

**Hawke Ridge Business Park Ltd and Bellway
Homes Ltd**

Land at Hawke Ridge Business Park

Environmental Statement: Volume 1, Main Text

Chapter 12: Water Quality, Hydrology and Flood Risk





12 WATER QUALITY, HYDROLOGY AND FLOOD RISK

INTRODUCTION

12.1 This chapter presents the approach and findings of the assessment of likely significant effects relating to Water Quality, Hydrology and Flood Risk for the Proposed Development at Hawke Ridge Business Park, Westbury BA13 4LD. The chapter describes the assessment methodology, establishes the baseline conditions for the Application Site and surrounding water environment, assesses the likely effects during construction and operation, and identifies mitigation measures required to avoid or reduce adverse effects.

12.2 This assessment has been undertaken by Tumu Consulting and makes reference to the Flood Risk Assessment and Drainage Strategy prepared for the planning application. The FRA confirms that the Proposed Development comprises a mixed-use scheme including residential dwellings, a care home, retail uses, a roadside drive-through unit, associated access roads, landscaping, blue-green infrastructure and supporting works. The assessment should be read in conjunction with the FRA and relevant chapters of the Environmental Statement, including those addressing soils, geology, contamination, ecology and climate resilience.

LEGISLATIVE & PLANNING POLICY CONTEXT

Legislative Context

12.3 Water resources are managed and protected under UK legislation and regulations consistent with assimilated European Community Directives. Where relevant, this assessment takes account of the legislative protection afforded to water resources. The main legislation affording protection to the water environment, relevant to this assessment is listed below:

- Flood and Water Management Act 2010 (Ref 12.1)
- Water Act 2014 (Ref 12.2)
- Water Industry Act 1991 (as amended by the Water Act 2003(Ref 12.3))
- Land Drainage Act 1991 (Ref 12.4)
- Water Resources Act 1991 (Ref 12.5)
- Environment Act 1995 (Ref 12.6)



- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 12.7)
- The Environmental Permitting (England and Wales) Regulations 2016 (ref 12.8)
- Water Framework Directive (2000/60/EC) (Ref 12.9)
- Groundwater Daughter Directive (2006/118/EC) (Ref 12.10); and
- Groundwater Directive (80/68/EEC) (Ref 12.11)

Planning Policy

National Planning Policy Framework (NPPF) (February 2025) (Ref 12.12)

12.4 The NPPF makes specific reference to flood risk and climate change in Section 14. Paragraph 164(a) of the NPPF requires that development should be planned in ways that:

12.5 Avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through incorporating green infrastructure and sustainable drainage systems...'

12.6 Paragraphs 170 to 181 address the need to avoid inappropriate development in areas at risk from flooding and paragraph 170 of the NPPF directs that:

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

Planning Practice Guidance

12.8 Section 14 of the NPPF is supported by Planning Practice Guidance: Water supply, wastewater and water quality (July 2019) (Ref 12.13) which advises on how planning can ensure water quality and the delivery of adequate water and waste water infrastructure; and Planning Practice Guidance: Flood risk and coastal change (September 2025) (Ref.12.14) which advises on how planning can take account of the risks associated with flooding and coastal change in plan-making and the application process.



Wiltshire Planning Policy and Drainage Requirements

12.9 The Application Site is located within Wiltshire. Local planning policy and Lead Local Flood Authority requirements seek to ensure that development is appropriately located with respect to flood risk, incorporates sustainable drainage systems, manages surface water at source where practicable, and does not increase flood risk elsewhere.

12.10 Wiltshire Council Drainage and Betterment Strategy (June 2024) (Ref 12.15) requirements have been considered in the FRA and drainage strategy. The surface water strategy restricts post-development discharge to provide betterment over existing greenfield runoff rates and incorporates Sustainable Drainage Systems to manage runoff quality, quantity, amenity and biodiversity.

River Basin Management Plan and Catchment Context

12.11 The Application Site drains towards the Bitham Brook Tributary, which discharges into Bitham Brook immediately east of the Site. Bitham Brook is a tributary of the River Biss, which ultimately flows into the River Avon. Environment Agency Water Framework Directive information reviewed within the FRA identifies Bitham Brook as having Moderate Ecological Status and Moderate Biological Quality Status. The EA states that the reasons for not achieving Good status and reasons for deterioration include:

- Point Source Sewage Discharge
- Poor Nutrient Management of Diffuse sources

ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Consultation

12.12 Consultation and review of relevant planning, flood risk and drainage information has informed the assessment. The FRA has been prepared using Environment Agency flood mapping and Product 6/Product 7 model data, Wiltshire Strategic Flood Risk Assessment information, site-specific topographical survey data, Wessex Water asset records, ground investigation information and drainage design calculations.



Sources of Information/Guidance

12.13 The preparation of this chapter has referenced a number of desk top information resources and two reports prepared as part of this planning application:

- British Geological Survey (BGS) website: www.bgs.ac.uk (Ref 12.16);
- Multi-Agency Geographical Information for the Countryside (MAGIC) website: www.magic.gov.uk (Ref 12.17);
- Environment Agency website and interactive maps: www.environment-agency.gov.uk (Ref 12.18);
- Guidance Documents that include:
 - The Sustainable Drainage Systems (SuDS) Manual, CIRIA C753 (Ref 12.19)
 - Designing for Exceedance in Urban Drainage – Good Practice, CIRIA C635 (Ref 12.20)
 - Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code") (Ref 12.21)
 - BS EN 752 2017 – Drain and Sewer Systems Outside Buildings (Ref 12.22)
 - CIRIA C532 - Control of Water Pollution from Construction Sites (Ref 12.23)
 - DEFRA/ EA Preliminary Rainfall Run Off Management for Developments (Ref 12.24)
 - CIRIA Interim Code of Practice for Sustainable Drainage (2004) (Ref 12.25)
 - CIRIA C737 Structural and Geotechnical design of Modular Geocellular Drainage Tanks (Ref 12.26)
- Baseline surveys including, CCTV Survey Information
- Wiltshire Strategic Flood Risk Assessment (SFRA) (2024) ArcGIS viewer (Ref 12.27)
- Flood Risk Assessment, Tumu Consulting Ltd (June 2026) (Ref 12.28)
- Interpretative Ground Investigation Report, Ground Investigation (South West) Ltd (May 2012) (Ref 12.29)
- Soakaway Testing, Ground Testing LTD (November 2025) (Ref 12.30)



Study Area

12.14 The principal study area for this assessment is the Application Site boundary at Hawke Ridge Business Park, Westbury. The assessment also considers receptors beyond the boundary where there is a potential hydrological connection, including the Bitham Brook Tributary, and Bitham Brook.

Assessment Process

12.15 This section of the chapter describes the approach that has been taken to the assessment process, including the determination of baseline conditions and the resultant assessment of receptor sensitivity. The approach to determining impact magnitude and the significance of effects on Water Quality, Hydrology and Flood Risk is also described.

12.16 An assessment groundwater is discussed in Chapter 13: Soil, Geology and Contaminated Land. Assessment of surface water is also discussed in the same chapter

Assessment of baseline Water Quality

12.17 Assessment of baseline water quality within the Application Site has been undertaken with reference to the existing drainage system and the known drainage characteristics of the Application Site.

Assessment of baseline Flood Risk

12.18 Baseline information on existing flood risk was derived from the Environment Agency's flood mapping for fluvial events, Tumu's Flood Risk Assessment and Drainage Report, the Wiltshire Strategic Flood Risk Assessment (SFRA) (2024) ArcGIS viewer, and consultation with the Environment Agency.

Approach to the impact assessment of Drainage

12.19 Potential changes in the volume, rate and quality of surface water discharging from the Proposed Development have been assessed by comparing the baseline drainage network characteristics with the drainage design for the Proposed Development (see Appendix 12.1).



Approach to the assessment of Flood Risk

12.20 The potential effect of the Proposed Development on flooding has been assessed by undertaking a review of the present and proposed site levels, surface water run-off flow regime and the proposed drainage strategy, in conjunction with predicted flood levels, as supplied by the Environment Agency. The assessment was informed by the FRA provided in Appendix 12.1.

12.21 The assessment of potential effects to Flood Risk has considered the potential change in volume and peak flows of surface water runoff generated by changes to the impermeable surfaces associated with the Proposed Development.

Approach to the assessment of sensitivity, magnitude and significance

12.22 The overarching approach to the assessment of receptor sensitivity, impact magnitude and effect significance is set out in Chapter 3: Environmental Impact Assessment Methodology of this ES. Table 12.1 sets out the scale of receptor sensitivity used in the assessment of the water environment and Table 12.2 sets out the criteria used for the assessment of impact magnitude.

Table 12.1 – Scale of Sensitivity

Sensitivity	Description	
	Flood Risk	Hydrology and Water Quality
Very High	Flood Zone 3 or where there is a flood defence protecting more than one hundred residential properties from flooding Surface, foul or combined drainage currently operating at, or exceeding design capacity.	Watercourses receiving surface water flows from the site with high ecological quality and good chemical quality
High	Flood Zone 3 or defence protecting between one and one hundred residential properties or industrial premises from flooding. Surface, foul or combined drainage currently operating within 100% of design capacity	Surface watercourses receiving surface water flows from the site with good ecological quality and good chemical quality. Watercourses within a SSSI/SPA/SAC/Ramsar. .



Sensitivity	Description	
	Flood Risk	Hydrology and Water Quality
Medium	Flood Zone 2 and a low probability of flooding of residential and industrial properties. Surface, foul or combined drainage operating at between 70% and 90% of design capacity.	Surface watercourses with moderate ecological quality and good chemical quality. Watercourses of high amenity value
Low	Flood Zone 1 and Residential properties close by Surface, foul or combined drainage operating at between 50% and 70% of design capacity	Surface watercourses with poor ecological quality and failed chemical quality
Negligible	Flood Zone 1 and industrial properties or agricultural fields close by. Surface, foul or combined drainage operating at <50% of design capacity	Surface watercourses with poor ecological quality and failed chemical quality.

Table 12.2 – Scale of Magnitude

Magnitude	Description		
		Flood Risk	Hydrology and Water Quality
Very Large		Substantial change in discharge rates that are in excess of watercourse capacity. This may lead to major changes in terms of flood risk. Any change in discharge rate that leads to exceedance of the design capacity of the surface, foul or combined drainage system	Substantial change in the quality of water being discharged off site to surface water bodies
Large		Substantial	Major change in



Magnitude		Description	
		Flood Risk	Hydrology and Water Quality
		change in discharge rates that are not in excess of watercourse capacity. This may lead to major changes in terms of flood risk. Any change in discharge rate that leads to surface, foul or combined drainage systems operating at close to capacity.	the quality of water being discharged to surface water bodies
Medium		Slight to moderate change in discharge rates to watercourse. Slight or moderate changes to flood risk, Moderate change to discharge rate to the surface, foul or combined drainage systems. System operating well within capacity.	Moderate change in the quality of water being discharged from the site
Small		Slight change to the discharge rates. Might lead to very localised changes to form of the river, but not to flood risk. Slight change to discharge rate to the surface, foul or combined drainage systems. System operating well within capacity.	Slight change in the quality of water being discharged from the site
Negligible		No or very slight	No change in



Magnitude		Description	
		Flood Risk	Hydrology and Water Quality
		change in discharge rates or the quality of water released to watercourses or flood risk.	the quality of water being discharged from the site. No or very slight change in discharge rates to the surface, foul or combined network

12.23 The significance of effects is determined by considering the perceived sensitivity of the receptor in conjunction with the predicted magnitude of impact, as described in Table 12.3 below. It is assumed for the purposes of this assessment that any effects of moderate significance or greater will be significant effects in EIA terms.

Table 12.3 – Scale of Significance of Effect

Magnitude of Effect	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very Large	Major	Major	Major	Moderate	Negligible to Minor
Large	Major	Major	Moderate to Major	Minor to Moderate	Negligible
Medium	Major	Moderate to Major	Moderate	Minor	Negligible
Small	Moderate	Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible	Negligible to Minor	Negligible	Negligible	Negligible	Negligible

Assumptions and Limitations

12.24 This assessment has been undertaken in support of the planning application and is therefore commensurate with the appropriate level of detail with respect to the Proposed Development described in Chapter 5: The Proposed Development of this ES and shown on the parameter plans. Data used to compile this report include secondary information derived



from a variety of sources. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

BASELINE CONDITIONS

Current baseline – Site context

Topography and surface water flow paths

12.25 A topographical survey undertaken by Clifton Survey in January 2026 identifies that the Application Site generally falls from west to east. The highest recorded level is 57.65m AOD within the south-western corner of the Application Site, while the lowest recorded level is approximately 47.10m AOD along the south-eastern boundary.

12.26 Existing overland flow paths generally follow the site topography towards lower lying areas and drainage features. Existing ditches intercept upstream catchment runoff and convey flows towards the Bitham Brook Tributary via piped outfalls.

Geology

12.27 Ground investigations undertaken in 2012, 2025 and 2026 indicate that the Application Site is generally underlain by Topsoil and/or Made Ground, Residual Soil, Alluvium and the Oxford Clay Formation. The Oxford Clay Formation generally comprises firm to very stiff silty clay with occasional gypsum, fossil shells, sand pockets and carbonate concretions.

12.28 Alluvium was encountered in several exploratory holes, predominantly in southern and eastern areas of the Application Site. Groundwater was predominantly encountered where Alluvium was present, generally between 1.0m and 2.5m below ground level, with monitoring recording groundwater levels between 0.17m and 3.82m below ground level.

Hydrology

12.29 The nearest ordinary watercourse is a tributary of Bitham Brook, which flows along the eastern boundary of the Application Site. The tributary discharges into Bitham Brook immediately east of the Application Site. Bitham Brook is the nearest Main River and is located approximately 40m east of the Application Site at its closest point.



12.30 Wessex Water asset records reviewed for the FRA identify no public gravity drainage infrastructure within the Application Site boundary. An existing foul water pumping station is located in the south-eastern corner of the Northern Parcel, with an associated rising main extending south-west across the Application Site before travelling south along Hawkeridge Road.

12.31 The topographical survey identifies existing drainage ditches discharging to the Bitham Brook Tributary via piped outfalls. These ditches currently intercept and convey flows from the Application Site and from upstream catchments.

12.32 There is a short section of private foul water drainage network linking the Southern Parcel to the existing pumping station. Spurs have also been provided on this gravity network to connect the Northern Parcel to the existing pumping station.

12.33 Existing drainage ditches will be retained or diverted where necessary as part of the drainage strategy, maintaining interception and conveyance of upstream flows to the Bitham Brook Tributary.

12.34 Surface water from the Application Site ultimately drains to the Bitham Brook Tributary and then to Bitham Brook. Environment Agency Water Framework Directive information reviewed within the FRA identifies Bitham Brook as having Moderate Ecological Status.

12.35 There are no surface water abstractions within 1km of the Application Site.

Hydrogeology, groundwater and infiltration tests

12.36 In terms of the Application Site's bedrock aquifer designation, the Oxford Clay Formation is classified as unproductive strata. The overlying superficial alluvial soils are likely to be classed as Secondary A. The Environment Agency defines Secondary A aquifers as permeable layers capable of supporting water supplies at a local rather than strategic scale, while Secondary B aquifers are predominantly lower-permeability layers which may store and yield limited amounts of groundwater due to localised features. The Defra map shows that most of the Application Site is on unproductive superficial drift. The map also shows some localised areas where the superficial drift is classed as a Secondary A aquifer. Areas with secondary drift layers mirror areas where superficial alluvium soil was encountered during ground investigation works. With regard to groundwater vulnerability, the Defra MAGIC map shows the Application Site has areas of unproductive strata and some areas with low groundwater vulnerability.



12.37 As part of the Application Site investigation works, groundwater was encountered at most investigations points and typically associated with the base of granular units (Alluvium) and above more impermeable clay strata. Water strikes, with generally low flow / seepage, varied from 0.60m to 4.45m depth bgl. This relatively shallow groundwater was also recorded in the monitoring visits within the shallow installed boreholes (between 0.34 m to 1.60m depth bgl).

12.38 The Source Protection Zone maps indicate that the Application Site is not within a groundwater source protection zone.

12.39 The Application Site is not within 2 km of any groundwater abstractions.

12.40 The underlying strata consist of the Oxford Clay Formation, which has relatively low permeability characteristics. Nonetheless, soil infiltration tests were carried out as part of the site investigation works. The results received were recorded as negligible.

12.41 Further information on the infiltration tests results is provided within Appendix 12.1.

Current Baseline - On-site flood risk

12.42 Environment Agency Flood Map for Planning data indicates that the vast majority of the Application Site is located within Flood Zone 1. Flood Zone 3 extents are largely confined within the Bitham Brook Tributary channel, while very small, localised areas adjacent to the western bank of the tributary are located within Flood Zone 2.

12.43 Environment Agency long-term surface water flood risk mapping indicates that the majority of the Application Site is at very low risk of surface water flooding. Areas of modelled ponding are associated with lower lying areas and existing drainage routes. The FRA notes that the national surface water mapping is conservative because it does not include all existing underground drainage infrastructure and pipe outfalls identified on the Application Site.

12.44 Watercourses in proximity to the Application Site are not tidally influenced. The risk of tidal flooding is therefore very low.

12.45 The Wiltshire Strategic Flood Risk Assessment viewer classifies the Application Site as having negligible groundwater flood risk. Reservoir flooding is considered highly unlikely, with the majority of the Application Site not at risk. A small area along the eastern boundary of



the Northern Parcel is shown to be at risk only in scenarios where reservoir flooding coincides with fluvial flooding.

Current Baseline - Drainage

12.46 Refer to Appendix 12.1 for the existing drainage plans.

12.47 The Application Site is greenfield. There are no public sewers on the Application Site. There is an existing private foul drainage network that was constructed to receive flows from the Proposed Development. This sewer, however, does not receive any flows, as there is no development on the Application Site.

12.48 A foul water pumping station and rising main are present on the Application Site and these were constructed exclusively to serve development on the Application Site. As the Application Site is still greenfield, there are no flows being generated and the pumping station is not receiving any foul water flows.

12.49 The rising main from the Application Site was constructed to discharge flows off site to a gravity sewer at a location where there is available capacity within the off-site gravity sewer network. The off-site public sewers are owned by Wessex Water.

12.50 Surface water flows from the Application site flow to the Bitham Brook Tributary east of the Site, by overland means or through existing ditches that have pipe outfalls. Some of the ditches on the Application Site also act as cut off drains for overland flows from upstream catchments and direct the flows to the Bitham Brook Tributary

12.51 The Application Site is not within an EA critical drainage area and there is no recorded sewer flooding within or close to the Application Site.

Current Baseline – Groundwater

12.52 Groundwater samples were taken from some of the onsite boreholes and examination did not identify any such elevated contaminants, with all hydrocarbon results found to be below the laboratory limits of detection.

12.53 A summary of the receptor sensitivity, based on the criteria set out in Table 12.1 is provided in Table 12.4 below.



Table 12.4 – Receptor Sensitivity to Change Table

Receptor	Sensitivity (Very High, High, Medium, Low or negligible)
Bitham Brook Tributary	Medium
Bitham Brook	Medium
On-site land fluvial flood risk	Low
On site land Surface water flood risk	Low
Public Off Site Foul sewer	Medium

Future baseline

12.54 In the future baseline, in the absence of the Proposed Development, it is envisaged that the Application Site would continue as a greenfield site. With respect to the water environment, it is envisaged that the current baseline will broadly reflect the future baseline, although it is acknowledged that climate change may contribute to more frequent extreme rainfall events, which will influence the pattern of site drainage and the potential for off-site effects.

ASSESSMENT OF POTENTIAL EFFECTS

12.55 The assessment of likely significant effects to Water Quality, Hydrology and Flood Risk during the construction and operational phases of the Proposed Development is described within this section of the chapter.

12.56 Key primary mitigation relevant to this chapter comprises the surface water and foul water drainage strategies. Surface water will be managed through SuDS including attenuation ponds, permeable paving, rainwater harvesting, retained or diverted drainage ditches and controlled discharge to the Bitham Brook Tributary.

12.57 The proposed foul water drainage strategy will convey flows from the Northern and Southern Parcels by gravity to the existing foul water pumping station. The foul drainage network is proposed to be offered for adoption by Wessex Water, with flows discharged off-site via the existing rising main.



Construction Phase

Surface Water Drainage

12.58 Prior to construction, a Construction Surface Water Management Plan will be prepared to ensure that construction activities will not directly affect water quality in on-site or off-site watercourses. The presence of boundary vegetation between construction areas and existing watercourses, and the implementation of best practice pollution prevention techniques through the Construction Surface Water Management Plan and the CEMP, will minimise the potential for suspended sediments and contaminants to reach these receptors.

12.59 Beyond the initial earthworks, it is envisaged that the surface water drainage system would be installed during early stages of the construction phase. Once installed, this will intercept any contaminants produced during the construction works, such as silty run-off, and prevent them entering the retained ditches, and in turn the Bitham Brook Tributary.

12.60 The impact of the construction phase on water quality within the existing on-site and off-site ditches and watercourses will be of negligible magnitude and, hence, of negligible significance.

Foul Water Drainage

12.61 It is unlikely that there will be significant volumes of foul water generated during the construction phase. Any welfare facilities are likely to be of a temporary nature and foul water will be removed from the Application Site for disposal, initially via tanker and then via the new foul water drainage system, once installed as part of the Proposed Development. As such, the impact of construction activities on foul water drainage will be of negligible magnitude and will not represent a significant effect.

Flood Risk

12.62 Construction activities associated with the Proposed Development will be undertaken in areas that are predominantly within Flood Zone 1. Built development is located away from the Bitham Brook Tributary and outside areas of fluvial flood influence.

12.63 Construction activities will be undertaken in accordance with the CEMP and a Construction Surface Water Management Plan. These documents will include temporary surface water attenuation measures, identification of temporary discharge locations, measures



to control sediment and pollution prevention measures to protect receiving watercourses including the Bitham Brook Tributary.

12.64 The impact of the construction phase on flow capacity within the existing on-site and off-site ditches and watercourses will be of negligible magnitude, and hence of negligible significance as flow off the Application Site will be attenuated to greenfield run off rates during the early stages of construction.

12.65 With implementation of the CEMP and construction-phase drainage controls, the effect of construction on flow capacity within existing drainage ditches and receiving watercourses will be negligible and not significant.

Operational Phase

Surface Water Drainage

12.66 During operation, the surface water drainage system will incorporate SuDS features including attenuation ponds, permeable paving, rainwater harvesting and retained or diverted drainage ditches. These measures will provide attenuation, water quality treatment, biodiversity and amenity benefits prior to controlled discharge to the Bitham Brook Tributary.

12.67 The total post-development surface water discharge rate will be restricted to 34.7 l/s for all rainfall events up to and including the 1% AEP plus climate change event, comprising 17.5 l/s from the Northern Parcel and 17.2 l/s from the Southern Parcel. This provides betterment over the existing greenfield runoff rates and will avoid increasing flood risk elsewhere.

12.68 The magnitude of effect of surface water discharge rate and quality within the Proposed Development and the watercourses nearby will be negligible following implementation of the proposed drainage strategy. No significant environmental effects are anticipated.

Foul Water Drainage

12.69 The foul water generated by the Proposed Development will be conveyed by gravity through suitably sized foul drainage pipes to the existing pumping station. Calculations within the FRA indicate that the gravity foul drainage network has adequate capacity to discharge peak flows and meets relevant self-cleansing velocity criteria.



12.70 Foul water will be discharged from the Proposed Development to an offsite gravity sewer through a rising main. The point of connection of the rising main was carefully identified to ensure foul flows from the Application Site are discharged where offsite sewers have adequate capacity.

12.71 The magnitude of effect on off-site foul sewers from the Proposed Development flows is small and this will not represent a significant environmental effect.

Flood Risk

12.72 The Proposed Development, including residential dwellings, commercial units and primary access routes, will be located on higher ground within Flood Zone 1 and set back from the Bitham Brook Tributary. Within the Northern Parcel, development is located more than 50m from the western bank of the tributary; within the Southern Parcel, dwellings and access roads are located over 100m from the tributary.

12.73 Finished floor levels will be set at least 150mm above proposed external ground or road levels and no lower than the 1% AEP plus 26% climate change fluvial water level plus 600mm free board. This equates to minimum levels of 47.51m AOD within the Northern Parcel and 48.07m AOD within the Southern Parcel.

12.74 The magnitude of effect on fluvial and surface water flood risk within the Proposed Development and the surrounding area will be negligible following implementation of the proposed drainage strategy, flood risk mitigation and exceedance routing. No significant environmental effects are anticipated.

12.75 A summary of the assessment of impacts during the construction and operational phases of the Proposed Development is presented within Table 12.5 below.



Table 12.5: Summary of Effects

Receptor	Sensitivity Evaluation	Effect	Magnitude of Effect	Significance of Effect	Temporary/ Permanent Beneficial/ Negligible/ Adverse Direct/Indirect
Construction Phase					
Bitham Brook Tributary	Medium	Potential for contamination during construction	Negligible	Negligible (Not Significant)	Temporary / Negligible / Direct
Bitham Brook	Medium	Potential for contamination during construction	Negligible	Negligible (Not Significant)	Temporary / Negligible / Direct
On-site land fluvial flood risk	Low	Potential for construction activities to increase fluvial flood risk	Negligible	Negligible (Not Significant)	Temporary / Negligible / Direct and Indirect
On site land Surface water flood risk	Low	Potential for construction activities to increase on and off-site surface water flood risk	Negligible	Negligible (Not Significant)	Temporary / Negligible / Direct
Public Off Site Foul sewer	Medium	Potential for increased pressure on the off-site drainage network during construction	Negligible	Negligible (Not Significant)	Temporary / Negligible / Direct
Operational Phase					
Bitham Brook Tributary	Medium	Potential for storm water flows from the Proposed Development to affect Bitham Brook Tributary's water quality and volume	Negligible	Negligible (Not Significant)	Permanent / Negligible / Direct
Bitham Brook	Medium	Potential for storm water flows from the Proposed Development to affect Bitham Brook's water quality and volume	Negligible	Negligible (Not Significant)	Permanent / Negligible / Direct



Receptor	Sensitivity Evaluation	Effect	Magnitude of Effect	Significance of Effect	Temporary/ Permanent Beneficial/ Negligible/ Adverse Direct/Indirect
On-and Off site land fluvial flood risk	Low	Potential for the Proposed Development to increase fluvial flood Risk On and Off-site	Negligible	Negligible (Not Significant)	Permanent / Negligible / Direct and Indirect
On site land Surface water flood risk	Low	Potential for the Proposed Development to increase surface water flood risk on and off-site	Negligible	Negligible (Not Significant)	Permanent / Negligible / Direct
Public Off Site Foul sewer	Low	Potential for increased pressure on the off-site drainage network following occupation	Small	Negligible to Minor (Not Significant)	Permanent / Negligible / Direct



Climate Change

12.76 Appropriate consideration of climate change is a fundamental requirement of flood risk assessment and drainage design. The FRA has considered climate change allowances for both peak river flows and peak rainfall intensity in accordance with Environment Agency guidance.

12.77 For fluvial flood risk, the Application Site lies within the Avon Bristol and North Somerset Streams Management Catchment. The FRA adopts a 26% central allowance for peak river flows for the 2080s epoch for the more vulnerable elements of the Proposed Development. For surface water drainage, the strategy has applied peak rainfall allowances of 40% for the 3.3% AEP event and 45% for the 1% AEP event, together with a 10% urban creep allowance for residential roof areas.

Accidents and Disasters

12.78 The main accident scenario with potential to affect the water environment is the accidental release of fuel, oil, sediment-laden runoff or other potentially polluting materials during construction or operation. During construction, this risk will be managed through the CEMP and Construction Surface Water Management Plan. During operation, runoff will be managed through SuDS treatment, attenuation ponds, permeable paving and controlled discharge arrangements.

12.79 Exceedance flow routes will be provided across the Application Site so that, in the event of blockage or rainfall exceeding the design capacity, overland flows are directed away from properties and critical infrastructure towards attenuation features and safe discharge routes.

12.80 With the provisions described above, no significant effects associated with accidents or disasters are anticipated in relation to Water Quality, Hydrology and Flood Risk.

ASSESSMENT OF CUMULATIVE EFFECTS

12.81 The following schemes were reviewed for assessment of cumulative effects with regards to Water Quality, Hydrology and Flood Risk:



Outline planning permission PL/2021/03749- Glenmore Farm Development

12.82 : The planning application is for the construction of up to 145 residential dwellings.

12.83 The Flood Risk and Drainage Report (Trace Design Transport and Civil Engineering , July 2022) identifies the following:

- The site is in Flood Zone 1 and has a low probability of flooding from fluvial and tidal sources. The risk of flooding from surface water, groundwater, sewers and artificial sources has also been assessed and can be considered low.
- It is proposed to discharge surface water via a soakaway and also to Bitham Brook Tributary through a sewer requisition. Runoff to Bitham Brook Tributary would be restricted to either 9.2 l/s or 13.3 l/s, subject to confirmation of whether partial infiltration can be utilised, for the 1 in 100 year + CC storm event.
- The potential for pollution from the proposed land uses for the site is classified as low to high as per CIRIA sustainable drainage system guidance. Appropriate treatment would be achieved through the proposed permeable paving, and attenuation pond.
- The main on-site drainage will be offered for adoption and will be managed and maintained for the lifetime of the development by a water company, ensuring they remain fit for purpose and function appropriately.

12.84 The Planning Inspectorate Appeal Decision notice however stipulated that the site does not exceed:

- 1 in 1 year storm event - 1.65 l/s
- 1 in 30 year storm event - 4.14 l/s
- 1 in 100 year storm event - 5.15 l/s

12.85 With regard to the potential for increasing the risk of flooding, the proposed development would increase the built area and area of hardstanding that, without mitigation, could lead to increases in peak discharges as the potential for infiltration to groundwater is reduced.

12.86 Sustainable Drainage Systems (SuDS) are proposed to mitigate the risk of increasing peak discharges offsite. SuDS are also proposed to improve water quality prior to discharge of surface water into the soakways and also to the Bitham Brook Tributary.



12.87 The surface water drainage strategy has been designed to ensure that the buildings within the development should not be flooded by a 1 in 100 year flood event (including allowance for climate change).

12.88 Considering the negligible flood risk and drainage effects anticipated, there are no significant cumulative effects arising from these proposals.

Planning ref PL/2026/03375 - Land off Storridge Road:

12.89 This is an outline application for up to 165 residential dwellings

12.90 The Flood Risk Assessment Report (Lees Roxburgh, April 2026) identifies the following:

- The site is in Flood Zone 1 and has a low probability of flooding from fluvial and tidal sources. The risk of flooding from surface water, groundwater, sewers and artificial sources has also been assessed and can be considered low.
- It is proposed to discharge surface water to a culvert north of the site. Runoff is to be restricted to a 20% reduction on the 1 in 1 year runoff rate, i.e. 12.9 l/s.
- The potential for pollution from the proposed land uses for the site is classified as low to high as per CIRIA sustainable drainage system guidance. Appropriate treatment would be achieved through the proposed permeable paving, and attenuation pond.
- The main on-site drainage will be offered for adoption and will be managed and maintained for the lifetime of the development by a water company, ensuring they remain fit for purpose and function appropriately.

12.91 Negligible flood risk and drainage effects are anticipated from this Development. In addition the Development is in a different drainage catchment to the Application Site hence negligible Water Quality, Hydrology & flood risk is also anticipated, therefore there are no significant cumulative effects.

Land at Shallow Waggon Lane

12.92 Up to 70 residential dwellings are proposed on the land southwest of the Application Site between the Application Site and Hawkridge Road. It is anticipated that a planning application is to be submitted in the second half of 2026



12.93 The site is in Flood Zone 1 and is at low risk of flooding from groundwater, sewers, reservoir inundation.

12.94 When the site is developed, it will have to comply with Wiltshire Council's Drainage and Betterment Strategy. Surface water will have to be discharged at 20% less than the current greenfield runoff rates.

12.95 Negligible flood risk and drainage effects are therefore anticipated from this development; therefore, there are no significant cumulative effects.

INTER-RELATIONSHIP EFFECTS

12.96 There are inter-relationships identified between this topic and Chapter 13 Soils, Geology and Contaminated Land. The effects of potential soil contamination have the potential to cause surface water and groundwater effects, this has been considered in the assessment presented.

12.97 An inter-relationship has also been identified between flood risk and climate change with regard to future flood extents and predicted impacts of increased rainfall intensity on sustainable drainage design. This has been considered within the assessment and within the Flood Risk and Drainage Strategy.

PROPOSED MITIGATION

12.98 No additional mitigation measures beyond the embedded mitigation within the FRA, drainage strategy, CEMP and Construction Surface Water Management Plan are required. Embedded mitigation includes finished floor level requirements, development setbacks from the Bitham Brook Tributary, controlled surface water discharge, SuDS treatment, exceedance routing and maintenance of drainage infrastructure.

RESIDUAL EFFECTS

12.99 The assessment of Water Quality, Hydrology and Flood Risk reported within this chapter demonstrates that, with implementation of the proposed mitigation and drainage strategy, residual effects will be negligible and not significant.



SUMMARY

12.100 The assessment has considered the interactions between the Proposed Development, surface water, groundwater, foul drainage infrastructure and receiving watercourses. The Application Site is predominantly within Flood Zone 1, with only small localised areas adjacent to the Bitham Brook Tributary falling within Flood Zone 2. The Proposed Development will be located within Flood Zone 1 and set back from the watercourse.

12.101 During construction, potential effects on the water environment will be controlled through the CEMP and Construction Surface Water Management Plan. The impact of the construction phase on water quality within the existing on-site and off-site ditches and watercourses will be of negligible magnitude, and hence of negligible significance.

12.102 During operation, the surface water drainage strategy will provide attenuation, SuDS treatment and controlled discharge to the Bitham Brook Tributary. The strategy will restrict total discharge to 34.7 l/s and incorporate climate change and urban creep allowances.

12.103 The proposed foul water drainage strategy will convey flows to the existing foul water pumping station and rising main. The FRA confirms that the proposed gravity network has adequate capacity to serve the Proposed Development. The proposed drainage strategy will also ensure that there will be no adverse impacts on the off-site sewer network.

12.104 Overall, the Proposed Development is not expected to increase flood risk either on-site or elsewhere and is not predicted to result in significant adverse effects on Water Quality, Hydrology or Flood Risk.

REFERENCES

Ref. 12.1: Flood and Water Management Act, 2010 - Available at:

www.legislation.gov.uk/ukpga/2010/29/pdfs/ukpga_20100029_en.pdf

Ref. 12.2: Water Act 2014. Available at: <https://www.legislation.gov.uk/ukpga/2014/21>

Ref. 12.3: Water Act, 2003. Available at: Available at:

www.opsi.gov.uk/acts/acts2003/ukpga_20030037_en_1

Ref. 12.4: Land Drainage Act 1991. Available at:

<https://www.legislation.gov.uk/ukpga/1991/59/section/23>



Ref. 12.5: Water Resources Act, 1991. Available at

www.opsi.gov.uk/ACTS/acts1991/ukpga_19910057_en_1

Ref. 12.6: Environment Act 1995. Available at: www.legislation.gov.uk/ukpga/1995/25

Ref 12.7: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 Available at : <https://www.legislation.gov.uk/uksi/2017/407/contents>

Ref 12.8: The Environmental Permitting (England and Wales) Regulations 2016 Available at <https://www.legislation.gov.uk/uksi/2016/1154/contents>

Ref. 12.9: Water Framework Directive - Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. Available at:

http://ec.europa.eu/environment/water/water-framework/index_en.html

Ref. 12.10: Groundwater Daughter Directive 2006/118/EC. Available at <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF>

Ref. 12.11: Groundwater Directive (80/68/EEC). Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31980L0068&from=EN>

Ref. 12.12: Ministry of Housing, Communities & Local Government. National Planning Policy Framework, February 2025 Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

Ref. 12.13: Ministry of Housing, Communities & Local Government. Planning Practice Guidance. Water supply, wastewater and water quality. Available at [Water supply, wastewater and water quality - GOV.UK \(www.gov.uk\)](http://www.gov.uk/government/publications/planning-practice-guidance/water-supply-wastewater-and-water-quality)

Ref. 12.14: Ministry of Housing, Communities & Local Government. Planning Practice Guidance. Flood Risk and Coastal Change. Available at [Flood risk and coastal change - GOV.UK \(www.gov.uk\)](http://www.gov.uk/government/publications/planning-practice-guidance/flood-risk-and-coastal-change)

Ref. 12.15: Wiltshire Council Drainage and Betterment Strategy (June 2024)

Ref. 12.15: Defra, Environment Agency Catchment data Explorer Bitham Bk - source to conf Biss Bk Water Body). Available at <https://environment.data.gov.uk/catchment-planning/v/c3-plan/WaterBody/GB109053021770>

Ref. 12.16: British Geological Society website, Available at: <http://www.bgs.ac.uk/data/mapViewers/home.html>



Ref. 12.17: Multi-Agency Geographical Information for the Countryside (MAGIC) website. Available at <http://www.magic.gov.uk>

Ref. 12.18: The Environment Agency Flood Map website, Available at <https://flood-map-for-planning.service.gov.uk/>

Ref. 12.19: CIRIA C753 - The SuDS Manual (2007) Available at https://www.ciria.org/Memberships/The_SuDs_Manual_C753_Chapters.aspx

Ref. 12.20: CIRIA C635 Designing for Exceedance in Urban Drainage Good Practice (2006);

Ref. 12.21: Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code"), Approved Version 2.0, and 10 March 2020. Available at: <https://www.water.org.uk/sewerage-sector-guidance-approved-documents>

Ref. 12.22: BS EN 752 2017 – Drain and Sewer Systems Outside Buildings (2017) The Building Regulations 2010 Drainage and Waste Disposal, Approved Document H, Office of Deputy Prime Minister. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/442889/BR_PD_F_AD_H_2015.pdf

Ref. 12.23: CIRIA C532 - Control of Water Pollution from Construction Sites, 2001. Available at: <http://www.orkneywind.co.uk/advice/SEPA%20Pollution%20Advice/ciria%20c532.pdf>

Ref. 12.24: DEFRA/ EA Preliminary Rainfall Run Off Management for Developments (2004)

Ref. 12.25: CIRIA Interim Code of Practice for Sustainable Drainage (2004)

Ref. 12.26: CIRIA C737 Structural and Geotechnical design of Modular Geocellular Drainage Tanks (2016)

Ref. 12.27: Wiltshire Strategic Flood Risk Assessment (SFRA) (2024) ArcGIS viewer available at <https://wiltscouncil.maps.arcgis.com/apps/webappviewer/index.html?id=28c00215d87b468a9a0cd79c63d3d270>

Ref. 12.28: Hawke Ridge Business Park Flood Risk Assessment, Tumu Consulting Ltd (June 2026)



(Ref 12.29) Proposed Commercial Development Land At Mill Lane, Hawkeridge,
Westbury Interpretative Ground Investigation Report, Ground Investigation
(South West) Ltd (May 2012)

Ref. 12.30: Hawke Ridge Business Park Westbury, Soakaway Testing, Ground
Testing LTD (November 2025)

Ref 12.31: Phase 1 Geo-Environmental Desk Study Report For Land Adjacent
Hawke Ridge Business Park, Mill Lane, Estbury, Wiltshire Ba13 4ld, Wilson
Associated (June 2026)