

Warth Business Park, Radcliffe

Flood Risk Assessment

Job Number: FRA241100

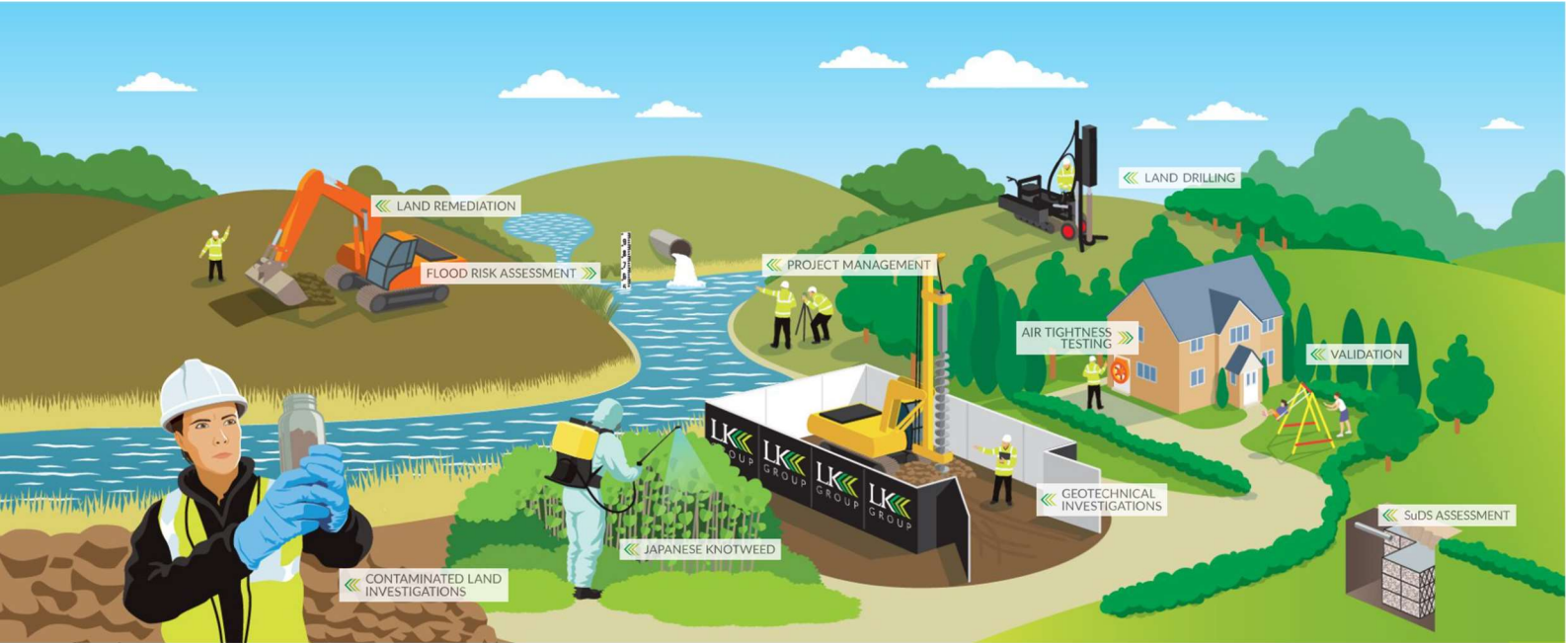
Date: December 2024

Client: GFIC Properties Ltd



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EXECUTIVE SUMMARY

Scope and Background

This Flood Risk Assessment (FRA) has been undertaken by LKC to support a planning application for renovation / refurbishment of the existing commercial / industrial properties on the site, external elevation works and demolition of some of the existing buildings located on land south of Warth Road and west of Radcliffe Road.

LKC has prepared this FRA in line with the NPPF and Technical Guidance where appropriate.

In considering the proposals the following key principles have therefore been applied:

- » Identification of flood risks.
- » Protection of users of the new development.
- » No increased flood risk to third parties.

Consultations

The Environment Agency (EA) has been consulted to inform the preparation of this report. They have provided onsite/adjacent modelled flood levels for the River Irwell located to the South of the site. The EA have also provided details of flood defences long the bank of the River Irwell.

Bury Council - Lead Local Flood Authority (LLFA) and United Utilities (UU) were also consulted concerning flood risk.

Not all consultees have provided information at the time of writing.

Flood Risk

The site is shown on published mapping to be located within the EA's Flood Zone 3. Comparison of topographical data with the EA modelled flood level data indicates that the whole site is in Flood Zone 3, however benefits from the presence of flood defences along the River Irwell to the south and defences are also indicated to be present to the west of the Metrolink line. Therefore, it is considered that the site is afforded a significant degree of protection and as such based on the operation of the defences the risk of flooding from fluvial sources is considered to be Low – Moderate.

Low to Moderate risks of flooding from pluvial / surface water and flooding from sewers has been identified.

Mitigation

An assessment of these risks in conjunction with the development proposals have resulted in the following recommendations to be built into the site wherever possible to allow the site to return to use quickly in the event that flooding occurs. Such measures could include, but are not limited to:

- » Raising electrical equipment above the flood level;
- » Raising kitchen appliances on plinths to reduce the potential for floodwater to impact them;
- » Use of water resistant walls, such as resilient wall plaster, water resistant paint or ceramic tiling or painted blockwork, wherever possible; and

- » Use of concrete, hard wood or ceramic tiles rather than carpets where possible at ground floor level.

Access

Based on the presence of the flood defences the site is offered a significant degree of protection from fluvial flooding. It is recommended that the site is registered with the EA Flood Warning Service and that a Flood Management Plan is developed for the site.

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Figure 1 – Site Location Plan

APPENDICES

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Appendix B – Environment Agency Data

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1 Introduction

1.1 Background

LKC were commissioned by GFIC Properties Ltd to carry out an FRA for Warth Business Park, Radcliffe. The report was undertaken in support of a planning application renovation / refurbishment of the existing commercial / industrial properties on the site, external elevation works and demolition of some of the existing buildings.

The report will address the vulnerability to flooding from all possible sources and will also consider the impact of the development on surface water runoff accounting for climate change and the potential to increase flood risk elsewhere. The issues of actual flood risk are discussed in Section 4.

Government policy with respect to development in flood risk areas is contained within the Ministry of Housing Communities and Local Government National Planning Policy Framework¹ and accompanying Planning Practice Guidance (PPG)². The guidance on Climate Change allowance issued by the Environment Agency in June 2022 has also been considered.

LKC has prepared this FRA in line with the NPPF and the PPG where appropriate. The level of detail entered into any flood risk assessment is dependent upon the scale and potential impact of the proposed development, and the vulnerability classification of the proposed land-use.

1.2 Site Details

A summary of the general site details is presented in Table 1-1.

Location	North of River Irwell, south of Warth Road and west of Radcliffe Road at approximate postcode BL9 9NB. A Site Location Plan is included at Figure 1. Centred at National Grid Reference 379580E 409170N.
Area	5.71Ha.
Topography	69.50-72 metres above ordnance datum (AOD). Further detail is provided in Section 2.4 below.
Current Site Use	<u>Site</u> Hardstood ground industrial park. <u>Surrounding Area/ Boundary Treatment</u> North: Residential Properties. East: Residential Properties. South: River Irwell. West: Tram track adjacent, with River Irwell at 80-140m west.
Proposed Development	The proposed development is for renovation / refurbishment of the existing commercial / industrial properties on the site, external elevation works and demolition of some of the existing buildings. It is understood that the site will remain as industrial / commercial use.

Table 1-1: Summary of site details.

¹ Ministry of Housing Communities and Local Government. "National Planning Policy Framework.". Last updated 20th December 2023.

² Ministry of Housing Communities and Local Government. "Planning Practice Guidance" <https://www.gov.uk/guidance/flood-risk-and-coastal-change>. Last updated 25th August 2022.

2 Site Setting

2.1 Vulnerability

As an initial phase in identifying whether a site is potentially at risk of flooding, LKC has consulted the EA's Flood Zone Mapping website (Flood Map for Planning at [.gov.uk](https://www.gov.uk)). This mapping is (often) based on coarse scale modelling and provides only an initial indication of the flood risk to a site. The EA Flood Zone maps were developed using a very coarse Digital Elevation Map (DEM) and are superseded by a more detailed analysis of modelled flood levels and topographic survey levels.

The Flood Zones divide the floodplain into three categories of flood risk, and do not take flood defences into account. The PPG (Table 1, Paragraph 78) defines the Flood Zones as:

- Flood Zone 1 – Very Low Risk, with annual probability of flooding from rivers and the sea of less than 0.1% (1 in 1000).
- Flood Zone 2 – Low Risk, with annual probability of flooding of 0.1 to 1.0% from rivers and 0.1 to 0.5% from the sea.
- Flood Zone 3 – Medium to High risk of flooding with an annual probability of flooding of 1.0% or greater from rivers, and 0.5% or greater from the sea.

The Flood Zone Mapping indicates the site as being within Flood Zone 3 therefore a Flood Risk Assessment is required for planning (footnote 59, NPPF).

The proposed development is for a commercial/non-residential end use, and this is classified within the 'Less Vulnerable' category in the PPG (Annex 3, NPPF).

It should be noted that the flood extents based on the Flood Map for Planning do not account for the impacts of climate change. Review of the Environment Agency guidance (Flood Risk Assessment: climate change allowances, last updated 27th May 2022)³.

2.2 The Sequential and Exception Tests

The NPPF requires that the Sequential Test be applied to development proposals in Flood Zones 2 or 3 to determine if there are any 'reasonably available' and suitable alternative sites at lower flood risk. The Sequential Test is outside this scope of works and shall be undertaken by others.

Notwithstanding the above, the principles outlined in the Sequential Test guidance should be applied for developments within the site such that, for example, dwellings are situated on a high part of the site when there is a risk of local surface water flooding. The issues of actual flood risk are discussed below. The issues of safety and reduction in flood risk to others required by an Exception Test are also discussed in this document.

It is of note that the development proposals are to refurbish the existing commercial / industrial properties on the site and demolition some of the existing buildings, with an existing commercial / light industrial estate. Not new built development is proposed.

³ Environment Agency. <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#peak-river-flow-allowances>. Last updated 27th May 2022.

Based on the proposals comprising alterations to existing buildings it is considered that these cannot be located elsewhere and as such meet the requirements of the Sequential Test.

The Local Planning Authority (LPA) will make the final decision with regard to any planning application.

2.3 Environmental Setting

LKC have previously undertaken a Preliminary Risk Assessment for the site⁴, as well as a review of public domain information including British Geological Survey data, Environment Agency data, historical mapping and aerial photography to provide a summary of the environmental setting of the site. This is summarised in Table 2-1 below.

Summary of the Environmental Setting			
Geology	Superficial		Alluvium (clay, silt, sand and gravel).
	Bedrock		Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone). Coal seam sub cropping on site in the south-west (Hell Hole Mine).
	BGS Boreholes		BH Ref: SD70NE448, 24m N: made ground to 0.85m, slightly organic sandy clay to 2.00m, gravelly fine to medium sand to 2.45m. GW strike at 1.20m. BH Ref: SD70NE450, 52m N: SD70NE450: made ground to 1.3m, gravel to 2.45m. BH Ref: SD70NE447, 61m N: made ground to 0.06m, firm sandy slightly gravelly clay to 0.20m, medium dense gravel and sand to 1.05m, medium dense sandy gravel to 2.70m, medium dense sandy gravel to 3.00m. GW strike at 1.90m. BH Reference: SD70NE449, 75m N: made ground to 1.70m, clay to 2.45m. GW strike at 1.20m, BH Reference: SD70NE446, 88m N: made ground to 0.5m, gravel to 3.4m, clay to 6.0m. GW strike at 5.60m.
	Defra Soilscape Mapping		Majority of site: Type 20 - Loamy and clayey floodplain soils with naturally high groundwater. North-east tip of site: Type 6 - Freely draining slightly acid loamy soils.
	BGS Groundwater Flooding Susceptibility		Potential for groundwater flooding to occur at surface across most of site. Limited potential for groundwater flooding to occur in the northern edge of site.
Hydro-geology	Aquifer Designation	Superficial	Secondary A Aquifer.
		Bedrock	Secondary A Aquifer.
	Source Protection Zone (SPZ)		Site not within an SPZ.

⁴ Phase 1 Preliminary Risk Assessment: LKC 24 1231-A1-PRA-Warth Business Park, Radcliffe R0, dated 17/07/2024

Summary of the Environmental Setting		
Hydrology	All adjacent and internal surface water	River Irwell – Present flowing south, 50-130m west of the western boundary, then flowing to the east immediately adjacent to the southern boundary of site. Bealey's Weir present adjacent south. Recorded flood defences recorded across entirety of both sides of River Irwell, as well as to the west of the railway line adjacent west of the site.
	Flooding	Flood Zone 3.
Site History		On site: Coal Pit, Warth cotton, paints and varnish mills, school, 2no. reservoirs, chimney, tanks, terraced housing, electricity substation. Surrounding area (250m): Coal pit, old gasometer, reservoir, refuse tips, works. The site is currently used for commercial / light industrial operations.

Table 2-1: Summary of the Environmental Setting.

2.4 Site Reconnaissance

A site reconnaissance was carried out on 1st July 2024 to inform the Phase 1 Preliminary Risk Assessment. At the time of the walkover, LKC were unable to access the full site as some areas were either unsafe, currently in-use, or had demolition / construction works being carried out.

Relevant features identified on site are summarised below:

- Ground cover generally comprised concrete in the central and western areas of site, with some areas patched with tarmacadam (good condition). The east of the site generally comprised tarmacadam (good condition) with limited grassed areas present along the eastern boundary of the site.
- Site is relatively flat.
- Approximately half of the site is occupied by buildings. Large brick industrial warehouse buildings occupy most of the eastern half of the site. No obvious external evidence of possible subsidence. Large metal industrial warehouse buildings occupy most of the western half of the site and noted to be unsafe to enter i.e. collapsing walls and damaged roofing.
- A large derelict two storey brick building was present in the central area of the site with a side tower building of approximately double the buildings height. An in-use brick two storey office building is also present in the north of the site.
- At the time of the walkover, construction work was ongoing in the centre and south / south-eastern areas of site. Piles of demolition rubble were present in these areas, as well as excavated pits.

The surrounding area comprises the River Irwell along the southern boundary of site, housing estates to the east and north of the site, and a Metrolink line along the western boundary of the site.

Site photographs are provided in Table 2-2.

	
Photograph 1: View of site entrance, from the N of the site, looking N.	Photograph 2: View of E of the site, from the SE, looking N. Showing existing buildings.
	
Photograph 3: View of the central N area of site, from the centre, looking NW.	Photograph 4: View of E / NE of site, from centre, looking NE showing existing buildings
	
Photograph 5: View of water pumping station located in SE of site.	Photograph 6: View of SE of site from centre, looking SE. Green buildings are currently in-use.

	
Photograph 7: Existing office building in N of site.	Photograph 8: View of SW of site from W.
	
Photograph 7: View of adjacent watercourse south and weir building.	Photograph 7: View of southern flood defences from inside the business park.

Table 2-1: Site photographs.

2.5 Site and Access Levels

A topographic survey of the site has not been explicitly provided at this stage, however, levels on the proposed development plans have been reviewed and compared to LiDAR data.

The following observations have been made regarding the levels in the site:

- Levels within the central yard area typically range between approximately 71.0 m AOD raising to approximately 71.75 m AOD to the south adjacent to the flood wall;
- Levels fall to the north from approximately 71.0 m AOD to approximately 70.80 m AOD at the site entrance adjoining Warth Road;
- Levels in the vicinity of the buildings at the western end of the site are in the region of 70.50 m AOD to 70.90 m AOD. The green space to the north of this area is indicated to be 71.50 m AOD to 71.70 m AOD;
- Levels in the vicinity of the buildings at the eastern end of the site are in the region of 70.0 m AOD;
- The current access joins Warth Road at around 70.70 m AOD to 71.00m AOD.

LiDAR cross section profiles are provided below to provide further information regarding the site levels. It should be noted that LiDAR typically has an accuracy of +/-150 mm.

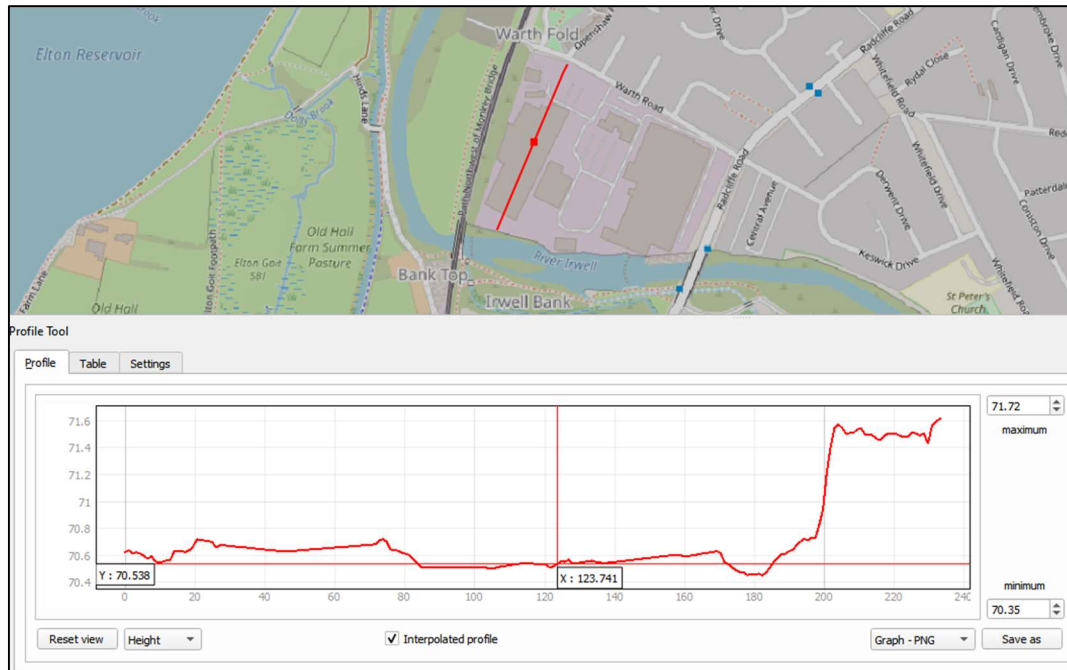


Image 1 – Profile South to North at Western end of site
 (Extract of LiDAR DTM (2022) Data and Flood Zone WMS Mapping.)

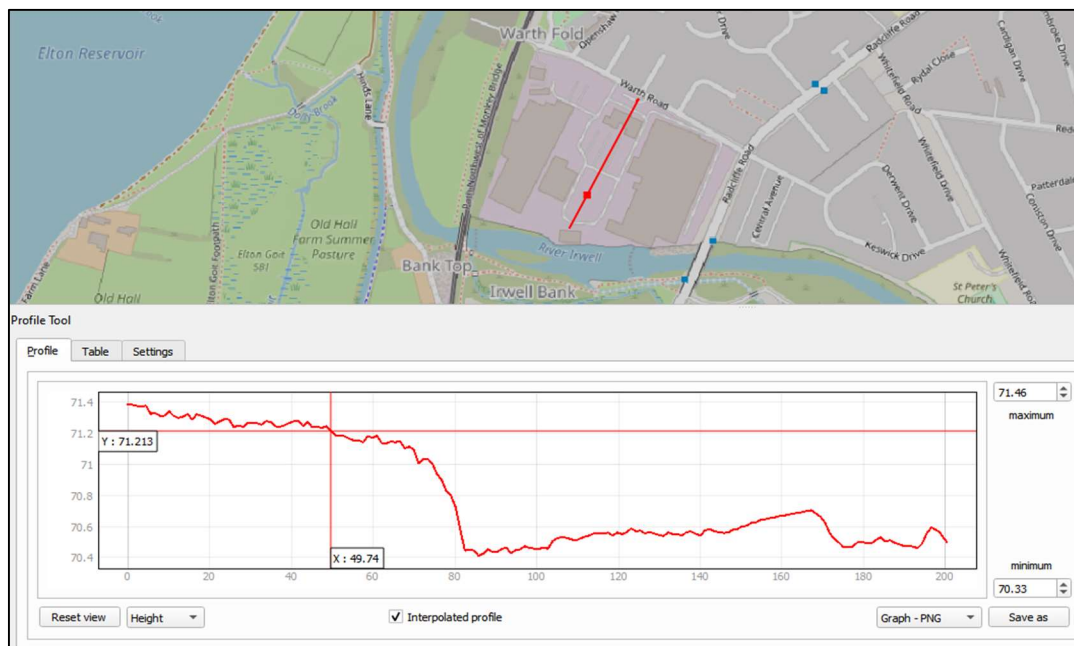


Image 2 – Profile South to North centrally in the site
 (Extract of LiDAR DTM (2022) Data and Flood Zone WMS Mapping.)



Image 3 – Profile South to North at Eastern end of site
 (Extract of LiDAR DTM (2022) Data and Flood Zone WMS Mapping.)

3 Consultation

Information from all relevant consultees is summarised in Table 3-1 below.

Relevant correspondence / information from the Environment Agency is provided in Appendix B and in from Other Consultees in Appendix C.

For modelled levels refer to extracted Level table and node location map in Appendix B.

Source	Details	
EA	Flood Zone 3: Medium to High risk of flooding with an annual probability of flooding of 1.0% or greater from rivers, and 0.5% or greater from the sea.	
	Modelled Levels for River Irwell. 8no. nodes located adjacent south of site; therefore, the range of the highest and lowest values are provided with respect to levels west (upstream) and east (downstream) of Bealey's Weir.	<u>Defences Removed</u> 1% AEP: Level of 71.66-72.26m west of the weir and 69.67-69.94m east of the weir. 0.1% AEP: Level of 72.04-72.71m west of the weir and 71.30-71.52m east of the weir. No data provided with climate change allowance. <u>Defended</u> 1% AEP: Level of 71.73-72.29m west of the weir and 69.74-70.00m east of the weir. 0.1% AEP: Level of 72.09-72.74m west of the weir and 71.40-71.59m east of the weir. No data provided with climate change allowance. Modelling data for these events is from the Radcliffe and Redvales 2016 model. At this stage it is not confirmed if the modelling represents the latest flood defences (constructed 2020/21).
	Modelled Floodplain Levels (2D) for the River Irwell	The EA have provided two floodplain nodes for the site, node 1 being located towards the western end of the site and node 2 being located towards the eastern end of the site. <u>2D Node 1</u> 1 % AEP / 1 in 100 year undefended level 71.44 m AOD 1% AEP / 1 in 100 year defended level 71.16 m AOD 0.1% AEP 1 in 1000 year defended level 72.04 m AOD <u>2D Node 2</u> 1 % AEP / 1 in 100 year undefended level 71.25 m AOD 1% AEP / 1 in 100 year defended level 70.99 m AOD 0.1% AEP 1 in 1000 year defended level 71.86 m AOD
	Flood Defences	Reference to information provided by the EA indicates the presence of flood defences along the southern boundary of the site. The flood defences present have a higher effective crest level than the adjacent 1% AEP / 1 in 100 year and 0.1% / 1 in 1000 year events within the River Irwell Channel adjacent to the site. Review of the flood map indicates that there is a source of flooding from the River Irwell upstream (west and northwest of the site) via an underpass of the Metrolink line at the western end of Warth Road and

Source	Details	
		an underpass of the Metrolink line to the west of The Derby High School. Review of GIS mapping the EA flood defence layers within this indicate that there are flood defences to the west of the Metrolink line, which are in excess of 74 m AOD to the west (end of Warth Road) and in excess of 75 m AOD to the northwest (west of The Derby High School). Flood levels at this location have not been provided by the EA.
	Records of Flooding	09/02/2020: River Irwell. Cause: channel capacity exceeded (no raised defences). Affected site. 26/12/2015: River Irwell. Cause: channel capacity exceeded (no raised defences). Affected site. 22/06/2012: River Irwell. Cause: channel capacity exceeded (no raised defences). Did not affect site. 21/01/2008: River Irwell. Unknown cause. Did not affect site.
	Records of Flood Warning Service	River Irwell at Radcliffe and Redvales Flood Warning Area. Affecting properties in Redvales from Milford Drive to Whitefield Road, including on and around Warth Road and Radcliffe Road. Also, properties on and around Dumers Lane, York Street and Gate Lane. Properties in Radcliffe on Bridgewater View
	Surface Water Flooding	Low to medium risk of surface water flooding in the east of site to a maximum depth of 600mm, generally flowing south. Low to high risk of surface water flooding in the centre of site to a maximum depth of 600mm, generally flowing south-east. The high-risk area is located adjacent west of the main western structure. Low to medium risk of surface water flooding in the west of site to a maximum depth of 300mm, with no direction. An area of high risk of surface water flooding in located in the north-east of site to a maximum depth of 600mm, generally flowing south-east.
	Flooding from reservoirs	At risk of flooding from reservoirs.
Bury Council (LLFA)	Bury Council were contacted for further information in October 2024. Information was not provided at the time of this reports issue.	
United Utilities (UU)	Existing Sewers	UU sewer plans indicate the presence of A 150 mm Becoming 225 mm, becoming 300 mm combined sewer located within Warth Road to the north of the site. The combined sewer flows in an easterly direction. A 900 mm surface water sewer is located in Milford Drive to the north of the site and flows in an easterly direction along Warth Road to the south of Openshaw Fold Road. At this point it appears to become a culverted watercourse where it turns southwest and flows beneath the site northern corner of the site and discharges to the west of the site, between the site

		boundary and the Metrolink line. It is not confirmed what the receptor to these flows would be. A further 450 mm surface water sewer is located adjacent to the northeastern corner of the site. This is shown to the south along Radcliffe Road, becoming a 700 mm pipe before turning southeast and discharging to the River Irwell downstream of Radcliffe Road at Warth Bridge.
	Likely conditions for connecting into their sewerage system	As there is no proposed change to the nature of the development, it is assumed by LKC that there is no necessary changes required and that the currently established sewerage system is sufficient for the site.
Strategic Flood Risk Assessment (SFRA) / Local Flood Risk Management Strategy (LFRMS)	Level 1 SFRA ⁵	No details provided in relation to the site.
	Level 2 SFRA ⁶	No details provided in relation to the site.
	Bury LFRMS ⁷	Site identified as an area particularly at risk of flooding.
Preliminary Flood Risk Assessment (PFRA) ⁸	The Preliminary Flood Risk Assessment (PFRA) for Manchester indicates that there are records of flooding for Radcliffe which conforms with information supplied by the EA.	

Table 3-1: Summary consultee information.

⁵ Level 1 Strategic Flood Risk Assessment for Greater Manchester (2019)- by JBA Consulting.

⁶ Greater Manchester Level 2 Hybrid Strategic Flood Risk Assessment – Main Report (2020)- by JBA Consulting.

⁷ Bury Local Flood Risk Management Strategy (2018) – Bury Council.

⁸ Preliminary Flood Risk Assessment (2011) - Manchester City Council, by JBA Consulting.

4 Assessment of Flood Risk

4.1 Flood Zones

The Flood Map for Planning indicates that the site is in Flood Zone 3 and is included in Appendix B.

A direct comparison was made between the provided EA flood levels at this location with the flood defence levels and the topographical levels.

The River Irwell flows south, approximately 50-130m west of the western boundary, then flows to the east adjacent to the southern boundary of site. Bealey's Weir is present adjacent to southeast corner of the site. EA recorded flood defences are recorded across entirety of the south of the site, as well as to the west of the railway line adjacent west of the site, as shown on the EA Product 4 included at Appendix B.

The effective crest level of these flood defences is shown in the table Included within the Product 4 at Appendix B. Flood defences (adjacent to site) upstream of the weir have an effective crest level of between 72.62-74.10m AOD and downstream of the weir they have a level of 71.95-72.06m AOD. The flood defences are indicated to be higher than the 1% / 1 in 100 year and 0.1% / 1 in 1000 year events, and as such the site is considered to protected by these defences and therefore the risk is a residual risk (i.e. in the event of a breach or overtopping of the defences).

In the absence of the defences the site could be impacted during the 1% / 1 in 100 year and 0.1% / 1 in 1000 year event. During the 1% / 1 in 100 year event the depth of flooding could be up to 1.5 m at the western end of the site and up to 0.1-0.2 m at the eastern end of the site. During the 0.1% / 1 in 1000 year event the depth of flooding could be up to 2.0 m at the western end of the site and up to 1.5-1.6 m at the eastern end of the site.

Modelled floodplain levels (2D) provided by the EA indicate that the development would be impacted in both the defended and undefended events. It is anticipated that that the modelling does not take account of upgrades to the flood defences.

Based on the floodplain levels the:

- Defended 1% AEP / 1 in 100 year depth is expected to be 0.35 m at the western end of the site and 0.7 m at the eastern end of the site.
- Defended 0.1% AEP / 1 in 1000 year depth is expected to be 1.5 m at the western end of the site and 1.5 m at the eastern end of the site.
- Undefended 1% AEP / 1 in 100 year depth is expected to be 0.95 m at the western end of the site and 0.95 m at the eastern end of the site.

4.2 Sources of Flooding

The risk of flooding from the following flood sources has been considered:

Fluvial – The EA has confirmed the study area is within Flood Zone 3. Therefore, the flood risk associated with this source is considered significant and should be considered further in terms of vulnerability and flood resilience.

The site is defenced and as such the risk of fluvial flooding is considered to be a residual risk. The depth of flooding in the absence of the defences could be significant at the site in the 1% / 1 in 100 year and 0.1% / 1 in 1000 year events.

The flood risk associated with fluvial flooding is considered to be **Low – Moderate** based on the presence of the defences whilst they are operational. In the absence of the defences or a breach of the defence the fluvial flood risk would be considered to be **High**.

Tidal – The study area is remote from the sea and tidally influenced water bodies. Therefore, the flood risk associated with this source is considered **Negligible**.

Pluvial (Rainfall) – The surface water flood risk maps show areas across the site of the site that have the potential to flood during prolonged heavy rainfall. These are shown below. The north-eastern and western area shown below at a high risk (>3.3% chance a year) are to a depth of below 300mm. The larger central area at a high risk is to a depth of up to 600mm.



The larger area noted in the centre of the site is associated with a slightly lower lying area, enclosed to the east by a structure and to the west and south by a retaining wall.

These areas of high risk from surface water flooding need consideration during the renovation / refurbishment of the structures present on site, particularly the large central area, due to the greater depth. Therefore, the risk of flooding from pluvial sources is **Low - Moderate** but should be considered further if any changes are made to the development.

The sites drainage system should be maintained to ensure that it is operation as intended and surveyed for defects which should be maintained.

Surface Water (Overland flow) – This relates to surface water entering the site. Observed impermeable areas are present to the north (Warth Road), and east (Radcliffe Road) of the site, and are generally situated at a similar level to that of the study area. Surface water arising from the north and east of the study area is likely to be intercepted by the highway drains and therefore is unlikely to impact the development. However, in the event of rainfall exceeding these, overland flow might occur.

It should be noted that the surface water mapping does not always take into account the full drainage systems in urban areas.

Therefore, the flood risk of flooding from surface water sources is considered **Low to Moderate**.

Groundwater – The BGS has groundwater records in close proximity to the study area in the form of borehole records. The records show the water table is recorded at the up to approximately 1.20mbgl. Based on the presence of the River Irwell to the south of the site, groundwater is likely to be in continuity with the watercourse and as such could be relatively shallow beneath the site.

The shallow groundwater records indicate that water may enter any deep excavations or service trenches during construction and de-watering may be necessary.

The proposed is for renovation / refurbishment of the existing commercial / industrial properties on the site, external elevation works and demolition some of the existing buildings. The risk of groundwater flooding is considered to be **Low**.

Sewers – UU sewer records show combined and surface water sewers within the vicinity of the study area and within the surrounding housing developments and roads. The surface water sewer located to the north and passing through the site as a culvert and the surface water sewer to the east of the site are potential sources of sewer flooding in the event of surcharging. The combined sewer to the north is at a similar level to the site, however, is a potential source of sewer flooding in the event of surcharging. Therefore, the flood risk associated with sewers is considered **Low to Moderate**.

Artificial sources – According to the EA online maps, the study area is at risk from reservoir flooding. The likely risk of an incident occurring if the reservoir is adequately maintained and monitored is low. In the event of a reservoir flood event, the water is expected to flow down the river Irwell, which borders the site.

Reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers. The EA are the enforcement authority for the Reservoirs Act 1975 in England. They ensure that reservoirs are inspected regularly and essential safety work is carried out.

Therefore, the flood risk associated with artificial sources is considered to be **Low**.

4.3 Summary of Flood Risk

Source of Flooding	Risk Assessment Level
Fluvial	Low to Moderate – based on operation of the defences High – in the event of a breach or overtopping of the defences
Tidal	Negligible
Pluvial (Rainfall)	Low – Moderate
Surface Water	Low – Moderate
Groundwater	Low
Sewers	Low – Moderate
Artificial Sources	Low

Table 4-1: Summary of Existing Risk Level.

The site is located within Flood Zone 3 and a Low to Moderate risk of flooding from fluvial, pluvial / surface water, and sewers have been identified for the site.

Mitigation measures to reduce or manage the impacts of flooding area discussed in Section 5.

5 Mitigation Measures

5.1 Proposed Site Levels and Development Level

The proposed development is for a commercial/non-residential end use and this is classified within the 'Less Vulnerable' category in the NPPF (Annex 3, NPPF).

As the development comprises renovation / refurbishment, external elevation changes and demolition of some existing buildings there is no change in site levels. Therefore, mitigation measures should be put in place to ensure the safety of site users, as well as to help protect and mitigate the damage caused by a flood event.

The demolition of the existing buildings provides betterment compared to the existing situation and provides additional storage within the floodplain in the event that the site were to be impacted by flooding.

5.2 Safe Access

Safe and dry access is not available via the entrance at Warth Road (70.70-71.00mAOD), which is within the 1% / 1 in 100 year flood extent and below the in channel flood levels provided by the Environment Agency.

Based on the presence of the flood defences the site is offered a significant degree of protection from fluvial flooding. It is recommended that the site is registered with the EA Flood Warning Service and that a Flood Management Plan is developed for the site. This would allow occupants to be evacuated in the event of a flood warning and allow them to reach an area outside of the floodplain extent in advance of the site being impacted.

5.3 Flood Resistance and Resilience

The site benefits from flood defences and as such the risk of flooding is considered to be a residual risk flooding.

It is recommended that flood resilience measures are built into the site wherever possible to allow the site to return to use quickly in the event that flooding occurs. Such measures could include, but are not limited to:

- » Ideally raising electrical equipment above the flood level, including plug sockets and gas, electric and water meters, by 1 m would provide resilience. In this case it is proposed to raise these by 600 mm above the current ground level. This provides 300 mm above the 1 in 100 year level. In addition, consider bringing electrical cables from the above rather than ground and keeping light switches at an elevated position;
- » Raising kitchen appliances on plinths to reduce the potential for floodwater to impact them;
- » Use of water resistant walls, such as resilient wall plaster, water resistant paint or ceramic tiling or painted blockwork, wherever possible, to reduce the impact of flooding on the development and allow quick return to use in the event of flooding. The use of stud walls should be avoided at ground floor level;

- » Use of concrete, hard wood or ceramic tiles rather than carpets where possible at ground floor level to reduce the impact in the event of a flood and allow a quicker return to use.

The development proposed may be subject to flooding at more extreme events than those considered. Flood resilience measures should be included into ground floor construction to aid recovery after any event. If utilised, typical measures would include solid floors, use of suitable materials and services fed from upper floors with outlets at high level. The need can be discussed and agreed with building control officers during detailed design.

5.4 Residual Risk

It is impossible to completely guard against flooding since extreme events greater than the design standard event are always possible. Given that the development comprises renovation / refurbishment of the existing site, external elevation works and demolition of some existing buildings. The site is indicated to be defended from fluvial flooding, however, there is a residual risk associated with a breach of the defences.

The demolition of the existing buildings provides betterment compared to the existing situation and provides additional storage within the floodplain in the event that the site were to be impacted by flooding.

Flood resilient construction techniques have been indicated to reduce the potential impact to the development in the event that flooding does occur, allowing a more rapid return to use of the site.

6 Conclusions

The site is currently an industrial/commercial park. The proposed development is for renovation / refurbishment of the existing commercial / industrial properties on the site, external elevation works and demolition of some of the existing buildings.

The site is shown on published mapping to be located within the EA's Flood Zone 3. Comparison of topographical data with the EA modelled flood level data indicates that the whole site is in Flood Zone 3, however benefits from the presence of flood defences along the River Irwell to the south and defences are also indicated to be present to the west of the Metrolink line. Therefore, it is considered that the site is afforded a significant degree of protection and as such based on the operation of the defences the risk of flooding from fluvial sources is considered to be Low – Moderate.

Low to Moderate risks of flooding from pluvial / surface water and flooding from sewers has been identified.

An assessment of these risks in conjunction with the development proposals have resulted in the following recommendations to built into the site wherever possible to allow the site to return to use quickly in the event that flooding occurs. Such measures could include, but are not limited to:

- » Raising electrical equipment above the flood level;
- » Raising kitchen appliances on plinths to reduce the potential for floodwater to impact them;
- » Use of water resistant walls, such as resilient wall plaster, water resistant paint or ceramic tiling or painted blockwork, wherever possible; and
- » Use of concrete, hard wood or ceramic tiles rather than carpets where possible at ground floor level.

Based on the presence of the flood defences the site is offered a significant degree of protection from fluvial flooding. It is recommended that the site is registered with the EA Flood Warning Service and that a Flood Management Plan is developed for the site.

Further details on the proposed mitigation measures are provided in Section 5. All proposed measures should be agreed with the Local Authority prior to commencement of the development.

Figures 1 – Site Location Plan



Client: GFIC Properties Ltd				Title: Site Location & Boundary Plan			
Site: Warth Business Park, Radcliffe				Scale (see scale bar): 1:25,000 & 1:2,500 @ A4			Figure: 1
Job No.: LKC241231	Drawn By: EH	Checked By: CC	Drawn: July 2024	Revision:			

Appendix A – Development Plans

Appendix B - Environment Agency Data

Matt Bell

From: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>
Sent: 25 October 2024 09:46
To: Sam Shaw
Subject: GMMC380585LB Response attached from the Environment Agency
Attachments: 1HHFWVHACHVW.pdf

Dear Sam,

Thank you for your enquiry which was received on 16/10/2024.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

I enclose Product 4: flood risk assessment data for 379583,409186

We have records of flooding affecting this site. The area was previously flooded in:

February, 2020

December, 2015

We recommend that you also contact United Utilities and Bury Council who may hold additional information (the former especially in relation to sewer flooding).

Please be aware you can check your risk of flooding on our external website <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

Here are some useful links below:

<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Bury Council is responsible for issues relating to surface water and hold information on surface water flooding.

For surface water information please use link: <https://check-long-term-flood-risk.service.gov.uk/map?easting=362125.07&northing=388310.97&map=SurfaceWater>

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards,

Lauren Blackley

Customer and Engagement Officer

Greater Manchester, Merseyside and Cheshire

Email: Inforequests.gmmc@environment-agency.gov.uk

Office address: Richard Fairclough House, Knutsford Road, Latchford, Warrington, WA4 1HT

From: Get flood risk information for planning <get.flood.risk.information.for.planning@notifications.service.gov.uk>
Sent: 16 October 2024 10:00
To: GMMC Info Requests <InfoRequests.GMMC@environment-agency.gov.uk>
Subject: GMMC380585LB 13.11 Flood risk assessment data (product 4). 1HHFWVHACHVW



GOV.UK

Request for flood risk assessment data for planning

Product 4: flood risk assessment data for 379583,409186 (easting and northing coordinates) has been automatically generated. This site is centred on the postcode BL9 9NB.

What you need to do

1. Record the request date: Wed Oct 16 2024 and customer reference number 1HHFWVHACHVW in the Freedom of Information tracker.
2. Review the location details in the automatically generated product 4 <https://fmp-pdfreport.prd.defra.cloud/1HHFWVHACHVW.pdf> (PDF) (this link will not expire) to check there is enough information to action the request.

If you have the information you need

Send this email to the relevant team to check the accuracy of the product 4: detailed flood risk data.

If you need more information

Contact the customer quoting their request reference number: 1HHFWVHACHVW.

Customer details

Customer: Sam Shaw

Customer email: s.shaw@thelkgroup.com

Customer request reference number: 1HHFWVHACHVW

Development size: 5.72 Ha

Feedback

Please leave us feedback to help improve the flood map for planning service:

<https://flood-map-for-planning.service.gov.uk/feedback>

Regards,

Flood map for planning service

<https://flood-map-for-planning.service.gov.uk/>

Environment Agency

Information in this message may be confidential and may be legally privileged. If you have received this message by mistake, please notify the sender immediately, delete it and do not copy it to anyone else. We have checked this email and its attachments for viruses. But you should still check any attachment before opening it. We may have to make this message and any reply to it public if asked to under the Freedom of Information Act, Data Protection Act or for litigation. Email messages and attachments sent to or from any Environment Agency address may also be accessed by someone other than the sender or recipient, for business purposes.

Flood risk assessment data

Location of site: 379578 / 409163 (shown as easting and northing coordinates)

Document created on: 16 October 2024

This information was previously known as a product 4.

Customer reference number: 1HHFWVHACHVW

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
- 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

Or you can contact your Lead Local Flood Authority for further information.

Your Lead Local Flood Authority is Bury District.

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

About the models used

Model name: Radcliffe and Redvales 2016

Scenario(s): Defended fluvial, defences removed fluvial

Date: 29 April 2019

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

The flood zones are not currently being updated. The last update was in November 2023. Some of the flood zones may have changed, however all source data is included in the models below.



Flood map for planning

Location (easting/northing)
379578/409163

Scale
1:10,000

Created
16 Oct 2024

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



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

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 Bury District Lead Local Flood Authority (LLFA) and your drainage board to get information about past flooding caused by surface water or drainage systems.



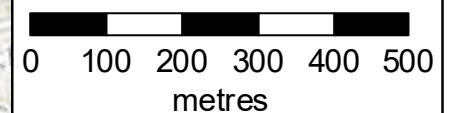
Past floods

Location (easting/northing)
379578/409163

Scale
1:10,000

Created
16 Oct 2024

-  Selected area
-  Main river
- Date of flood event
 -  February, 2020
 -  December, 2015
 -  June, 2012
 -  January, 2008



Data on past flood events

Start date	End date	Source of flood	Cause of flood	Affects location
9 February 2020	9 February 2020	main river	channel capacity exceeded (no raised defences)	Yes
26 December 2015	26 December 2015	main river	channel capacity exceeded (no raised defences)	Yes
22 June 2012	22 June 2012	main river	channel capacity exceeded (no raised defences)	No
21 January 2008	22 January 2008	main river	unknown	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



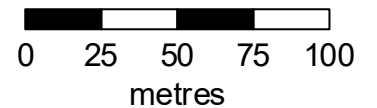
Flood defences

Location (easting/northing)
379578/409163

Scale
1:2,500

Created
16 Oct 2024

-  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	90815	Embankment			71.36	72.98	71.36
2	758009	Wall	100		74.10	74.10	74.10
3	758779	Wall	100		73.24		
4	758784	Wall	100		73.10	73.10	73.10
5	758783	Wall	100		72.95	72.95	72.95
6	758782	Wall	100		72.82	72.82	72.82
7	758781	Wall	100		72.62		72.62
8	758778	Wall	100		72.35	72.62	
9	758777	Wall	100		72.06	72.06	72.06
10	758776	Wall	100		71.95	71.95	71.95
11	758993	Wall	100		70.97	70.97	70.97
12	758996	Wall	100		70.90	70.90	70.90
13	759127	Wall	100		70.80	70.80	70.80

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

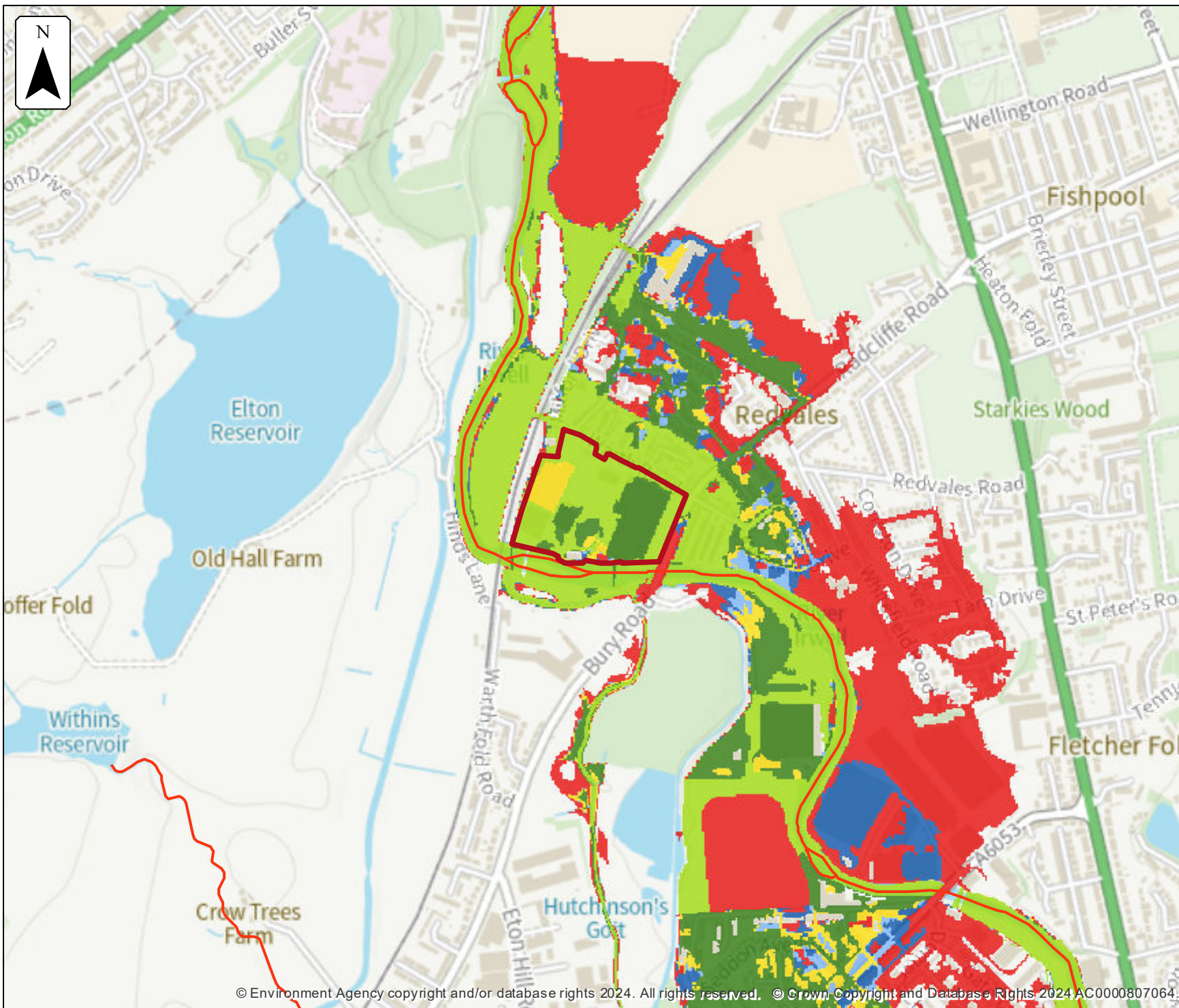
The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

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



Defended modelled fluvial extent

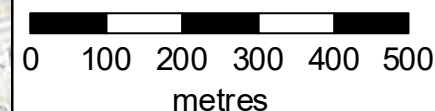
Location (easting/northing)
379578/409163

Scale Created
1:10,000 16 Oct 2024

Model name
Radcliffe and Redvales 2016

-  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





Defences removed modelled fluvial extent

Location (easting/northing)
379578/409163

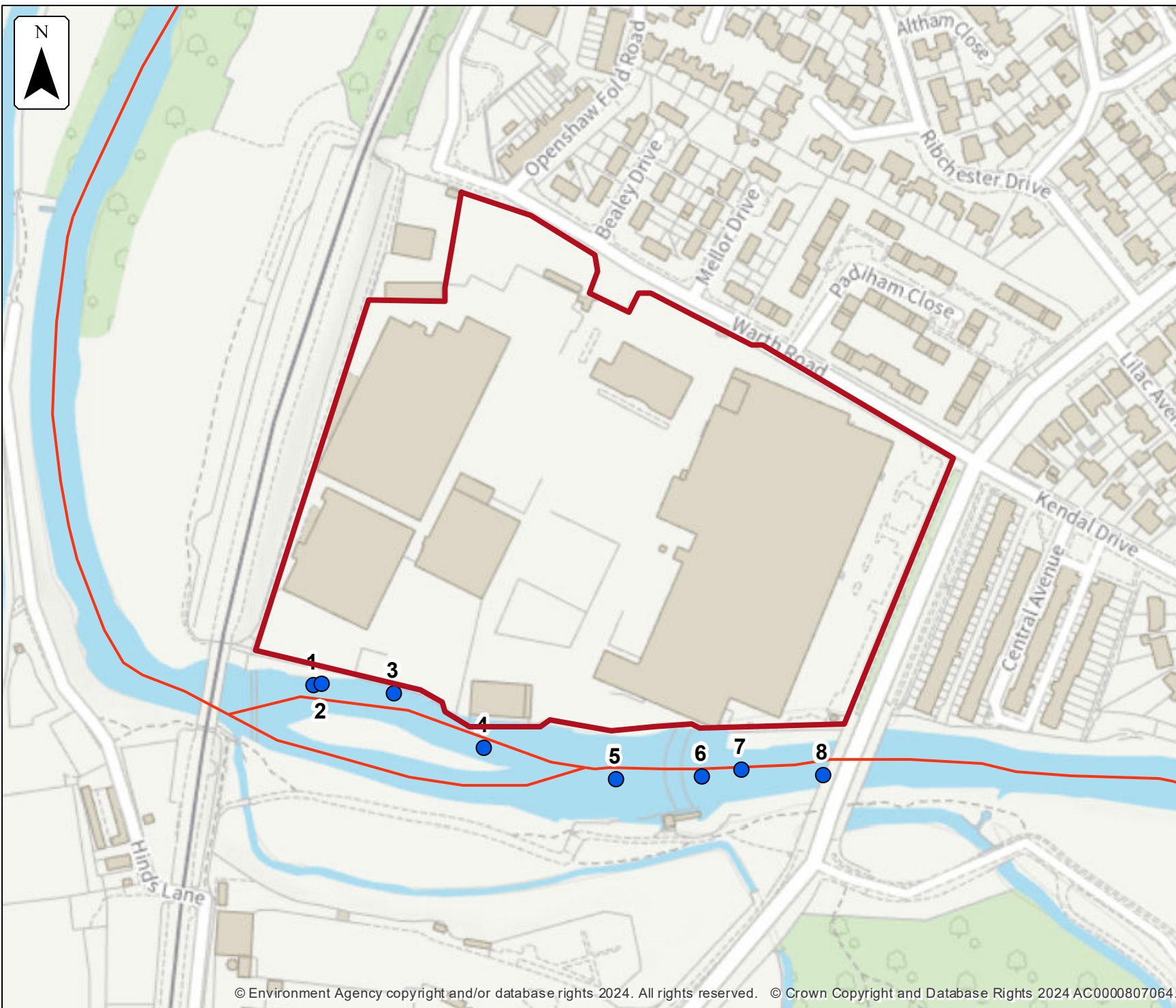
Scale Created
1:10,000 16 Oct 2024

Model name
**Radcliffe and
Redvales 2016**

-  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





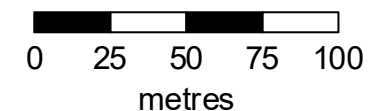
Defended modelled fluvial node locations

Location (easting/northing)
379578/409163

Scale Created
1:2,500 16 Oct 2024

Model name
**Radcliffe and
Redvales 2016**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defended

Label	Modelled location ID	Easting	Northing	50% AEP	10% AEP	5% AEP	4% 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	977193	379442	409077	71.55	71.89	72.0	72.05	72.08	72.17	72.24	72.29	72.40	72.74
2	977134	379446	409078	71.46	71.79	71.89	71.93	71.97	72.06	72.12	72.16	72.25	72.56
3	977204	379481	409073	71.40	71.73	71.83	71.88	71.91	72.0	72.07	72.11	72.20	72.52
4	977194	379525	409047	71.29	71.59	71.69	71.73	71.77	71.86	71.93	71.98	72.08	72.42
5	977195	379589	409031	71.13	71.41	71.50	71.53	71.56	71.64	71.69	71.73	71.81	72.09
6	977130	379631	409033	68.12	68.91	69.26	69.36	69.44	69.68	69.86	70.0	70.34	71.59
7	977125	379650	409036	68.03	68.80	69.15	69.25	69.33	69.57	69.74	69.89	70.23	71.50
8	977201	379689	409034	67.90	68.66	69.0	69.11	69.18	69.43	69.60	69.74	70.09	71.40

Data in this table comes from the Radcliffe and Redvales 2016 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.

If no level or flow data is available for a scenario, no table will be shown.

Defended

Label	Modelled location ID	Easting	Northing	50% AEP	10% AEP	5% AEP	4% 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	977193	379442	409077	118.48	155.89	167.41	171.97	175.05	187.74	196.45	203.60	223.96	302.96
2	977134	379446	409078	118.48	155.89	167.41	171.97	175.05	187.74	196.45	203.60	223.96	302.96
3	977204	379481	409073	116.31	154.14	166.32	170.46	174.30	186.36	194.81	201.29	221.62	284.78
4	977194	379525	409047	118.84	160.78	174.46	179.72	183.86	195.51	204.03	210.26	225.84	277.19
5	977195	379589	409031	118.84	160.74	175.10	180.98	185.99	199.22	209.47	216.87	233.81	292.52
6	977130	379631	409033	118.84	160.76	175.09	180.96	185.98	199.18	209.26	216.39	232.19	285.40
7	977125	379650	409036	122.07	176.94	194.67	201.57	207.52	223.85	236.60	245.69	264.85	321.84
8	977201	379689	409034	122.63	179.06	202.53	210.12	216.54	234.27	248.22	258.18	281.29	346.49

Data in this table comes from the Radcliffe and Redvales 2016 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.

If no level or flow data is available for a scenario, no table will be shown.



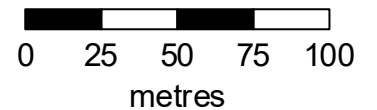
Defences removed modelled fluvial node locations

Location (easting/northing)
379578/409163

Scale Created
1:2,500 16 Oct 2024

Model name
**Radcliffe and
Redvales 2016**

-  Selected area
-  Modelled location
-  Main river



Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	50% AEP	10% AEP	5% AEP	4% 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	977193	379442	409077	71.52	71.81	71.95	72.0	72.04	72.14	72.21	72.26	72.37	72.71
2	977134	379446	409078	71.44	71.71	71.84	71.89	71.92	72.01	72.07	72.11	72.22	72.50
3	977204	379481	409073	71.36	71.64	71.78	71.83	71.87	71.95	72.02	72.07	72.18	72.47
4	977194	379525	409047	71.26	71.50	71.63	71.68	71.72	71.81	71.88	71.92	72.04	72.39
5	977195	379589	409031	71.10	71.31	71.42	71.47	71.50	71.57	71.62	71.66	71.76	72.04
6	977130	379631	409033	68.10	68.87	69.19	69.31	69.39	69.63	69.81	69.94	70.24	71.52
7	977125	379650	409036	68.01	68.77	69.09	69.20	69.28	69.52	69.70	69.82	70.13	71.42
8	977201	379689	409034	67.87	68.63	68.94	69.05	69.13	69.37	69.55	69.67	69.97	71.30

Data in this table comes from the Radcliffe and Redvales 2016 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.

If no level or flow data is available for a scenario, no table will be shown.

Defences removed

Label	Modelled location ID	Easting	Northing	50% AEP	10% AEP	5% AEP	4% 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	977193	379442	409077	116.18	150.18	166.58	172.83	177.76	191.33	202.51	210.71	232.53	305.26
2	977134	379446	409078	116.18	150.18	166.58	172.83	177.76	191.33	202.51	210.71	232.53	305.26
3	977204	379481	409073	114.38	148.06	164.15	170.29	175.01	187.83	198.31	205.83	225.94	295.22
4	977194	379525	409047	116.41	153.07	171.24	177.86	182.99	195.74	205.71	212.76	230.26	283.93
5	977195	379589	409031	116.41	153.07	171.39	178.34	183.82	197.97	209.16	217.19	236.72	297.05
6	977130	379631	409033	114.84	148.79	166.57	173.92	179.42	192.25	202.53	209.81	228.23	285.26
7	977125	379650	409036	118.58	163.36	186.04	194.29	200.43	216.71	230.32	239.68	261.44	327.98
8	977201	379689	409034	120.67	171.80	195.79	204.51	211.12	228.93	243.20	253.61	278.97	357.61

Data in this table comes from the Radcliffe and Redvales 2016 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.

If no level or flow data is available for a scenario, no table will be shown.

2D Levels



1:2,000

N



Legend

-  Site Location
-  2D Levels
-  Main River

					Undefended					Defended						
Map Reference	Model Node Reference	Easting	Northing	Data	50 % AEP (1 in 2 year)	4 % AEP (1 in 25 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	0.5 % AEP (1 in 200 year)	50 % AEP (1 in 2 year)	10 % AEP (1 in 10 year)	4 % AEP (1 in 25 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)
1	2D Levels	379512	409186	Modelled Water Level (m aodN)	70.91	71.25	71.41	71.44	71.58	70.62	70.76	70.81	71.08	71.16	71.36	72.04
2		379645	409148	Modelled Water Level (m aodN)	70.68	71.06	71.26	71.25	71.38	70.27	70.55	70.62	70.92	70.99	71.18	71.86

Model data taken from Radcliffe and Redvales 2016

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumeics - cubic metres per second

Notes:

Climate Change Scenario - We do not hold climate change measurements at this location. For further guidance on climate change please see <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

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 Bury District.

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

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
379583/409186

Created
16 Oct 2024 9:17

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 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.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2024 OS AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>

Flood map for planning

Your reference
<Unspecified>

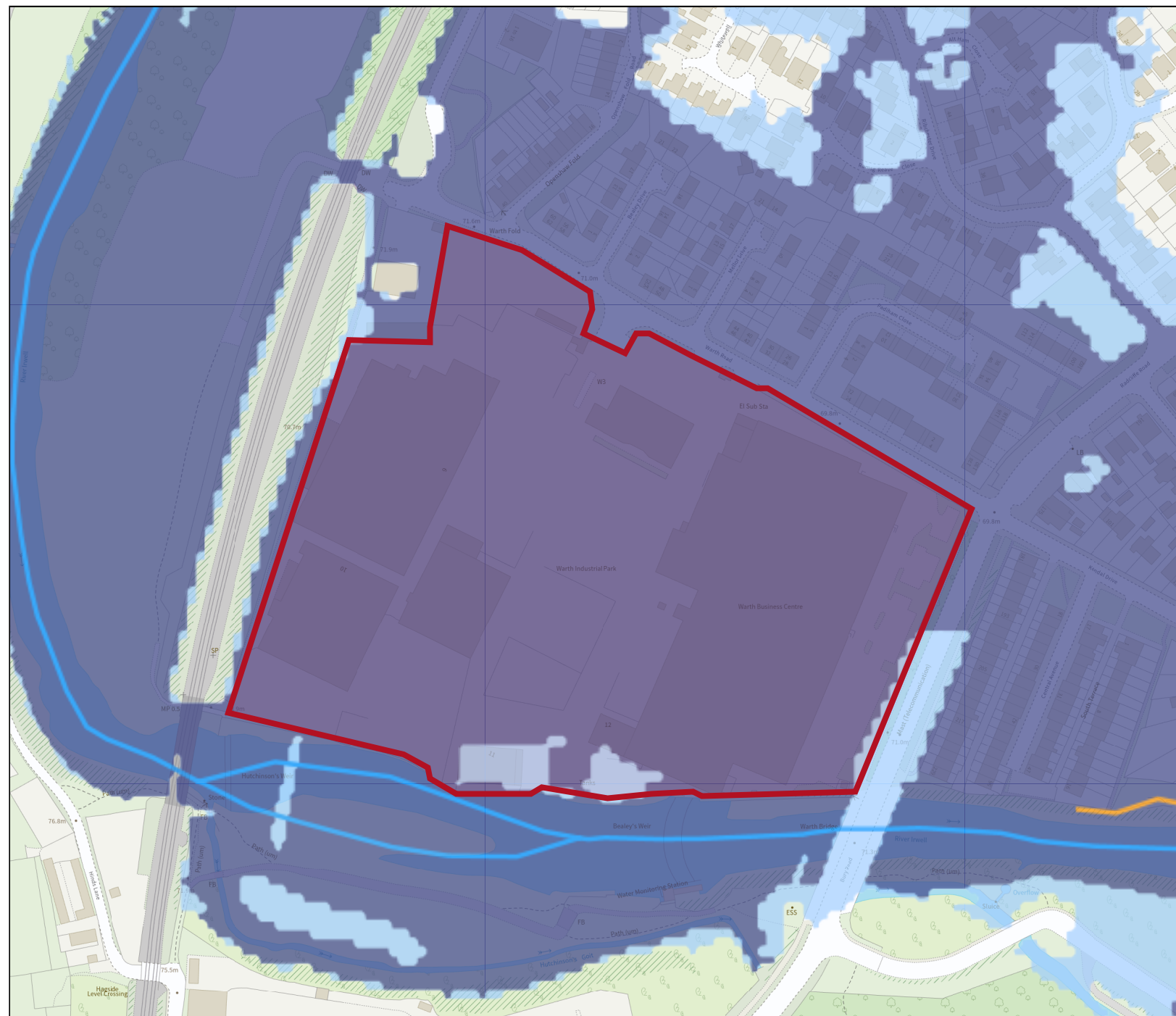
Location (easting/northing)
379583/409186

Scale
1:2500

Created
16 Oct 2024 9:17

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

0 20 40 60m



Appendix C – Consultee Correspondence

From: seweradoptions@uuplc.co.uk
Sent: 17 October 2024 13:37
To: Sam Shaw
Subject: RE: Request for Information - Warth Business Park UU Ref 06488501

Good afternoon Sam,

Pre Development Enquiry for: Warth Business Park, Warth Road, Bury, Greater Manchester, BL9 9NG UU
Reference Number : 06488501

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 225mm diameter public combined sewer within Warth Road located to the North east of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

- 1. into the ground (infiltration);**
- 2. to a surface waterbody;**
- 3. to a surface water sewer or highway drain;**
- 4. to a combined sewer.**

For guidance, The [North West SuDS Pro-Forma](#) provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of

the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the river Irwell located South of the proposed site.

We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.
If we can be of any further assistance please don't hesitate to contact us further.

I can confirm that we have modelled flood risk within the vicinity of the proposed development.

Please note that United Utilities Water Limited (Uuw) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events.

Our response does not include:

- any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which Uuw has no control and not a facet of sewer capacity; or*
- any historical sewer flooding events that have been resolved as a result of investment in our infrastructure.*

As with all development sites, we recommend you liaise with our water and wastewater engineers by contacting our Developer Services team so the details of your development proposal can be considered further. Details can be found at the following link.

<https://www.unitedutilities.com/services/builders-developers/>

Many thanks and kind regards,



James Darlington
Developer Engineer
Developer Services & Metering
T: 01925 33253
M: 07917096253
unitedutilities.com

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----- Original Message -----

From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]

Sent: 17/10/2024 11:45

To: s.shaw@thelkgroup.com

Subject: Request for Information - Warth Business Park UU Ref 06488501

Good Morning

PRE DEVELOPMENT APPLICATION AT WARTH BUSINESS PARK : – UU Ref 06488501

Please accept this email as receipt of your application received on 16/10/2024 for the above development. This has now been logged on our system and the job reference is 06488501 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to James Darlington for technical assessment. You will receive their response on or before 30/10/2024

Kind regards



Emily Stockley
Customer Advisor Advanced
Developer Services & Metering
Customer Services
T: 0345 026 8989 option 4
unitedutilities.com

If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated



Visit: <https://unitedutilities.thewowawards.co.uk/nominate>

----- Original Message -----

From: Sam Shaw [s.shaw@thelkgroup.com]

Sent: 16/10/2024 10:54

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: Request for Information - Warth Business Park (FRA 24 1100)

To whom it may concern,

LK Consult Ltd. has been commissioned to undertake a Sustainable Drainage Systems (SuDS) Strategy, for a site located at Warf Business Park, Redvales, Hollins, Bury, Greater Manchester, BL9 9NG, centred at approximate National Grid Reference 379561, 409187.

The area of interest appears to be within Flood Zone 3.

The site location and Wastewater Pre-Development Enquiry form are attached to this email.

To complete the SuDS Strategy, we would be grateful if you could supply us with the following, if available, for the vicinity of the site:

1. Records of any historic flood events and potential sources of flooding from foul and surface water sewers on site and in the area.
2. Any restrictions to discharge into the sewers

If you have any queries, please do not hesitate to get in touch.

We are, of course, happy to pay your reasonable charge for this service. Please let me know by return what information is available, what the charge will be, and we will pay the relevant fees by debit card as soon as possible.

Any advice or recommendations you may have regarding the potential discharges from the development of this site would also be appreciated.

We will be in contact with all other relevant authorities to get a more complete understanding of the issues in the area.

Regards

Sam Shaw



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Business Park, Lingley Green Avenue, Great Sankey,
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LKGroup**Unit 29
Eton Hill Road,
Radcliffe,
m26 2zs****FAO:****How to contact us:****United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP****Telephone: 0370 7510101****E-mail: propertysearches@uuplc.co.uk****Your Ref: FRA 24 1100
Our Ref: UUPS-ORD-607237
Date: 21/10/2024****Dear Sirs****Location: Warth Business Park Radcliffe**

I acknowledge with thanks your request dated 16/10/2024 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



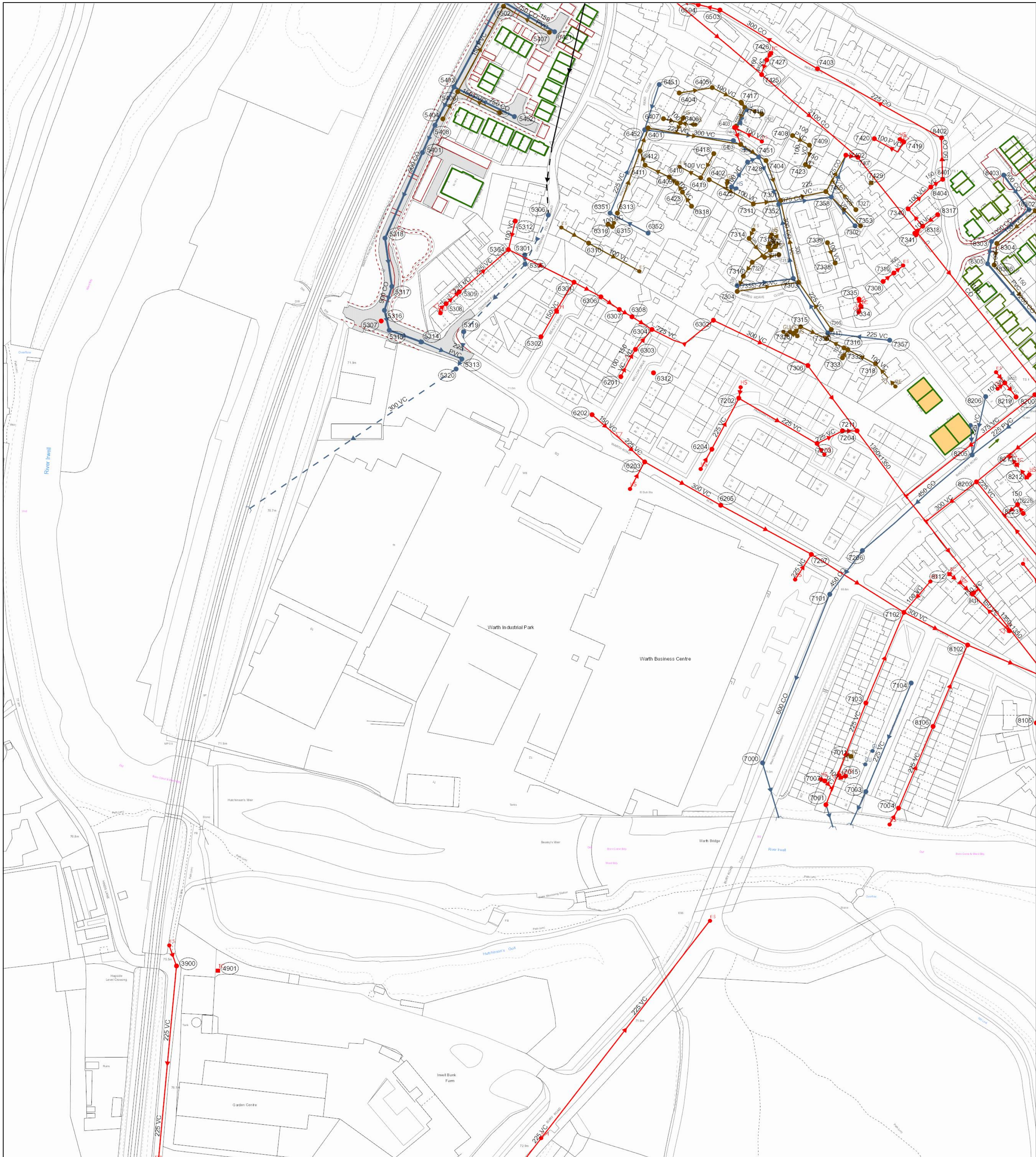
Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
6201	70.74	CO	69.22	100	VC		VC	8.944272	1 in 47
7304		FO	0	225			VC	34.36566	
6306	71.44	CO	0	225			VC	12.20555	
7311		FO	0	100			VC	15.05055	
6404		FO	0	150			VC	18.55045	
6306	72.5	FO	69.49	150			PVC	43.15561	1 in 70
7408		FO	0	100			PVC	10.62382	
7202	69.97	FO	69.57	100			VC	49.75932	225
6452	72.07	SW	69.8	300			VC	49.36598	1 in 81
9402	73.32	SW	70.9	750			CO	37.18306	1 in 45
9453	71.68	SW	69.17	300			VC	16.64332	1 in 238
7339		FO	0	100			VC	21.37759	1 in 153
7102	69.57	CO	67.83	300			VC	39.35734	1 in 492
5315	71.84	SW	69.58	100			VC	18.77029	1 in 376
8305	72.42	SW	69.85	1200			CO	44.31429	1 in 554
6316		FO	0	225			VC	20.1553	
6304	70.95	CO	68.5	225			VC	40.35649	
7204	70.21	CO	68.21	225			VC	6.242735	
6313	71.52	SW	69.3	300			VC	2.738925	
8317		FO	0	100			VC	10.36834	
8402		CO	0	225			PVC	42.63711	1 in 138
5502	73.24	FO	69.83	150			VC	78.25375	
5309		CO	0	225			VC	35.78232	
6404	73.24	FO	71.36	150			PVC	17.05964	1 in 107
6403	73.15	SW	69.99	800			CO	23.50016	1 in 392
7355		SW	0	225			VC	31.257	
6451		FO	0	225			VC	28.34881	
7317		FO	0	150			VC	5.848938	
7356		SW	0	225			VC	35.51056	
6405		FO	0	100			VC	17.66205	
8111		CO	0	100			VC	14.21547	
7308		CO	0	100			VC	7.563097	
7302		FO	0	225			CO	26.87006	
6203	70.14	FO	68.07	300			VC	48.37355	1 in 179
7303		FO	0	225			VC	46.09772	
6307	70.82	FO	68.78	225			VC	6.962598	1 in 58
6418		SW	0	100			VC	15.2655	
6303	72.39	FO	69.88	100			VC	12.40596	1 in 413
7316		FO	0	100			VC	10.66229	
5312		CO	0	100			VC	18.4494	
7358	71.75	CO	69.59	100			VC	24.35159	
8304	72.41	FO	69.65	150			PVC	12.02535	1 in 75
6401		FO	0	225			VC	51.78933	
7004	69.33	CO	68.75	225			VC	48.8467	1 in 104
3900	75.19	CO	72.59	225			VC	108.492	1 in 123
5407	73.35	FO	71.34	150			PVC	28.99446	1 in 66
6501		FO	0	300			CO	14.02631	
7320		FO	0	100			VC	9.078912	
6406		FO	0	100			VC	6.060203	
6403	72.62	FO	70.34	100			VC	53.47993	1 in 293
7451	71.79	SW	69.09	300			VC	14.31782	1 in 110
7315	71.95	SW	69.61	100			VC	11.31715	1 in 377
8318		FO	0	100			VC	12.3215	
7326		FO	0	100			VC	4.827048	
7357		SW	0	225			VC	34.23449	
5305	71.08	SW	69.07	300			VC	50.34307	1 in 205
5405	73.3	FO	71.59	150			PVC	27.73498	1 in 66
5302	71.4	CO	69.71	150			VC	34.95248	1 in 56
7203	69.93	CO	68.26	225			VC	15.65348	1 in 622
8106	69.36	CO	68.26	225			VC	48.8467	1 in 111
6301	72.7	SW	70.11	1050			CO	27.04227	1 in 339
7301		FO	0	225			VC	25.4951	
7319		FO	0	225			VC	9.22119	
5301	71.15	SW	69.87	100			VC	5.659331	1 in 25
5406	73.17	FO	71.2	150			PVC	53.42279	1 in 148
7310		CO	0	100			VC	6.744116	
7207	69.8	CO	68.08	300			VC	60.20797	1 in 262
7427		CO	0	100			PVC	6.641734	
6412		FO	0	225			VC	13.31288	
6203	70.3	CO	67.98	300			VC	35.66955	
8302	72.77	FO	70.61	150			PVC	27.65041	1 in 29
6202	70.57	FO	68.98	150			VC	19.84943	1 in 132
8401		CO	0	150			CO	22.73928	
7305		FO	0	225			VC	31.62278	
7407	71.85	CO	67.19	2100			CO	163.1914	1 in 1484
7327		FO	0	100			VC	20.8419	
7332		FO	0	100			VC	2.387363	
8223		FO	0	150			VC	5.701834	
7286	70.24	CO	67.51	150			VC	30	1 in 54
7404		FO	0	225			VC	23.4094	
5316	72.74	SW	69.72	800			VC	26.89425	1 in 383
7104	68.54	SW	68.09	225			VC	65	1 in 138
7405		FO	0	150			VC	22.8542	
8220		CO	0	150			VC	9.542895	
6303	70.77	CO	68.85	150			VC	14.21267	1 in 47
7406		FO	0	225			VC	16.64332	
5306		SW	0	100			UN	29.98719	
6407		FO	0	100			VC	6.650297	
5314	71.79	SW	69.65	0			UN	0.4197948	
5317	72.07	SW	69.65	300			VC	13.75582	1 in 66
6205	69.89	CO	68.39	2100			CO	58.82429	1 in 183
7425		FO	0	2100			VC	69.84936	
7340		CO	0	100			VC	17.38187	
6315		FO	0	100			VC	2.315825	
5408	73.15	SW	69.89	100			CO	16.52984	1 in 331
7333		FO	0	100			VC	5.403782	
6310		CO	0	100			VC	31.92126	
8200	70.76	CO	68.08	375			VC	90.42677	1 in 1005
7306		CO	0	1050			VC	45	
5308		CO	0	150			VC	7.242534	
7103	69.36	CO	68.31	225			VC	54.22099	1 in 132
7101	71.23	SW	68.78	800			VC	100.09	1 in 142
6204	69.87	CO	68.62	225			VC	31.76478	1 in 138
6205	70.4	SW	68.54	450			VC	80.32614	1 in 78
6302		CO	0	300			VC	57.69749	
8102	69.24	CO	67.74	300			VC	62	1 in 433
5304		CO	0	225			VC	40.24922	
6421	73.31	SW	70.31	750			CO	34.57643	1 in 432
7115		FO	0	100			VC	15.75552	
7316		FO	0	100			VC	9.027988	
7403		CO	0	300			VC	62.87903	
7314		FO	0	100			VC	13.49169	1 in 154
7352	71.95	SW	68.78	375			VC	29.27456	1 in 84
5319	71.53	SW	69.48	300			VC	15.03217	1 in 92
8208	70.55	SW	68.14	225			VC	33.10117	
6402		FO	0	100			VC	27.74849	
7318		FO	0	100			VC	17.15331	
6351		SW	0	225			VC	46.78947	
6308	70.66	CO	68.64	225			VC	13.0384	1 in 100
8105	69.69	CO	67.94	300			VC	25.07987	1 in 418
6503		CO	0	300			CO	12.19891	
7211		CO	0	1350			VC	186.8237	
6313		FO	0	225			VC	36.66712	
7402		CO	0	375			VC	6.639561	
6301	71.58	CO	69.09	225			CO	51.5836	1 in 430
5401	73.99	SW	69.84	800			VC	53.79554	
6352		SW	0	225			VC	11.61065	
7409		FO	0	100			VC	9.885489	
8222		CO	0	100			VC	12.12324	
7315		FO	0	100			VC	13.16971	1 in 32
7423		FO	0	100			VC	2.247177	
6411		FO	0	100			VC	6.507835	
7428		SW	0	100			VC	6.713779	
6404		FO	0	100			VC	7.775903	
6423		FO	0	100			VC	5.786714	
6422		SW	0	100			VC	16.25913	
6318		FO	0	100			VC	9.279088	
7007		CO	0	100			VC	5.941875	
6410		FO	0	100			VC	14.91615	
7001	69.3	CO	67.71	225			VC	60.1966	1 in 97
7003	69.35	SW	67.8	225			VC	20.29819	
7431		CO	0	100			VC	10.08143	
6419		FO	0	100			VC	13.03553	
6409		FO	0	100			VC	5.319418	
7000	71.04	CO	66.08	800			CO	31.70205	1 in 138
7417		VC	0	100			VC	3.846862	
7419		CO	0	100			PVC	21.37677	
7416		VC	0	100			VC	11.22291	
5320		SW	69.52	300			VC	137.8326	
6403		CO	0	150			VC	9.870391	

LEGEND

Abandoned

Foul

Surface Water

Combined

Public Sewer

Section 104

Rising Main

Sludge Main

Overflow

Water Course

Highway Drain

All point assets follow the standard colour convention:

red - combined

blue - surface water

brown - foul

purple - overflow

Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Washout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate

Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Ww Pumping Station

Septic Tank

Control Kiosk

DNM Network Monitoring Point

Change of Characteristic

MANHOLE FUNCTION

FO Foul

SW Surface Water

CO Combined

OV Overflow

SEWER SHAPE

CI Circular

EG Egg

OV Oval

FT Flat Top

RE Rectangular

SQ Square

TR Trapezoidal

AR Arch

BA Barrel

HO HorseShoe

UN Unspecified

SEWER MATERIAL

AC Asbestos Cement

BR Brick

PE Polyethylene

RP Reinforced Plastic Matrix

CO Concrete

CSB Concrete Segment Bolted

CSU Concrete Segment Unbolted

CC Concrete Box Culverted

PSC Plastic / Steel Composite

GRC Glass Reinforced Plastic

DI Ductile Iron

PVC Polyvinyl Chloride

CI Cast Iron

SI Spun Iron

ST Steel

VC Vitrified Clay

PP Polypropylene

PF Pitch Fibre

MAC Masonry, Coursed

MAR Masonry, Random

U Unspecified

Address or Site Reference:

Warth Business Park Radcliffe,