Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area - Environmental Statement Volume 4 Appendix C.1: Flood Risk Assessment

United Utilities Water Limited

Haweswater Aqueduct Resilience Programme

Planning Application Document RVBC–P&R-APP-RP-002 / ES-TA-C-1
February 28, 2025

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Jacobs U.K. Limited

5 First Street
Manchester M15 4GU
United Kingdom

T +44 (0)161 235 6000
F +44 (0)161 235 6001
www.jacobs.com

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Acronyms and abbreviations

AEP	Annual Exceedance Probability
EA	Environment Agency
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
MHCLG	Ministry of Housing, Communities and Local Government
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
SDAA	Site Drainage Attenuation Area
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems

1 Overview and Scope of the Assessment

1.1 Scope of the Assessment

1) This document presents a Flood Risk Assessment (FRA) for the proposed Alternative Facility, as required through Ribble Valley Borough Council's validation checklist. The Alternative Facility is to provide a temporary park and ride and Heavy Goods Vehicle (P&R / HGV) marshalling area for the consented Marl Hill Section and the Newton-in-Bowland compound serving the consented Proposed Bowland Section (refer to Chapter 3 Description of the Alternative Facility).

1.2 Key Legislation, Policy and Guidance

2) Table 1.1 sets out key legislation, policy and guidance of relevance for Flood Risk Assessment.

Table 1.1: Key Legislation, Policy and Guidance for Flood Risk Assessment

Document Title	Description
Legislation	
The Flood Risk Regulations 2009[1]	These Regulations establish a framework for managing flood risk. They require a cyclical process (every six years) that includes: Preliminary Flood Risk Assessment: assessment to identify areas potentially at risk of flooding; Flood hazard mapping: Creation of maps that show the areas at risk from different sources of flooding (rivers, sea, surface water); Flood Risk Management Plans: Strategic plans to manage and mitigate flood risk.
Flood and Water Management Act 2010[2]	This Act introduces a framework for managing flood and coastal erosion risk. It requires local authorities to produce Local Flood Risk Management Strategies and developers to submit flood risk assessments with planning applications in flood-prone areas.
National Policy	
National Planning Policy Framework (NPPF)[3]	This document sets out the government planning policies for England. It includes Chapter 14 Meeting the challenge of climate change, flooding and coastal change. Paragraphs 161 to 186 require planning decisions to take account of flood risk, including the need for flood risk assessments.
National Planning Practice Guidance (NPPG): Flood Risk and Costal Change[4]	This provides guidance on the implementation of the NPPF by providing more specific guidance on flood risk assessment requirements. It clarifies how to interpret and apply the NPPF's policies in practice. It encourages sustainable development that minimises flood risk and protects people and property.
The SuDS Manual (C753F)[5]	The SuDS Manual (C753F) provides the latest guidance on planning, designing, constructing, and managing sustainable drainage systems. It incorporates new research and industry best practices to help deliver cost-effective Sustainable Drainage Systems (SuDS) that meet government standards.

[1] The Flood Risk Regulations 2009. [Online] Available at: https://www.legislation.gov.uk/uksi/2009/3042/contents/made [Accessed: February 2025].

[2] Flood and Water Management Act 2010. [Online] Available at: https://www.legislation.gov.uk/ukpga/2010/29/contents [Accessed: December 2024].

[3] Ministry of Housing, Communities and Local Government (2024). National Planning Policy Framework. [Online] Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 [Accessed: December 2024].

[4] Ministry of Housing, Communities and Local Government (2022). National Planning Practice Guidance: Flood risk and costal change. [Online] Available at: https://www.gov.uk/guidance/flood-risk-and-coastal-change [Accessed: December 2024].

[5] CIRIA (2015). The SuDS Manual (C753F). [Online] Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C753F [Accessed: December 2024].

Document Title	Description
Local Policy	
Ribble Valley Borough Council Core Strategy[6]	The following local planning policies are relevant to Flood Risk Assessment DME6: Water Management EN3: Sustainable Development and Climate Change
Ribble Valley Borough Council Level 1 Strategic Flood Risk Assessment (SFRA)[7]	The SFRA for the Ribble Valley summarises the current flood risks and related policies for the area, as well as guiding development towards safe and sustainable areas.
Local Flood Risk Management Strategy for Lancashire[8]	This strategy outlines the local flood risks, challenges, and opportunities. It also details a business plan for implementing measures to mitigate risks and maximise opportunities, while also incorporating monitoring and review processes.
Ribble Catchment Flood Management Plan[9]	The Ribble Catchment Flood Management Plan is a comprehensive assessment of inland flood risks, aiming to establish sustainable long-term flood risk management policies.

1.3 Study Area

3) The study area for the FRA is defined as the planning application boundary of the Alternative Facility with an additional 100 m buffer zone beyond this boundary.

[6] Ribble Valley Borough Council (2014). Core Strategy 2008 – 2028 A Local Plan for Ribble Valley. [Online] Available at: https://www.ribblevalley.gov.uk/downloads/file/1700/adopted-core-strategy [Accessed: October 2024].

[7] Ribble Valley Borough Council (2017). Strategic Flood Risk Assessment – Level One. [Online] Available at: https://www.ribblevalley.gov.uk/downloads/file/2029/strategic-flood-risk-assessment-level-1-revised-2017- [Accessed: September 2024].

[8] Blackpool Council, Blackburn with Darwen Council and Lancashire County Council (2021). Lancashire Local Flood Risk Management Strategy 2021 – 2027. [Online] Available at: https://www.lancashire.gov.uk/council/strategies-policies-plans/environmental/lancashire-and-blackpool-flood-risk-management-strategy/ [Accessed: October 2024].

[9] Environment Agency (2009). The Ribble Catchment Flood Management Plan. [Online] Available at: https://assets.publishing.service.gov.uk/media/5a7baedfed915d01ba1ca531/Ribble_Catchment_Flood_Management_Plan.pdf [Accessed: October 2024].

2 UK Planning Policy

2.1 National Planning Policy Framework

4) The NPPF[10], updated 12 December 2024, sets out the UK Government's planning policies for England. The NPPF details the Sequential and Exception Tests to protect people and property from flooding, which all local planning authorities are required to follow. Where these tests are not passed, national policy is clear that new developments should not be permitted. The Sequential Test is designed to ensure that new developments are steered towards areas at low risk from flooding, in preference to areas at higher risk, where this can be achieved. The NPPF is supported by the National Planning Practice Guidance (NPPG)[11]. This provides further guidance to local planning authorities to help with the effective implementation of planning policy for developments in areas at risk of flooding. The definitions of Flood Zones are found in Appendix B of this document.

2.2 Site-Specific Flood Risk Assessment

5) Footnote 63 in the NPPF states that a site-specific FRA is required for developments larger than 1 ha within Flood Zone 1; and all proposals for new developments (including minor developments and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems, as notified to the local planning authority by the Environment Agency (EA). A site-specific FRA is also required where proposed developments or a change of use to a more vulnerable class may be subject to other sources of flooding.

6) Additionally, the FRA should demonstrate to Ribble Valley Borough Council how flood risk would be managed now and over the lifetime of the development, taking climate change into account, and with regard to the vulnerability of its users. As stated in the NPPG, the FRA should establish:

- Whether the proposed development is likely to be affected by current or future flooding from any source
- Whether it will increase flood risk elsewhere
- Whether the measures proposed to deal with these effects and risks are appropriate
- The evidence for the local planning authority to apply (if necessary) the Sequential Test
- Whether the development will be safe and pass the Exception Test, if applicable.

7) The Alternative Facility is located in Flood Zone 1, 2 and 3 and the area within the proposed planning application boundary is greater than 1 ha; therefore, a site-specific FRA is required.

2.3 The Vulnerability Classification

8) The flood risk from fluvial flooding is assessed through the use of the EA Flood Map for Planning (Rivers and Sea)[12]. This map defines three zones of different flood risk, the third of which is subdivided into two categories. The Flood Zone which a site is in has an impact on the type of development that is considered appropriate.

[10] Ministry of Housing, Communities and Local Government (2024). *Op. cit.*

[11] Ministry of Housing, Communities and Local Government (2022). *Op. cit.*

[12] Environment Agency (2024a). Flood Map for Planning (Rivers and Sea) - Flood Zone 2. [Online] Available at: https://www.data.gov.uk/dataset/cf494c44-05cd-4060-a029-35937970c9c6/flood-map-for-planning-rivers-and-sea-flood-zone-2 [Accessed: December 2024].

9) Annex 3 of the NPPF identifies the flood risk vulnerability classifications for various development types. Table 2 of the Flood Risk and Costal Change NPPG[13] classifies the flood risk vulnerability of all land uses, shown in Table 2.1.

Table 2.1: Flood Risk Vulnerability and Flood Zone 'Incompatibility' (NPPG Table 2)

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	✓	✓	✓	✓	✓
2	✓	Exception Test required	✓	✓	✓
3a	Exception Test required	×	Exception Test required	✓	✓
3b	Exception Test required	×	×	×	✓

✓ = Development is appropriate, × = Development should not be permitted

10) Given that the Alternative Facility is situated within Flood Zone 1, all types of developments are considered appropriate in accordance with the NPPG. The parts of the planning application boundary that lie in Flood Zone 2 and Flood Zone 3 would need to be less vulnerable or more water compatible.

11) The Alternative Facility is in Flood Zone 1 therefore the Sequential Test and Exception Test are not required.

2.4 Climate Change

12) The EA guidance on climate change allowances[14] for flood risk assessments has been considered for this assessment. The EA guidance details the level of climate change required to assess the impacts of climate change on flooding for new developments. This is dependent on the location (Flood Zones), design life and vulnerability classification, detailed in Table 2 of the NPPG.

2.4.1 Peak Rainfall Intensity

13) The peak rainfall intensity allowance recommended by the EA to assess impacts of climate change is determined by the lifetime of the development and shown in Table 2.2. Given the 5 to10 year lifespan of the Alternative Facility, the central allowance for the 2050s epoch (2022 to 2060) and assessment of both the 1% and 3.3% Annual Exceedance Probability (AEP) rainfall events will be applied.

Table 2.2: Recommended Climate Change Allowance for Peak Rainfall Intensity in Small and Urban Catchments – Data for Ribble Management Catchment[14]

Event	Allowance	2050	2070
1% AEP event	Central allowance	25%	35%
	Upper end allowance	40%	50%
3.3% AEP event	Central allowance	25%	35%
	Upper end allowance	30%	40%

[13] Ministry of Housing, Communities and Local Government (2022). *Op. cit.*

[14] Environment Agency (2022). Flood risk assessments: climate change allowances. [Online] Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances [Accessed: October 2024].

3 Local Flood Risk Policy

14) The Alternative Facility is within the area of Ribble Valley Borough Council. The guidance below is of relevance to the Alternative Facility.

3.1 Ribble Valley Borough Council Level 1 Strategic Flood Risk Assessment

15) In May 2010 Ribble Valley Borough Council produced a Level 1 SFRA which was revised in 2017. The Ribble Valley Borough Council SFRA[15] provides sufficient data and information on all types of flood risk to guide development to locations that minimise the risk of flooding.

16) Appendix 4 of Ribble Valley Borough Council's SFRA shows that in Clitheroe, the policy option is P5 which is 'Take further action to reduce flood risk' in the area. Justification behind this policy selection is quoted below:

'Flood risk management activities in the town include the maintenance of screens on the inlet and outlet of culverted watercourses, general maintenance of banks of open watercourses, and the provision of formal flood warnings to the Clitheroe and Low Moor areas. Further action is needed to reduce the predicted effects of climate change and further urban development in and around Clitheroe. Culverted stretches of Mearley Brook pose a high flood risk to the town, and work is required to reduce this risk.

Whilst the projected damages in this unit are not as high as other policy units where P5 is proposed, this level of damage in such a small area indicates the action is needed to reduce the flood risk and therefore a proactive P5 policy is recommended, rather than any policy which would provide a lower level of flood risk management now and into the future. Being a wholly urban policy unit means that, by implications, opportunities for a policy P6 policy are extremely limited, although there is potential for flood storage upstream of the town. Work in this policy unit is likely to get priority on a national scale, with work programmed in Clitheroe to address flood risk. Implementing flood resilience measures within existing and future properties may also help to reduce flood risk.'

And:

'Promote application of rigorous planning control for any new development on floodplains in and around Clitheroe using the principles of PPS25 and encourage the implementation of SuDS. Where development, exceptionally, take place in areas of flood risk, we will seek to ensure that floor levels are raised to an appropriate level, flood resilience is incorporated into buildings, and it is demonstrated that safe access and evacuation can be provided during flood events.'

3.2 Lancashire Local Flood Risk Management Strategy

17) The Lancashire Local Flood Risk Management Strategy 2021-2027[16] outlines a collaborative approach to managing flood risk across the region.

18) Lancashire faces diverse flood risks due to its varied topography and network of watercourses. The western districts, with their low-lying land and reclaimed wetlands, are prone to flooding from surcharged drainage systems and high groundwater levels. The River Ribble, for instance,

[15] Ribble Valley Borough Council (2017). *Op. cit.*

[16] Blackpool Council, Blackburn with Darwen Council and Lancashire County Council (2021). *Op. cit.*

has a relatively narrow floodplain within the wider valley bottom, making areas like Clitheroe, which is built on a series of flat or gently sloping terraces, more susceptible to flooding.

19) To mitigate these risks, the strategy emphasises the importance of SuDS. The Lancashire Strategic Partnership has identified the promotion and implementation of SuDS as a significant opportunity to enhance flood resilience across the region. The Partnership is working towards all local authorities adopting the SuDS pro forma[17], which will empower Planning Authority and Lead Local Flood Authority (LLFA) officers to guide and encourage developers in incorporating suitable SuDS solutions in all new developments.

3.3 Ribble Catchment Management Plan

20) The Ribble Catchment Flood Management Plan[18] is an overview of current and future flood risks in the Ribble catchment and proposes sustainable solutions to manage these risks.

21) Clitheroe faces a high risk of flooding due to Mearley Brook, with certain sections being culverted as it passes through the town. Worston Brook, which flows adjacent to the Alternative Facility, is a tributary of Mearley Brook and could contribute to flooding downstream. The under-capacity or blockage of these culverted stretches present the most significant flood risk to the town. The Low Moor area is also at risk, this time from the River Ribble. Currently, 260 properties, three schools and one healthcare facility are at risk of flooding in a 1% AEP flood event. This number is expected to rise to 490 properties by 2100 due to climate change. There are some issues with sewer and surface water flooding, although not as severe as in other parts of the catchment. There are approximately 37 properties at risk of flooding in a higher frequency 10% AEP flood event, which requires more urgent action. Residents of Clitheroe and Low Moor can sign up for a flood warning service due to the high flood risk.

22) To address this high flood risk, the Ribble Catchment Flood Management Plan has designated Clitheroe as Sub-area 4, which falls under Policy 5: '*Areas of moderate to high flood risk where we can generally take further action to reduce flood risk. This policy will tend to be applied to those areas where the case for further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. Taking further action to reduce risk will require additional appraisal to assess whether there are socially and environmentally sustainable, technically viable and economically justified options.*'

23) Additionally, the document states in 'Proposed Actions' to implement the preferred policy: '*Promote the application of rigorous planning control for any new development in and around Clitheroe using the principles in PPS25 and encourage the implementation of SuDS.*'

[17] North West Regional Flood and Coast Committee (2022). SuDS pro-forma. [Online] Available at: https://thefloodhub.co.uk/wp-content/uploads/2022/05/NW-SuDS-Pro-forma-v.5.-May-2022-002.pdf [Accessed: October 2024].

[18] Environment Agency (2009). *Op. cit.*

4 Site Characteristics

4.1 Location

24) The Alternative Facility is situated to the west of Pimlico Link Road in Ribble Valley Borough, approximately 1.75 km north-east of Clitheroe town centre. The planning application boundary of the Alternative Facility is shown in Figure 1.1, Volume 3 of the Environmental Statement and includes a section of Pimlico Link Road.

4.2 Existing Site Characteristics

25) The Alternative Facility would be mostly located on agricultural land, currently under pasture. The land is undeveloped, with no existing buildings or areas of hardstanding, and occupies an area of some 3.78 ha. The site is generally flat, and field boundaries are marked by hedgerows and tree groups. A small area of the proposed development includes alterations to the existing Pimlico Link Road.

4.3 Elevation

26) Figure 6.8, Volume 3 of the Environmental Statement shows Light Detection and Ranging Composite data obtained from Department for Environment, Food and Rural Affairs (Defra) Data Services[19]. The Alternative Facility lies within an area with an elevation range of around 95-103 mAOD.

4.4 Geology

27) The bedrock geology consists of the Clitheroe Limestone Formation, primarily composed of limestone; and the Hodder Mudstone Formation, composed of mudstone.[20] These sedimentary rocks are shallow marine in origin. They are biogenic and detrital, generally comprising carbonate material (coral, shell fragments), forming beds and locally, reefs. The superficial deposits which are geological deposits formed during the Quaternary period vary across the site:

- The northern part of the site is characterised by alluvial deposits consisting of clay, silt, sand, and gravel
- The southern part of the site is characterised by Devensian till, a type of diamicton.

4.5 Surface Water Features/Local Watercourses

28) Worston Brook is a main river to the north of the planning application boundary. Approximately 150 m downstream, Worston Brook converges with Mearley Brook (Water Body ID GB112071065510, Water Body Type: River, Hydromorphological designation: not designated artificial or heavily modified). This is another main river. Both are shown in Figure 6.1, Volume 3 of the Environmental Statement.

[19] Defra (2022). Data Services Platform. Lidar Composite data. [Online] Available at: https://environment.data.gov.uk/DefraDataDownload/?Mode=survey [Accessed: July 2024].

[20] British Geological Survey (2017). BGS Geology Viewer. [Online] Available at: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ [Accessed: October 2024].

4.6 Existing Site Drainage

29) The site is currently greenfield in nature, subject to natural pluvial runoff, infiltration, and land drainage systems. A site visit conducted in June 2024 revealed that there is a steep gradient between the northern edge of the main planning application boundary and Worston Brook. The planning application boundary includes a corridor through this steep terrain to allow for an outfall to Worston Brook. Additionally, signs of existing land drainage are evident in the north-eastern corner of the site.

5 Existing Flood Risk

5.1 Introduction

30) In accordance with the NPPG[21] an assessment of the flood risk to the Alternative Facility has been completed based on the following sources of information:

- Flood risk information available from the EA online mapping[22]
- Ribble Valley Borough Council Level 1 SFRA[23].

31) The impact of the Alternative Facility on all sources of flood risk has considered the following forms of flooding:

- Rivers and sea flood risk
- Surface water flood risk
- Flooding from reservoirs
- Sewer flood risk
- Groundwater flood risk.

5.2 Rivers and Sea Flood Risk

32) According to the EA Flood Map for Planning[24], the Alternative Facility is located mostly in Flood Zone 1 (see Appendix A Indicative Flood Map for Planning of this document). Land within Flood Zone 1 has a 'low' probability of flooding from rivers and the sea as shown in Figure 6.3, Volume 3 of the Environmental Statement. A small corridor of the planning application boundary is in Flood Zone 2 and 3 where an outfall is proposed.

5.3 Surface Water Flood Risk

33) A review of the EA's surface water flood risk mapping[25] indicates that a portion of the Alternative Facility falls within areas designated as having 'high' risk of surface water flooding (3.3% AEP) and 'medium' risk (1% AEP) as shown in Environmental Statement Volume 3 Figure 6.2. These high-risk areas include:

- Where Pimlico Link Road crosses the culverted Worston Brook
- Where the proposed outfall discharges into Worston Brook.

[21] Ministry of Housing, Communities and Local Government (2022). *Op. cit.*

[22] Environment Agency (2024b). Flood risk Environment Agency online mapping [Online] Available at: https://check-long-term-flood-risk.service.gov.uk/map# [Accessed: November 2024].

[23] Ribble Valley Borough Council (2017). *Op. cit.*

[24] Environment Agency (2024a). *Op. cit.*

[25] Environment Agency (2023). Check your long term flood risk. [Online] Available at: https://check-long-term-flood-risk.service.gov.uk/postcode [Accessed: July 2024].

5.4 Flooding from Reservoirs

34) The EA's Reservoirs Flood Risk mapping[26] was reviewed, and the Alternative Facility is not within the area shown to be at risk of flooding from reservoirs.

5.5 Sewer Flood Risk

35) Based on available mapping provided by United Utilities there is no existing sewerage infrastructure within the Alternative Facility area.

5.6 Groundwater Flood Risk

36) The SFRA[27] states that no evidence of groundwater flooding has been identified in the area. However, the SFRA acknowledges the possibility of unrecorded or future events, stating: '*While no risk has been demonstrated, this is not to say that unrecorded groundwater flooding events may have taken place or that groundwater flooding may not occur in the future, but using the best available information they are not considered to be a significant risk at this time.*'

[26] Environment Agency (2021). Risk of Flooding from Reservoirs. [Online] Available at: https://www.data.gov.uk/dataset/44b9df6e-c1d4-40e9-98eb-bb3698ecb076/risk-of-flooding-from-reservoirs-maximum-flood-extent-web-mapping-service [Accessed: December 2024].

[27] Ribble Valley Borough Council (2017). *Op. cit.*

6 Alternative Facility

6.1 Proposed Works

37) Full description of the Alternative Facility can be found in Chapter 3 Description of the Alternative Facility and is summarised here. The Alternative Facility is the provision of a temporary P&R / HGV marshalling area for construction traffic. The total footprint area of the Alternative Facility is approximately 3.78 ha. The hardstanding area encompasses a total of 2.17 ha, comprising an access from Pimlico Link Road, parking spaces, HGV marshalling spaces, a circulation area, Site Drainage Attenuation Area (SDAA) and drainage outfall area.

38) Surface drainage from the hardstanding would be directed through filter drains and a new drainage network to an SDAA. The SDAA is designed to accommodate sediment deposition, which would be supplemented by a silt interceptor facility and oil interceptor chamber as required. Attenuated flows at agreed greenfield discharge rates would be directed through a new, small diameter pipe connecting the SDAA to Worston Brook via a new, temporary outfall structure on the left bank of the watercourse.

39) The construction scope includes:

- Full tarmacadam-type product surfacing proposed
- Positive drainage collection wrapped with geotextile membrane
- Treatment through filter drains, silt interceptor facility, SDAA and oil interceptor chamber as required
- Restricted discharge rates to Worston Brook
- New outfall to Worston Brook
- Temporary site buildings and pick-up/drop-off area in the form of construction site cabin-type facilities and an access on the site.

40) The Alternative Facility involves constructing a vehicle parking area and supporting facilities on open agricultural land. After project completion, the Alternative Facility would be entirely dismantled, removed and reinstated back to agricultural land.

6.2 Proposed Drainage

41) The drainage system is designed to effectively manage surface water runoff from the car park, welfare facilities and surrounding areas while minimising the environmental impact. It incorporates sustainable drainage principles to mimic the natural flow of water and protect the nearby Worston Brook.

- An SDAA would collect surface water runoff, allowing sediment to settle and reducing the risk of pollution
- An oil interceptor chamber would be installed to remove hydrocarbon pollutants from site drainage before it is discharged into the SDAA
- Drainage outfall: The water from the SDAA would be discharged into Worston Brook through a carefully designed outfall, ensuring controlled flow and minimal disturbance to the natural watercourse.

42) The proposed construction method includes blacktop surfacing to facilitate positive drainage collection. The positive drainage collection would be wrapped to prevent leaks and ensure efficient collection. The collected water would be treated through filter drains, silt interceptor

facility, SuDS, SDAA, and oil interceptor chamber, as required. Discharge rates to Worston Brook would be restricted to prevent overwhelming the watercourse. A new temporary outfall to Worston Brook would be created to safely discharge treated water.

43) The following document and guidance are to be followed to determine mitigation measures:

- Lancashire County Council LLFA SuDS pro forma[28]
- The SuDS Manual (C753F)[29].

44) The Sustainable Drainage Strategy, RVBC–P&R-APP-RP-005 is attached to the planning application.

45) Some of the mitigation measures to be adopted in the Sustainable Drainage Strategy are:

- Ensure restricted discharge velocity and flow rates and compliance with Environmental Permit requirements (greenfield runoff rates to be maintained)
- Sustainable drainage, treatments/interceptors/pollution hazard reduction, would be required to ensure no worsening of environmental impact and water quality impacts
- Storage of peak runoff flows would be required through operation to ensure neither the floodplain nor the conveyance of Worston Brook are adversely impacted
- Once the site is operational, any SuDS features to be maintained appropriately.

46) A SuDS pro forma has been submitted with the application to outline the proposed SuDS design for the development.

47) The Alternative Facility has been designed for management of rainfall events, including those exceeding a 1 in 100-year (plus climate change) event.

48) The details contained within the Sustainable Drainage Strategy include provisions for the SDAA at the Alternative Facility to determine the approximate size of the SDAA.

[28] North West Regional Flood and Coast Committee (2022). *Op. cit*.

[29] CIRIA (2015). *Op. cit.*

7 Impact of the Alternative Facility

7.1 Rivers and Sea and Flood Risk

49) The Alternative Facility would include a new outfall to Worston Brook that may be within Flood Zones 2 and 3.

50) The outfall would have minimal additional volume within the existing floodplain.

51) The discharge of surface water from the Alternative Facility would be restricted to the QBAR 2 year runoff rate to ensure there is no impact on the volume of water within Worston Brook.

52) It is assessed that there would be a low risk of increased flooding to Worston Brook.

7.2 Surface Water Flood Risk

53) A SuDS pro forma has been submitted with the application to outline the proposed SuDS design for the development.

54) It is assessed that there would be a low risk of increased surface water flooding within the existing flood network.

7.3 Flooding from Reservoirs

55) The Alternative Facility would have no impact on reservoir flooding.

56) It is assessed that there would be a low risk of increased reservoir flooding.

7.4 Sewer Flood Risk

57) The Alternative Facility is designed to provide a new sewer network based on SuDS principles to current standards as required by Lancashire LLFA and the SuDS Manual (C753F)[30]. This would not interact with the existing off-site sewer network.

58) It is assessed that there would be a low risk of increased sewer flooding within the existing flood network.

7.5 Groundwater Flood Risk

59) The Alternative Facility is designed to ensure limited construction within the ground or additional discharge to ground.

60) It is assessed that there would be a low risk of increased groundwater flooding.

[30] CIRIA (2015). *Op. cit.*

8 Conclusions

61) The Alternative Facility involves constructing a temporary P&R / HGV marshalling area. From the Alternative Facility, marshalled HGVs and construction personnel in minibuses would proceed in a general north-westerly direction along local roads, via the consented Ribble Crossing and Waddington village, to the Newton-in-Bowland, Bonstone and Braddup compounds.

62) The existing flood risk to the Alternative Facility outlined in Section 5 is typically low. There are small areas of Flood Zone 2 and 3 near to a proposed outfall and some isolated areas of medium and high surface water flood risk within the planning application boundary, but outside of the main construction works.

63) Mitigation proposed within the Alternative Facility and outlined in the Sustainable Drainage Strategy would provide for attenuation of any additional runoff from hard surfaces. The rate of discharge to Worston Brook would be managed to replicate existing discharge rates.

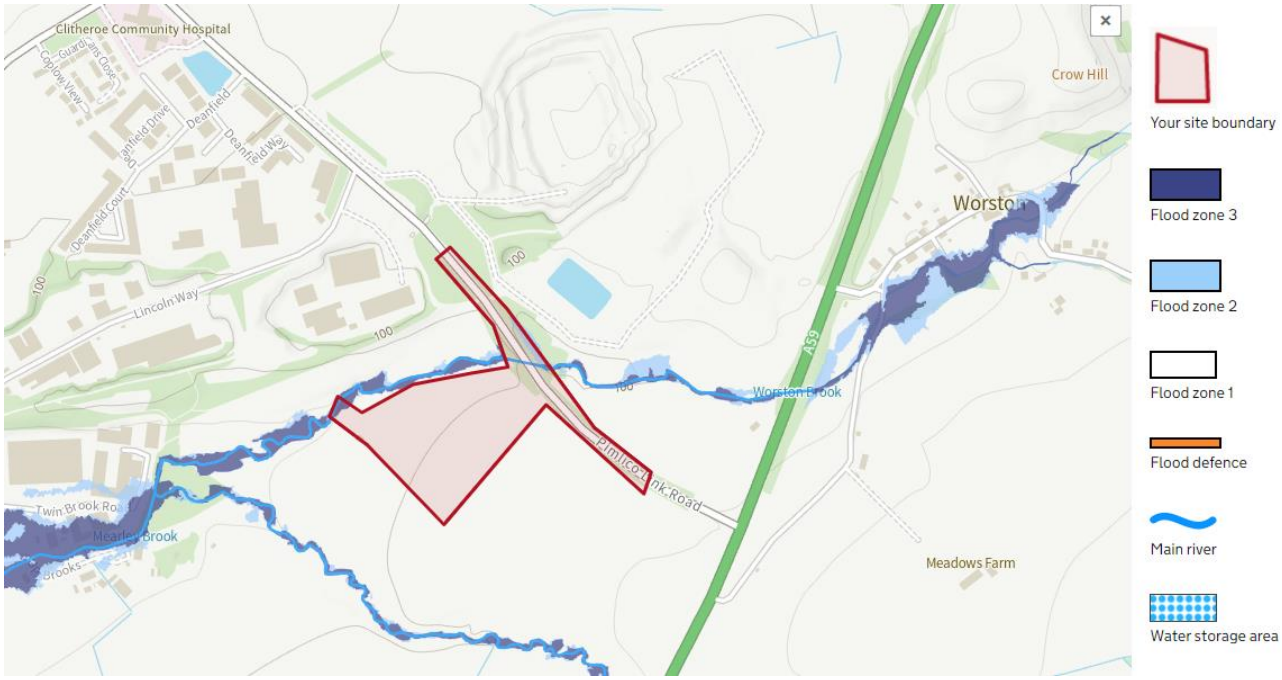
64) The impact of the Alternative Facility outlined in Section 7 is assessed as low.

9 Recommendations

65) Prior to the commencement of works, it is recommended that:

- A ground investigation be conducted to support the development of a detailed Sustainable Drainage Strategy. It should also assess soil permeability, groundwater levels, and potential contamination risks. This information would inform the drainage strategy and determine the feasibility of various surface water disposal methods
- A plan for ongoing maintenance and monitoring of the drainage system and flood mitigation measures is developed
- A Flood Risk Activity Permit application for permission to discharge to Worston Brook would likely be required by the EA.

Appendix A. Indicative Flood Map for Planning



Appendix B. Definitions of Flood Zones

Flood Zone	Definition[31]
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding (land shown in light blue on the Flood Map).
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or land having a 0.5% or greater annual probability of sea (land shown in dark blue on the Flood Map).
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: ▪ Land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or ▪ Land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map.)

[31] Ministry of Housing, Communities and Local Government (2024). Planning Practice Guidance: flood risk and coastal change. Appendix 2 Table 1 NPPF PPG. [Online] Available at: https://assets.publishing.service.gov.uk/media/66b1e160ce1fd0da7b593334/Flood_Risk_Assessment_June_2024_Appendix_2_-_Table_1_NPPF_PPG_CHECKED.pdf [Accessed: January 2025].