	5.82
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.82
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	NoData	5.31	5.47	5.52	5.54	5.56	5.58	5.66	5.82
7	297213	518076	NoData	NoData	5.31	5.47	5.52	5.54	5.56	5.58	5.66	5.82
8	297224	518076	NoData	NoData	NoData	5.47	5.52	5.54	5.56	5.58	5.66	5.82
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	NoData	5.31	5.47	5.52	5.55	5.56	5.58	5.66	5.82

Label	Easting	Northing	50% AEP	20% 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	Height
13	297224	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.66	5.82
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	NoData	NoData	5.32	5.47	5.52	5.55	5.56	5.58	5.66	5.82
19	297224	518098	NoData	NoData	NoData	5.47	5.52	5.55	5.57	5.58	5.67	5.82
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	NoData	NoData	5.48	5.50	5.53	5.57	5.59	5.60	5.68	5.83
24	297235	518109	NoData	NoData	NoData	NoData	5.60	5.61	5.62	5.63	5.70	5.84

Label	Easting	Northing	50% AEP	20% 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	Height
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	NoData	NoData	5.61	5.65	5.65	5.67	5.69	5.70	5.73	5.86
Max value in selected area:			NoData	NoData	5.47	5.50	5.60	5.61	5.70	5.70	5.73	5.85

Data in this table comes from the Pow Beck 2023 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.
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'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

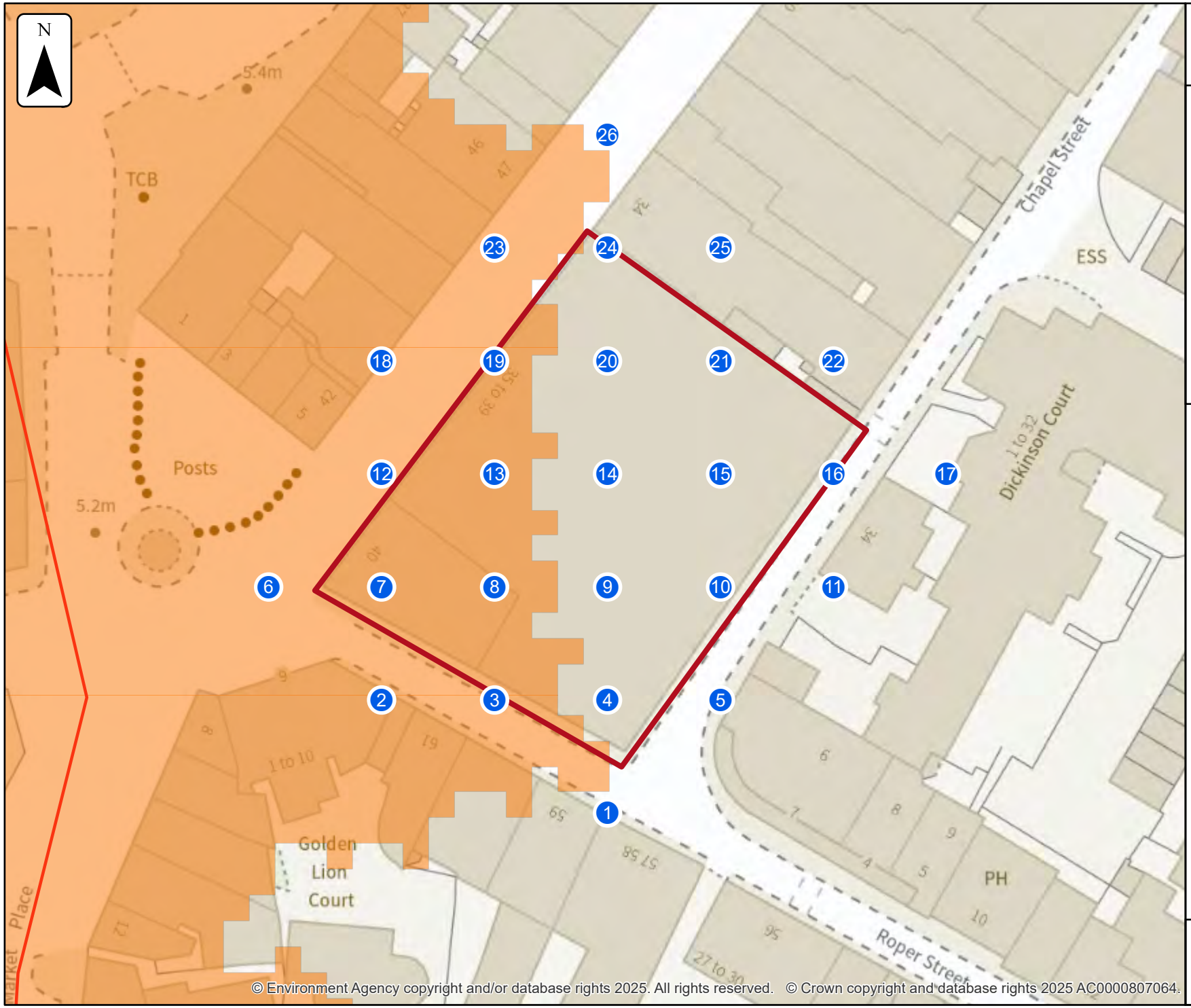
Defences removed

Label	Easting	Northing	50% AEP	20% 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	Depth
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.05	0.19
2	297213	518065	NoData	NoData	0.18	0.34	0.38	0.41	0.42	0.44	0.53	0.69
3	297224	518065	NoData	NoData	0.11	0.26	0.31	0.34	0.35	0.37	0.46	0.62
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.10
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	NoData	0.26	0.42	0.47	0.49	0.51	0.53	0.61	0.77
7	297213	518076	NoData	NoData	0.04	0.20	0.24	0.27	0.29	0.31	0.39	0.55
8	297224	518076	NoData	NoData	NoData	0.03	0.08	0.11	0.12	0.14	0.23	0.38
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	NoData	0.16	0.32	0.37	0.39	0.41	0.43	0.51	0.67

Label	Easting	Northing	50% AEP	20% 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	Depth
13	297224	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.11	0.27
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	NoData	NoData	0.00	0.13	0.18	0.21	0.23	0.24	0.33	0.49
19	297224	518098	NoData	NoData	NoData	0.06	0.11	0.14	0.16	0.17	0.26	0.41
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	NoData	NoData	0.09	0.12	0.15	0.18	0.20	0.22	0.29	0.45
24	297235	518109	NoData	NoData	NoData	NoData	0.00	0.00	0.01	0.02	0.05	0.19

Label	Easting	Northing	50% AEP	20% 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	Depth
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	NoData	NoData	0.08	0.12	0.13	0.14	0.17	0.17	0.20	0.34
Max value in selected area:			NoData	NoData	0.21	0.37	0.42	0.44	0.46	0.48	0.56	0.72

Data in this table comes from the Pow Beck 2023 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 modelled tidal extent and height

Location (easting/northing)
297234/518084

Scale
1:500

Created
27 Jun 2025

Model name
Whitehaven Tidal

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 0.75
- 0.75 - 1.5
- 1.5 - 2.25
- 2.25 - 3.0
- 3.0 - 3.75
- 3.75 - 4.5
- 4.5 - 5.25
- 5.25 - 6.0
- 6.0 - 6.75

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defended

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	297213	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
3	297224	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
7	297213	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
8	297224	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height
13	297224	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
19	297224	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50
24	297235	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height	Height	Height	Height	Height
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	5.50

Data in this table comes from the Whitehaven Tidal 2012 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.

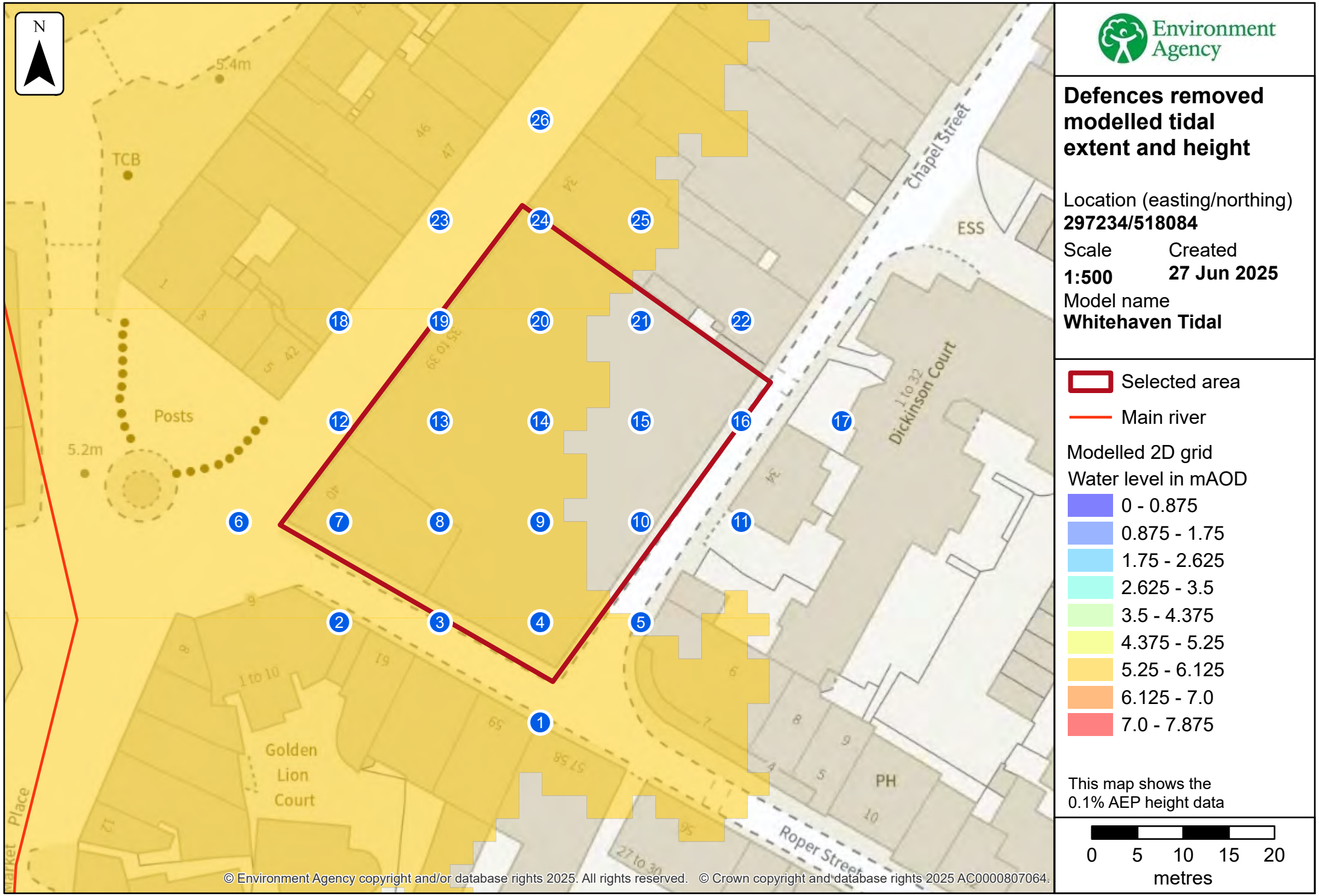
Defended

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
1	297235	518054	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
2	297213	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.45
3	297224	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.32
4	297235	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.54
7	297213	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.42
8	297224	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.22
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.39

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
13	297224	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.11
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.33
19	297224	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.18
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.16
24	297235	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData

Label	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth	Depth
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData
Max value in selected area:			NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	0.50

Data in this table comes from the Whitehaven Tidal 2012 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 tidal extent and height

Location (easting/northing)
297234/518084

Scale
1:500

Created
27 Jun 2025

Model name
Whitehaven Tidal

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 0.875
- 0.875 - 1.75
- 1.75 - 2.625
- 2.625 - 3.5
- 3.5 - 4.375
- 4.375 - 5.25
- 5.25 - 6.125
- 6.125 - 7.0
- 7.0 - 7.875

This map shows the 0.1% AEP height data

0 5 10 15 20
metres

Sample point data

Defences removed

Label	Easting	Northing	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height
1	297235	518054	NoData	NoData	5.74	5.84	6.07
2	297213	518065	5.54	5.69	5.74	5.84	6.08
3	297224	518065	5.54	5.69	5.74	5.84	6.07
4	297235	518065	NoData	5.69	5.74	5.84	6.07
5	297246	518065	NoData	NoData	NoData	NoData	NoData
6	297202	518076	5.54	5.69	5.74	5.84	6.07
7	297213	518076	5.54	5.69	5.74	5.84	6.07
8	297224	518076	5.54	5.69	5.74	5.84	6.07
9	297235	518076	NoData	NoData	NoData	NoData	6.08
10	297246	518076	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData
12	297213	518087	5.54	5.69	5.74	5.84	6.07

Label	Easting	Northing	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height
13	297224	518087	5.54	5.69	5.74	5.84	6.07
14	297235	518087	NoData	NoData	NoData	NoData	6.08
15	297246	518087	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData
18	297213	518098	5.54	5.69	5.74	5.84	6.07
19	297224	518098	5.54	5.69	5.74	5.84	6.07
20	297235	518098	NoData	5.69	5.74	5.84	6.08
21	297246	518098	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData
23	297224	518109	5.54	5.69	5.74	5.84	6.07
24	297235	518109	NoData	5.69	5.74	5.84	6.08

Label	Easting	Northing	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Height	Height	Height	Height	Height
25	297246	518109	NoData	NoData	NoData	NoData	6.07
26	297235	518120	5.54	5.69	5.74	5.84	6.07
Max value in selected area:			5.54	5.69	5.74	5.84	6.08

Data in this table comes from the Whitehaven Tidal 2012 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.

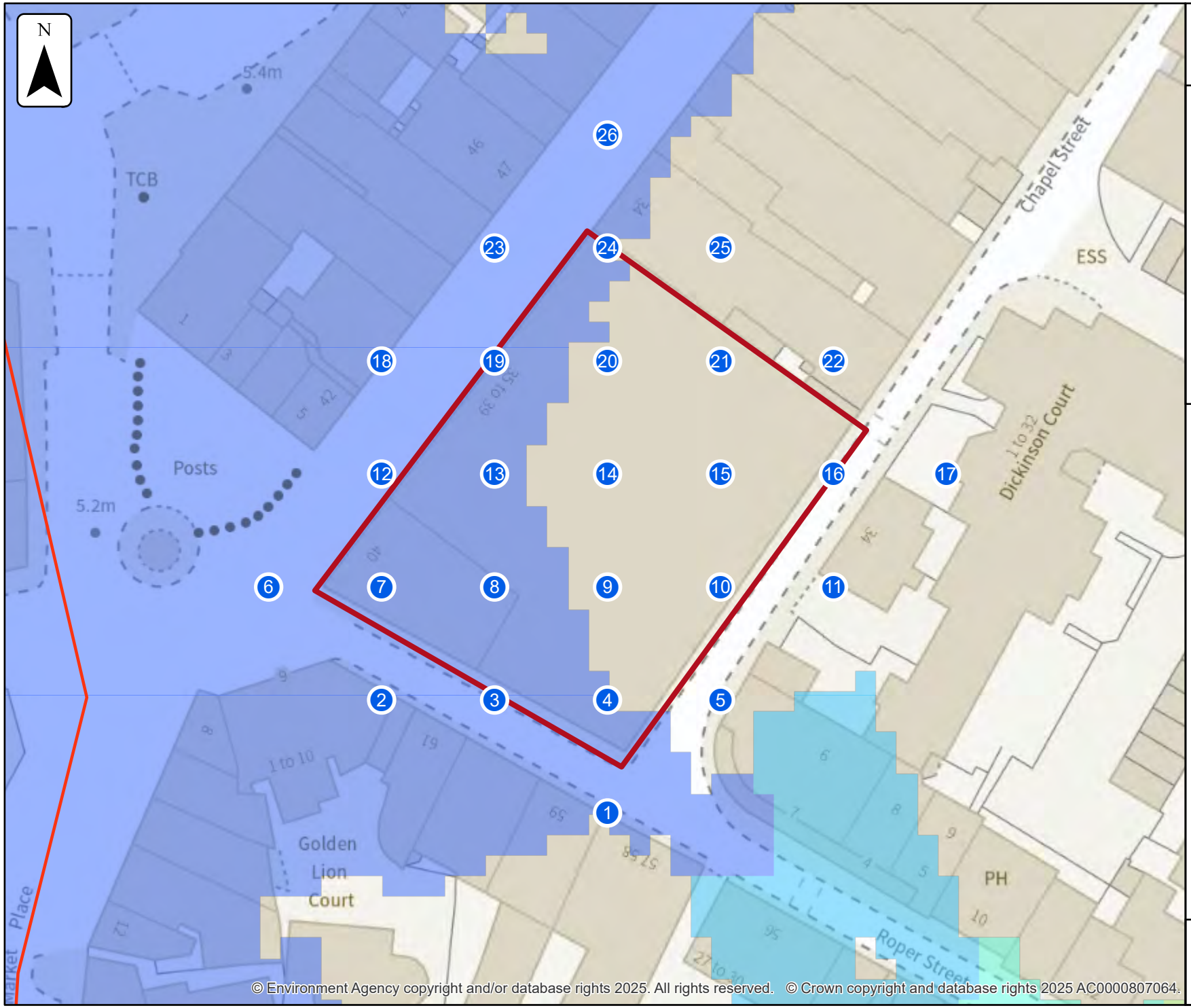
Defences removed

Label	Easting	Northing	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth
1	297235	518054	NoData	NoData	0.19	0.28	0.52
2	297213	518065	0.49	0.65	0.70	0.80	1.03
3	297224	518065	0.36	0.52	0.56	0.67	0.90
4	297235	518065	NoData	0.14	0.18	0.28	0.51
5	297246	518065	NoData	NoData	NoData	NoData	NoData
6	297202	518076	0.58	0.74	0.78	0.88	1.12
7	297213	518076	0.46	0.62	0.67	0.77	1.00
8	297224	518076	0.26	0.42	0.47	0.57	0.80
9	297235	518076	NoData	NoData	NoData	NoData	0.29
10	297246	518076	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData
12	297213	518087	0.43	0.58	0.63	0.73	0.97

Label	Easting	Northing	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth
13	297224	518087	0.15	0.31	0.35	0.46	0.69
14	297235	518087	NoData	NoData	NoData	NoData	0.27
15	297246	518087	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData
18	297213	518098	0.37	0.53	0.58	0.68	0.91
19	297224	518098	0.22	0.37	0.42	0.52	0.76
20	297235	518098	NoData	0.02	0.04	0.11	0.35
21	297246	518098	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData
23	297224	518109	0.20	0.36	0.41	0.51	0.74
24	297235	518109	NoData	0.14	0.19	0.29	0.52

Label	Easting	Northing	3.33% AEP	1.33% AEP	1% AEP	0.5% AEP	0.1% AEP
			Depth	Depth	Depth	Depth	Depth
25	297246	518109	NoData	NoData	NoData	NoData	0.12
26	297235	518120	0.08	0.23	0.28	0.38	0.61
Max value in selected area:			0.54	0.70	0.75	0.85	1.08

Data in this table comes from the Whitehaven Tidal 2012 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)
297234/518084

Scale
1:500

Created
27 Jun 2025

Model name
Pow Beck 2023

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 5 - 5.5
- 5.5 - 6.0
- 6.0 - 6.5
- 6.5 - 7.0
- 7.0 - 7.5
- 7.5 - 8.0
- 8.0 - 8.5
- 8.5 - 9.0
- 9.0 - 9.5

This map shows the
1% AEP +63% height data

0 5 10 15 20
metres

Sample point data

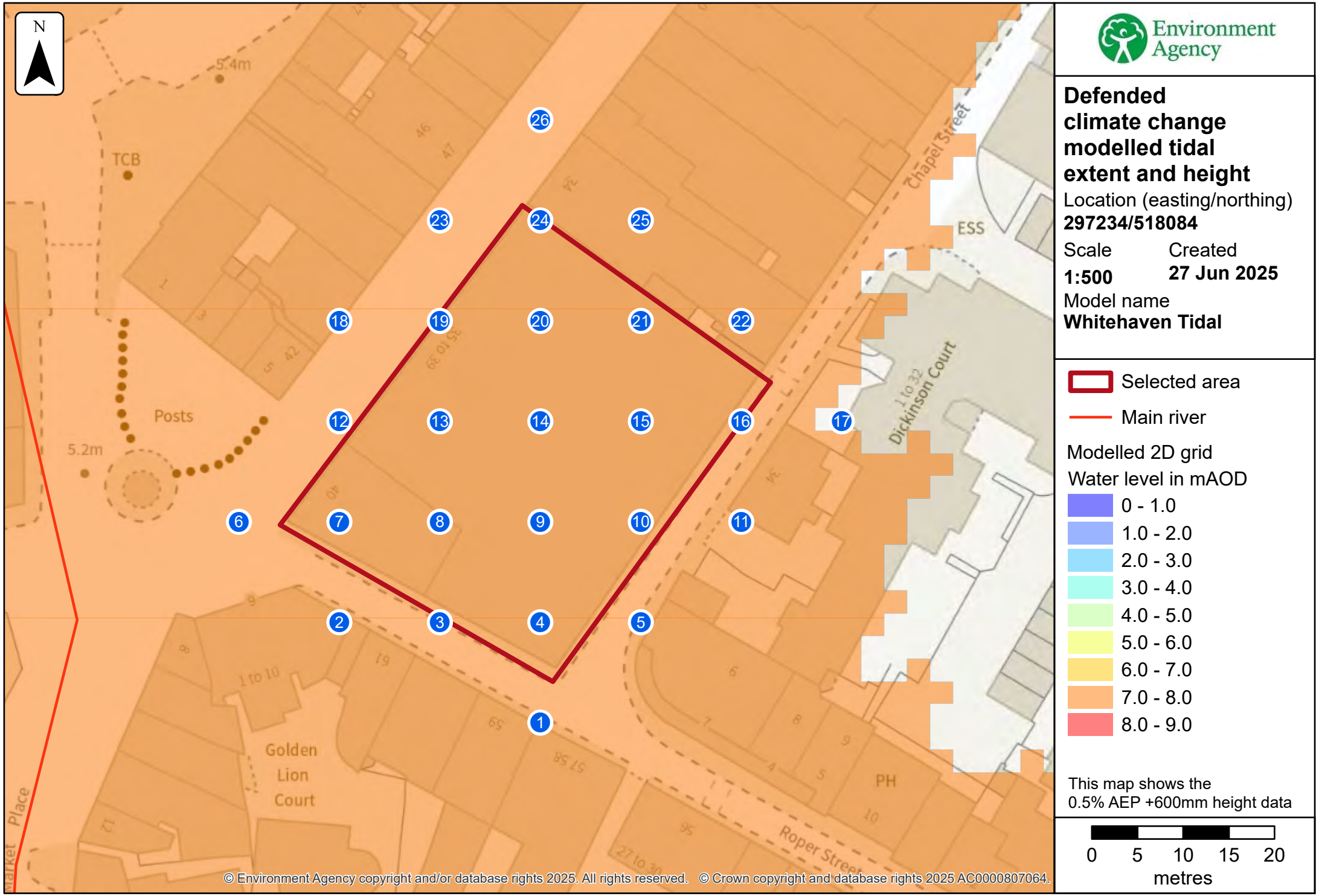
Defended climate change

Label	Easting	Northing	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)
			Height	Height	Height	Depth	Depth	Depth
1	297235	518054	5.68	5.71	5.76	0.05	0.07	0.13
2	297213	518065	5.67	5.69	5.76	0.53	0.56	0.62
3	297224	518065	5.67	5.69	5.76	0.46	0.49	0.56
4	297235	518065	NoData	5.69	5.76	NoData	0.02	0.06
5	297246	518065	NoData	NoData	NoData	NoData	NoData	NoData
6	297202	518076	5.67	5.69	5.76	0.62	0.64	0.71
7	297213	518076	5.67	5.69	5.76	0.40	0.42	0.49
8	297224	518076	5.67	5.69	5.76	0.23	0.26	0.32
9	297235	518076	NoData	NoData	NoData	NoData	NoData	NoData
10	297246	518076	NoData	NoData	NoData	NoData	NoData	NoData
11	297257	518076	NoData	NoData	NoData	NoData	NoData	NoData
12	297213	518087	5.67	5.69	5.76	0.52	0.54	0.61

Label	Easting	Northing	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)
			Height	Height	Height	Depth	Depth	Depth
13	297224	518087	5.67	5.69	5.76	0.12	0.14	0.21
14	297235	518087	NoData	NoData	NoData	NoData	NoData	NoData
15	297246	518087	NoData	NoData	NoData	NoData	NoData	NoData
16	297257	518087	NoData	NoData	NoData	NoData	NoData	NoData
17	297268	518087	NoData	NoData	NoData	NoData	NoData	NoData
18	297213	518098	5.67	5.70	5.76	0.34	0.36	0.43
19	297224	518098	5.68	5.70	5.76	0.27	0.29	0.36
20	297235	518098	NoData	NoData	NoData	NoData	NoData	NoData
21	297246	518098	NoData	NoData	NoData	NoData	NoData	NoData
22	297257	518098	NoData	NoData	NoData	NoData	NoData	NoData
23	297224	518109	5.69	5.72	5.78	0.31	0.33	0.39
24	297235	518109	5.71	5.73	5.79	0.06	0.08	0.14

Label	Easting	Northing	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)	1% AEP (+30%)	1% AEP (+39%)	1% AEP (+63%)
			Height	Height	Height	Depth	Depth	Depth
25	297246	518109	NoData	NoData	NoData	NoData	NoData	NoData
26	297235	518120	5.74	5.76	5.81	0.22	0.24	0.29
Max value in selected area:			5.73	5.74	5.80	0.57	0.59	0.66

Data in this table comes from the Pow Beck 2023 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 tidal extent and height

Location (easting/northing)
297234/518084

Scale
1:500

Created
27 Jun 2025

Model name
Whitehaven Tidal

Selected area

Main river

Modelled 2D grid
Water level in mAOD

- 0 - 1.0
- 1.0 - 2.0
- 2.0 - 3.0
- 3.0 - 4.0
- 4.0 - 5.0
- 5.0 - 6.0
- 6.0 - 7.0
- 7.0 - 8.0
- 8.0 - 9.0

This map shows the 0.5% AEP +600mm height data

0 5 10 15 20
metres

Sample point data

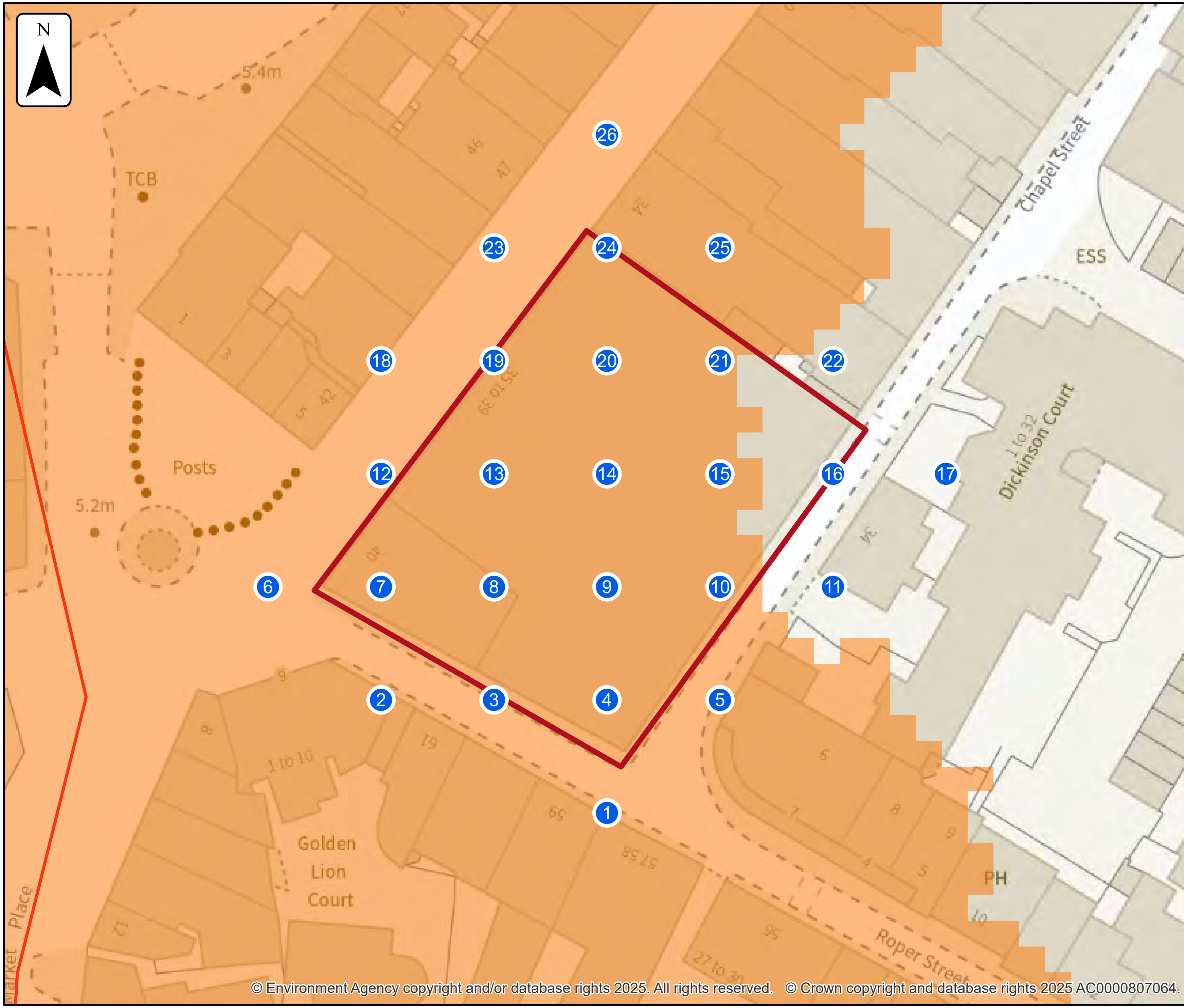
Defended climate change

Label	Easting	Northing	0.5% AEP (+600mm)	0.5% AEP (+600mm)
			Height	Depth
1	297235	518054	7.39	1.83
2	297213	518065	7.39	2.35
3	297224	518065	7.39	2.21
4	297235	518065	7.39	1.82
5	297246	518065	7.39	1.28
6	297202	518076	7.39	2.43
7	297213	518076	7.39	2.31
8	297224	518076	7.39	2.11
9	297235	518076	7.39	1.60
10	297246	518076	7.39	1.04
11	297257	518076	7.39	0.56
12	297213	518087	7.39	2.28

Label	Easting	Northing	0.5% AEP (+600mm)	0.5% AEP (+600mm)
			Height	Depth
13	297224	518087	7.39	2.00
14	297235	518087	7.39	1.58
15	297246	518087	7.39	1.01
16	297257	518087	7.39	0.62
17	297268	518087	NoData	NoData
18	297213	518098	7.39	2.23
19	297224	518098	7.39	2.07
20	297235	518098	7.39	1.66
21	297246	518098	7.39	1.05
22	297257	518098	7.39	0.65
23	297224	518109	7.39	2.05
24	297235	518109	7.39	1.83

Label	Easting	Northing	0.5% AEP (+600mm)	0.5% AEP (+600mm)
			Height	Depth
25	297246	518109	7.39	1.42
26	297235	518120	7.39	1.93
Max value in selected area:			7.39	2.39

Data in this table comes from the Whitehaven Tidal 2012 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 climate change modelled tidal extent and height

Location (easting/northing)
297234/518084

Scale **1:500**

Created **27 Jun 2025**

Model name
Whitehaven Tidal

Selected area

Main river

Modelled 2D grid
Water level in mAOD

0 - 0.875
0.875 - 1.75
1.75 - 2.625
2.625 - 3.5
3.5 - 4.375
4.375 - 5.25
5.25 - 6.125
6.125 - 7.0
7.0 - 7.875

This map shows the
0.5% AEP +600mm height data

0 5 10 15 20
metres

Sample point data

Defences removed climate change

Label	Easting	Northing	0.5% AEP (+600mm)	0.5% AEP (+600mm)
			Height	Depth
1	297235	518054	6.51	0.95
2	297213	518065	6.51	1.47
3	297224	518065	6.51	1.33
4	297235	518065	6.51	0.95
5	297246	518065	6.51	0.40
6	297202	518076	6.51	1.55
7	297213	518076	6.51	1.44
8	297224	518076	6.51	1.24
9	297235	518076	6.51	0.72
10	297246	518076	6.51	0.16
11	297257	518076	NoData	NoData
12	297213	518087	6.51	1.40

Label	Easting	Northing	0.5% AEP (+600mm)	0.5% AEP (+600mm)
			Height	Depth
13	297224	518087	6.51	1.12
14	297235	518087	6.51	0.71
15	297246	518087	6.52	0.14
16	297257	518087	NoData	NoData
17	297268	518087	NoData	NoData
18	297213	518098	6.51	1.35
19	297224	518098	6.51	1.19
20	297235	518098	6.51	0.78
21	297246	518098	6.52	0.18
22	297257	518098	NoData	NoData
23	297224	518109	6.51	1.18
24	297235	518109	6.51	0.96

Label	Easting	Northing	0.5% AEP (+600mm)	0.5% AEP (+600mm)
			Height	Depth
25	297246	518109	6.51	0.55
26	297235	518120	6.51	1.05
Max value in selected area:			6.52	1.52

Data in this table comes from the Whitehaven Tidal 2012 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 Cumberland.

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 Cumbria and Lancashire Environment Agency team at inforequests.cmblnc@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 F

Copeland Borough Council Level 1 SFRA GeoPDF Map 16

Level 1 SFRA
for
Copeland Borough Council

JBA consulting

16

Turn Map Labels On/Off: ☑

Please select the data you wish to view from the drop down menu below:

Map Data

- CBC boundary
- Main Rivers
- Ordinary watercourses
- Main River buffer
- Housing
- Employment
- Opportunity Area
- Wellbeing Village

Flood Zones

Flood Zones

- Flood Zone 3b
- Flood Zone 3a
- Flood Zone 2

Copeland borough council

Proud of our past. Energised for our future.

N

Bransty
Whitehaven
A5094
New Road
Loop Road North
WN003
WN004
HWH2
Loop Road South
Mirgey Gill
Road
Corkickle
E3
Arrowthwaite
WEO06
WEO05
OS2
WP005

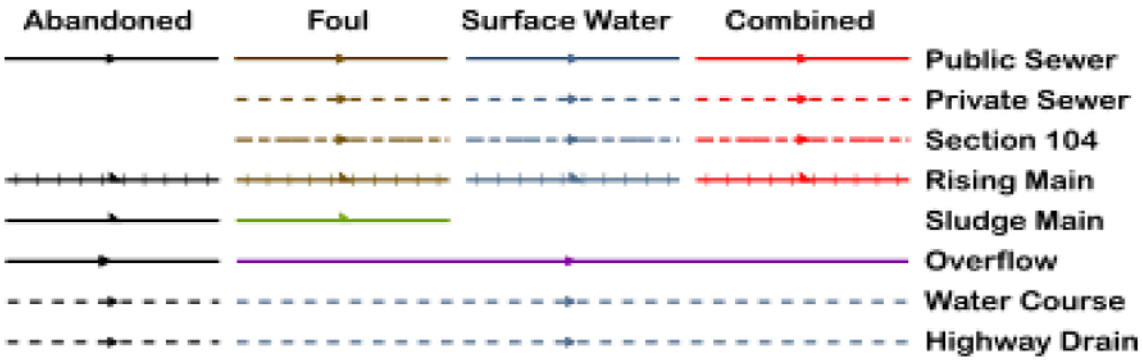
0 0.2 0.4 0.8 Kilometres

Appendix G

United Utilities Drainage Records

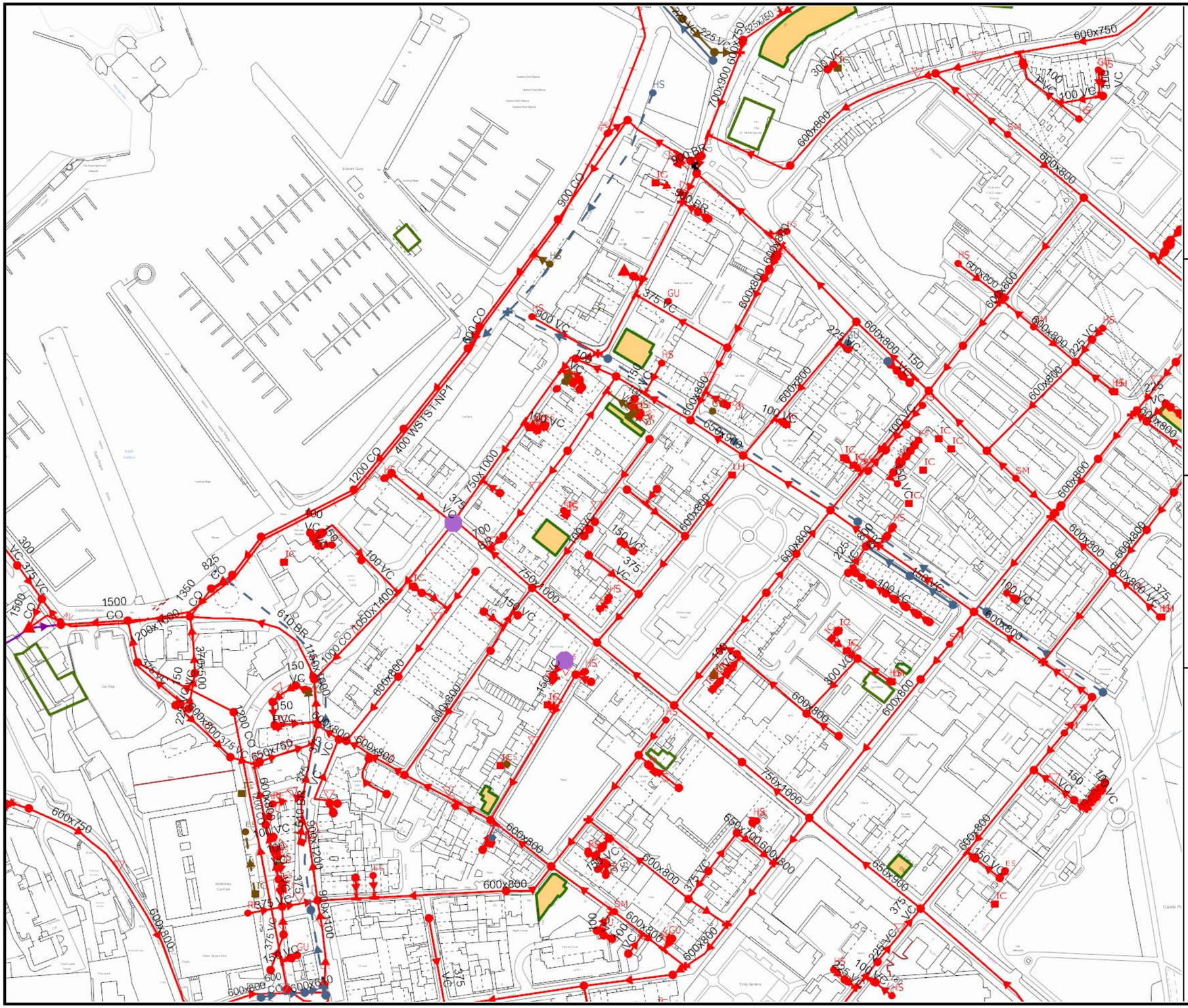
United Utilities
Water for the North West

Wastewater Symbology



All point assets follow the standard colour convention: red – combined, brown - foul, blue – surface water, purple - overflow

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- ST Septic Tank
- CK Control Kiosk
- DNM Network Monitoring Point
- Change of Characteristic



United Utilities

Water for the North West

SEWER RECORDS

Address or Site Reference

MILLETS 19 KING STREET,
WHITEHAVEN,
CA28 7LA

Scale: 1:2500

Date: 04/07/2025

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

Appendix H

Reference Documents List

The National Planning Policy Framework (December 2024)	Communities and Local Government
The Technical Guidance to the NPPF (March 2012)	Communities and Local Government
Flood Risk Assessment Guidance Note 1	Environment Agency
Copeland Borough Council Level 1 Strategic Flood Risk Assessment (October 2021)	JBA Consulting
Cumbria County Council Flood Risk Management Strategy 2022	Cumbria County Council