

Hydroecological & Drainage Technical Note



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Client:	Lorea Johnston: Wates Developments Group
Subject:	Hydroecological & Drainage Technical Note: Strategic Site Allocation.
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Introduction

Hilson Moran has been appointed to provide a briefing note to inform Wates call for site allocation in Rother and Hastings Councils' Local Plan (Regulation 18).

The contents of this note comprise the following:

1. Background information on Breadsell Farm Masterplan;
2. Drainage Strategy Summary;
3. Recommendations and next steps; and
4. Summary to inform the Vision Strategy Document for Hastings and Rother draft Local Plans.

1. Background Information

Breadsell Farm, hereafter referred to as the "Site", covers an area of approximately 25.34 ha and comprises greenfield land dissected by the Hastings Borough/Rother District Boundary. The Site includes the northern part of the Marline Valley Woods Site of Special Scientific Interest (SSSI) within its boundary.

The Site currently comprises three agricultural fields, with woodland in the east and south-east. This woodland is designated as Ancient Woodland and forms part of the SSSI. The Marline Valley Stream flows in a southerly direction through the SSSI. Varied bryophyte (mosses, liverworts and hornworts) assemblages are present within the SSSI associated with the stream and woodland, with both the Ancient Woodland and bryophyte assemblages forming notifiable features for which the SSSI has been designated.

The Site has historically been identified for its potential to provide new dwellings to support the housing needs of both boroughs. However, this has not yet progressed, due to objections from Natural England (NE), particularly in relation to a lack of baseline water monitoring and suitable Surface Water Drainage Strategy. Hastings Borough Council are currently updating their Local Plan to cover 2019 to 2039, and this includes planning for new development to meet local housing shortages and enhance the environment. As a result, there is a renewed focus on the Site.

In 2025, Hilson Moran undertook a Hydroecological Assessment of Breadsell Farm and, as part of the assessment, carried out a comprehensive review of the previous studies to date. A summary of the activities and key findings is provided within Table 1.

Table 1 Summary of the activities carried out to date.

Date	Activity	Findings
2008	NE letter, Hastings Borough Council LDF Core Strategy, Preferred Approaches	This letter was written by NE in response to Hastings Borough Council’s request for comments on their LDF Core Strategy document, regarding the allocation of the Breadsell Lane site (which covered a much larger area than the current Site). NE was concerned about the nature and location of this option to develop this area for housing, due to the potential to adversely affect the SSSI.
2009	Simon Davey Ecological Consultancy, Bryophyte Survey of the Breadsell Lane Area of Upper Marline Wood.	The survey concluded that, at the time, the study area was not a healthy habitat for bryophytes, as many common species that would be expected in such areas are absent or only present in very small quantities. The report identified several anthropogenic and natural factors likely influencing the abundance, distribution and quality of the bryophyte assemblages within the SSSI. Hilson Moran identified several limitations in the survey, including the time of year it was undertaken (late season), and reference made to ‘poor water quality’ throughout the report based on visual and olfactory observations taken by the surveyor, with no sampling and analysis of surface water undertaken as part of the survey.
	Premier Water Solutions (PWS) Ltd Review of HydroLogic Preliminary Hydrology Report for the Proposed Development at Breadsell Lane	Upon reviewing HydroLogic’s Preliminary Hydrology Report, PWS noted that the emphasis was to assess the natural hydrological processes at the Site, principally the water balance as it affects the SSSI. Rainfall monitoring, surface water and groundwater level monitoring and indication of the evapotranspiration rates was considered to be required to inform the provision of Sustainable Drainage Systems (SuDS). PWS agreed with the main principles of the drainage scheme proposed by HydroLogic, <i>i.e.</i> the ground is not suitable for standard infiltration techniques such as soakaways.
	Rigare Ltd, Scoping Level Hydrological and Hydrogeological Assessment of a Proposed Housing Development Site, Breadsell Lane	Rigare were commissioned by Hastings Borough Council to preliminarily assess the Site and they recommended that a 3-year monitoring programme of groundwater and surface water would be required to gain a confident assessment of the local hydrological regime, enabling a robust assessment of the impact of any development on the Site to be conducted.
2010	NE letter, Breadsell Lane allocation, Hydrological report	NE did not consider that there was sufficient information, at this stage, to determine the impacts of the proposed allocation on the SSSI and that further studies, as recommended in the report, would be

Date	Activity	Findings
		required to address this. NE therefore maintained its objection to the inclusion of this Site as a strategic allocation.
2012	Monson Drainage Strategy	The strategy relied on the “Drainage Hierarchy” in which priority is given to the removal of rainfall runoff by infiltration to ground in preference to discharge to watercourses and attenuation within several infiltration basins located at the south-eastern end of the Site. However, no infiltration testing was conducted as part of the strategy to demonstrate if such an approach was feasible.
2012	NE letter, Monson Strategy	NE concluded that although the proposed SuDS had the potential to protect the SSSI from pollution, the strategy had not understood the complex hydrology of the Site and has therefore failed to protect and mirror the natural environment. NE stated that proper site characterisation is required to inform a strategy which does not alter the current hydrological and hydrogeological regime, and reiterated that for them to remove their objection, as per Rigare’s recommendations, at least 3 years of monitoring would be required to develop a detailed hydrological understanding and provide a baseline against which future change can be assessed.
2025	Hilson Moran Hydroecological Assessment	<ol style="list-style-type: none"> 1. The Outline Drainage Strategy identified that at least 70% of the input into the Marline Valley Stream comes from surface water runoff. Consequently, the standard drainage hierarchy has been disregarded in favour of maintaining the current apportionment of surface water to sub-surface flows. The updated strategy proposes to mimic the existing multiple natural discharge points into the main watercourse from the various springs and ditches that dissect the Site. 2. A recommendation of the Hydroecological Assessment was to carry out infiltration testing at the Site to determine the feasibility of infiltration as a means of surface water disposal for the proposed development. If infiltration is found to be feasible and there is a risk of elevated groundwater levels, the LLFA require groundwater level monitoring (fortnightly readings from November to the end of March) to demonstrate that there will be at least 1 m unsaturated zone between the base of the infiltration features and the highest groundwater level recorded. 3. A comprehensive review of available bryophyte survey data for the Site, together with a detailed bryophyte survey was conducted to provide up-to-date data on the composition, health and extent of the bryophyte assemblage and to help understand any likely impacts the proposed development may have on it. Consequently, the field survey was extended to include the full SSSI. The survey conclude that a rich bryophyte was still present, and that the impacts of increased storm intensity and frequency

Date	Activity	Findings
		<p>associated with climate change may be more detrimental than water quality issues, with bank erosion and sedimentation impacting bryophyte habitats.</p> <p>4. Water Monitoring Programme: A comprehensive one year-long monitoring programme was proposed to collect data on surface water, groundwater, and soil conditions and potentially support site allocation. Further monitoring would then continue afterward to address any data gaps while the Local Plan or planning application progresses. This approach aligns with similar schemes affecting sensitive SSSIs, where NE has accepted one year of pre-development monitoring to establish baseline conditions and assess interactions with nearby water-dependent habitats.</p>
2026	Hilson Moran, Infiltration Testing	<ol style="list-style-type: none"> 1. The infiltration testing, carried out in December 2025, indicates that the site has low infiltration rates and therefore validates the Hilson Moran Outline Drainage Strategy approach. 2. As infiltration has not been found to be feasible, there is no longer a requirement for shallow groundwater monitoring to be conducted on the Site during the winter months, although deep groundwater monitoring is still proposed.
	Hilson Moran, 1-year Water Monitoring Programme	<p>This approach is currently under review by JBA on behalf of Hastings Borough Council. At the time of writing this note, a formal response is still pending. The approval of the proposed programme would signify an important milestone in enabling the Site to provide new dwellings to support the housing needs of both boroughs.</p>

Flood Risk Classification

According to the Environment Agency’s (EA) Flood Map for Planning, the majority of the Site is located in Flood Zone 1 (“low risk”). Some areas of Flood Zone 2 and 3 (“medium” and “high risk”, respectively) are located in close proximity to the Marline Valley Stream (an “Ordinary watercourse”) within Coneyburrow Wood, Birchen Wood and Four Acre Wood (Figure 1a).

The Marline Valley Stream runs through the eastern part of the Site within Coneyburrow and Birchen Woods (Ancient Woodland), flowing in a south-easterly direction. It then confluences with another branch of the stream and travels in a south westerly direction along the southern boundary of the Site.

The Marline Valley Stream enters the Coombe Haven (the nearest Main River) approximately 1.9 km south-west of the Site. The EA currently classifies the Coombe Haven as being of ‘Poor’ ecological quality and exhibiting a ‘Fail’ in chemical quality under the Water Framework Directive (WFD) classification scheme (dated 2022 and 2019, respectively).

There are three ponds on the Site, which are located within the woodland separating the northern and southern fields (and are associated with a small tributary of the Marline Valley Stream, which flows southeasterly through the woodland).

Surface Water Flood Risk

According to the Long-term Flood Risk Service Surface Water Flood Map (Figure 1b), the Site is predominantly located in an area of very low flood risk. There is a surface water flow path of low risk flowing in a southerly direction across the northern field towards the Ancient Woodland and Marline Valley Stream. The areas immediately adjacent to the Marline Valley Stream and ponds are at high risk, however these are contained within the woodland and do not encroach onto the fields. These surface water flood flow routes will need to be preserved within any masterplan for the Site, ideally within green infrastructure corridors.

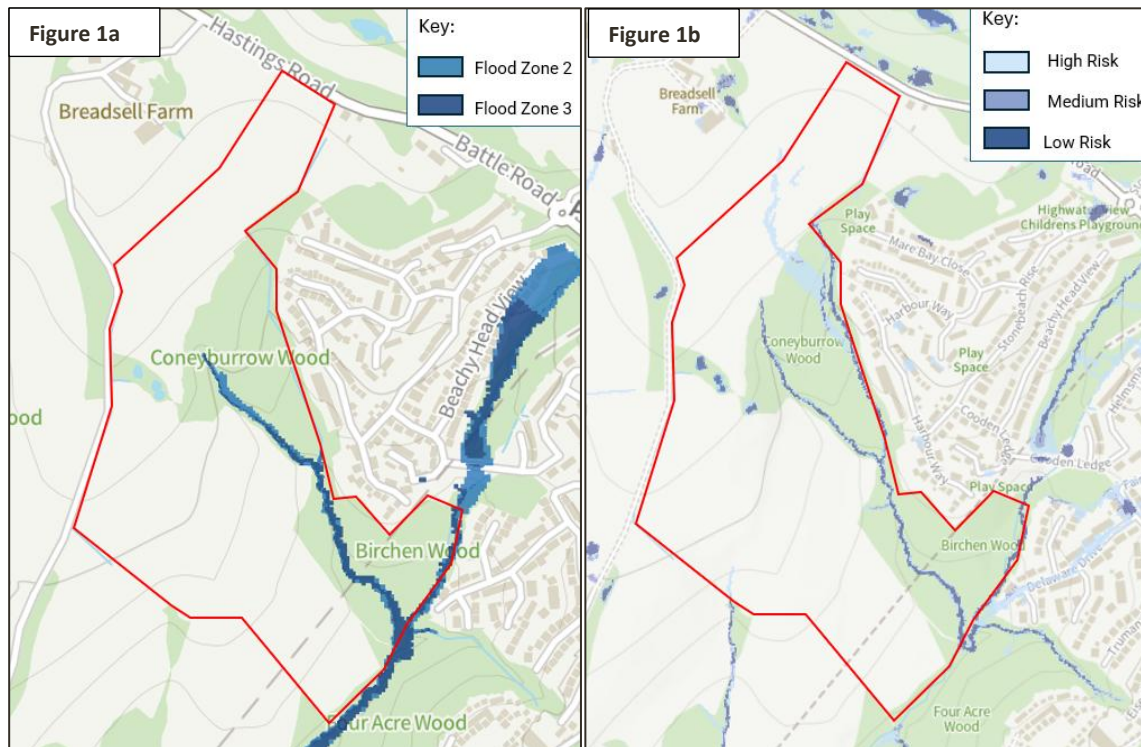


Figure 1: a) EA Flood Map for Planning, b) Long-term Flood Risk Service Surface Water Flood Map.

Groundwater and Surface Water Vulnerability

The majority of the Site is located in an area classified as of moderate groundwater sensitivity, due to the underlying Secondary A Aquifer within the Ashdown Formation, located within the eastern and southern portions of the Site. The western and northern margins of the Site are located in less permeable areas, within the Wadhurst Clay formation.

At present, the vulnerability of the groundwater receptor (*i.e.* the underlying aquifer) in the vicinity of the Site is considered to be high as the whole Site comprises fields, with no superficial deposits or hardstanding to afford protection against the vertical migration of contaminants into groundwater. Where present in the far north and west, the Wadhurst Clay Formation (unproductive strata) should offer

some protection to the underlying aquifer. The proposed development would introduce buildings / hardstanding cover and likely reduce this vulnerability. Any proposed development would reduce local nutrient inputs as a result of the removal of agricultural activities, whilst diffuse pollution from new urban sources would be effectively managed through the widespread provision of SuDS throughout the scheme.

2. Drainage Strategy Summary

The 2025 Outline Drainage Strategy (Figure 2), prepared by Hilson Moran as part of the Hydroecological Assessment, proposes to mimic the existing local hydrogeological regime by maintaining the apportionment of surface water runoff and sub-surface flow. The provision of appropriate SuDS will also provide water quality enhancement. The proposed strategy will therefore limit any disturbance to the associated bryophyte assemblage and Ancient Woodland within the SSSI.

As part of the strategy, surface water runoff is proposed to be attenuated within SuDS features, including detention basins and attenuation ponds, distributed throughout the scheme, with swales and filter strips used to convey runoff. It is proposed that this runoff is discharged to the Marline Valley Stream at seven different locations across the Site.

With the proposed strategy in place, runoff rates will be restricted to the existing 1 in 100-year greenfield runoff rate (*circa* 285 l/s for the whole Site) by means of flow regulation devices such as Hydrobrakes. In line with the Local Lead Flood Authorities (LLFAs) of Rother and Hastings and, the National Planning Policy Framework (NPPF), the proposed drainage strategy is designed to be safe for present and future flood risk scenarios, including a 45% climate change allowance. The Site attenuation (calculated to be *circa* 3380 m³), will be achieved by providing the storage across 7 sub-catchments, as detailed in Table 2 below.

The gradients of the slopes of the swales, detention basins and attenuation ponds should be gentle and not exceed 1:3 to allow safe access and egress, and bankside maintenance. It is envisaged that the basins and ponds will have an average depth of 400 mm, except in Catchment 6 where they will have an average depth of 200 mm. The swales, filter strips, detention basins and attenuation ponds present an opportunity to enhance biodiversity, including the creation of wetlands.

Table 2 Summary of Site greenfield runoff rates and attenuation volumes.

Catchment	1:100 year Greenfield runoff rate (l/s)	Attenuation Storage (m ³)
1	47.57	266
2	33.93	720
3	34.11	288
4	35.37	703
5	47.34	525
6	34.01	244
7	53.04	634
Total	285	3380

The Simple Index Approach, as outlined in the SuDS Manual, has been applied to each of the proposed SuDS treatment trains on the Site. It has been demonstrated that the SuDS mitigation index is greater than the pollution hazard index for each contaminant type in each catchment. The SuDS treatment trains will therefore provide adequate pollutant removal on site before runoff is discharged to the Marline Valley Stream, thereby protecting the stream and its tributaries from harm.

It is anticipated that the location and sizes of the attenuation basins may be subject to revision as the Masterplan evolves, particularly:

- Additional residential units could be located within sub-catchment S1 (Figure 2), with maintained at the greenfield rate;
- If any additional lands are incorporated into the Masterplan, they would be integrated into the outline drainage strategy and will follow its general design principles i.e. that surface water runoff apportionment will be maintained, runoff rates will be restricted to greenfield using suitable SuDS for attenuation, and discharge will be by means of multiple outfalls to the Marline Valley Stream.

Infiltration Testing

A recommendation of the Hydroecological Assessment was to carry out infiltration testing at the Site to determine the feasibility of infiltration as a means of surface water disposal for the proposed development. The infiltration testing was carried out in December 2025 in accordance with BRE365 methodology. The results show low infiltration rates across the Site and therefore, it is not recommended to discharge surface water runoff from the proposed development via dedicated infiltrating SuDS devices, such as soakaways and infiltration basins.

The infiltration testing results therefore:

- Invalidate the approach of the 2012 Monson Engineering Ltd Surface Water Strategy for the Site, that relied heavily on the infiltration of runoff to groundwater by means of soakaways and infiltrating permeable pavements;
- Supports the Hilson Moran proposed SuDS Strategy that is based on the maintenance of the current apportionment of surface water to sub-surface flow, which will be targeted using detention devices, with naturally slow rates of percolation permitted through the bases of basins and swales, where possible. The SuDS devices, which will accommodate runoff from the 1 in 100-year event, will be distributed throughout the Masterplan, with multiple discharge points to the small watercourses that dissect the Site. This approach will mimic the existing natural drainage routes and preserve the current hydrological regime, important for maintaining the health of the Ancient Woodland, Marline Valley Stream and associated bryophyte assemblage; and
- Negates the need for shallow groundwater monitoring required for demonstrating the year-round efficacy of infiltrating SuDS devices (although the installation of deep boreholes and a 1-year programme of groundwater monitoring will still be progressed in order to provide important data on the water table levels and quality across the Site).

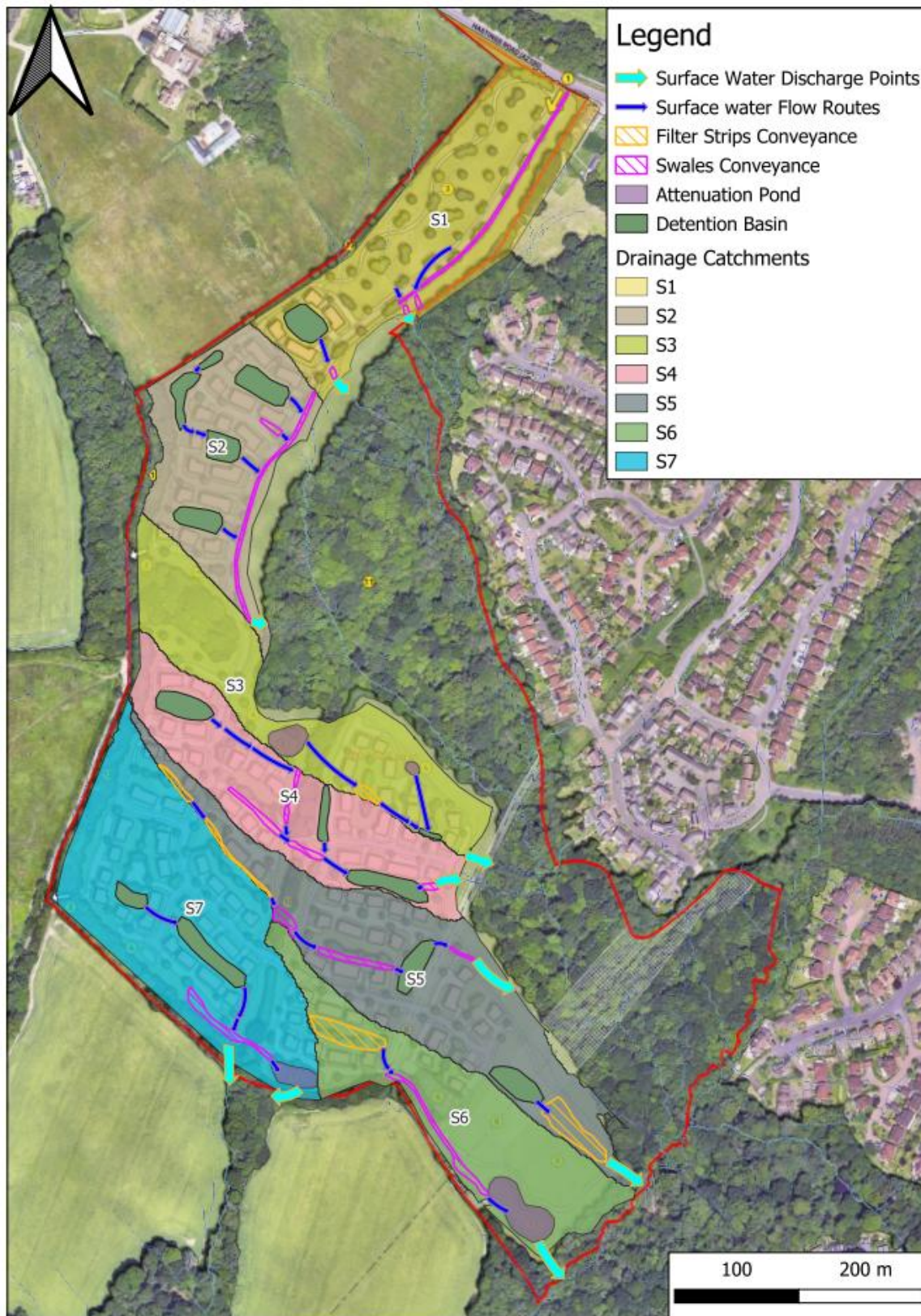


Figure 2: Proposed Outline Drainage Strategy (Hilson Moran, 2025)

3. Recommendations and Next steps

As part of the Hydroecological Assessment, the following recommendations have been made to ensure that the Site will provide much needed housing for the borough, whilst at the same time minimising impacts on the neighbouring SSSI and sustainably conserving the Ancient Woodland and sensitive bryophyte assemblages associated with it:

- Appropriate drainage, treatment and water management should be included into the development design in order to carefully control the quality and volumes of water entering the ghyll stream catchment.
- The drainage strategy for the proposed development should comply fully with the recommendations for an outline sustainable drainage strategy presented within this Hydroecological Assessment, which aims to mimic the existing scenario and limit disturbance to the local hydrogeological regime and associated bryophyte assemblage in and around the stream.
- Silt control should be of particular focus within the drainage design of the proposed development.
- Run-off from roads, other hard surfaced ground, roofs *etc.* should be captured within the development and treated on-site with appropriate features to remove silt and pollutants at source. The current apportionment of surface water and sub-surface flows will be maintained, with detention SuDS also permitting evaporation and gradual infiltration to groundwater, where possible.
- Access of people into Coneyburrow and Birchen Wood from the new development should be carefully planned and managed to prevent a proliferation of entry points and paths within this part of the SSSI. In particular, stream crossing points would benefit from construction of footbridges to discourage bank erosion.

Water Monitoring Programme

Hilson Moran propose to conduct an initial, year-long comprehensive monitoring programme to provide physical and qualitative data on surface water, groundwater and soil conditions, and potentially enable allocation of the Site¹.

This approach would align with other projects and schemes where there are potential impacts on SSSIs sensitive to changes in the hydrological/hydrogeological regimes, and where NE has agreed, through consultation, to one-year's pre-development monitoring in order to provide suitable baseline data and understand the interactions between the proposed scheme and the nearby water-sensitive SSSIs.

The proposed approach is currently under review by JBA Consulting Ltd, on behalf of Hastings Borough Council. At the time of writing this note, a formal response is still pending. The approval of the proposed

¹ Hilson Moran Hydroecological Assssment, Chapter 8.2.2 Water Monitoring Programme, June 2025.

programme would signify an important milestone in enabling the Site to provide new dwellings to support the housing needs of both Hastings and Rother.

4. Vision Strategy Summary

The Site has historically been identified for its potential to provide new dwellings to support the housing needs of both Hastings and Rother. However, this has not yet progressed due to objections from NE, particularly in relation to a lack of baseline water monitoring and suitable Surface Water Drainage Strategy for the Site.

Hastings Borough Council and Rother District are currently updating their draft Local Plans and this includes planning for new development to meet local housing shortages and enhance the environment.

As a result, there is a renewed focus on the Site for strategic allocation within both Local Plans.

The Hydroecological Study carried out by Hilson Moran in 2025, on behalf of Wates, aims to respond to the concerns raised by NE, by providing a comprehensive 1-year water monitoring programme and presenting an outline surface water drainage strategy that will limit any disturbance to the neighbouring SSSI and its associated Ancient Woodland and bryophyte assemblages.

The outline drainage strategy is based on the maintenance of the current apportionment of surface water to sub-surface flow, which will be targeted using Sustainable Drainage System (SuDS) detention devices, with naturally slow rates of percolation permitted through the bases of basins and swales, where possible. The SuDS devices, which will accommodate runoff from the 1 in 100-year event, will be distributed throughout the Masterplan, with multiple discharge points to the small watercourses that dissect the Site. This approach will mimic the existing natural drainage routes and preserve the current hydrological regime, important for maintaining the health of the Ancient Woodland, Marline Valley Stream and associated bryophyte assemblage.

It is anticipated that the location and sizes of the attenuation basins may be subject to revision as the Masterplan evolves, however, any revisions would be integrated into the outline drainage strategy and follow its general design principles *i.e.* that surface water runoff apportionment will be maintained, runoff rates will be restricted to greenfield using suitable SuDS for attenuation, and discharge will be by means of multiple outfalls to the Marline Valley Stream.

Following the infiltration testing carried out in December 2025, the Hilson Moran outline drainage strategy has been proven to be the most appropriate and sustainable option for surface water disposal. It is anticipated that, with the approval of the proposed one year-long water monitoring programme, the provision of the required physical and qualitative data on surface water, groundwater and soil conditions will enable the sympathetic development of the site for housing, in line with its strategic allocation in both the Hastings and Rother Local Plans.