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Flood risk, water and environment

Flood Risk Assessment AEG02589_OL11_Rochdale_01

Site Address: Sparth Community Centre

Norman Road

Rochdale

OL11 4HS

UK Experts in Flood Modelling, Flood Risk
Assessments, and Surface Water Drainage Strategies

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Flood risk, water and environment

Document Issue Record

Project: Flood Risk Assessment

Prepared for: Your Trust

Reference: AEG02589_OL11_Rochdale_01

Site Location: Sparth Community Centre, Norman Road, Rochdale, OL11 4HS

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Summary

Development Description	Existing	Proposed
Development Type	Commercial premises - community centre	Change of use of the former community centre building to an office building for use by Your Trust operations
EA Vulnerability Classification	Less Vulnerable	Less Vulnerable
Ground Level	EA LiDAR data shows that the ground elevations of the site vary between approximately 114.72m AOD and 116.90m AOD and vary between approximately 115.61m AOD and 116.03m AOD at the location of the proposed development/existing building	No Change. Development is change of use of existing building with no increase in Flood Risk Vulnerability (Less Vulnerable to Less Vulnerable)
Surface Water Drainage	N/A ¹	Internal change of use. Discharge via existing.
Development Size	Approximately 245m ²	No change
Risk to Development	Summary	Comment
EA Flood Zone	Flood Zone 3 and Flood Zone 2	The site is located within Flood Zone 3 (high risk) and Flood Zone 2 (medium risk). The proposed development and store are located wholly within Flood Zone 3
Flood Source	Fluvial and Pluvial	The River Roch
SFRA Available	Bury Rochdale and Oldham Strategic Flood Risk Assessment Volume 1 User Guide (Rochdale Borough Council, 2009) Level 1 Strategic Flood Risk Assessment for Greater Manchester - Update (Greater Manchester Combined Authority, 2019)	

Management Measures	Summary	Comment
Ground floor level above extreme flood levels	N/A ¹	No change in finished floor levels. Development is change of use of existing building with no increase in Flood Risk Vulnerability (Less Vulnerable to Less Vulnerable)
Safe Access/Egress Route	Yes	Safe access/egress could be possible during the modelled 0.1%AEP pluvial event given that the majority of the flood extent at the entrance is shown to be low with isolated areas denoted as moderate/significant. However, safe access/ egress not considered possible in the modelled 1.0%AEP+CC fluvial event given the potential flood depths on site. The owner and management of the site should sign up to the EA flood warning services for River Roch in Rochdale. This service should be made available to all site staff and users.
Flood Resilient Design	Yes	The proposed development is located wholly within Flood Zone 3. As such mitigation measures are recommended in accordance with the CLG Report, Improving the Flood Performance of New Buildings - Flood Resilient Construction (2007) (see section 5).
Site Drainage Plan	N/A ²	Recommended to discharge runoff as per existing. Betterment could be provided through small-scale SuDS such as rainwater planters and water butts
Flood Warning & Evacuation Plan	Recommended	As a precaution, owners and occupants should sign up for the

		warning service for River Roch in Rochdale.
Offsite Impacts	Summary	Comment
Displacement of floodwater	No	The proposed development is for change of use with no increase in footprint
Increase in surface run-off generation	N/A ¹	Recommended to discharge runoff as per existing. Betterment could be provided through small-scale SuDS such as rainwater planters and water butts.
Impact on hydraulic performance of channels	No	The nearest EA main river to the site is the River Roch, located approximately 65m north of the site. The river is a tributary of the River Irwell. The River Spodden is also a main river, located approximately 186m north of the site.

¹ not required for this assessment. ² data not available.

1. Introduction

- 1.1. Aegaea were commissioned by Your Trust to undertake a Flood Risk Assessment (FRA) to facilitate a planning application for the proposed development. This FRA has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.
- 1.2. This FRA is intended to support a full planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Site Overview

- 1.3. The site of the proposed development is Sparth Community Centre, Norman Road, Rochdale, OL11 4HS (Figure 1).



Figure 1: Site Location (Base map and data from Google Hybrid Mapping ©)

- 1.4. The existing site is a commercial premises. It is understood that the proposed development is for change of use of the former community centre building to an office building for use by Your Trust operations.
- 1.5. In the absence of a topographical survey, Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model - 1m resolution has been used to review the topography of the site. Figure 2). The LiDAR data shows that the ground elevations of the site vary between approximately 114.72 metres Above Ordnance Datum (m AOD) and 116.90m AOD. The ground elevations at the location of the proposed development/existing building vary between approximately 115.61m AOD and 116.03m AOD.

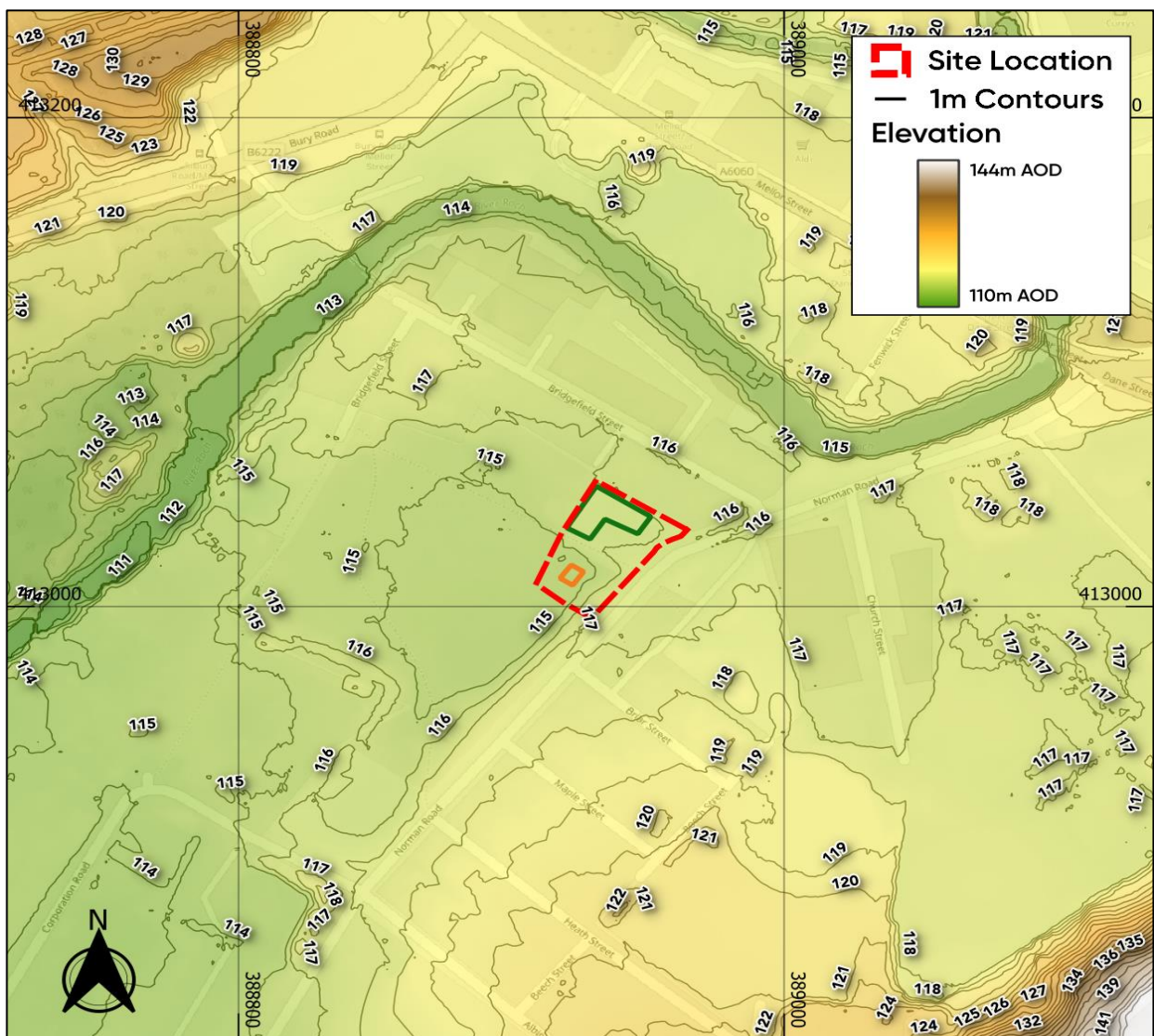


Figure 2: Site Topography (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 1.6. Rochdale Borough Council is the Local Planning Authority (LPA) for the site, and also the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's Greater Manchester Merseyside and Cheshire region.

Planning Policy and Guidance

- 1.7. UK government planning guidance states¹ that an FRA is required for developments which are:

- *“in flood zone 2 or 3 including minor development and change of use*
- *more than 1 hectare (ha) in flood zone 1*
- *less than 1 ha in flood zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs)*
- *in an area within flood zone 1 which has critical drainage problems as notified by the Environment Agency”*

- 1.8. The site is located within Flood Zone 3. According to NPPF Footnote 55 an FRA is required.
- 1.9. The objective of this FRA is to demonstrate that the proposals are acceptable in terms of flood risk. This report summarises the findings of the study and specifically addresses the following issues in the context of the current legislative regime:
- Fluvial flood risk
 - Surface water flood risk
 - Risk of flooding from other sources

¹ <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment>

2. Planning Policy

- 2.1. Inappropriate development in a flood risk area could pose significant risk in terms of personal safety and damage to property for the occupiers of the development or for people elsewhere. The approach taken in the assessment of flood risk at the planning stage is set out in national, regional, and local planning policy and associated guidance. This section summarises the key policies and guidance relevant to the proposed development.

National Planning Policy Framework (NPPF)

- 2.2. The National Planning Policy Framework² (NPPF) (DLUHC, 2021) which includes UK Government policy on development and flood risk states:

"159. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

167. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*

² <https://www.gov.uk/guidance/national-planning-policy-framework>, last updated July 2021

- d) *any residual risk can be safely managed; and*
- e) *safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

168. Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 55."

2.3. Footnote 55 of the NPPF states:

"A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use."

2.4. Flood Zones in England are defined as follows:

Table 1: Flood Zone Definitions

Flood Zone	Definition
Zone 1 Low Probability	Land having less than 1 in 1,000 annual probability of river or sea flooding (all land outside Zones 2 and 3).
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

- 2.5. An FRA should be appropriate to the scale, nature, and location of the development. It should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.

Local Planning Policy

- 2.6. The Adopted Rochdale Core Strategy (2016) prepared by the Local Planning Authority, Rochdale Borough Council, sets out the policies for development in the local area. The proposed site lies under the jurisdiction of this LPA and therefore will be required to adhere to the local plan policies. The policy related to flood risk is replicated below:

G8 - Managing water resources and flood risk

We will ensure that new development (including flood risk mitigation measures) does not lead to any form of increased flooding locally or further downstream, does not impede natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources. We will require:

- a. Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;*
- b. Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;*
- c. Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;*
- d. Incorporation of appropriate measures for the management of surface and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';*
- e. Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;*
- f. The avoidance of culverting, and support the opening up of existing culverts wherever possible;*
- g. The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;*

- h. Development that does not directly or indirectly lead to pollution of existing water resources such as watercourses and groundwater or the derogation of the quantity of groundwater;*
- i. The incorporation of measures to improve water quality; and*
- j. The taking of opportunities to improve the habitat value of watercourses and water bodies. In addition, we will identify additional flood storage areas which will be protected from development.*

Sequential and Exception Tests

- 2.7. The Sequential and Exception Tests are applied in specific cases defined by UK Government policy. Their purpose is to drive development to areas of low flood risk and to support developments which improve flood risk for developments in areas at risk of flooding.
- 2.8. Under the NPPF all new planning applications should undergo a Sequential Test accordance with paragraph 168 and footnotes 55 and 56. This test should be implemented by local planning authorities with a view to location particularly vulnerable new developments outside of the floodplain.
- 2.9. Paragraph 168 of the NPPF states:

*168. Applications for some minor development and **changes of use** should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 55.*

- 2.10. As such, a site-specific Sequential Test and Exception Test for the proposed developments is not considered necessary in line with the NPPF given that the proposal is for a **Change of Use**.

Summary

- 2.11. This flood risk assessment has been prepared with due consideration to the above local and national policy.

3. Consultation and Review

Consultation

- 3.1. The site sits within the Environment Agency's Greater Manchester Merseyside and Cheshire region. The EA were contacted in May 2023 and asked to provide detailed modelling data for the proposed development location. In response, the EA provided Product 4 data from the Rochdale and Littleborough (2013) flood model relating to the site. This information will be used in Section 4 of this report in order to determine the flood risk to the site. A full copy of the Product 4 information will be provided in Appendix B of this report.

Documents and Online Mapping

- 3.2. Local Governments and Lead Local Flood Authorities provide documents which contain data and policies on flood risk and new development in their areas. These documents are introduced and briefly summarised below. For the purposes of this FRA, these documents have been reviewed for relevant information and any relevant data is discussed within the appropriate sub heading of this report.
- 3.3. The following sources of information have been reviewed for this assessment:
- Flood Map for Planning on the Environment Agency website <https://flood-map-for-planning.service.gov.uk/>
 - Long Term Flood Risk Information on the Environment Agency website <https://www.gov.uk/check-long-term-flood-risk>
 - National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2021)³
 - Planning Practice Guidance - Flood Risk and Coastal Change (Department for Levelling Up, Housing and Communities, 2022)⁴

3 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

4 <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

- Geoindex Onshore (British Geological Survey, 2022)⁵
- Adopted Core Strategy (Rochdale Borough Council, 2016)⁶
- Bury Rochdale and Oldham Strategic Flood Risk Assessment Volume 1 User Guide (Rochdale Borough Council, 2009)⁷
- Level 1 Strategic Flood Risk Assessment for Greater Manchester - Update (Greater Manchester Combined Authority, 2019)⁸
- Rochdale Borough's Strategy for Flood Risk Management 2014- 2024 (Rochdale Borough Council, 2014)⁹

Preliminary Flood Risk Assessment (PFRA)

- 3.4. The PFRA, published in 2009, is a high-level appraisal of flood risk across Lead Local Flood Authority Rochdale Borough Council. The flood risk from all sources, including fluvial, surface water, groundwater and surcharged sewers is evaluated. It is the basis upon which the Local Flood Risk Management Strategy is produced.
- 3.5. The PFRA summarises historical flood incidents in Rochdale Borough Council. The site is not recorded as having been affected by any flood event.

Strategic Flood Risk Assessment (SFRA)

- 3.6. The SFRA provides the evidence base for the Local Planning Authority Rochdale Borough Council Local Plan and guidance for consideration when determining planning applications. The SFRA seeks to place new development into areas of lower flood risk taking into account current flood risk, future flood risk, and the effect a proposed development would have on the risk of flooding.

5 <https://mapapps2.bgs.ac.uk/geoindex/home.html>

6 <https://www.rochdale.gov.uk/downloads/file/405/core-strategy>

7 <https://www.rochdale.gov.uk/downloads/file/542/preliminary-flood-risk-assessment>

8 <https://www.salford.gov.uk/planning-building-and-regeneration/salfords-natural-environment/flood-risk/strategic-flood-risk-assessment/>

9 <https://www.rochdale.gov.uk/downloads/file/808/flood-risk-management-strategy>

- 3.7. The SFRA mapping provided by Rochdale Borough Council has been used throughout production of this report as a source of information, particularly pertaining to historical flood incidents.

Local Flood Risk Management Strategy (LFRMS)

- 3.8. The Local Flood Risk Management Strategy sets out roles and responsibilities for flood risk management, assesses the risk of flooding in the area, where funding can be found to manage flood risk, and the policies, objectives and actions of the Lead Local Flood Authority. The Rochdale Borough Council LFRMS is used within this report to identify any flood management infrastructure and historical incidences of flooding.

4. Sources of Flood Risk

Fluvial

- 4.1. Flooding from watercourses arises when flows exceed the capacity of the channel, or where a restrictive structure is encountered, resulting in water overtopping the banks into the floodplain.

Main Rivers and Ordinary Watercourses

- 4.2. The nearest EA main river to the site is the River Roch, located approximately 65m north of the site. The river is a tributary of the River Irwell.
- 4.3. The River Spodden is also a main river, located approximately 186m north of the site. The river is a tributary of the River Roch.
- 4.4. There are no other watercourses within the vicinity of the site.

EA Flood Map for Planning

- 4.5. The EA Flood Map for Planning (Figure 3) shows the site is located within Flood Zone 3 (high risk) and Flood Zone 2 (medium risk). The Flood Zones are defined as follows:
- Flood Zone 3 denotes a risk of flooding from fluvial sources greater than 1 in 100 (1%).
 - Flood Zone 2 denotes a risk of flooding from fluvial sources between a 1 in 100 (1%) and 1 in 1,000 (0.1%).
- 4.6. The proposed development and store are located wholly within Flood Zone 3 (Figure 3).

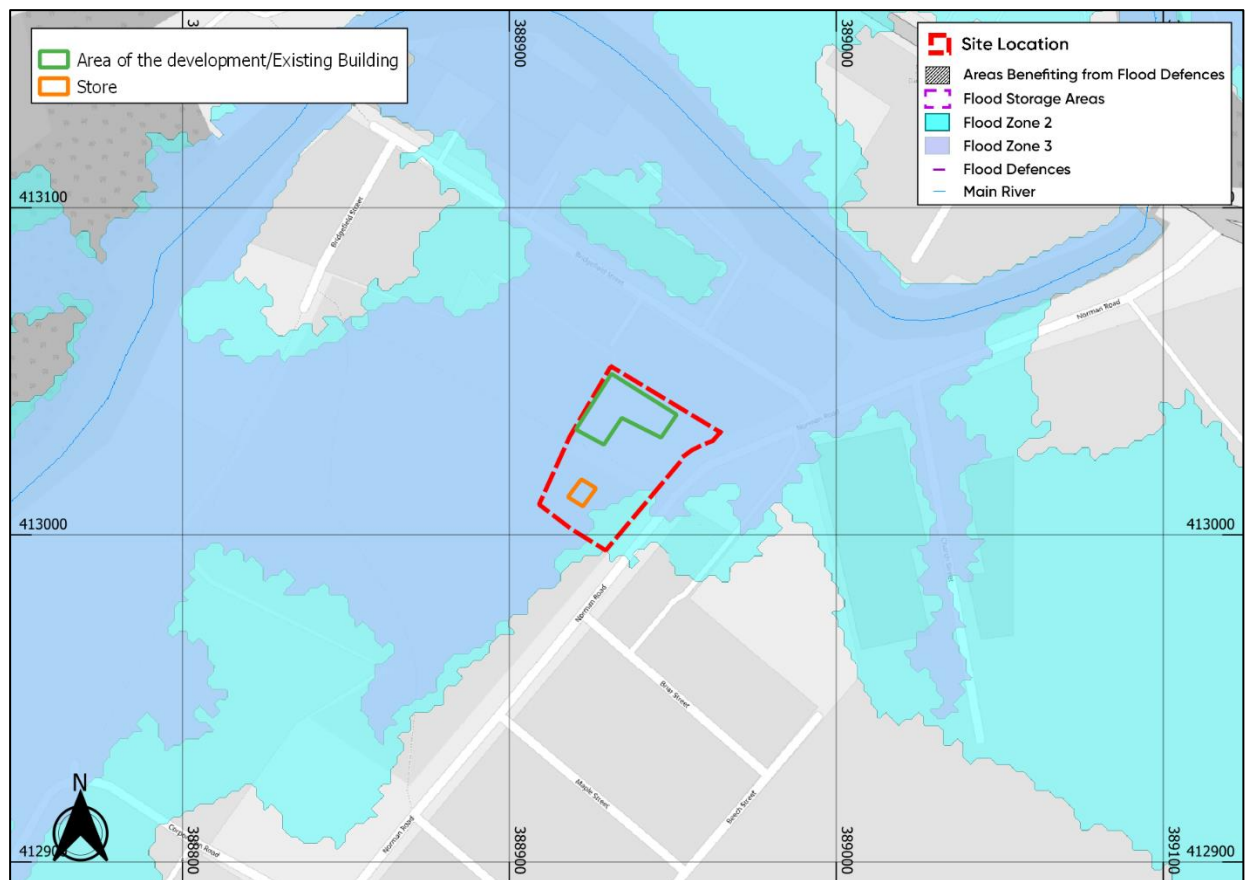


Figure 3: EA Flood Map for Planning (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

Climate Change

- 4.7. The site is located within the EA Irwell Management Catchment for which the climate change central allowance for peak river flow, applicable for 'less vulnerable' developments, is stated as 35%.

EA Product 4 Data - Rochdale and Littleborough (2013) Model

- 4.8. The EA have provided detailed modelling results for the site location in the form of Product 4 information extracted from the Rochdale and Littleborough (2013) Model. The results have been used to determine the fluvial flood risk to the site.

- 4.9. The EA Product 4 included several maps and tables/ datasets providing both flood levels and extents. Various return periods have been provided, however for the purposes of this report the 1.33%AEP, 1.0% AEP, 1.0%AEP+35%CC allowance and 0.1%AEP has been analysed.
- 4.10. Within the EA Product 4 data provided, a +35% climate change scenario was provided which will be used to determine the climate change. It should be noted that defended and undefended scenarios were provided within the EA data.
- 4.11. Figure 4 shows the proposed development lies within the extent of the defended modelled 0.5%AEP and 0.1%AEP events. The data also shows the proposed development lies within the extent of the undefended modelled 5.0%AEP and 1.33%AEP events.

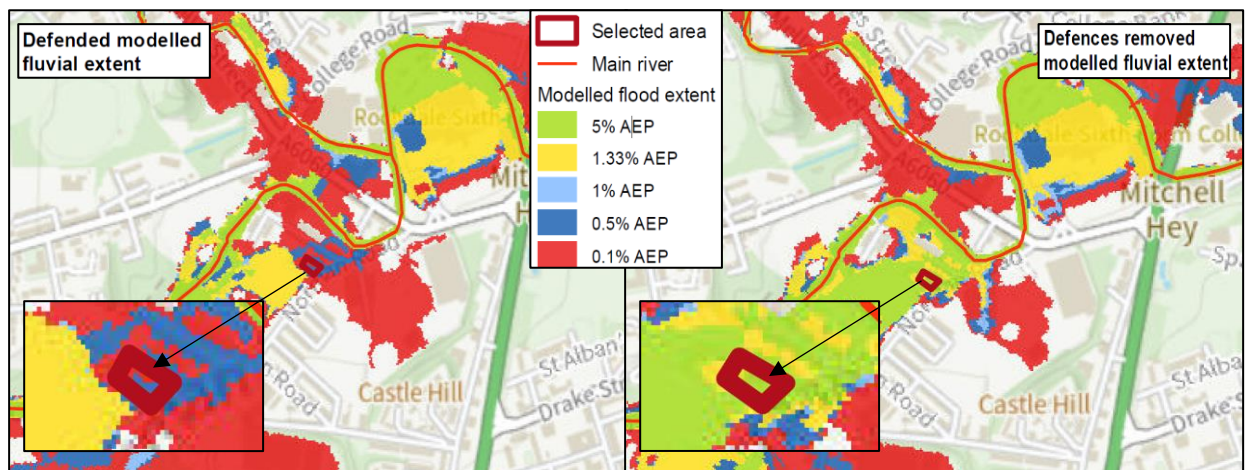


Figure 4: EA Product 4 – The Rochdale and Littleborough (2013) Model Outputs (5%AEP, 1.33%AEP, 1%AEP, 0.5%AEP and 0.1%AEP defended and undefended events). Proposed Development located in red rectangular.

- 4.12. Although the proposed development is shown to be affected in the undefended modelled 5.0%AEP and 1.33%AEP (the latter of which could be considered a conservative estimate of the 3.33% AEP (Flood Zone 3b), the proposed development is benefiting from the presence of the defences (Figure 5), and thus the defended scenarios are considered more representative of the actual risk scenario. The defended scenario data indicates that the site would remain unaffected in the modelled 1.33%AEP and thus the site is not considered to be in Flood Zone 3b.

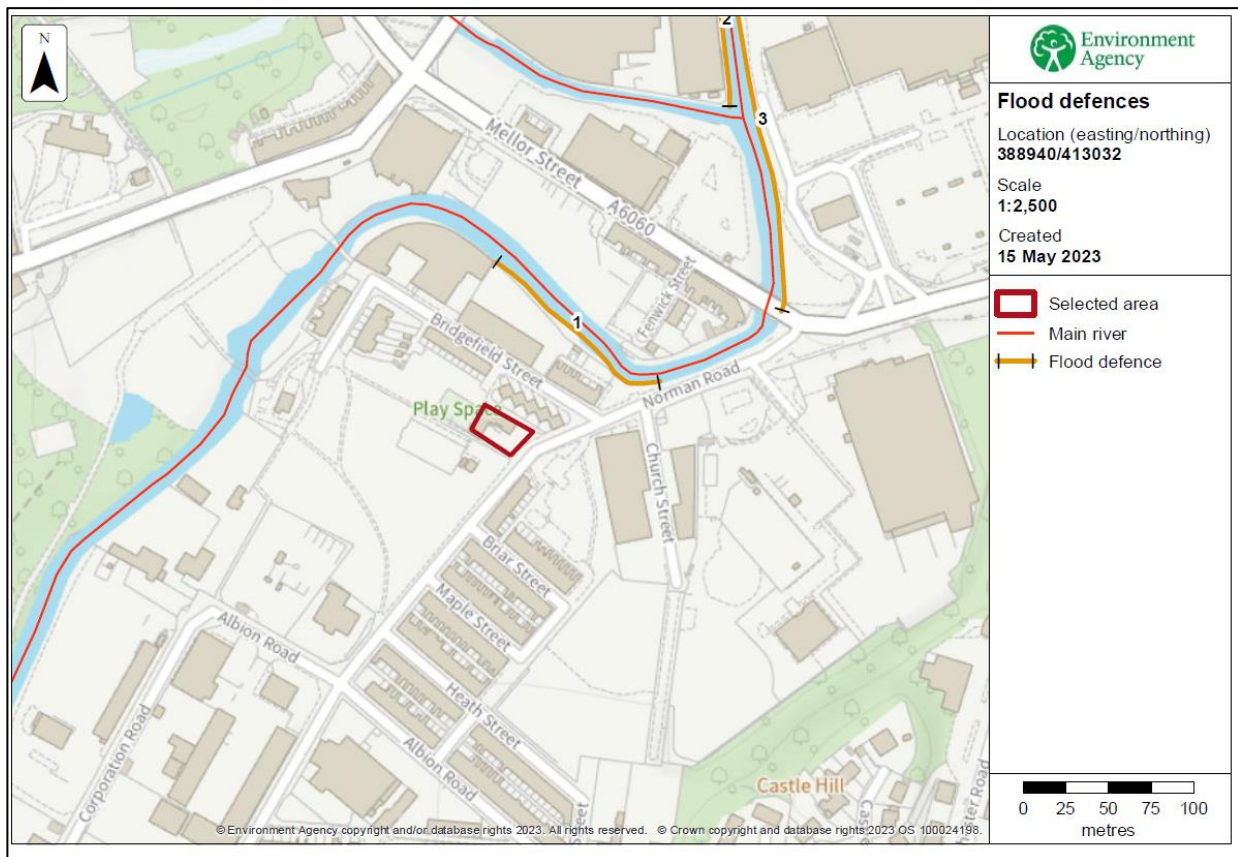


Figure 5: EA Product 4 – The Rochdale and Littleborough (2013) Model - Showing the proposed development is benefiting from Flood Defences

- 4.13. Figure 6 shows that the proposed development lies within the extent the defended modelled 1.0%AEP+20%CC and 1.0%AEP+35%CC event.

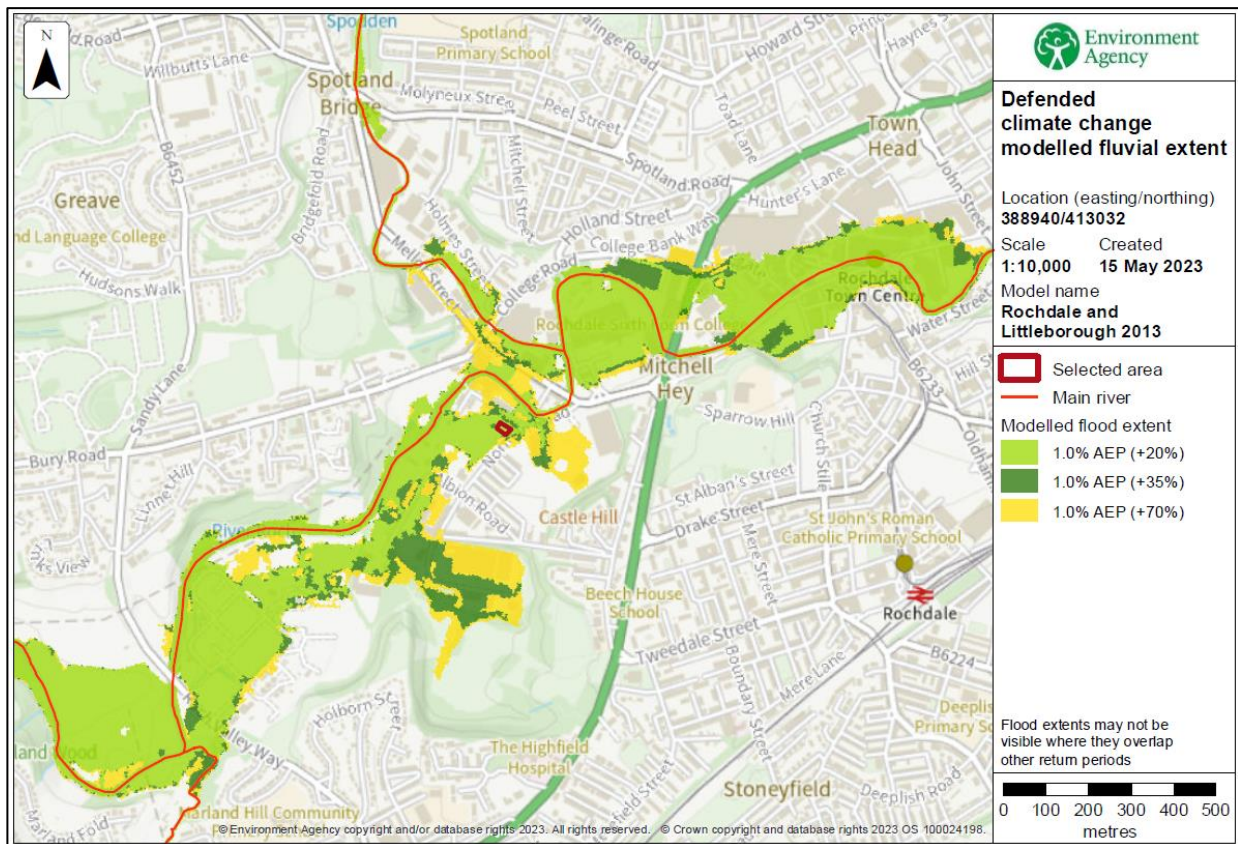


Figure 6: EA Product 4 – The Rochdale and Littleborough (2013) Model Outputs (1.0%AEP+20%CC, 1.0%AEP+35%CC and 1.0%AEP+70%CC defended and undefended events). Proposed Development located in red rectangular.

- 4.14. The EA have provided modelled flood levels at in-channel nodes and 2D floodplain nodes. Due to being unaffected in the defended 1.33%AEP event, no modelled 2D level has been provided. The EA have not provided 2D flood levels for the present-day 1%AEP event either. However, they have provided 2D flood levels for the 1.0%AEP+35%CC event, which is considered the design flood event.
- 4.15. For the 1.0%AEP+35%CC, the flood level data used is based on the 2D level (Label 19 – worst scenario) (Figure 7). In the defended modelled 1.0%AEP+35%CC event, the maximum flood level across the proposed development is 116.46m AOD. Based on the EA LiDAR topography, the lowest ground level at the location of the proposed development is 115.61m AOD. As such, the site could experience flood depths of up to 0.85m in the modelled 1.0%AEP+35%CC event.

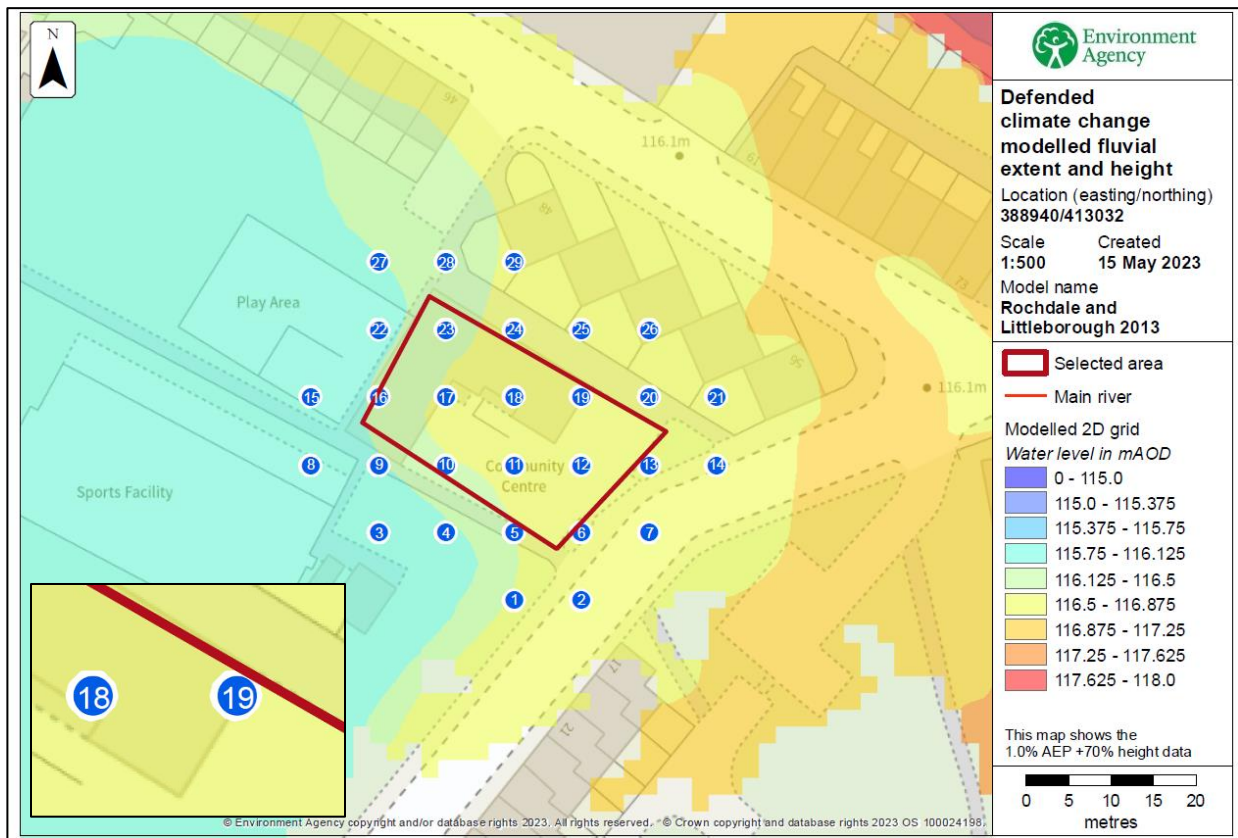


Figure 7: EA Product 4 – The Rochdale and Littleborough (2013) Model Outputs – 2D Level Data for the defended 1.0% AEP + 35% CC

Historical Fluvial Flooding

- 4.16. The EA Recorded and Historical Flood Outlines shows that there is no record of historical fluvial flooding on-site (Figure 8). The nearest historical fluvial flooding is approximately 32m north of the site.

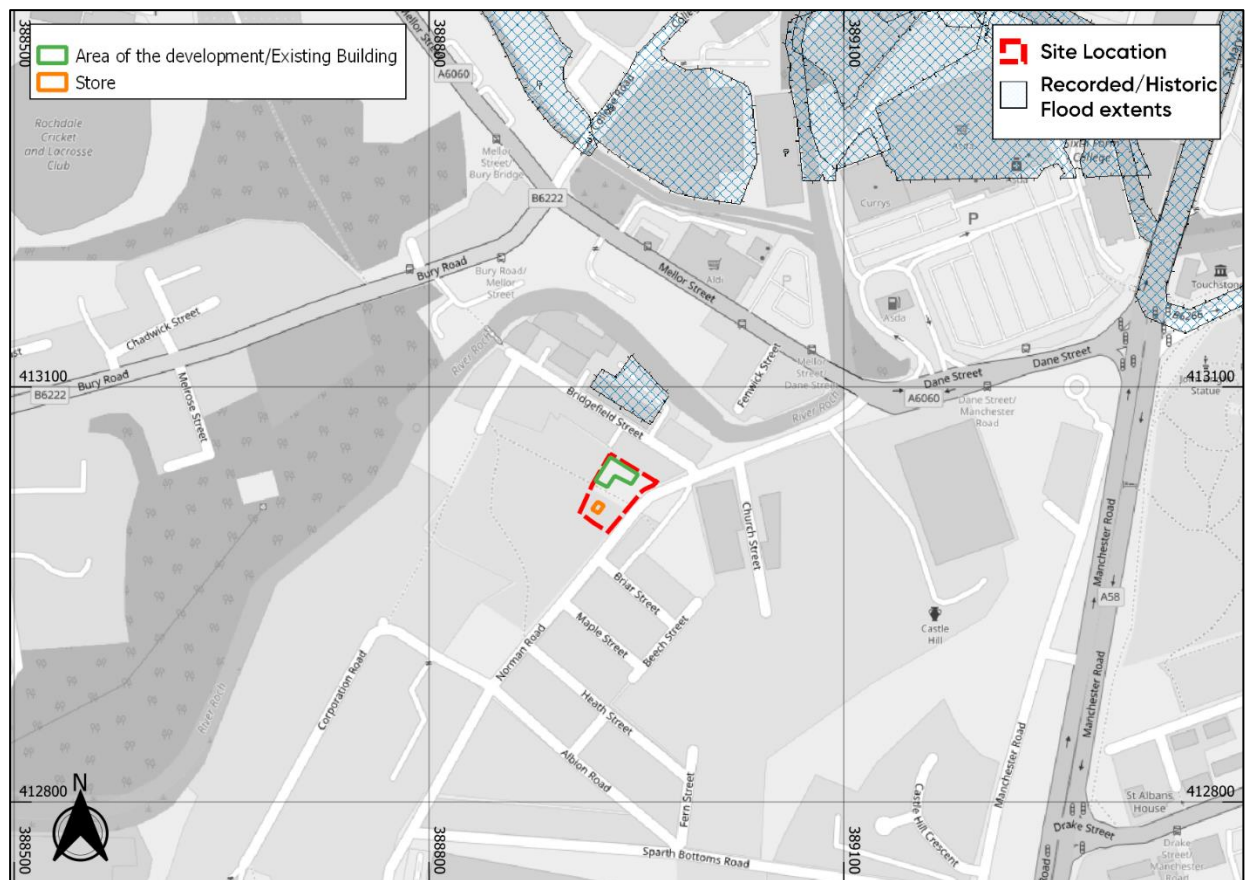


Figure 8: EA Historic Flood Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.17. Based on this information the risk of fluvial flooding is considered to be high.
- 4.18. However, the proposed development is for the change of use of the existing building, and the site vulnerability remains unchanged (Less Vulnerable). However, mitigation measures are recommended as specified in section 5.

Tidal

- 4.19. Tidal flooding occurs when a high tide and high winds combine to elevate sea levels. An area behind coastal flood defences can still flood if waves overtop the defences or break through them. Tidal flooding can also occur a long way from the coast by raising river levels. Water may overtop the riverbank or river defences when tide levels are high.
- 4.20. The site is a significant distance from any tidal source and above the anticipated extreme tidal levels, even when considering the impacts of climate change. The risk of flooding from tidal sources is considered low.

Canals

- 4.21. The Canal and River Trust (CRT) generally maintains canal levels using reservoirs, feeders, and boreholes and manages water levels by transferring it within the canal system.
- 4.22. Water in a canal is typically maintained at predetermined levels by control weirs. When rainfall or other water enters the canal, the water level rises and flows out over the weir. If the level continues rising it will reach the level of the storm weirs. The control weirs and storm weirs are normally designed to take the water that legally enters the canal under normal conditions. However, it is possible for unexpected water to enter the canal or for the weirs to become obstructed. In such instances the increased water levels could result in water overtopping the towpath and flowing onto the surrounding land.
- 4.23. Flooding can also occur where a canal is impounded above surrounding ground levels and the retaining structure fails.
- 4.24. There are no canals identified within 1,000m of the site.
- 4.25. The risk of flooding to this site from canals is considered to be low.

Pluvial

- 4.26. Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 4.27. Annual surface water flood risk is labelled by the EA as:
- 'High Risk'; >3.3% AEP (annual probability greater than 1 in 30).
 - 'Medium Risk'; 1.1% to 3.3% AEP (annual probability between 1 in 100 and 1 in 30).
 - 'Low Risk'; 0.1% to 1% AEP (annual probability between 1 in 1000 and 1 in 100).
 - 'Very Low Risk'; <0.1% AEP (annual probability less than 1 in 1000).
- 4.28. Examination of the EA's Flood Risk from Surface Water mapping (Figure 9) shows the site is at risk of flooding in the modelled 'Low Risk' and 'Medium Risk' surface water flood events.
- 4.29. The proposed development/existing building is at a low risk of flooding from surface water. However, the majority of the building remains unaffected. A small section of the existing store is at a medium risk.

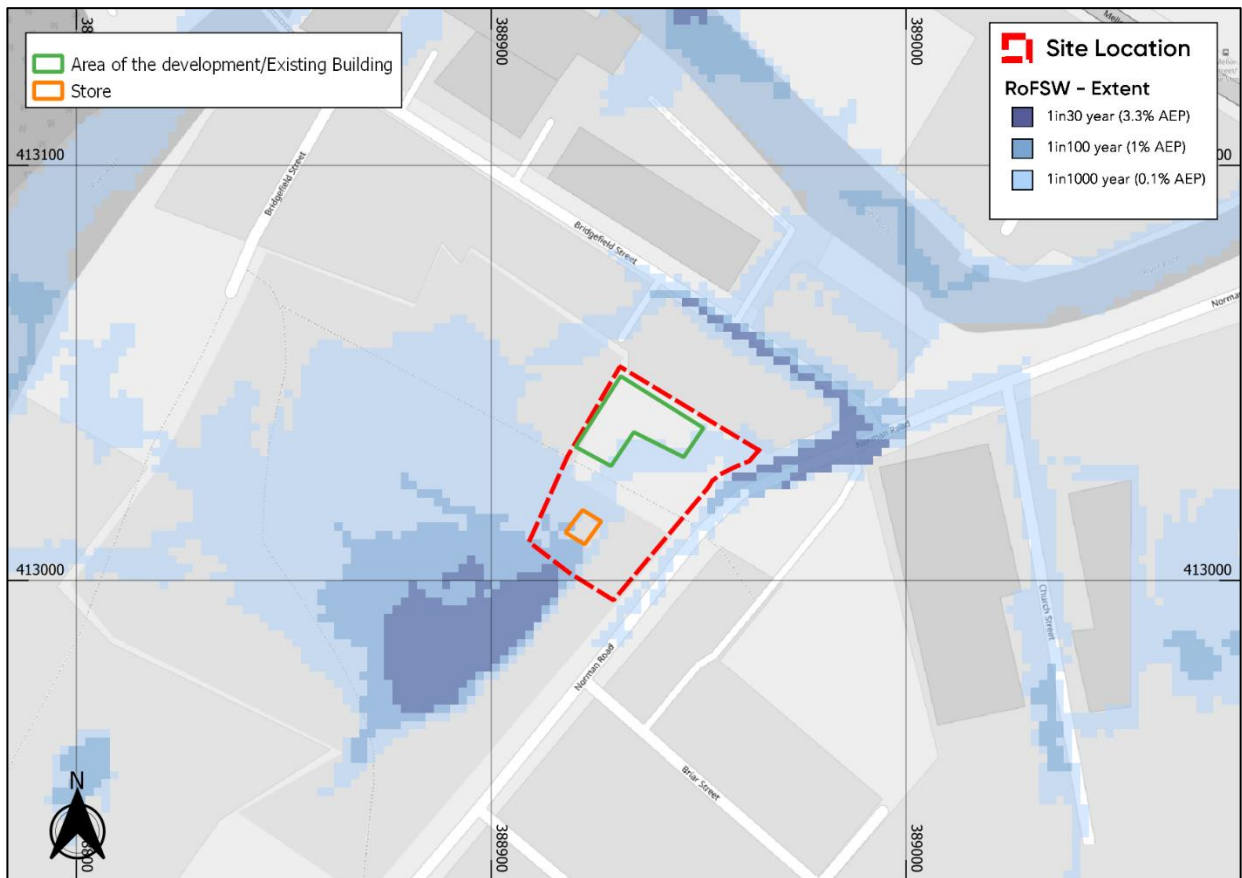


Figure 9: EA Surface Water Flood Risk Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.30. Analysis of flood depths during the modelled 'Medium' risk event (equivalent to the 1 in 100 year scenario) shows that the proposed development/existing building remains unaffected by flooding (Figure 10). However, a small section of the existing store could be affected by flooding with the area at the store location could experience flood depths between 150mm and 300mm.
- 4.31. An area close to the site at Norman Road could experience flood depths between 300mm and 600mm.

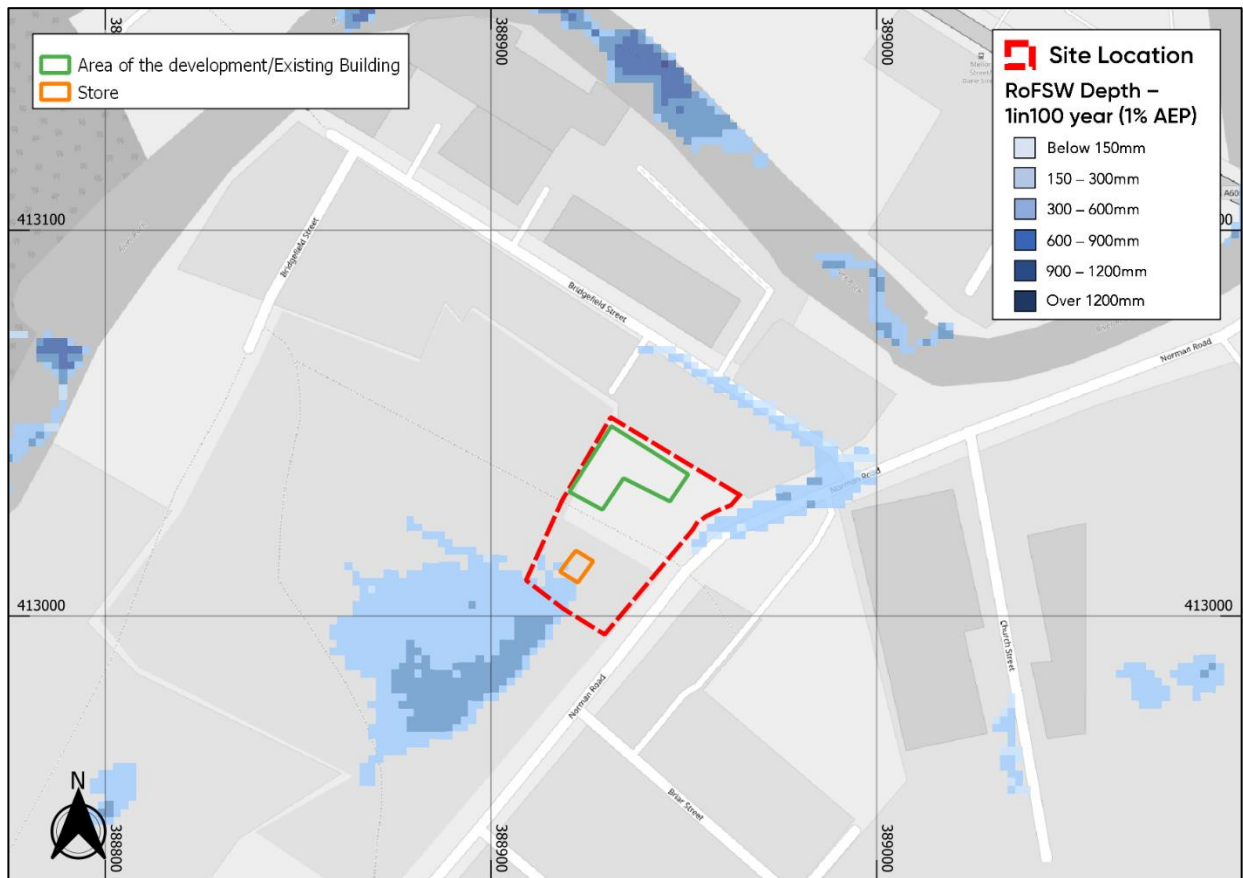


Figure 10: EA Surface Water Flood Risk Mapping 1.0% AEP (Source: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors, © EA copyright and/or database right 2015)

- 4.32. In the modelled 1.0% AEP event, the EA hazard rating for the flood extent on some part of the access road (Norman Road) (Figure 11) is shown to be 'Moderate' (0.75 – 1.25). However, the southern part of the access road remains unaffected, as such safe access/egress may be possible via this route.

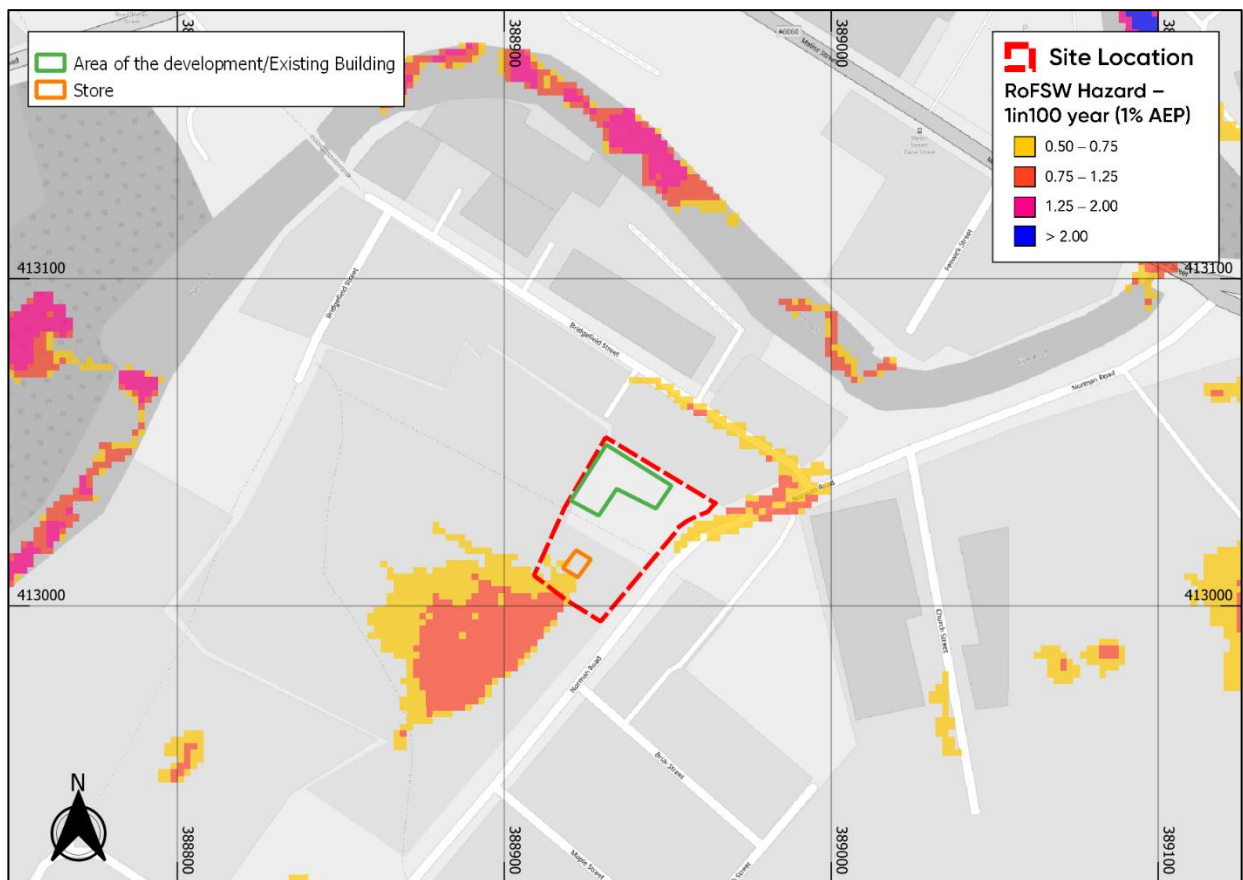


Figure 11: RoFSW Hazard map (1.0%AEP) - (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA).
 © <https://www.openstreetmap.org> and contributors, EA RoFSW: © Environment Agency copyright and/or database right 2015.

- 4.33. Analysis of flood depths during the modelled 'Low' risk event (equivalent to the 1 in 1000 year scenario) shows that the proposed development/existing building could be affected by flooding (Figure 12). The building and the driveway could experience flood depths between 300mm and 600mm.
- 4.34. The existing store could be affected by flooding with the area at the store location could experience flood depths between 300mm and 600mm.
- 4.35. An area close to the site at Norman Road could experience flood depths between 300mm and 600mm.

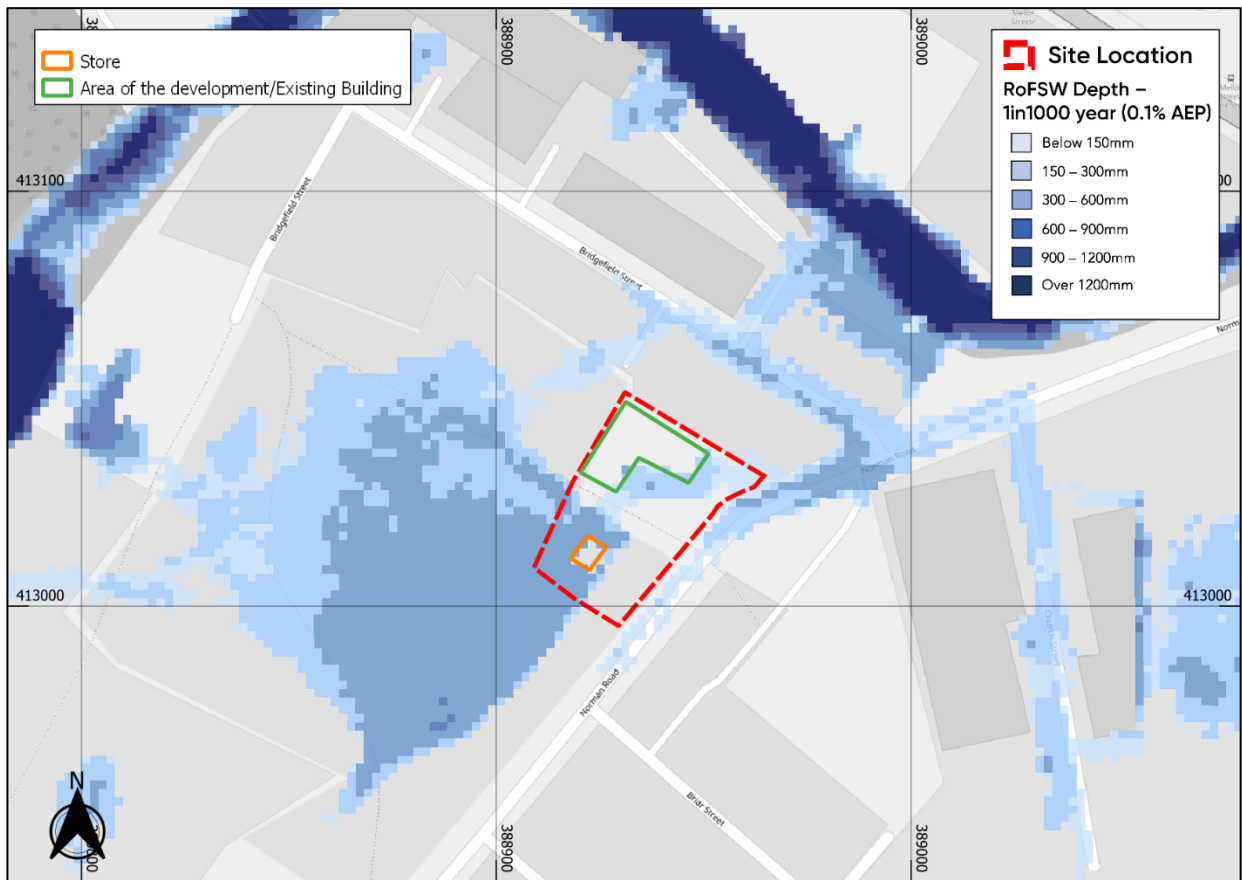


Figure 12: EA Surface Water Flood Risk Mapping 0.1% AEP (Source: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors, © EA copyright and/or database right 2015)

- 4.36. In the modelled 0.1%AEP event, the EA hazard rating for the flood extent on some part of the access road (Norman Road) and by the building entrance (Figure 13) is shown to be 'significant' (1.25 – 2.00). However, safe access/egress could be possible given that the majority of the flood extent at the entrance is shown to be low with isolated areas denoted as moderate/significant.

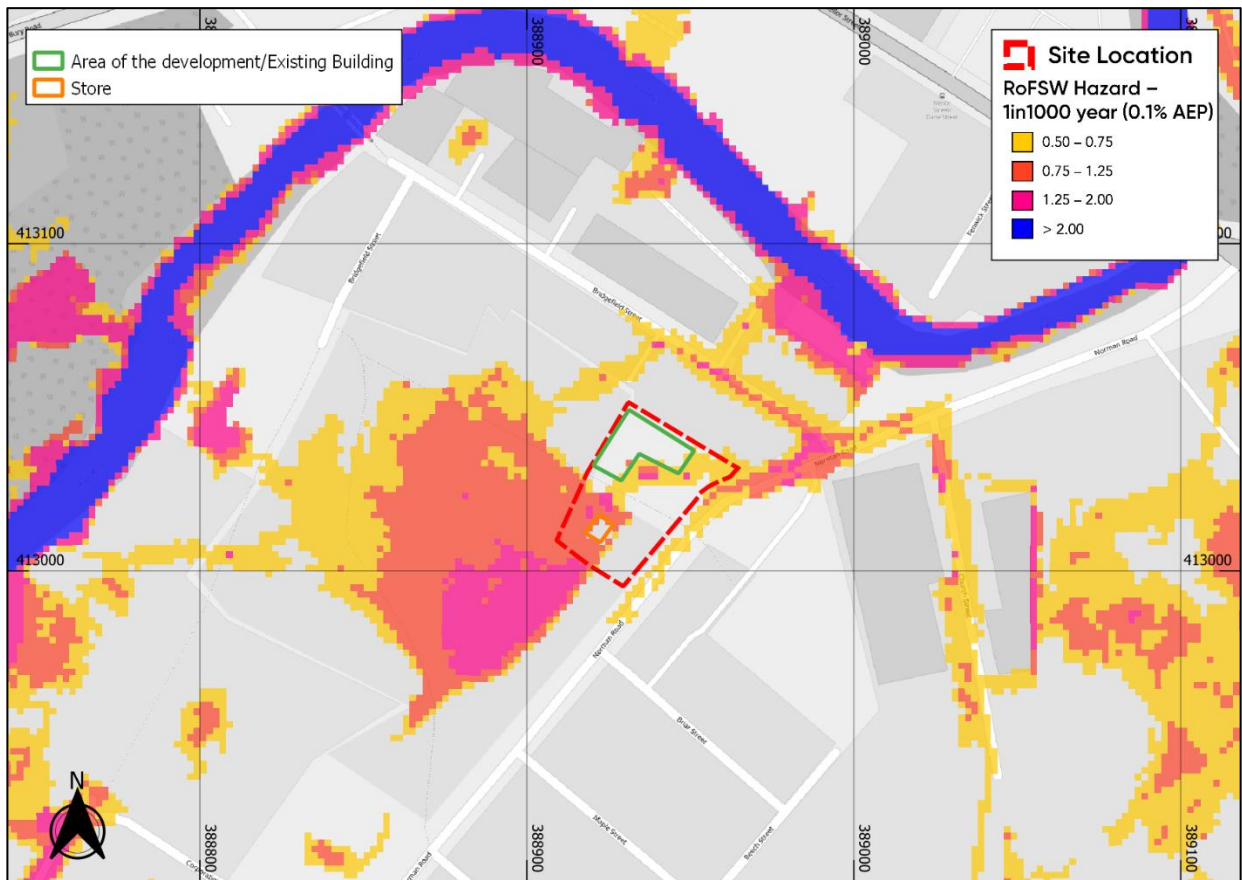


Figure 13: RoFSW Hazard map (0.1%AEP) - (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA).
© <https://www.openstreetmap.org> and contributors, EA RoFSW: © Environment Agency copyright and/or database right 2015.

Reservoirs

- 4.37. Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain floodwater. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.
- 4.38. According to the EA's Flood Risk from Reservoirs mapping (Figure 14) the site is at risk of flooding in the event of a breach at multiple reservoirs where the site is mostly dry through the day. The worst reservoir failure model is a 'dry day' scenario meaning that it could be caused by reservoir walls failing due to old age, accident, or because excess flood water has been added to the reservoir.

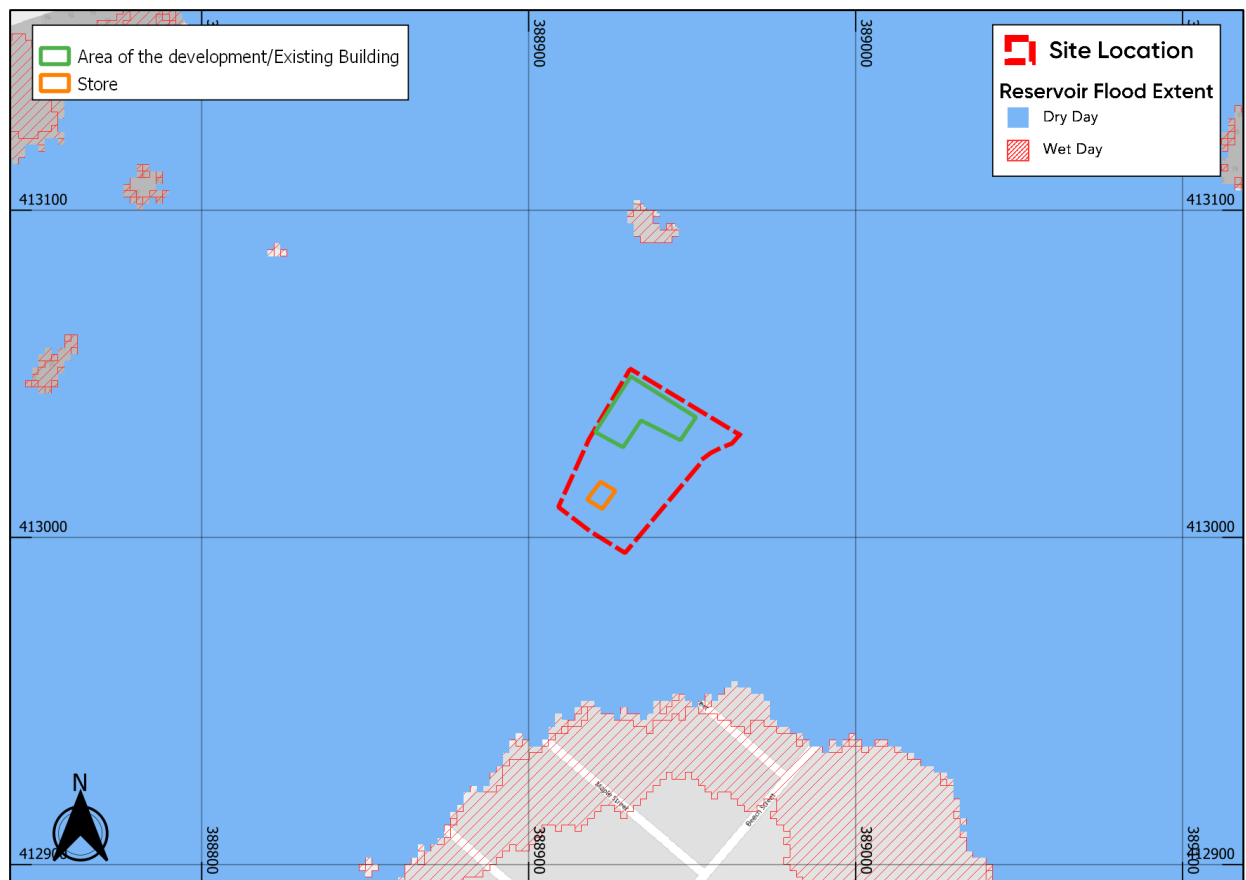


Figure 14: EA Reservoir Flood Risk Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). ©<https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.39. All large reservoirs must be inspected and supervised by reservoir panel engineers as detailed by the Reservoirs Act 1975 in England and Wales. The EA are responsible to ensure that reservoirs are inspected regularly, and essential safety work carried out. As reservoirs are highly managed the maximum flood extent provided in the EA Risk of Flooding from Reservoirs mapping is considered a worst-case scenario. As reservoir flooding is unlikely and the modelled flood depths are based on the worst-case scenario, flooding from this source may be considered as a relatively low risk.

Groundwater

- 4.40. Groundwater flooding occurs in areas where underlying geology is permeable, and water can rise within the strata sufficiently to breach the surface.
- 4.41. The British Geological Survey's (BGS) mapping shows superficial deposits of Glaciofluvial Deposits, Devensian composed of sand and gravel, and Alluvium composed of clay, silt, sand

and gravel underlying the area. The bedrock underlying the area is Ennine Lower Coal Measures Formation composed of mudstone, siltstone and sandstone.

- 4.42. Historical BGS borehole Ref: SD81SE614 approximately 58m northeast of the site confirm the that the geology at this location consists of clay, sandstone and gravel and recorded that groundwater was struck at 3.20m below ground level.
- 4.43. The SFRM presents the EA's Areas Susceptible to Groundwater Flooding mapping (Figure 15). The site is within a 1km cell of which $\geq 25\%$ $>50\%$ is considered susceptible to groundwater flooding.

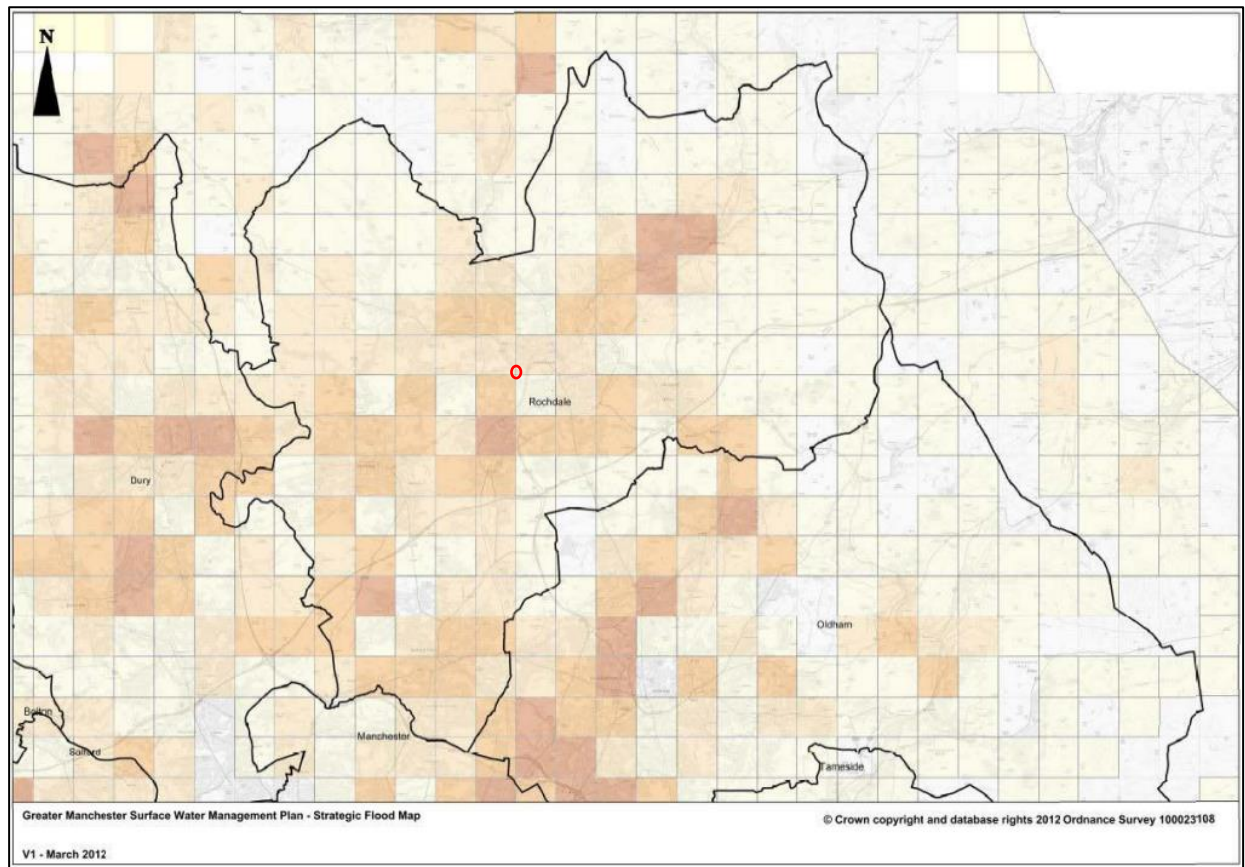


Figure 15: EA Areas Susceptible to Groundwater Flooding (Rochdale Borough's Strategy for Flood Risk Management, 2014). Site located within Red Circle

- 4.44. Additionally, Rochdale SFRA, 2009 states the following in relation to groundwater flooding:

"There is not a significant risk of groundwater flooding in Bury, Rochdale or Oldham but it should not be dismissed as a possibility and the FRA should consider the potential mechanisms that could affect the development site. If a risk of groundwater

flooding is found, developers should consult with the LPA and Environment Agency at an early stage as to the next steps.”

- 4.45. As the development proposal is for change of use only and do not include any proposed basements, the risk from groundwater to the development is considered to be low.

Sewers

- 4.46. Foul or surface water sewers can be a cause of flooding if the drainage network becomes overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.
- 4.47. Greater Manchester Combined Authority SFRA (2019) provides mapping (Figure 16) of historical sewer flood incident records kept by the local authority (United Utilities). The map shows the site is close to hotspots (GM SWMP) incidents area. No specifics of which properties have been affected have been provided.

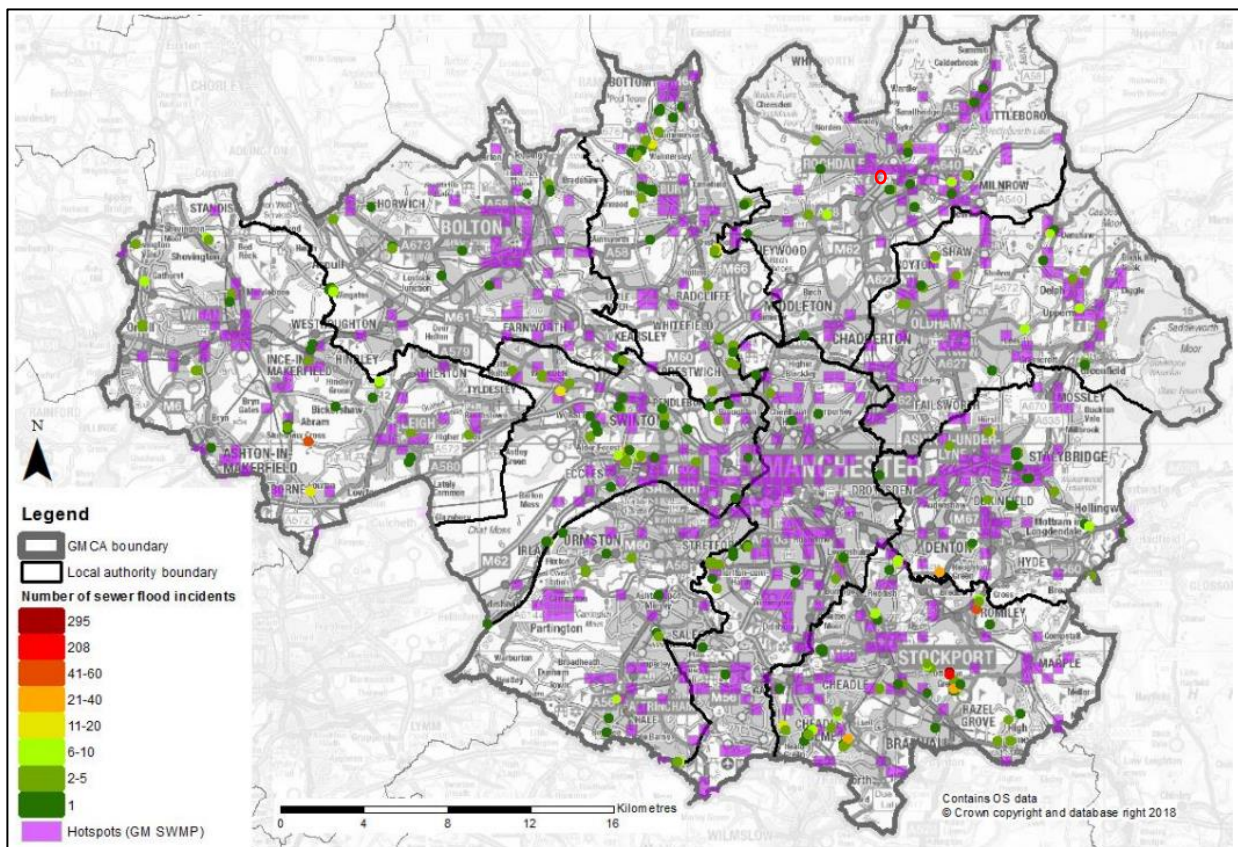


Figure 16: UU historic sewer flooding incidents and GM SWMP Hotspots (Greater Manchester Combined Authority SFRA, 2019). Site located within Red Circle

- 4.48. Local policy documentation does not identify the site as being in a Critical Drainage Area.
- 4.49. The development is therefore considered to be at low risk of flooding from sewers.

5. Flood Risk Mitigation

Fluvial

5.1. Based on the Product 4 data, the proposed development is considered to be at a high risk of fluvial flooding and is affected in defended modelled 1.0%AEP+35%CC event. However, it is understood that the proposed development is for change of use and the site vulnerability remains unchanged (Less Vulnerable). Furthermore, the footprint of the building remains unchanged. However, mitigation measures are recommended in accordance with the CLG Report, *Improving the Flood Performance of New Buildings - Flood Resilient Construction (2007)* including, where practical, measures such as the below:

- Raising electrical sockets above the predicted flood level. Wet proofing wall and floor furnishings using materials such as tiles and paint.
- Units to be raised on legs above plinth.
- Air brick covers to be installed (if applicable).
- Any PVC window/door sills should be adequately sealed. Double glazing should be used to provide resistance against external flood water pressure.
- Flood door/barrier.
- Non-return valves to be installed (if applicable)
- The owner of the site should sign up to the EA flood warning services for River Roch in Rochdale.

Pluvial

5.2. The proposed development/existing building is considered to be at a low risk of flooding from surface water. However, the majority of the building remains unaffected with a small section of the existing store is located in a medium risk area. The mitigation measures listed in the fluvial section are deemed sufficient mitigation against this risk.

Other sources

5.3. Flood risk from tidal, canals, reservoirs, groundwater and sewers are considered to be low, therefore mitigation is not required.

Increase to Flood Risk Elsewhere

- 5.4. It is understood that the proposed development is for the change of use of the existing building, with no increase in built footprint.
- 5.5. As such, the proposed development in isolation should have a negligible impact on flood risk elsewhere.

EA Flood Warning Service

- 5.6. As a further precaution and risk reduction, the owners/occupants of the site should sign up for River Roch in Rochdale EA flood warning service and should check the EA flood alert service for the Upper River Irwell catchment with Oldham, Bolton, Rochdale, Haslingden, Ramsbottom and Rawtenstall. These services allow site owners/occupants to register an address, which is at risk of flooding, along with contact details so that in the event of a flood being forecast, the site owner will be sent an alert directly to their chosen method of contact.
- 5.7. Flood warnings/alerts can be enforced at any time of the day or night. Signing up for this service provides site owners some notice before a flood event. The amount of time afforded before a flood occurs depends on the site-specific location (e.g. proximity to the source of flooding, topography of the surrounding area) and the flood mechanism (e.g. bank over topping versus a breach event). Flood alerts and warnings provide site managers with time to take necessary action, e.g. communication of the risk of flooding to occupants/employees etc, evacuation of occupants offsite or to a safe level, removal of valuable items out of reach of flooding and the mounting of site-specific flood defences.

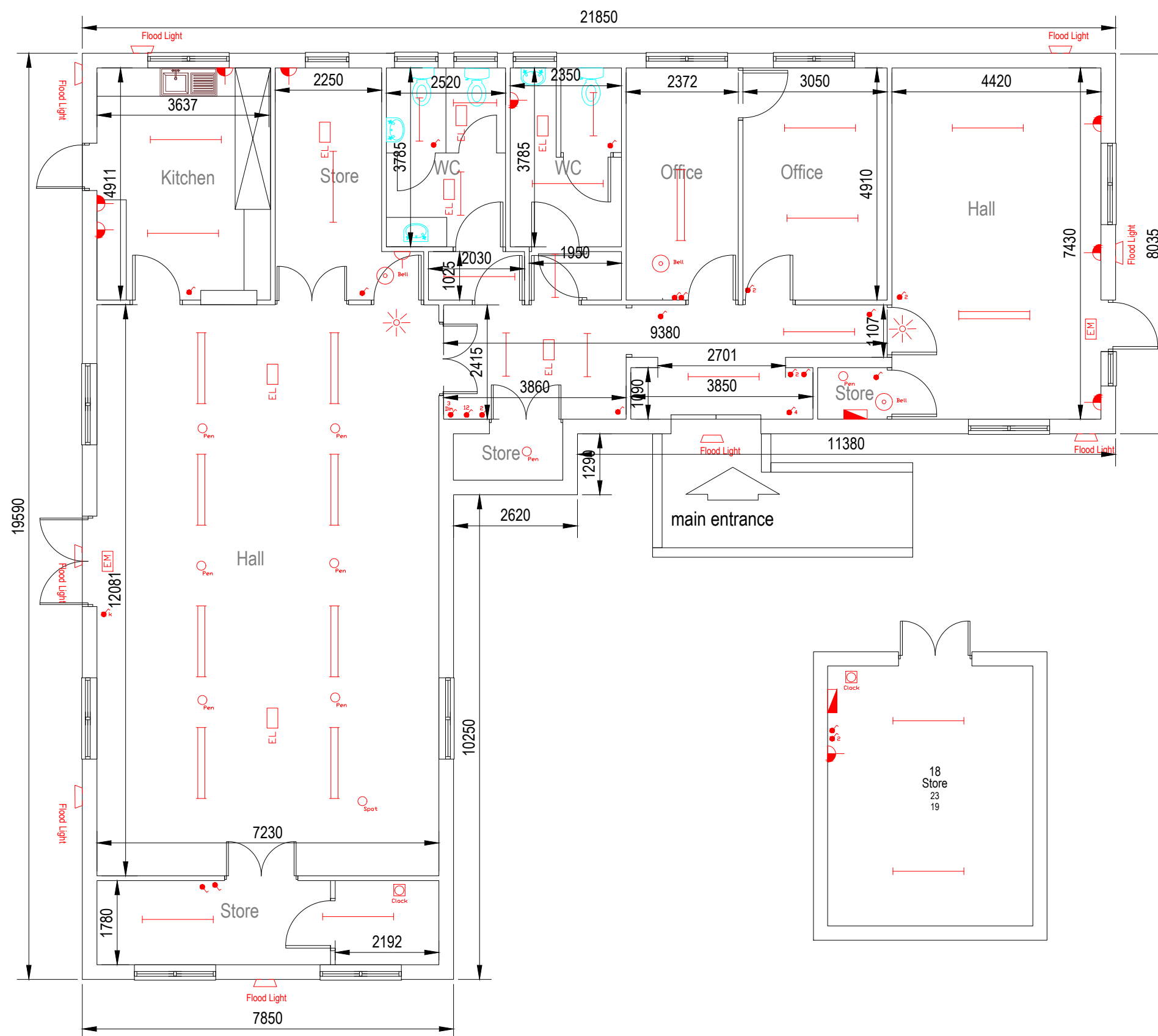
6. Conclusions

- 6.1. This FRA has been undertaken with reference to the requirements of NPPF and Planning Practice Guidance with respect to the development at Sparth Community Centre, Norman Road, Rochdale, OL11 4HS. It has been written to support a planning application and has been prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.
- 6.2. An assessment of the risk of flooding from all sources has been undertaken and is summarised in the table below:

Source of Flooding	Flood Risk Summary
Fluvial	The EA Flood Map for Planning shows the site is located within Flood Zone 3 (high risk) and Flood Zone 2 (medium risk). Based on Product 4 data, the defended scenario data indicates that the site would remain unaffected in the modelled 1.33%AEP and thus the site is not considered to be in Flood Zone 3b. The proposed development is affected in the defended modelled 1.0%AEP+35%CC (design flood event). Based on this information the risk is considered high, however, the vulnerability classification remains unchanged (Less Vulnerable). However, mitigation measures are recommended as specified in section 5.
Pluvial	Examination of the EA's Flood Risk from Surface Water mapping shows the site is at risk of flooding in the modelled 'Low Risk' and 'Medium Risk' surface water flood events. The proposed development/existing building is at a low risk of flooding from surface water. However, the majority of the building remains unaffected with a small section of the existing store located in an area of medium risk.
Tidal Reservoirs Groundwater Sewers Canals	The site is considered to be at low risk from other sources.

- 6.3. The FRA supports the planning application and demonstrates that there is an acceptable level of flood risk to the site if the mitigation strategies recommended are implemented in the scheme. The development does not increase flood risk off site or to the wider area.
- 6.4. Safe access/egress could be possible during the modelled 0.1%AEP pluvial event given that the majority of the flood extent at the entrance is shown to be low with isolated areas denoted as moderate/significant. However, safe access/ egress not considered possible in the modelled 1.0%AEP+CC fluvial event given the potential flood depths on site.
- 6.5. This FRA has identified no prohibitive constraints in developing the proposed site for the proposed usage.
- 6.6. This Flood Risk Assessment should be submitted as part of the planning application to satisfy the requirements under NPPF.

Appendix A - Development Proposals

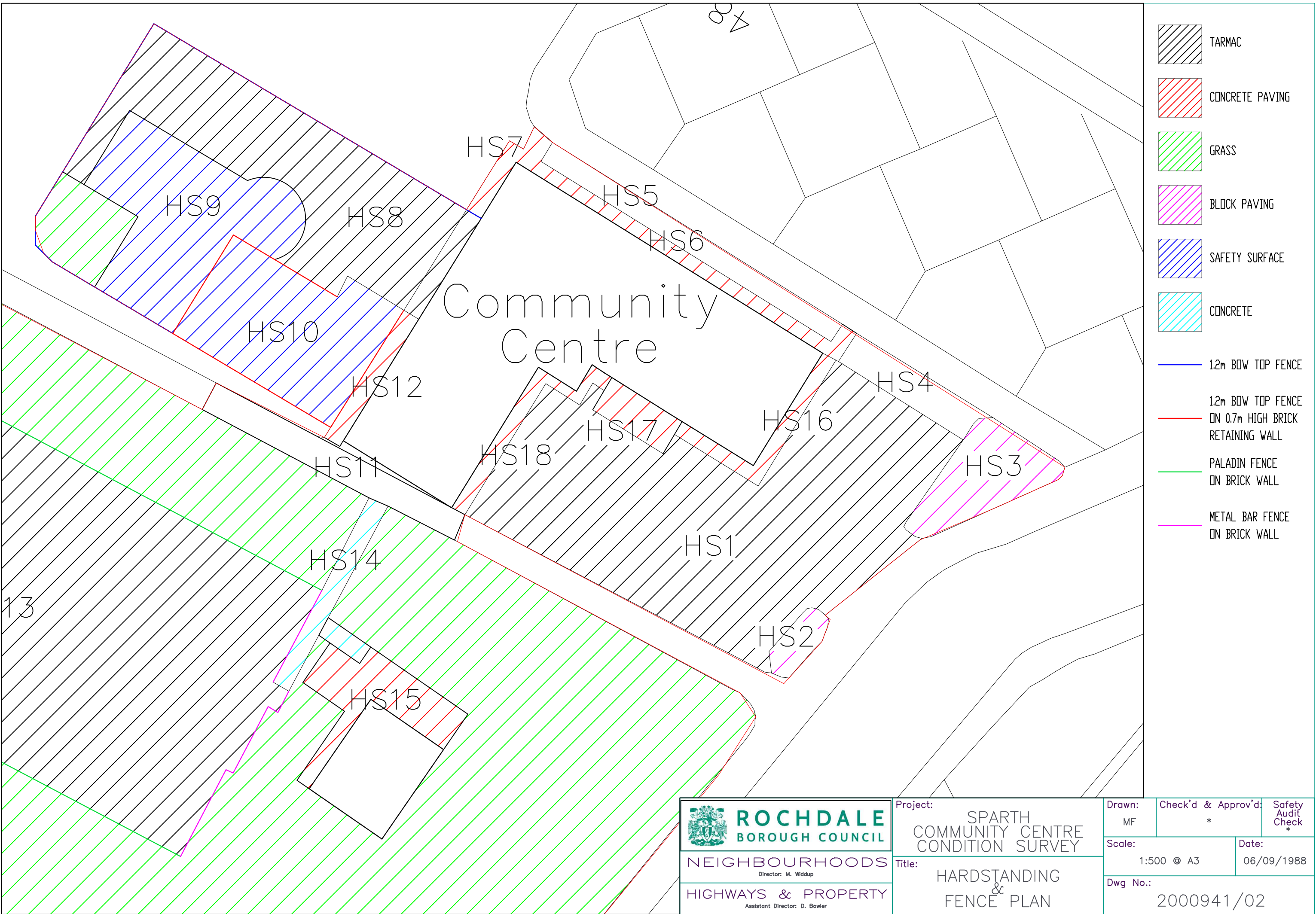


Figured dimensions to be used. Do not scale from drawing				
Rev.	Revision detail		By	CHK, Date
ROCHDALE BOROUGH COUNCIL				
Client				
Project Sparth Community Centre				
Title EXISTING LAYOUT.				
Drawn by DH	Date Mar 16	Purpose of issue Feasibility	Scale 1:50 @ A1	
Checked by	Date	Project No. 2		
Approved by	Date	Drawing No.		Rev. A

The floor plan shows a building layout with the following rooms and features:

- Kitchen:** Located in the top left corner.
- Store:** Located in the top center, adjacent to the Kitchen.
- WC:** Two restrooms located in the top center, adjacent to the Store.
- Office:** Two office spaces located in the top right.
- Hall:** A large central hallway connecting the various rooms.
- main entrance:** Located in the bottom center, with a set of stairs leading up.
- 18 Store 21 19:** A large storage area located in the bottom right corner.
- Annotations:** Red lines and symbols are scattered throughout the plan, indicating specific points of interest or safety measures. There are also green symbols along the left and bottom walls.

By email: development@rochdale.gov.uk or call: 0161 266 6600 (press 2)									
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ROCHDALE
BOROUGH COUNCIL

NEIGHBOURHOODS
Director: M. Widdup

HIGHWAYS & PROPERTY
Assistant Director: D. Bowler

Project: SPARTH COMMUNITY CENTRE
CONDITION SURVEY

Title: HARDSTANDING
&
FENCE PLAN

Drawn: MF	Check'd & Approv'd: *	Safety Audit Check *
Scale: 1:500 @ A3		Date: 06/09/1988
Dwg No.: 2000941/02		

Appendix B - Consultation

Flood risk assessment data

Location of site: 388940 / 413032 (shown as easting and northing coordinates)

Document created on: 15 May 2023

This information was previously known as a product 4.

Customer reference number: GMMC310170SW

Map showing the location that flood risk assessment data has been requested for.



How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

We recommend that you work with a flood risk consultant to get your flood risk assessment.

Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- historic flooding
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

Surface water and other sources of flooding

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

- surface water
- ordinary watercourses
- reservoirs

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

About the models used

Model name: Rochdale and Littleborough 2013

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

Date: 1 June 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 occurring in any one year, is described as 1% AEP.

Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

Flood map for planning (rivers and the sea)

Your 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

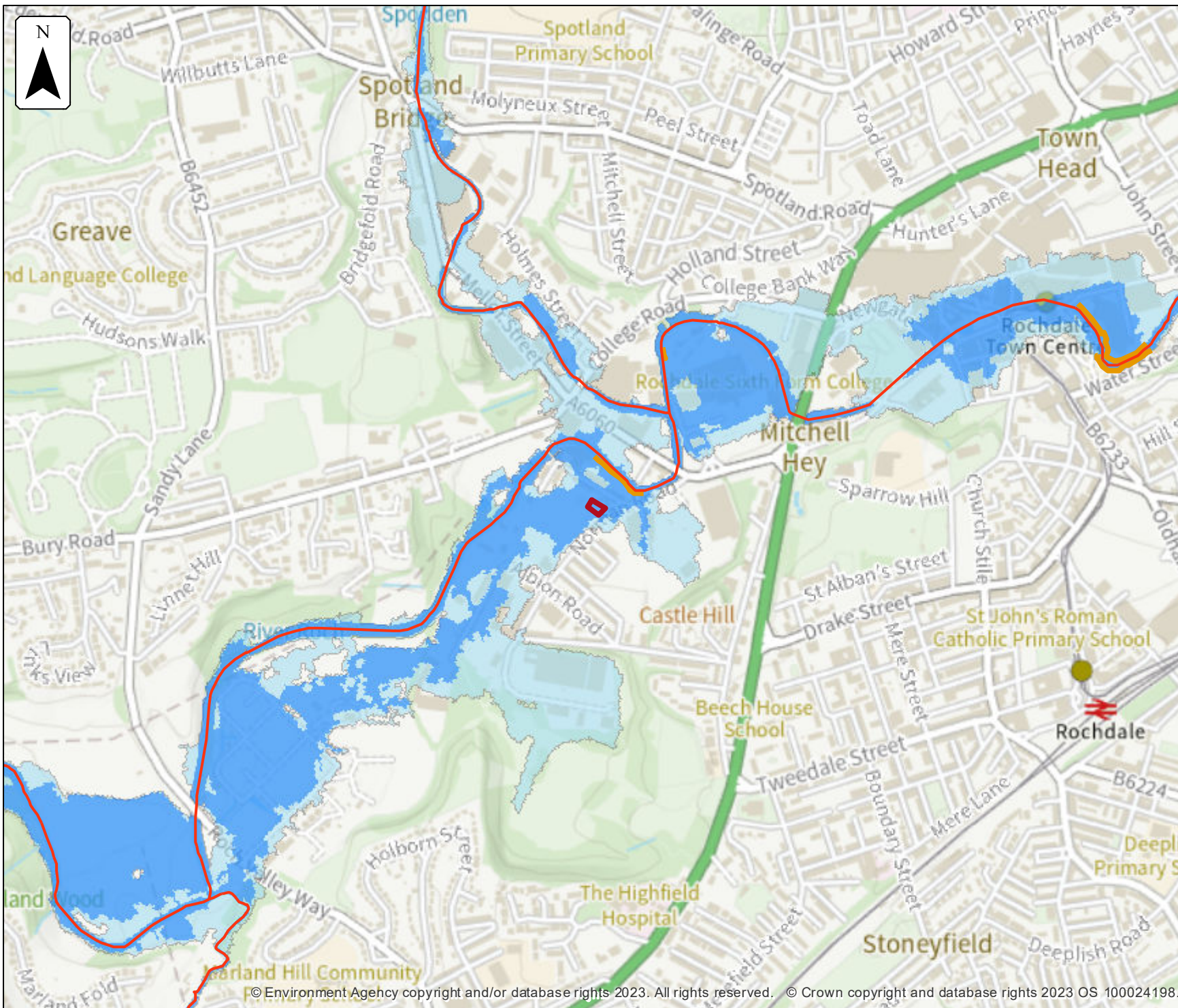
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- 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

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



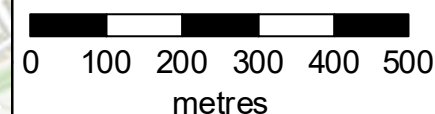
Flood map for planning

Location (easting/northing)
388940/413032

Scale
1:10,000

Created
15 May 2023

- Selected area
- Main river
- Flood defence
- Flood zone 3
- Flood zone 2



Historic flooding

This map is an indicative outline of areas that have previously flooded. Remember that:

- our records are incomplete, so the information here is based on the best available data
- it is possible not all properties within this area will have flooded
- other flooding may have occurred that we do not have records for
- flooding can come from a range of different sources - we can only supply flood risk data relating to flooding from rivers or the sea

You can also contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

[Download recorded flood outlines in GIS format](#)

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



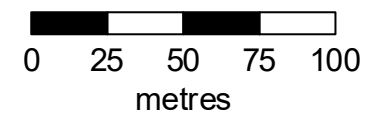
Flood defences

Location (easting/northing)
388940/413032

Scale
1:2,500

Created
15 May 2023

-  Selected area
-  Main river
-  Flood defence



Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	62721	Wall	100	Good	120.46	117.06	
2	63750	Engineered High Ground	100	Fair	116.62	116.23	
3	69326	Engineered High Ground	100	Fair	117.07	119.17	

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

Modelled data

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

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

Climate change

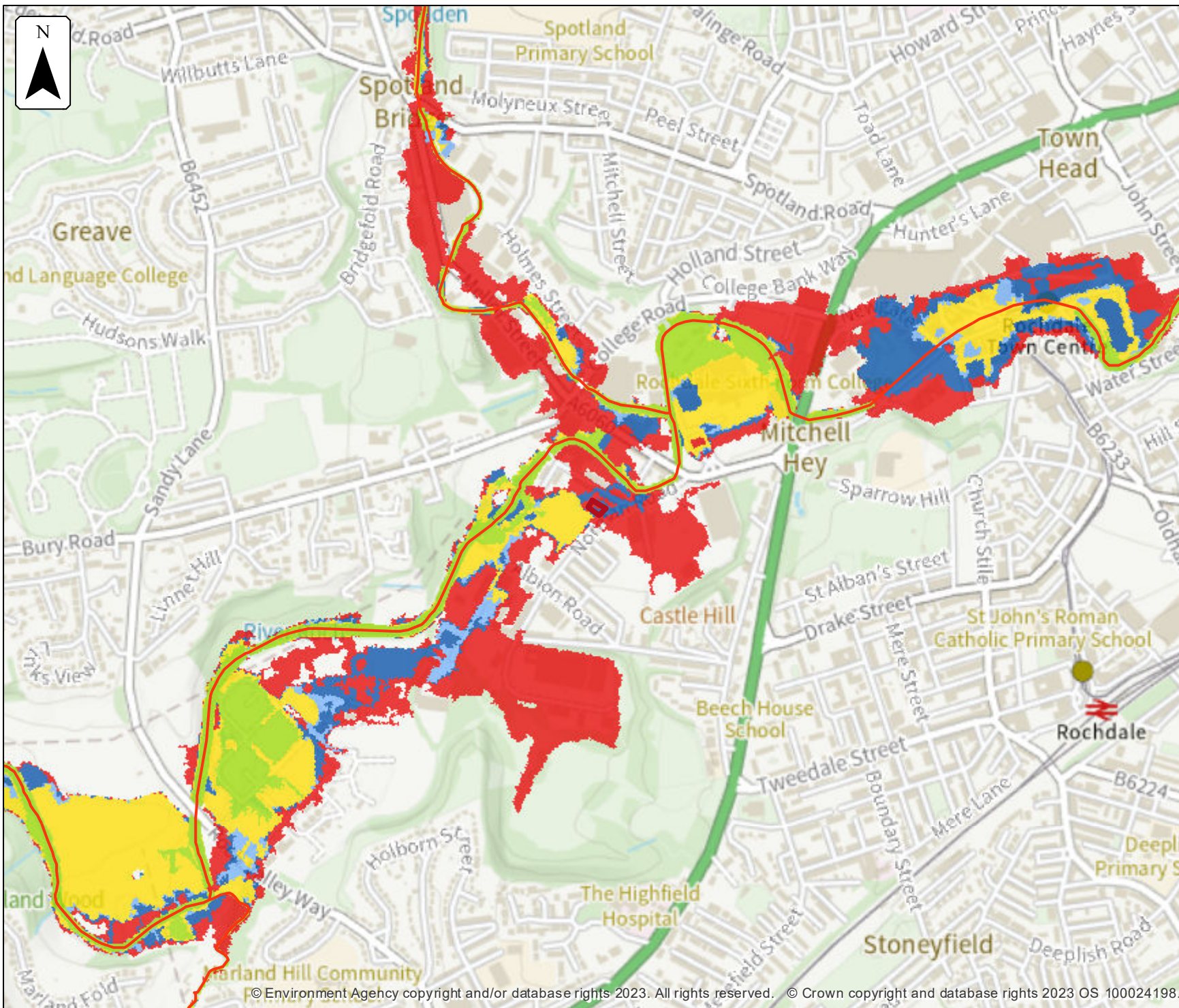
The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- No defences exist modelled fluvial: risk of flooding from rivers where there are no flood defences
- Defended climate change modelled fluvial: risk of flooding from rivers where there are flood defences, including estimated impact of climate change
- Defences removed climate change modelled fluvial: risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change



Defended modelled fluvial extent

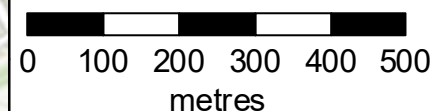
Location (easting/northing)
388940/413032

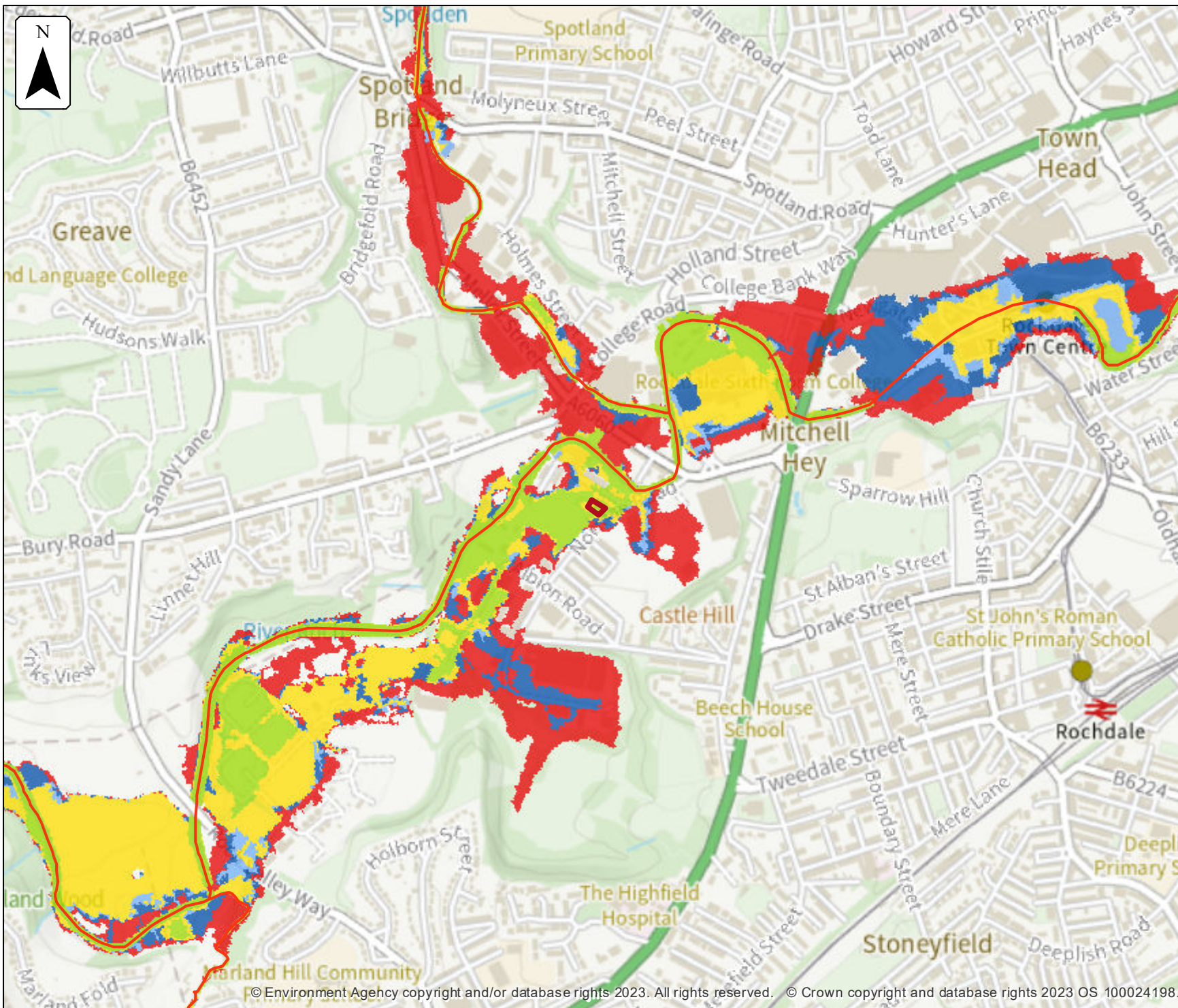
Scale Created
1:10,000 15 May 2023

Model name
Rochdale and Littleborough 2013

- 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





Defences removed modelled fluvial extent

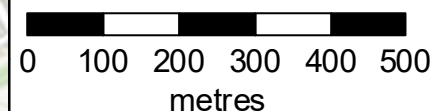
Location (easting/northing)
388940/413032

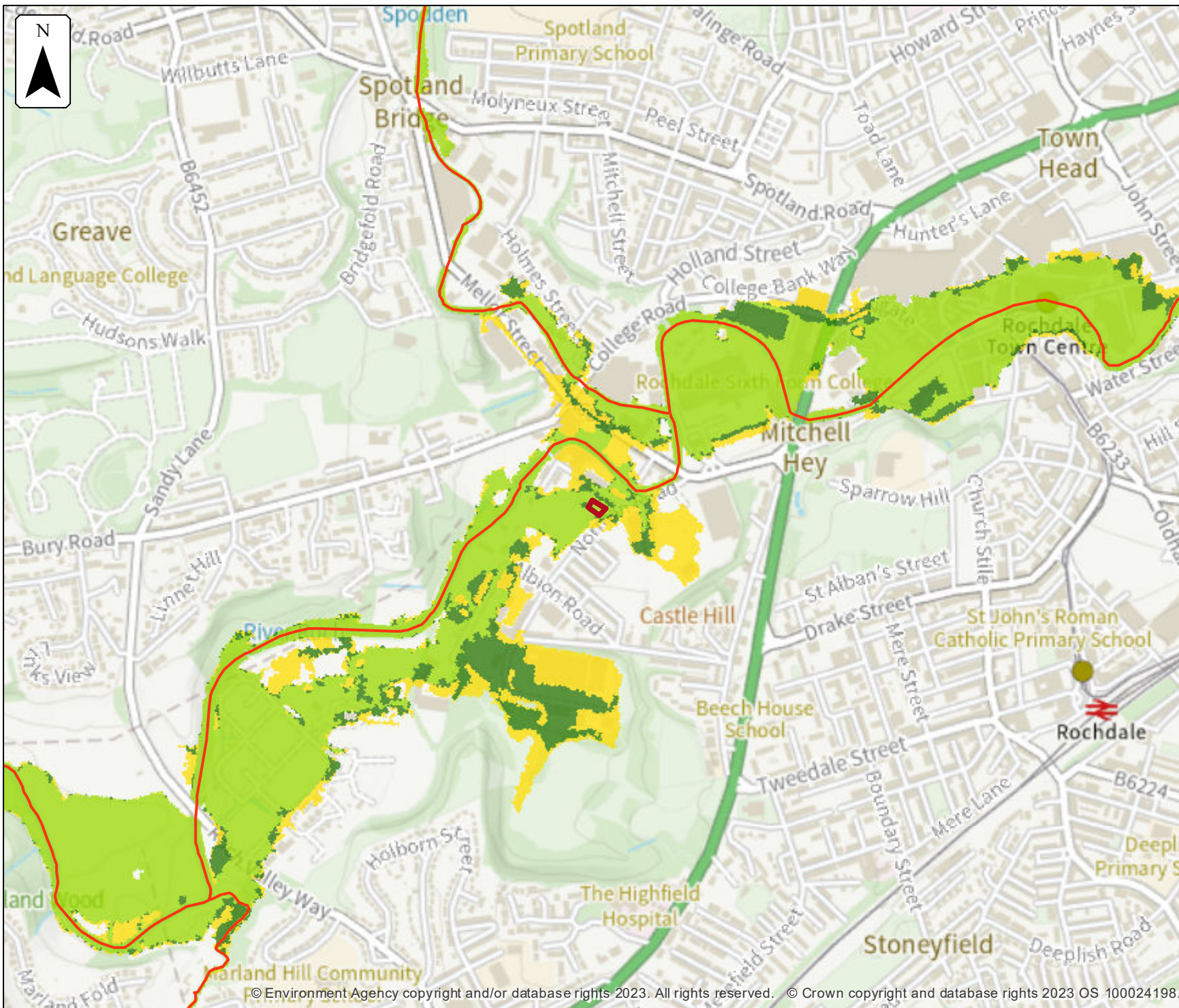
Scale Created
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Model name
**Rochdale and
Littleborough 2013**

- 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





Defended climate change modelled fluvial extent

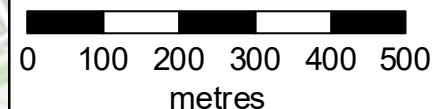
Location (easting/northing)
388940/413032

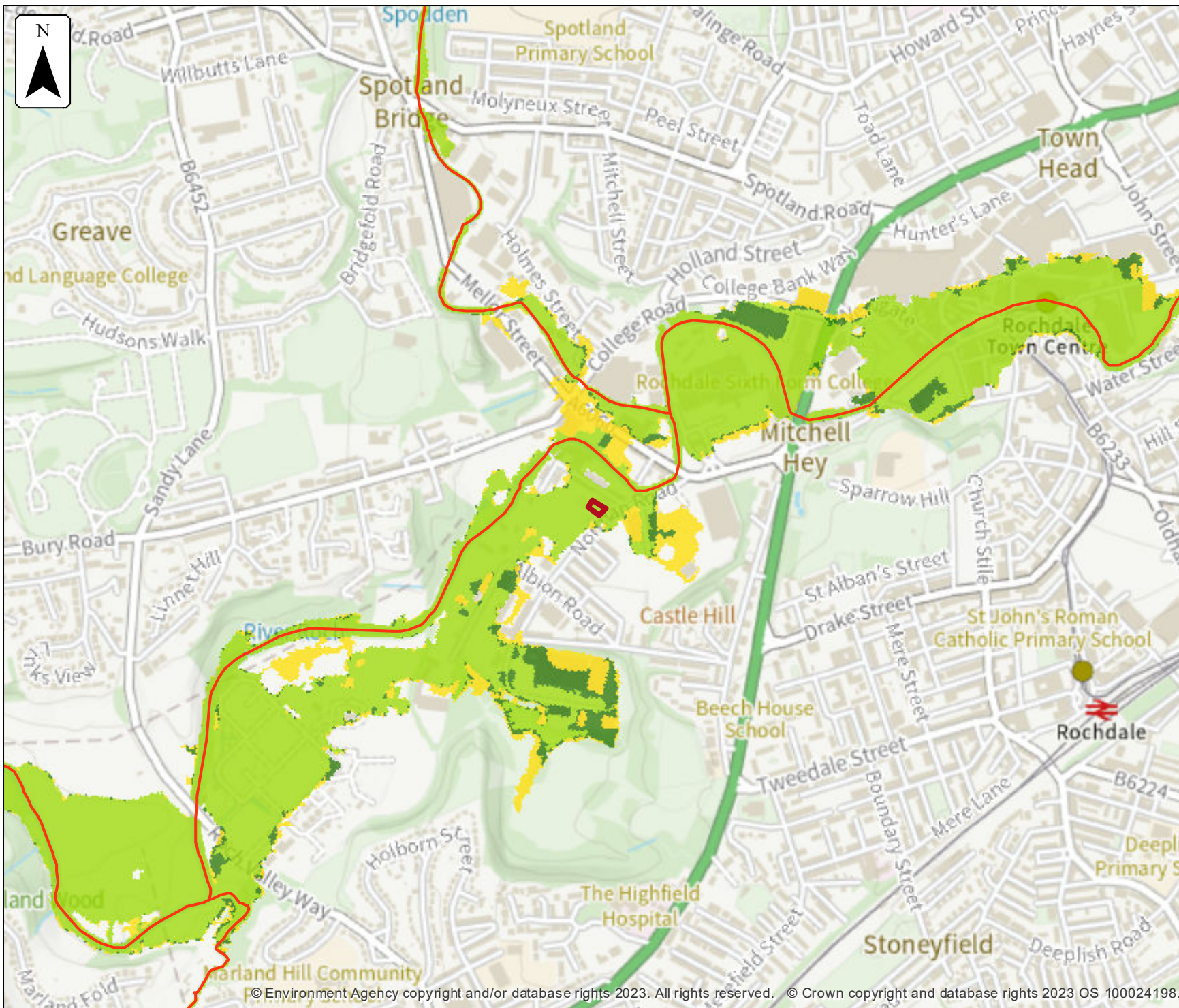
Scale Created
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Model name
**Rochdale and
Littleborough 2013**

- Selected area
- Main river
- Modelled flood extent
 - 1.0% AEP (+20%)
 - 1.0% AEP (+35%)
 - 1.0% AEP (+70%)

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





Defences removed climate change modelled fluvial extent

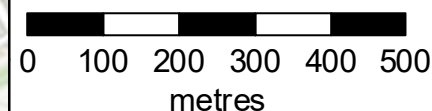
Location (easting/northing)
388940/413032

Scale Created
1:10,000 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

- Selected area
- Main river
- Modelled flood extent
 - 1.0% AEP (+20%)
 - 1.0% AEP (+35%)
 - 1.0% AEP (+70%)

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





Defended modelled fluvial node locations

Location (easting/northing)
388940/413032

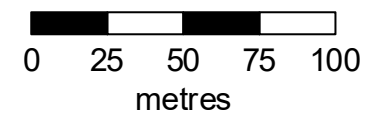
Scale Created
1:2,500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

-  Selected area
-  Modelled location
-  Main river



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Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	13454	388781	413050	113.80	80.34			114.23	99.59	114.36	105.21	114.60	115.18	115.30	140.55
2	35389	388791	413071	115.88	78.63			116.10	92.17	116.16	95.84	116.25	101.90	116.50	118.41
3	256201	388796	413084	116.10	80.44			116.32	103.05	116.37	110.04	116.45	122.99	116.61	167.67
4	125399	388834	413128	116.07	80.44			116.26	103.12	116.31	110.20	116.37	123.27	116.44	169.76
5	25654	388843	413139	116.08	80.44			116.26	103.05	116.31	110.04	116.36	123.01	116.42	168.99
6	194897	388893	413165	116.31	80.44			116.62	103.05	116.71	110.04	116.85	123.01	117.38	166.06
7	253784	388956	413125	116.52	80.44			116.85	103.05	116.95	110.04	117.11	123.0	117.83	150.21
8	121357	389010	413071	116.69	80.44			117.04	103.06	117.14	110.05	117.32	123.0	118.02	150.39
9	13995	389078	413082	116.92	80.44			117.29	103.05	117.39	110.04	117.56	124.11	117.87	173.51
10	152029	389094	413098	117.07	80.45			117.46	103.06	117.58	110.05	117.77	124.13	118.22	173.39

Data in this table comes from the Rochdale and Littleborough 2013 model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.



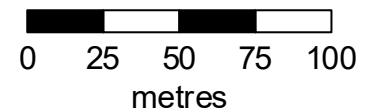
Defences removed modelled fluvial node locations

Location (easting/northing)
388940/413032

Scale Created
1:2,500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	13454	388781	413050	113.77	77.63			114.21	94.14	114.32	98.06	114.63	108.01	115.31	126.98
2	35389	388791	413071	115.84	75.92			116.01	86.18	116.04	88.27	116.13	94.13	116.38	110.34
3	256201	388796	413084	116.05	76.75			116.23	92.31	116.26	95.94	116.35	106.69	116.55	144.31
4	125399	388834	413128	116.02	76.75			116.18	92.35	116.21	95.98	116.28	106.81	116.43	145.24
5	25654	388843	413139	116.04	76.75			116.19	92.32	116.22	95.94	116.29	106.69	116.42	144.85
6	194897	388893	413165	116.25	76.75			116.48	92.32	116.53	95.94	116.67	106.69	117.12	142.37
7	253784	388956	413125	116.45	76.75			116.69	92.83	116.74	96.81	116.88	108.78	117.44	137.83
8	121357	389010	413071	116.62	77.13			116.84	96.36	116.88	101.23	117.01	115.95	117.27	165.08
9	13995	389078	413082	116.83	79.19			117.05	102.66	117.09	109.09	117.19	128.83	117.59	177.84
10	152029	389094	413098	116.99	79.19			117.28	102.66	117.34	109.09	117.52	128.82	118.07	177.75

Data in this table comes from the Rochdale and Littleborough 2013 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.

Modelled node locations data

No defences exist

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	143039	388165	412093							111.35	13.15			111.67	19.97
2	129261	388188	412129							111.34	13.15			111.67	19.96

Data in this table comes from the SuddenBrook 2007 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.



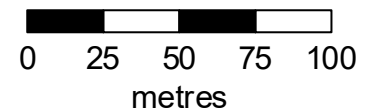
Defended climate change modelled fluvial node locations

Location (easting/northing)
388940/413032

Scale Created
1:2,500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defended climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)		1.0% AEP (+35%)		1.0% AEP (+70%)	
				Level	Flow	Level	Flow	Level	Flow
1	13454	388781	413050	114.74	120.14	114.96	131.78	115.31	141.47
2	35389	388791	413071	116.31	105.48	116.33	115.99	116.43	123.24
3	256201	388796	413084	116.49	131.61	116.55	146.07	116.60	166.56
4	125399	388834	413128	116.40	132.02	116.42	147.04	116.44	168.35
5	25654	388843	413139	116.39	131.59	116.41	146.51	116.42	167.68
6	194897	388893	413165	116.95	131.60	117.11	146.51	117.35	166.20
7	253784	388956	413125	117.21	131.59	117.39	146.51	117.81	150.79
8	121357	389010	413071	117.44	131.60	117.64	146.51	118.0	151.07
9	13995	389078	413082	117.65	134.39	117.78	154.87	117.85	171.99
10	152029	389094	413098	117.89	134.42	118.07	154.86	118.20	171.97

Data in this table comes from the Rochdale and Littleborough 2013 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.



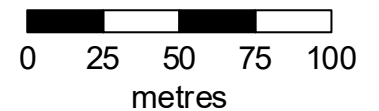
Defences removed climate change modelled fluvial node locations

Location (easting/northing)
388940/413032

Scale Created
1:2,500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+20%)		1.0% AEP (+35%)		1.0% AEP (+70%)	
				Level	Flow	Level	Flow	Level	Flow
1	13454	388781	413050	114.80	112.13	114.94	115.90	115.17	122.50
2	35389	388791	413071	116.19	97.54	116.24	100.73	116.33	106.72
3	256201	388796	413084	116.40	113.38	116.44	120.28	116.50	135.19
4	125399	388834	413128	116.32	113.58	116.36	120.55	116.40	135.71
5	25654	388843	413139	116.33	113.38	116.36	120.31	116.40	135.30
6	194897	388893	413165	116.75	113.38	116.83	120.31	116.99	135.07
7	253784	388956	413125	116.97	116.45	117.05	124.01	117.24	137.79
8	121357	389010	413071	117.07	125.53	117.15	134.09	117.28	153.06
9	13995	389078	413082	117.24	141.07	117.29	152.25	117.39	174.90
10	152029	389094	413098	117.63	141.08	117.73	152.24	117.95	174.89

Data in this table comes from the Rochdale and Littleborough 2013 model.

Level values are shown in mAOD, and flow values are shown in cubic metres per second.

Any blank cells show where a particular scenario has not been modelled for this location.



Defences removed modelled fluvial extent and height

Location (easting/northing)
388940/413032

Scale Created
1:500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

 Selected area

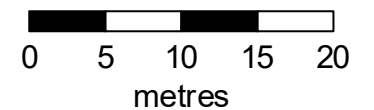
 Main river

Modelled 2D grid

Water level in mAOD

-  0 - 115.0
-  115.0 - 115.25
-  115.25 - 115.5
-  115.5 - 115.75
-  115.75 - 116.0
-  116.0 - 116.25
-  116.25 - 116.5
-  116.5 - 116.75
-  116.75 - 117.0

This map shows the
1.33% AEP height data



Sample point data

Defences removed

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
1	388940	413012	NoData	NoData			NoData	NoData						
2	388948	413012	NoData	NoData			0.19	116.50						
3	388924	413020	0.41	115.43			0.61	115.64						
4	388932	413020	0.06	115.70			0.16	115.83						
5	388940	413020	NoData	NoData			0.05	116.30						
6	388948	413020	NoData	NoData			0.21	116.48						
7	388956	413020	0.14	116.31			0.33	116.50						
8	388916	413028	0.30	115.39			0.52	115.62						
9	388924	413028	NoData	NoData			0.22	115.94						
10	388932	413028	0.27	116.14			0.45	116.32						
11	388940	413028	0.31	116.19			0.50	116.38						
12	388948	413028	0.34	116.22			0.57	116.46						
13	388956	413028	0.10	116.27			0.31	116.47						
14	388964	413028	0.20	116.32			0.38	116.50						
15	388916	413036	NoData	NoData			0.10	115.79						
16	388924	413036	NoData	NoData			0.01	116.20						

Label	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
			Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height	Depth	Height
17	388932	413036	NoData	NoData			0.03	116.36						
18	388940	413036	0.06	116.23			0.22	116.39						
19	388948	413036	0.20	116.25			0.42	116.46						
20	388956	413036	0.15	116.26			0.36	116.47						
21	388964	413036	0.12	116.28			0.32	116.49						
22	388924	413044	NoData	NoData			0.10	115.98						
23	388932	413044	NoData	NoData			0.06	116.28						
24	388940	413044	0.03	116.22			0.19	116.38						
25	388948	413044	0.09	116.25			0.26	116.45						
26	388956	413044	NoData	NoData			0.12	116.51						
27	388924	413052	0.08	115.86			0.21	116.00						
28	388932	413052	0.04	116.08			0.17	116.21						
29	388940	413052	0.00	116.20			0.18	116.43						

Data in this table comes from the Rochdale and Littleborough 2013 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.



**Defended
climate change
modelled fluvial
extent and height**

Location (easting/northing)
388940/413032

Scale Created
1:500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

 Selected area

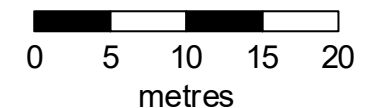
 Main river

Modelled 2D grid

Water level in mAOD

-  0 - 115.0
-  115.0 - 115.375
-  115.375 - 115.75
-  115.75 - 116.125
-  116.125 - 116.5
-  116.5 - 116.875
-  116.875 - 117.25
-  117.25 - 117.625
-  117.625 - 118.0

This map shows the
1.0% AEP +70% height data



Sample point data

Defended climate change

Label	Easting	Northing	1% AEP (+35%)		1% AEP (+70%)	
			Depth	Height	Depth	Height
1	388940	413012	NoData	NoData	0.35	116.55
2	388948	413012	0.20	116.51	0.47	116.78
3	388924	413020	0.60	115.62	0.91	115.93
4	388932	413020	0.16	115.82	0.41	116.07
5	388940	413020	0.05	116.30	0.26	116.52
6	388948	413020	0.21	116.48	0.49	116.76
7	388956	413020	0.33	116.50	0.61	116.77
8	388916	413028	0.49	115.60	0.78	115.88
9	388924	413028	0.18	115.91	0.36	116.08
10	388932	413028	0.44	116.32	0.61	116.48
11	388940	413028	0.50	116.38	0.73	116.60
12	388948	413028	0.58	116.46	0.85	116.74
13	388956	413028	0.31	116.48	0.57	116.73
14	388964	413028	0.39	116.51	0.65	116.77
15	388916	413036	0.09	115.77	0.16	115.89
16	388924	413036	0.01	116.17	0.02	116.22

Label	Easting	Northing	1% AEP (+35%)		1% AEP (+70%)	
			Depth	Height	Depth	Height
17	388932	413036	0.02	116.35	0.20	116.53
18	388940	413036	0.22	116.39	0.42	116.59
19	388948	413036	0.42	116.46	0.66	116.71
20	388956	413036	0.36	116.47	0.60	116.71
21	388964	413036	0.32	116.49	0.56	116.73
22	388924	413044	0.08	115.96	0.12	116.02
23	388932	413044	0.05	116.28	0.16	116.39
24	388940	413044	0.17	116.37	0.36	116.56
25	388948	413044	0.26	116.44	0.47	116.65
26	388956	413044	0.10	116.48	0.34	116.73
27	388924	413052	0.17	115.96	0.34	116.12
28	388932	413052	0.16	116.20	0.30	116.34
29	388940	413052	0.12	116.36	0.27	116.53

Data in this table comes from the Rochdale and Littleborough 2013 model.

Height values are shown in mAOD, and depth values are shown in metres.

Any blank cells show where a particular scenario has not been modelled for this location.

Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.



**Defences removed
climate change
modelled fluvial
extent and height**

Location (easting/northing)
388940/413032

Scale Created
1:500 15 May 2023

Model name
**Rochdale and
Littleborough 2013**

 Selected area

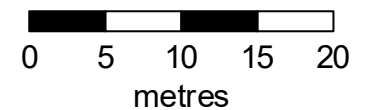
 Main river

Modelled 2D grid

Water level in mAOD

-  0 - 115.0
-  115.0 - 115.375
-  115.375 - 115.75
-  115.75 - 116.125
-  116.125 - 116.5
-  116.5 - 116.875
-  116.875 - 117.25
-  117.25 - 117.625
-  117.625 - 118.0

This map shows the
1.0% AEP +70% height data



Sample point data

Defences removed climate change

Label	Easting	Northing	1% AEP (+35%)		1% AEP (+70%)	
			Depth	Height	Depth	Height
1	388940	413012	0.33	116.52	0.38	116.57
2	388948	413012	0.44	116.75	0.51	116.82
3	388924	413020	0.90	115.93	1.02	116.05
4	388932	413020	0.40	116.06	0.47	116.14
5	388940	413020	0.25	116.50	0.31	116.56
6	388948	413020	0.47	116.74	0.55	116.82
7	388956	413020	0.59	116.75	0.67	116.84
8	388916	413028	0.79	115.90	0.91	116.01
9	388924	413028	0.36	116.08	0.43	116.16
10	388932	413028	0.61	116.49	0.67	116.55
11	388940	413028	0.72	116.59	0.79	116.66
12	388948	413028	0.84	116.72	0.93	116.81
13	388956	413028	0.56	116.73	0.65	116.82
14	388964	413028	0.65	116.77	0.74	116.86
15	388916	413036	0.17	115.90	0.28	116.01
16	388924	413036	0.02	116.22	0.03	116.25

Label	Easting	Northing	1% AEP (+35%)		1% AEP (+70%)	
			Depth	Height	Depth	Height
17	388932	413036	0.21	116.53	0.27	116.60
18	388940	413036	0.42	116.59	0.49	116.66
19	388948	413036	0.67	116.71	0.75	116.80
20	388956	413036	0.61	116.72	0.69	116.80
21	388964	413036	0.57	116.74	0.64	116.81
22	388924	413044	0.15	116.04	0.21	116.11
23	388932	413044	0.18	116.41	0.25	116.48
24	388940	413044	0.38	116.58	0.46	116.66
25	388948	413044	0.48	116.67	0.57	116.75
26	388956	413044	0.36	116.75	0.45	116.84
27	388924	413052	0.38	116.17	0.44	116.22
28	388932	413052	0.34	116.38	0.41	116.45
29	388940	413052	0.29	116.56	0.36	116.63

Data in this table comes from the Rochdale and Littleborough 2013 model.

Height values are shown in mAOD, and depth values are shown in metres.

Any blank cells show where a particular scenario has not been modelled for this location.

Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.

Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

[Find out more about flood risk activity permits](#)

Help and advice

Contact the Greater Manchester Merseyside and Cheshire Environment Agency team at inforequests.gmmc@environment-agency.gov.uk for:

- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for