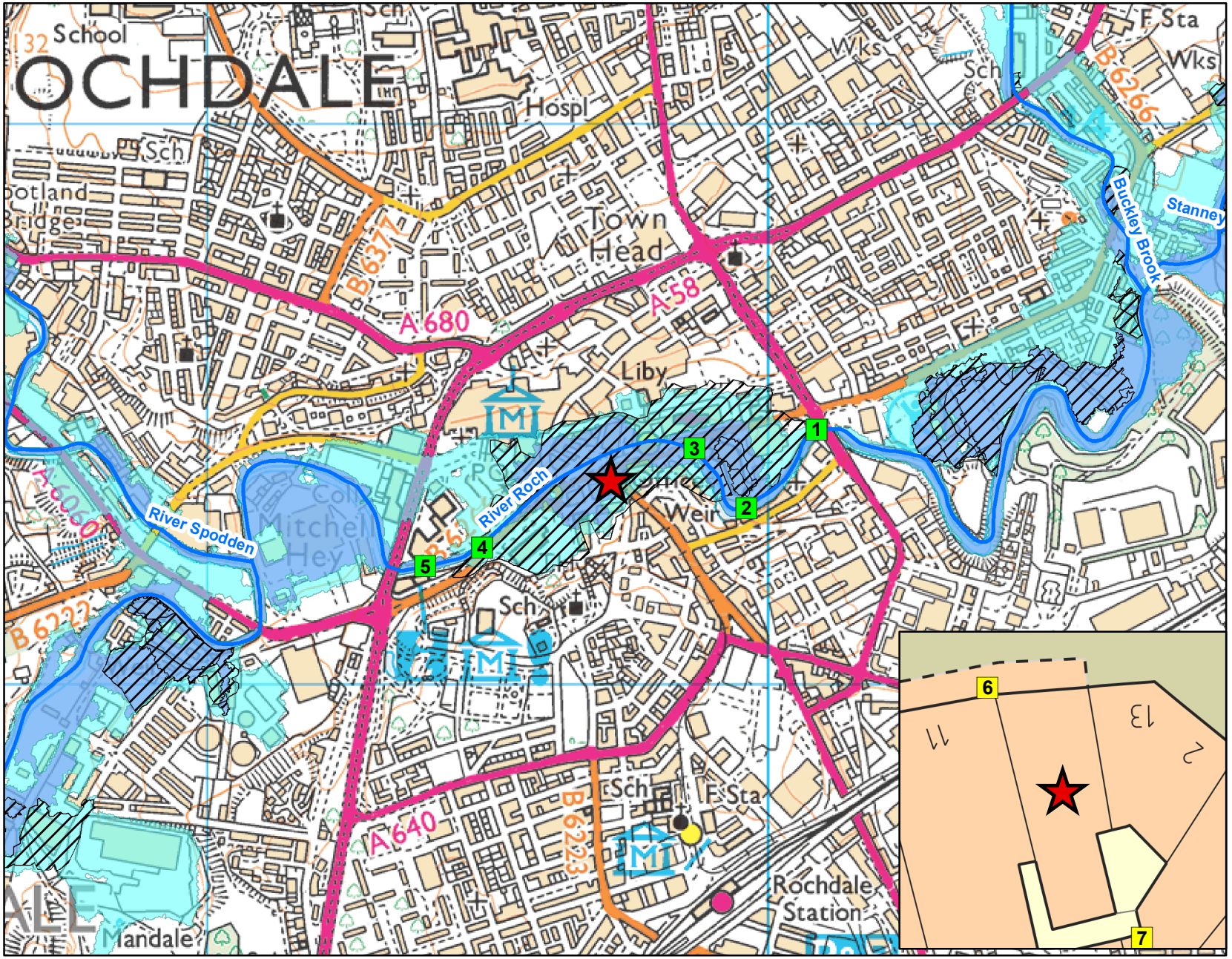
Appendix C Environment Agency's Data and Information

Detailed Flood Map centred on South Parade, Rochdale, OL16 1LR. Created on 21/09/2020 [GMMC184915SW]



Environment Agency

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Legend

- Site Location
- Model Measurements
- 2D Measurements
- Main River
- Areas Benefitting
- Flood Zone 3
- Flood Zone 2

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					Undefended									Defended								
Map Reference	Model Node Reference	Easting	Northing	Data	5 % AEP (1 in 20 year)	3.33 % AEP (1 in 30 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 20% Increase in Flow*	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	5 % AEP (1 in 20 year)	3.33 % AEP (1 in 30 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 20% Increase in Flow*	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)
1	ea013_model_ROCH04_2890d	390087	413448	Modelled Water Level (m aodN)	120.98	121.06	121.29	121.39	122.04	122.10	122.33	121.65	122.34	121.00	121.06	121.28	121.34	121.77	122.14	122.50	121.59	122.36
				Modelled Flow (cumecs)	57.30	60.67	72.73	78.26	101.29	110.04	134.84	93.91	133.96	57.59	60.29	70.65	74.26	97.70	113.45	150.67	90.02	134.16
2	ea013_model_ROCH04_2679	389960	413312	Modelled Water Level (m aodN)	120.13	120.19	120.48	120.70	121.47	121.51	121.79	121.25	121.74	120.13	120.18	120.45	120.54	121.41	121.58	121.83	121.12	121.71
				Modelled Flow (cumecs)	56.91	59.77	67.44	70.48	101.98	101.95	108.52	72.61	113.91	57.59	60.29	67.98	70.30	74.26	100.99	129.28	73.68	119.41
3	ea013_model_RCH04_2518i	389874	413422	Modelled Water Level (m aodN)	119.36	119.55	120.10	120.43	121.41	121.59	121.89	121.16	121.88	119.40	119.55	120.05	120.16	121.33	121.64	122.04	120.98	121.88
				Modelled Flow (cumecs)	57.81	61.19	71.45	74.95	83.05	85.24	100.77	80.85	97.57	58.14	60.86	70.66	74.20	79.40	79.67	89.45	77.93	95.46
4	ea013_model_ROCH4C2025	389495	413243	Modelled Water Level (m aodN)	118.42	118.54	118.83	118.95	119.30	119.40	119.70	119.20	119.71	118.46	118.56	118.84	118.94	119.28	119.47	119.91	119.18	119.73
				Modelled Flow (cumecs)	57.81	61.18	71.66	77.43	95.54	97.99	100.23	91.40	100.41	58.14	60.86	70.17	74.22	93.84	97.83	100.13	87.83	99.36
5	ea013_model_ROCH04_1902	389394	413211	Modelled Water Level (m aodN)	118.20	118.33	118.61	118.72	119.05	119.15	119.46	118.95	119.49	118.25	118.35	118.64	118.73	119.04	119.25	119.67	118.94	119.52
				Modelled Flow (cumecs)	57.81	61.18	71.66	77.44	95.51	98.79	105.47	91.40	104.43	58.15	60.87	70.18	75.10	93.84	98.99	109.01	87.83	103.45
6	2D Measure	389717	413372	Modelled Water Level (m aodN)				120.43	121.41				121.87									
7	2D Measure	389726	413356	Modelled Water Level (m aodN)				120.43	121.41				121.87									

Model data taken from Rochdale & Littleborough 2013

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes:

*Climate Change Scenario - 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

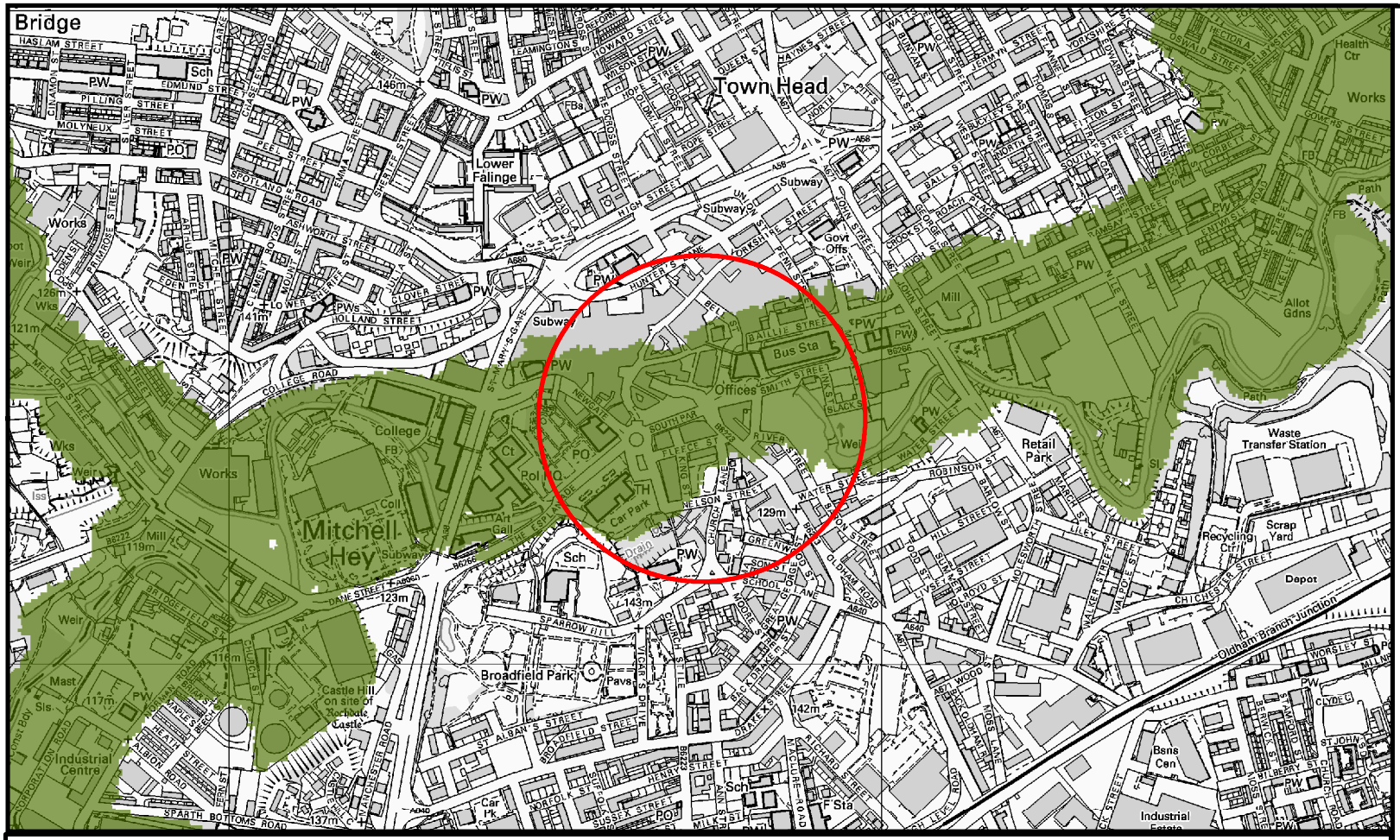
*Climate Change Scenario - We only hold climate change measurements based on the previous climate change guidance (20% increase in flow). The new climate change guidance is available at https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

Recorded Flood Outlines

Flood Event Code	Name	Start Date	End Date	Source of Flooding	Cause of Flooding
4079733	Rochdale Town Centre	26/12/2015	26/12/2015	Main river	channel capacity exceeded (no raised defences)
4086006	South Parade	16/03/2019	16/03/2019	Drainage	local drainage/surface water

Reservoir Flood Map

Environment Agency
Asiantaeth yr Amgylchedd



The area within the red circle could be at risk of flooding from the following reservoirs:

Reservoir Name	Reservoir Owner	Location	Local Authority	Environment Agency Office
Hollingworth Lake	United Utilities Water plc	394020, 415140	Rochdale	Environment Agency - Greater Manchester, Merseysid
Piethorne	United Utilities Water plc	396194, 412542	Rochdale	Environment Agency - Greater Manchester, Merseysid
Chelburn Upper	United Utilities Water plc	395242, 418523	Rochdale	Environment Agency - Greater Manchester, Merseysid
Kitcliffe	United Utilities Water plc	395822, 412470	Rochdale	Environment Agency - Greater Manchester, Merseysid
Ogden (Milnrow)	United Utilities Water plc	395081, 412292	Rochdale	Environment Agency - Greater Manchester, Merseysid
Blackstone Edge	United Utilities Water plc	396847, 418042	Rochdale	Environment Agency - Greater Manchester, Merseysid
Watergrove	United Utilities Water plc	390841, 417523	Rochdale	Environment Agency - Greater Manchester, Merseysid
Rooden	United Utilities Water plc	397130, 412010	Rochdale	Environment Agency - Greater Manchester, Merseysid

Note - this map provides a general indication of the largest area that might be flooded if a reservoir were to fail and release the water it holds. It is taken from a national assessment and displays a worst case scenario. The map is only intended as a guide and is not a prediction of what will happen.

Important

- This map has been produced for emergency planning purposes and displays a worst case scenario.
- It is not suitable for use at an individual property scale due to the method used.
- This map does not give any information on the likelihood of reservoir flooding or on the depth or speed of floodwaters. It also does not include any smaller reservoirs (which hold less than 25,000 cubic metres of water) or reservoirs commissioned or registered after Spring 2009.
- The information should not be interpreted as stating that the location you are interested in will or won't actually flood, but simply that it is in or not in an area that could be affected by reservoir flooding as shown on the maps.

Maximum extent of flood

1:10,000

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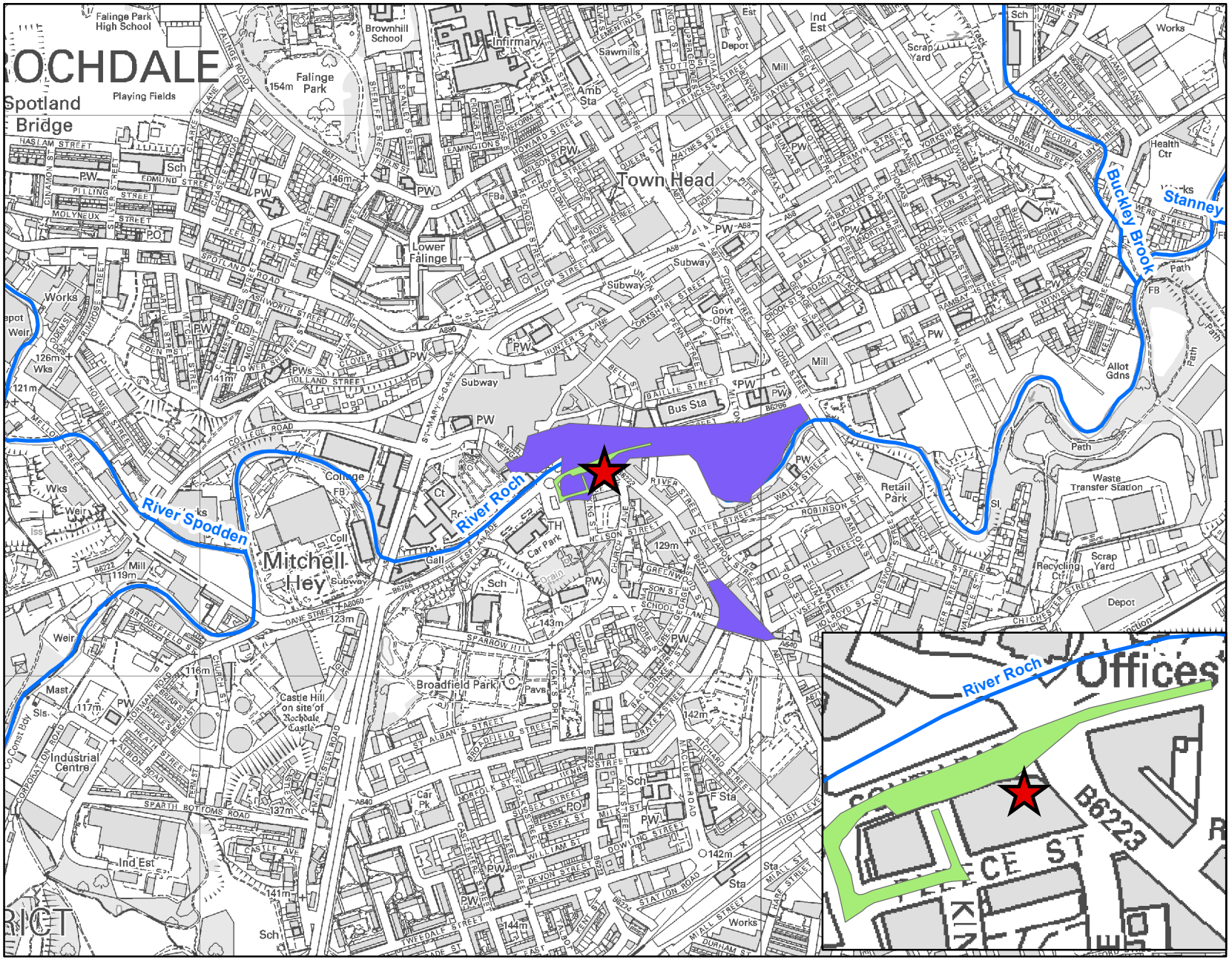
Recorded Flood Outline Map centred on South Parade, Rochdale, OL16 1LR. Created on 21/09/2020 [GMMC184915SW]



Environment Agency

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Legend

Site Location

Start Date

26/12/2015

16/03/2019

Main River

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Reservoir Flood Map

This text must be read with the extract from the Reservoir Flood Map which we have sent to you

How to use the maps

Reservoir flood maps are available to help you find out if you could be affected by reservoir flooding. Even though reservoir flooding is very unlikely it may be helpful to you to find out if you live or work in an area that could be affected. If you do, you might want to think about what you would do if an emergency did happen.

For more information on what to do if you live or work near a reservoir, including some frequently asked questions, visit our website at http://www.environment-agency.gov.uk/flood.

The maps have been prepared for emergency planning purposes and for this reason they reflect a credible worst case scenario – this means that if a reservoir failure did occur it would most likely be far less severe than the scenario shown in the maps. We've mapped a credible worst case scenario so that emergency planners have all the information they might need to increase public safety.

Reservoir safety

Reservoirs in the UK have an extremely good safety record with no failures resulting in the loss of life since 1925. Reservoirs are more carefully maintained now. This means reservoir flooding is very unlikely to happen.

The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England. All large reservoirs that we think could endanger human life must be inspected and supervised by reservoir engineers. We ensure that reservoirs are regularly inspected and essential safety work is carried out.

For more information on reservoir safety visit our website at:

https://www.gov.uk/guidance/reservoirs-owner-and-operator-requirements.

Emergency planning

Lead Local flood authorities are responsible for coordinating emergency plans for reservoir flooding and ensuring communities are well prepared. Lead Local flood authorities work with other members of the Local Resilience Forum (LRF) to develop generic and site-specific emergency plans, depending on local circumstances and priorities.

If you want to find out about local emergency plans you should contact the responsible lead local flood authority as identified on the map.

Flood risk assessments: Climate change allowances

Application of the allowances and local considerations

Greater Manchester, Merseyside & Cheshire

1) The climate change allowances

The National Planning Practice Guidance refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in February 2016 and is available on Gov.uk and should be read in conjunction with this document. The guidance can be used for planning applications, local plans, neighbourhood plans and other projects. It provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

2) Assessment of climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location. This should be used as **a guide only**. Ultimately, the agreed approach should be based on expert local knowledge of flood risk conditions, local sensitivities and other influences. **For these reasons we recommend that applicants and / or their consultants should contact the Environment Agency at the pre-planning application stage to confirm the assessment approach, on a case by case basis**. **Table A** defines three possible approaches to account for flood risk impacts due to climate change, in new development proposals:

- **Basic:** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- **Intermediate:** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the 'design flood' flow.
- **Detailed:** Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

VULNERABILITY CLASSIFICATION	FLOOD ZONE	DEVELOPMENT TYPE		
		MINOR	SMALL-MAJOR	LARGE-MAJOR
ESSENTIAL INFRASTRUCTURE	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
HIGHLY VULNERABLE	Zone 2	Intermediate/ Basic	Intermediate/ Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
MORE VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
LESS VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
WATER COMPATIBLE	Zone 2	None		
	Zone 3a	Intermediate/ Basic		
	Zone 3b	Detailed		

NOTES:

- Minor: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveller site over 30+ pitches | any other development that creates a non residential building or development over 1000 sq m.

The assessment approach should be agreed with the Environment Agency as part of pre-planning application discussions to avoid abortive work.

3) Specific local considerations

Where the Environment Agency and the applicant and / or their consultant has agreed that a '**basic**´ level of assessment is appropriate the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local precautionary allowances for potential climate change impacts

Watercourse	Central	Higher Central	Upper
All	0.15m	0.24m	0.48m

Use of these allowances will only be accepted after discussion with the Environment Agency.

4) Fluvial food risk mitigation

Read the guidance on Gov.uk to find out which allowances to use to **assess** the impact of climate change on flood risk.

For planning consultations where we are a statutory consultee and our Flood risk standing advice **does not** apply we use the following benchmarks to inform flood risk **mitigation** for different vulnerability classifications. **These are a guide only**. **We strongly recommend you contact us at the pre-planning application stage to confirm this on a case by case basis. Please note you may be charged for this advice.** For planning consultations where we are not a statutory consultee or our Flood risk Standing advice applies we recommend local planning authorities and developers use these benchmarks but we do not expect to be consulted.

- For development classed as '**Essential Infrastructure**' our benchmark for flood risk mitigation is for it to be designed to the '**upper end**' climate change allowance for the epoch that most closely represents the lifetime of the development, including decommissioning.

- For **highly vulnerable** in flood zone 2, the '**higher central'** climate change allowance is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **upper end** allowance.

- For **more vulnerable developments** in flood zone 2, the '**central**' climate change allowance is our minimum benchmark for flood risk mitigation, and in flood zone 3 the '**higher central**' climate change allowance is our minimum benchmark for flood risk

mitigation. In sensitive locations it may be necessary to use the **higher central** (in flood zone 2) and the **upper end** allowance (in flood zone 3).

- For **water compatible** or **less vulnerable** development (e.g. commercial), the '**central**' climate change allowance for the epoch that most closely represents the lifetime of the development is our minimum benchmark for flood risk mitigation. In sensitive locations it may be necessary to use the **higher central** (particularly in flood zone 3) to inform built in resilience.

There may be circumstances where local evidence supports the use of other data or allowances. Where you think this is the case we may want to check this data and how you propose to use it.

END.