

Implications of Strategic Policy HA2 on Flooding, Wastewater Management, Water Supply, and Environmental Impact.

A report prepared for Save West of Ifield Campaign to Horsham District Plan Regulation 19 Consultation¹

“Water, water every where, nor any drop to drink²”

Unlike the ancient mariner, we are not stranded out at sea – but there are parallels. Periods of extreme drought are common coupled with periods of flooding. Quantities of saline water on Planet Earth far outweigh those of freshwater whose quality may make it far from ‘fresh’.

1 Introduction

- 1.1 This report examines the policies and evidence base pertinent to the subject of water in the Horsham District Plan 2023 -2040 with respect to Strategic Policy HA2. The evidence base documents operate at a high level explaining modelling used, allowances for climate change, capacity of utilities companies, flood risk assessments, whole catchment development plans and legislation.
- 1.2 To obtain a more granular picture of what is happening ‘on the ground’ it also draws on the work of the River Mole River Watch Group (RMRW) - the River Mole being the receptor river from HA2. Simon Collins, a trustee of the group, put together his assessment of likely impacts of HA2 in a paper for SWOI in light of their studies of the Mole. His paper (virtually a small book) is too large to send as an accompanying document. I have however drawn from it and can make it available later if the inspector wishes to see it. The RMRW group would class as a citizens’ group. Dr Jess Neumann, Associate Professor of Geography and Environmental Science at the University of Reading³, is a fellow trustee.

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¹ The author of this report is Jenny Frost. She was professionally involved in science teacher education. Her first degree was in physics; subsequent qualifications were in Education. She is indebted to Simon Collins for his advice and information through his explanatory paper and through discussions on field visits. Simon Collins’ background is in Geography and Education.

² Samuel Coleridge Taylor 1797-8 *The Rime of the Ancient Mariner*

³ Jess Neumann <https://www.reading.ac.uk/ges/staff/jess-neumann>

2 Water within the context of site HA2

- 2.1 The Horsham District (HDC) draft local plan proposes a development of 3,000 houses on primarily greenfield sites and is allocated under Strategic Policy HA2. The site comprises: fields of Ifield Court Farm, Furlongs 'farm' (a relatively small area used for small businesses), the Grove (erstwhile nursery now closed) and Ifield Golf Course.
- 2.2 Most of the site is owned by Homes England (HE). Some ownership goes back to the compulsory purchase order (CPO) for the development associated with Crawley New Town in the late 1940s. Under the original Minoprio⁴ plans much of the area covered by HA2 was marked as GREEN BELT. Ownership has passed from the Commission for the New Towns to Homes England. Subsequently HE has purchased most of the remaining site.
- 2.3 The proposal as outlined in HE's Environmental Impact Assessment Scoping Opinion Report (EIASOR, 2023) shows more than the 3,000 houses. It includes a travellers' site for 12 pitches, three schools (one secondary and two primary), a commercial and business centre, a community centre and an 80-bed hotel.
- 2.4 It is assumed that Southern Water will supply drinking water from its supply at the Hardham water works. As HA2 is within the North Sussex Water Resources Zone (SNWRZ) it will be subject to the water neutrality policies of that region. It is also assumed that Thames Water will deal with wastewater at its Crawley wastewater treatment works (WwTW). Other solutions have been mooted.
- 2.5 The receptor river from HA2 is the River Mole which runs north to join the Thames at East Molesey. Four water courses run through the site: Hyde Hill Brook, Ifield Brook, an unnamed water course from the golf course, and the River Mole. There are no extant ponds on the site, other than the mediaeval moat at Ifield Court Farm, even though there is frequently standing water in the fields after heavy rain. Parts of the site associated with Ifield Brook and the Mole are in Flood Zones 2 & 3. The rest is in Flood Zone 1. There is one large impounded water body to the south of the site, Ifield Mill Pond and another, Douster Pond, further south, which feeds into Ifield Mill Pond via Douster Brook. The Mill Pond flows into Ifield Brook. The Bewbush Brook flows through the Kilnwood Vale development, which is still in the construction phase, and this also flows into Ifield Mill Pond and thus into Ifield Brook and ultimately the River Mole.
- 2.6 Homes England has previously promoted the 3,000 site as the first phase of a 10,000 site. Even though the Horsham Plan has 'parked' this idea for the period of this planning period, the idea of the larger site is in the public domain. This larger site is also entirely within the Upper Mole Catchment Area. See figure on the front cover of the report from Simon Collins.

⁴ Charles Anthony Minoprio (1900 -1988) was a British Architect and Town Planner; he was the lead town planner for the design of Crawley New Town. The map is reproduced I Gynne, D. figure 68 p 159.

3 Executive Summary

- 3.1 Strategic Policy HA2, West of Ifield, has too many unresolved problems related to water supply, wastewater treatment, flooding and the protection of water quality to justify it as a sustainable development. The solutions and mitigations will be costly in terms of finance, carbon costs and time and there is limited certainty that they can be achieved.
- 3.2 The long-term maintenance of the necessary infrastructure is not built into the policy at a level that inspires confidence that it will be achieved. As a result, HA2 will not be a sustainable development rendering the Local Plan regulation 19 unsound.

4 Water Policy Context

National Policy

- 4.1 National Policy supports development that is sustainable over its lifetime (taken to be 100 years), and that infrastructure should be aligned with growth, mitigate against climate change and adapt to its effect (NPPF 11a).
- 4.2 NPPF requires local planning authorities (LPAs) to prepare policies that
make sufficient provision for: ...b) infrastructure for water supply, wastewater, flood risk...d) conservation and enhancement of the natural... environment, including ...planning measures to address climate change mitigation and adaptation. (NPPF 20)
- 4.3 NPPF requires that development should avoid areas of flood risk, and that building should be made safe for its lifetime.
Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas of high 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. (NPPF 159).

- 4.4 An important part of flood management requires safeguarding land from development for current or future flood management (NPPF 161 b), ensuring safe access and escape routes.
- 4.5 NPPF also requires sequential tests and exception tests to determine suitability of sites which are within certain flood zones. (NPPF 162) and for development to be flood resistant and resilient so that the area can be brought back to use easily following a flood event (167 b) – and that there are safe access and escape routes (NPPF 167 c).
- 4.6 NPPF 167 c) and 169 refer to the need to incorporate Sustainable Drainage Systems (SuDS) and that
- they have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development (169 c) and d) where possible provide multifunctional purposes.*
- 4.7 The environmental impact of development on water is addressed in both the transport and flood sections. The two transport issues are: road pollution ending up in water courses, and the propensity of development to increase the risk of surface flooding. Transport issues should be considered from the earliest stages of plan-making and developmental proposals, so that:
- d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains. (NPPF 104)*
- 4.8 The environmental impact is addressed more fully in section 15 Conserving and Enhancing the Natural Environment (pp 50 – 54).
- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of...water pollution.... (NPPF 174e)*

Local Plan Policy

- 4.9 The adopted Local Plan is the Horsham District Planning Framework (2015) and the emerging Local plan is the Reg 19 Horsham Draft Local Plan 2023 -2040. (Dec 2023)

Horsham District Planning Framework (2015)

- 4.10 Policy 37 states that designs should include measures to “Limit water use to 110 litres per person per day”. This has now been superseded by the need for water neutrality, which limits water use to 85l/p/d in the NSWZ (North Sussex Water Resource Zone).
- 4.11 Strategic Policy 38 on flooding states that:
- Development proposals will follow a sequential approach to flood risk management, giving priority to development sites with the lowest risk of flooding and making required development safe and without increasing flood risk elsewhere. (38.1)*

4.12 It also requires measures that developers: “Comply with tests and recommendations set out in the Horsham District Strategic Flood Risk Assessment (38.2)” and “Where there is an increased flood risk, incorporate SuDS.... “(38.3)

4.13 The following statements address ecological and biodiversity issues:

Consider the vulnerability and importance of local ecological resources such as water quality and biodiversity when determining the suitability of SuDS...(38.4).

Utilise drainage techniques that mimic natural drainage patterns and manage surface water as close to its sources as possible ...where technically possible...(38.5).

4.14 There is also a directive to:

Be in accordance with the objective of the Water Framework Directive and accord with the findings of the Gatwick Sub Region Water Cycle Study in order to maintain water quality and water availability in rivers and wetlands and wastewater treatment requirements (38.6).

4.15 Issues related to water appear in the SP35 Climate Change in order to keep water in the environment, to help prevent heat islands developing and because water supply and wastewater treatment are large users of energy. The Policy states:

Development must be designed so that it can adapt to the impacts of climate change, reducing vulnerability, particularly in terms of flood risk, water supply and changes to the district’s landscapes.

Horsham District Local Plan Regulation 19 2023-2040

- 4.16 Policies pertaining to water occur in SP6 Climate Change; SP 9 Water Neutrality and SP 10 Flooding. As with the NPPF, Wastewater Treatment is only covered under infrastructure in general terms (SP 2.3) and there are statements in SP HA2.
- 4.17 SP 6 Climate Change states that developers should take climate change into consideration when assessing the impact on water supply and flooding. The phrase ‘use of blue/green infrastructure’ is used which indicates the use of natural ways of holding water in the environment to prevent floods rather than putting in ‘flood defences’ (e.g. walls and concrete channels for rapid run-off which only cause further problems downstream). SuDS should provide multifunctional benefits (SP6, 2b & c). This is a reference to the ability of well-designed SuDs to impound water, release it slowly into receptor rivers, so that it can feed vegetation, and filter out some contaminants.
- 4.18 SP6.3 states that “In considering the likely impact of climate change over the lifetime of the development reference should be made to the most recent climate change projections” – which takes us into the 2140 epoch – the lifetime of a development being 100 years.
- 4.19 SP 9 Water Neutrality requires that: ‘all development within the Sussex North Water Resource Zone (WRZ) will need to demonstrate water neutrality through water efficient design and offsetting of any additional water use of the development’. Water neutrality means that the water demand for any new development must not require more water to be extracted from Hardham than at present.
- 4.20 The policy states that Water neutrality will be achieved by water consumption in new builds being restricted to 85 l/p/d for domestic use and non-domestic enterprises achieving 3 credits within the BREEAM standard or equivalent. The water then needed will be sourced from savings made elsewhere; by recycling water; from mending of leaks; or from potential new sources.
- 4.21 The policy states that:
- A local authority led offsetting scheme will be introduced to bring forward development and infrastructure supported by Local and Neighbourhood Plans. The authorities will manage access to the offsetting scheme to ensure that sufficient water capacity exists to accommodate planned growth within the plan period. (ref)*

4.22 SNOWS (Sussex North Offsetting Water Scheme) was established at the end of 2023 between the participating local authorities and West Sussex County Council and is still recruiting staff. The first reporting of data is expected at the end of 2024 (SNOWS Newsletter, Feb 2024). Only after the public examination of the Horsham Local Plan will we know if there is evidence that sufficient offsetting can be achieved for the scale of building that is envisaged in HA2. Some rewording of Policy 9 is perhaps needed to synch development plans with that of SNOWS. Despite the trials on water saving that have taken place in Crawley on a limited number of council properties, sufficient data simply is not present yet.

4.23 A technical note on achieving water neutrality issued in 2021 by Aecom concluded that all development, regardless of size should incorporate re-use technologies:

The results have shown a range of theoretical scenarios which achieve differing levels of progress towards water neutrality but which all include significant challenges. In order to achieve 100% water neutrality within the district a significant funding pool and associated 'delivery plan' would be required, along with more stringent local policy requirements within the Local Plan which would require developers to incorporate reuse technologies within all new homes, regardless of the size of the development"⁵

4.24 One of the solutions that has been suggested for achieving water neutrality is to source water for more areas in the north Crawley Area from SES Water (Sutton and East Surrey Water) and then pump effluent back into the Arun catchment – a costly and environmentally questionable solution.

4.25 It goes on to require that proposals meet a list of 13 criteria. These cover considerations related to: flood zones within the site; avoiding flood plains; undergoing sequential and exception tests for flood zones 2 & 3, using a 1% exceedance event probability; avoiding creating flood elsewhere; having a site specific flood assessment; complying with HDC flood risk tests and recommendations; using SuDS; making appropriate provision for surface water drainage (not into the foul sewer); following directives to prevent water contamination; mimicking natural drainage patterns and ...importantly *"include a management plan to maintain the flood water assets in perpetuity"*.

4.26 Strategic Policy 11 *Environmental Protection* addresses environmental quality related to water. Development proposals must ensure that they: *"Maintain or improve the environmental quality of any watercourses, groundwater and drinking water supplies, and prevent contaminated run-off to surface water sewers, taking account of the Water Framework Directive (WFD) and South East River Basin Management Plan or any subsequent updates"*.

⁵ Horsham-LP_Water-Neutrality-Technical-Note-March 2021by Aecom

Horsham Local Plan Regulation 19 Strategic Site Allocations Strategic Policy HA2 Land West of Ifield

- 4.27 Para 10.87 states that because of water neutrality there will be the delivery of only 1,600 houses in the plan period “the requirement for new development to be water neutral has lengthened anticipated delivery times”.
- 4.28 In para 10.94 it states that: “A comprehensive masterplan (Figure 7) has been developed to ensure that issues such as flood risk...and water neutrality are comprehensively addressed ahead of any development...”. It is premature to suggest that the masterplan has been developed when a site-specific flood risk assessment has not yet been completed.
- 4.29 Given the need for Wastewater Treatment, SP HA2.10 requires close liaison with water utilities companies, “to ensure that a new or expanded Wastewater treatment Works (WwTW) is provided to provide timely additional capacity for the sewerage network.” We are not privy to progress on this. The presence of Thames Water laying large pipes across the fields of Ifield Court Farm before the pandemic and the recent appearance of a Thames Water notice announcing ‘Sewage pumping Station, at (xx) has sparked questions locally that preparations were being laid ahead of the public examination of the plan. However, Rusper WwTW is about to close and the sewage pumped to Crawley WwTW (GWCS, 2021, p7). This could account for this activity.
- 4.30 Land is to be safeguarded for the search of the route for a full Crawley Western Multi-modal Transport Corridor (MmTC) (HDC SPHA2.9). If this were built (obviously in in a later planning period) then the area of greenfield land being urbanised would be vastly increased. Even the section of MmTC within HA2 will be large. This has potential to significantly increase surface water discharge which would increase nitrogen levels in nearby water courses, requiring further mitigation not fully addressed in the Reg19 Local Plan.
- 4.31 Turning to environmental impact, the strategy refers to:

delivery of a biodiverse River Mole Linear Park (4 c) and other ponds, watercourses, wetlands... are in the first instance protected in situ, or else impacts appropriately mitigated to ensure the protection of protected or vulnerable species. (4d).

Linear parks have their place but development often goes as near as flood risks allow to a water course and debris from a development finds its way into the river. It is not uncommon to see an accumulation of cans, bottles and such-like in a river especially near crossing points when they are close to housing. Debris also goes into rivers during construction, a phenomenon we have observed locally with the construction of Kilnwood Vale.

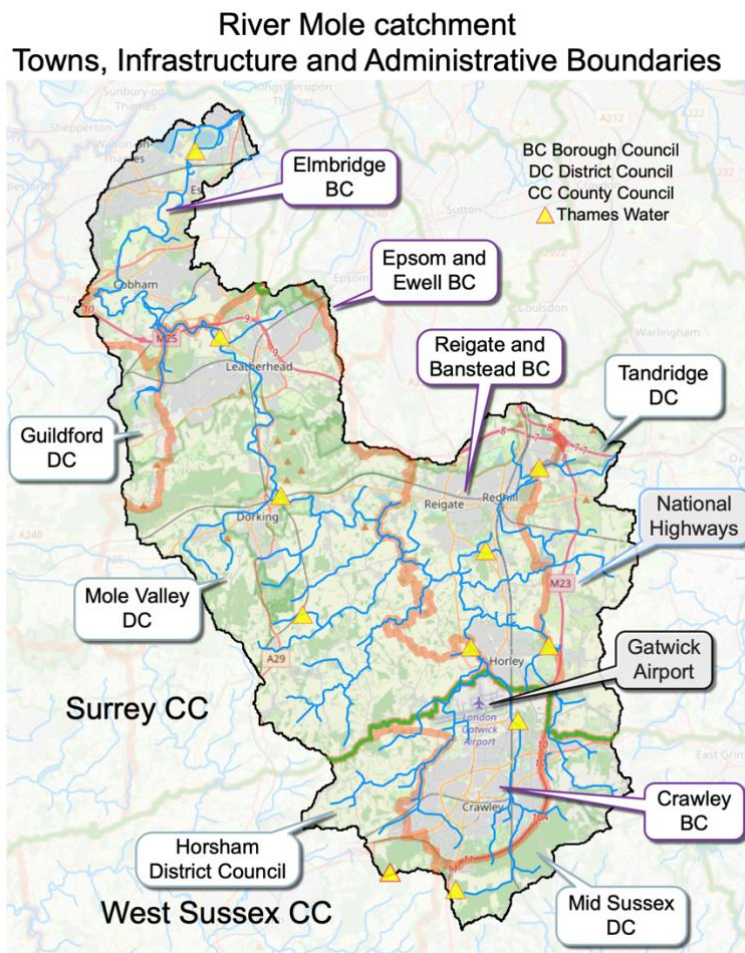
Statements of Common Ground and Duty to Cooperate

4.32 Despite the fact that water flows across boundaries, the statements of common ground with respect to water are limited. In the case of Crawley Borough Council this is partly circumvented by the Gatwick Water Cycle Study being prepared for, and presumably financed by, both HDC and CBC. The SCG between Mole Valley and HDC is however indefensible. Questions related to water have not been addressed despite the receptor river running through Mole Valley. The additional traffic is not seen as a problem despite the fact that it will lead to increase pollution in the river. On the other hand, the statement of agreement between Crawley and Reigate and Banstead does contain an agreement to

- *to develop an agreed position on cross boundary flooding impacts;*
- *to develop an agreed position in relation to water supply and waste water treatment impacts of strategic allocation sites.*

While the wording of this implies that the positions are not yet agreed it does indicate an awareness of the cross-boundary water issues.

The map below shows the large number of LPAs within the River Mole catchment.



5 The Evidence Base - sources of Information

Gatwick Sub-Region Water Cycle Study 2020 and

Crawley Borough Council Addendum to the Water Cycle Study (2021)

- 5.1 The HDC Development Policy Framework includes adherence to advice and guidance from the Gatwick Sub-Region Water Cycle Study (GWCS). The latest version was published in August 2020. It contains information about statutory bodies that must be consulted and legislation that regulates the industry. The study aims not only to outline its directives and guidance but to display the evidence on which they are based. It highlights capacity issues for different scenarios of growth (including no growth) and has modelled impacts of climate change at three levels of 'allowance'. The addendum (2023), by comparison, is a short document showing changes in light of slightly different housing projections from those used in 2020. The findings of the 2020 study were not significantly altered.
- 5.2 There are several directives for protection of the environment: **The Urban Wastewater Treatment Directive** (UWWTD) to protect the environment from adverse impacts on the environment from wastewater discharge from WWTWs; The Habitats Directive which aims to protect plants, animals and habitats and The Water Development Framework (WDF) (law since 2003) is used to determine the status of waterways.
- 5.3 The **Habitat Directive** "*created a network of protected areas around the European Union of national and international importance called Natura 2000 sites. These include: Special Areas of Conservation (SACs) – [which] support rare, endangered or vulnerable natural habitats, plants and animals (other than birds) [and]. Special Protection Areas (SPAs) – [which] support significant numbers of wild birds and habitats*". (GWCS, 3.62). None of these are within HA2, but there are two downstream on the stretch from the Mole Gap to Reigate SAC and SSSI: and at Esher Commons and Reigate Heath.
- 5.4 The **Water Development Framework** (WDF) (law since 2003) is used to determine the status of waterways. "It introduced a more rigorous concept of what "good status" should mean than the previous environmental quality measures. The WFD estimated that 95% of water bodies were at risk of failing to meet 'good status.'" (ref) The WDF also requires River Basin Management Plans to be developed to provide baseline classification for each waterbody based on relevant data and programmes for improvement of the water bodies. The Mole falls within the Thames Water River Basin.
- 5.5 A key objective of WFD is to prevent deterioration in environmental status. Another equally important objective requires all water bodies to achieve good ecological status. "Future development needs to be planned so that it helps towards achieving the WFD objectives and does not result in further pressure on the water environment and compromise WFD objectives."

- 5.6 A measure designed to prevent further deterioration is the **Nutrient Neutrality** policy—such that a development does not add to the nutrient pollution of water at nationally and internationally protected sites. Two of the key indicators are phosphates and nitrates where high levels can lead to eutrophication of water. It requires an assessment of current pollution levels of the site and a comparison with predicted future levels. Mitigations are required if the latter are greater than the former. A developer does not have responsibility for existing poor water levels, they only have to answer whether they will make things any worse.
- 5.7 The findings of the GWCS are not encouraging for WwTW at Crawley. It was rated as ‘red’ in the 2020 study (figure 7.3 p114); it was operating at capacity and would require significant infrastructure upgrades to prevent their flow permit being exceeded between 2025 and 2030. The next WwTW downstream at Horley was also rated ‘red’. The updated assessment (2023) still showed that improvements would be needed and “Thames Water requested that the ‘red’ assessment is still appropriate for Crawley WwTW”.(GWCS 2021, p 9). The problem is also acknowledged in the Sustainability assessment (LUC, July 2021, 7.202).
- 5.8 The complexity (and financial investment) of the task can be gauged from the (GWCS 2021, p9): “...early engagement with Thames Water is recommended to ensure delivery of additional capacity is aligned with delivery of development. They will also require certainty that a capacity upgrade is required in that period before making the investment decision”. There was also a plea for the three LPAs that use Crawley WwTW (Horsham, Crawley and Mid Sussex), to collaborate and co-ordinate their development.
- 5.9 Crawley WwTW is one of nine WwTW on the River Mole. The impact of growth in development is predicted to produce a deterioration in water quality although this might be able to be ‘mitigated via working at the Technical Achievable Limit’(TAL).
- 5.10 The River Mole currently has only 5% of its length with good status; the rest is either poor or moderate and there is evidence of increasing deterioration in some of the tributaries. There is not a great deal of confidence that it will achieve ‘good’ for some time to come. Recent events such as the discharges of untreated sewage at Horley onto playing fields and footpaths – and the National Trust putting up notices warning of contaminated water by the famous Stepping Stones near the base of Box Hill – an area of outstanding Natural Beauty – are signs that the river is already under considerable stress.
- 5.11 Recent publicity about the state of our rivers exposes assumptions and practices which are now deemed unrealistic or unacceptable. There is the assumption that development can go ahead and somehow water and sewage companies will cope i.e. that the necessary infrastructure can and will be provided and that the funding can be found. Having Technical Achievable Limits does not mean they can, or will, be achieved in practice. In any case the storm overflows whether within the permitted levels or exceeding them can make TALs irrelevant. The lack of investment in the infrastructure has also been highlighted in nearly all reports in water management plans as well as in the press. This lack of investment has put water companies into a state of catch-up – let alone being able to build for future sustainability.

- 5.12 Water pollution can come from both point and diffuse sources. WwTW are point sources. “Diffuse pollution is defined as *“unplanned and unlicensed pollution from farming, old mine workings, homes and roads”*. It includes urban and rural activity and arises from industry, commerce, agriculture and civil functions and the way we live our lives. Examples of diffuse sources of water pollution include: *“Contaminated runoff from roads – this can include metals and chemicals; Drainage from housing estates; Misconnected sewers (foul drains to surface water drains); Accidental chemical/oil spills from commercial sites; Surplus nutrients, pesticides and eroded soils from farmland; Septic tanks and non-mains sewer systems. The most likely sources of diffuse pollution from new developments include drainage from housing estates, runoff from roads and discharges from commercial and industrial premises”*. (GWCS 11.2)
- 5.13 At HA2 run off from estates and roads will be the most likely sources of diffuse water pollution. Given the proximity of the site to the water courses, the pathways for the pollution is relatively short. The greatest risk of pollution occurs after heavy rain following a dry period when chemicals and dust on roads are washed away rapidly. The receptor of the pollution will be Hyde Hill Brook, the un-named water course, Ifield Brook and the River Mole. The negative impact of further development in the catchment area on the SCA and SSSI further downstream is labelled as ‘possible’. (GWCS, 2023, 11.5.5 Table 11.7). The water quality assessment results (GWCS Table 9.1) have to be read with care. It shows effectively whether development will change the status of the river – it does NOT say what the current status of the river is. Elsewhere in the document it points out that when the WDF was introduced, 95% of rivers did not have ‘Good’ status – and the River Mole is one of them.
- 5.14 Developers will be expected to demonstrate to the Lead Local Flood Authority (LLFA) that surface water from a site will be disposed using a sustainable drainage system (SuDS) with connection to surface water sewers seen as the last option. New connections for surface water to foul sewers will be resisted by the LLFA.
- 5.15 The Figure below from the HE consultation shows the position of SuDS on the HE plans (the blue parts), with idealised pictures of what they might look like – a mixture of ponds with swales alongside the Multimodal transport corridor.

Water management

- No residential development in the flood plain
- Integrating flood mitigation and control measures to address the risk of flooding on and off site
- Swales will be incorporated within primary and secondary streets



Restored & diverted River Mole at Gatwick Airport



Green corridor and SuDS at Edington, Cambridge

KEY

- Indicative SuDS and surface water attenuation locations
- Indicative river flood attenuation areas



The on-site SuDS may mitigate the impact within the site and by trapping sources of diffuse pollution as well as water, but they will not reduce the increased pollution from the traffic once it emerges onto the Charlwood Road. We are also aware that what is in plans does not always materialise in practice. SuDS in the plans for the Maples became merely an underwater storage tank.

- 5.16 SuDS require long term maintenance. It is not clear if the Community Land Trust for HA2 (para 10.94) is envisaged as having estate management responsibilities.
- 5.17 Turning from pollution to water supply, the issues related to water supply which have occasioned the implementation of a water neutrality study were outlined in detail in this 2020 study. It emphasised the whole of the south east being water stressed and aiming for a 100l/p/d across all its area. This has been replaced by the 85 l/p/d in the Sussex North Water Resource Zone.

Crawley Borough and Upper Mole Catchment Strategic Flood Risk Assessment (December 2023)

- 5.18 The problem of flooding, while addressed in the GWCS, is more fully addressed in *Crawley Borough and Upper Mole Catchment Strategic Flood Risk Assessment December 2023 (UMSFRA)*. The Horsham District Flood Risks Assessments only deal with the Rivers Arun and Adur.
- 5.19 Crawley, including its surroundings, is classified as a ‘wet spot’. This results from the area having many tributaries of the Mole running through it, the underlying soil being mostly weald clay and the area being urbanised.

“West Sussex County Council has classified Crawley as a ‘wet spot’ within its draft Local Flood Risk Management Strategy (2021-2026), where 9,000 residential properties and business buildings are at risk of surface water flooding. The EA and DEFRA also classify Crawley as a Flood Risk Area”.

Overtopping of some rivers, surface water along roads and on occasions overflowing of drainage sewers are the main causes.

- 5.20 The UMSFRA (2020) lists the areas which are subject to flooding. The relevant sections for HA2 are: the Crawley neighbourhoods of Ifield, Langley Green and Bewbush; and Rusper Parish. HA2 is in Rusper Parish on the other side of Ifield Brook from Ifield neighbourhood. The Environment Agency puts the area along Ifield Brook and the River Mole in zones 2 & 3.
- 5.21 Allowances for climate change are based on peak river flow and peak rainfall intensity and are given for three different epochs: The 2020s (2015 – 2039); The 2050s (2040 to 2069); The 2080s (2070 to 2125). Peak river flow allowances are based on using 'central'; higher central and Upper end allowances for different epochs. Which allowance is used depends on the vulnerability of a particular part of a development within a site. Peak rain intensity allowances are based on the likelihood of an annual exceedance probability (AEP): the 3.3% or 1% AEP. These replace the former way of describing flood risk as a one in 30 year flood and a one in a hundred year flood respectively. The 1% flood is therefore the much more severe flood, even if it is predicted to occur less frequently. Tables showing the figures for both the peak river flow allowances and the peak rainfall intensity allowances are given in tables 4.1 -4.6 of the UMSFRA and a summary is given in appendix to this report.
- 5.22 UMSFRA provides both surface water and fluvial flooding maps for 1% AEP; 1% +20% allowance for climate change; and 40% allowance for climate change (UMFRA Appendices C, D, E & F).

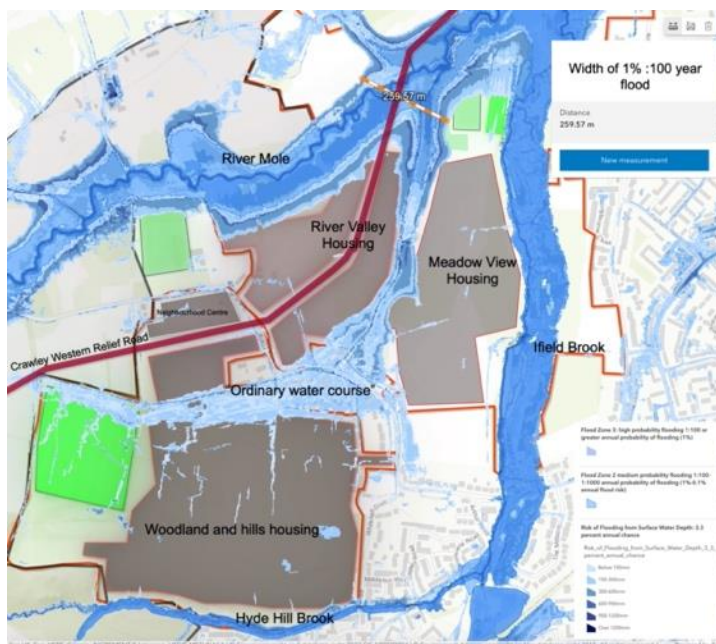
Homes England (HE) Environmental Impact Scoping Opinion Report, May 2023

- 5.23 The Environmental Impact Scoping Report, 2023, documents the legislation and the discussion that Homes England has had relating to, particularly, water supply, wastewater treatment and flooding. On water supply, Southern Water has plans to ‘to reduce leakage by 1 MI/day and 2022 and 2 MI/d by 2024’ . I do not know if this level of reduction has been achieved. On wastewater treatment, Thames Water has given assurance that they have the capacity to cope with the additional wastewater at the Crawley WwTW.
- 5.24 Talks with the Environment Agency over flooding have extended over several years. They seem to have led to HE agreeing to establish flood prevention mechanisms at the north end of the site (para 13.2.1 Table 13.1), in recognition that the fourth stage of the Upper Mole Catchment Flood scheme was never implemented because of lack of finance⁶. They recognise that the main sources of flooding are surface flooding and fluvial flooding. The list of legislation and considerations to be addressed form a long list in section 13 (pp 119 – 130).
- 5.25 The main source of information is to be derived from desk-based exercises. *‘Field study/data collection will not be undertaken as the data provided by other sources is deemed to be adequate and representative of the Site conditions’* (13.3.12). A closer look at data is necessary as they quote the status of the Mole as ‘good’. This may be the case for the short stretch from Rusper to Ifield, but the river as a whole does not rate as good. (Table 13.4 Sensitive receptors: local hydrology).
- 5.26 While the scoping report indicates awareness of the responsibility to carry out studies related to water, the studies have not yet, as far as I am aware, been undertaken.

⁶ The UMCFRS completed three sections: The Parish Lane pond for water retention; the raising of the dam at Tilgate Lake to cope with a 0.1 % flood (one in a thousand year flood) and the meandering of the river at Grattons Park. The last section at Ifield was never completed because of lack of funding.

Land West of Ifield: A paper on the Impacts of Proposed development on Flooding, Water Pollution and Water Supply (Simon Collins, River Mole River Watch Group, September 2003)

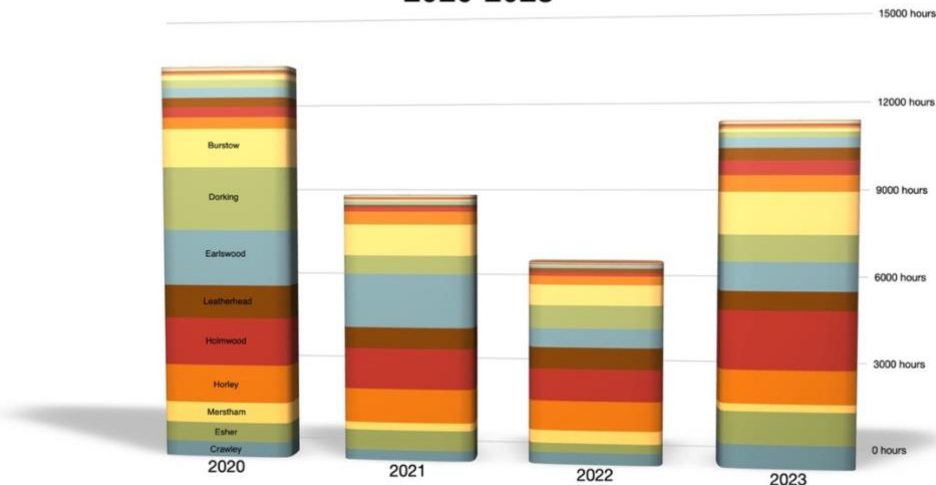
- 5.27 This paper focused on the impact of the development on the receptor river. It points out that the particular characteristics of the Upper Mole Catchment, renders the River Mole susceptible to both rapid flooding during heavy rainfall and detrimental low flows in periods of drought. The river exhibits a naturally flashy regime due to its small size, relatively low-lying land in the Upper Mole Basin, and impermeable geology. This results in rapid fluctuations in water levels and also naturally short lag times between peak rainfall intensity and peak discharge.
- 5.28 Development makes the river even more flashy, exacerbating flood risk by facilitating more rapid discharge off rooves, buildings and roads thus diminishing lag times. Conversely during dry spells, urban surfaces reduce natural water retention and attenuation in soils and vegetation, depriving rivers and their surrounding habitats of essential water. At times of low flow, the majority of the river flow comprises treated sewage effluent.
- 5.29 In light of the climate change allowances used in the UMSFRA, this study explored the potential vulnerability of flooding risk from both peak river flow and peak rainfall intensity occurring at the same time. The upper end figure and the 2080 epoch figures were used for peak flow and 1% AEP was used for the same epoch for peak rainfall



intensity. The result is alarming with the people in Meadow View Housing trapped between flooded areas without the necessary safe evacuation routes that are required. The width of the widest part (the red dotted line) is wider than the Thames through London. While the author of the paper would not claim this to be an expert assessment, it does indicate how necessary a site flood risk assessment is needed and the need for both the sequential test and an exception test to be undertaken.

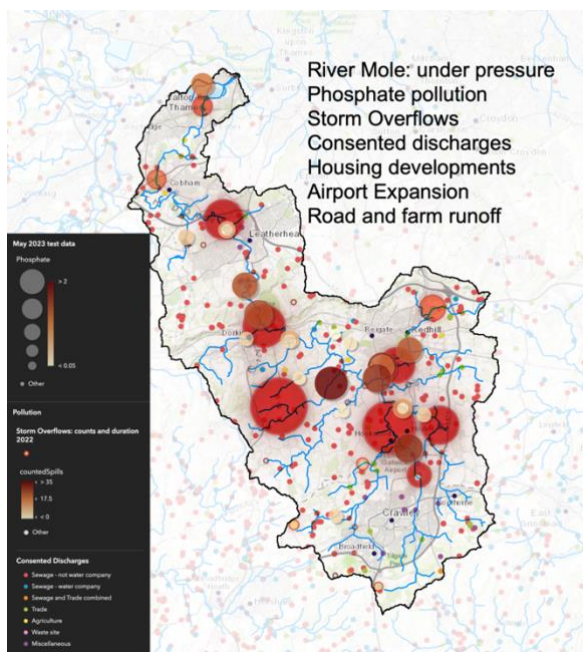
5.30 The requirement for the protection of protected sites downstream and the WFD to get all rivers to have a status of good, needs to be seen in the context of the status quo. The diagram below shows the number of hours of storm overflow discharges into the River Mole over the last four years. (This is total – i.e. both permitted flows and exceedance flows). These inevitably bring with them higher levels of pollution. The river will be under further pressure from a large development as in HA2.

River Mole Catchment Total Annual Storm Overflows duration (hours)
2020-2023



While there is overall downward trend in the four years, the difference between 2022 and 2023 reflects that 2022 was a particularly dry year and 2023 was particularly wet.

5.31 The River Mole River Watch group has trained its volunteers to measure and record the phosphate levels in the Mole once a month. The results from May 2023 give a snapshot of the state of the river (see figure below). Many of those hotspots relate to urban areas and closeness to WwTW.



The pollution burdening the river is of course not only from point sources such as the WwTW but also from more diffuse sources: such as the nutrient enriched runoff from agriculture and the toxic runoff from roads. The diagram is a snapshot of the phosphates in May last year, but also shows the positions of various point sources. The regular testing not only supplies information about the river it means that once a month places along the full length of the river are being monitored and problems identified – and hopefully improvements seen.

- 5.32 The overwhelming picture that emerges from this paper and from more recent events is that Thames Water (and for that matter other water companies) are not keeping pace with the demands being put on them by development and by climate change. The recent event at Horley which hit the news was a case in point (ITV News Jan 30). Horley has an unmanned sewage works regulated remotely from Reading. It required local people to alert Thames Water to the fact that sewage overflows were across a public footpath and a children's playing field giving very high levels of bacterial readings.
- 5.33 S. Collins' paper is not being sent as an accompanying document to my report because of its size. It does contain a lot of information about what people are seeing on the ground and, to be fair, the work that is being put in by water companies and businesses (particularly Gatwick Airport) to mitigate the impacts that are occurring now. We hope to have a shortened version available in due course.

6 Impacts of the development on water supply, wastewater treatment, flooding and water quality

- 6.1 Given that water is a scarce resource globally, the reduction to 85 l/p/d and the imposition of the water neutrality policy are welcomed. Apart from leaving more water in the environment, reduction in use will contribute to a reduced carbon footprint. The steps to achieve neutrality, however, are far from straightforward and the outcomes are as yet unknown. Measures to achieve it are costly in both financial and carbon terms, and they will take time. Much data has not been collected on which to base the offsetting scheme and no one knows how it will be monitored for effectiveness. Changing people's attitudes to water use, may also take time.
- 6.2 Water neutrality does however bring into question whether the swathe of development in the South East should continue and whether environmental objectives and a commitment to addressing a climate change emergency are compatible.
- 6.3 Development West of Ifield fails to account for the distinct vulnerabilities of the River Mole catchment and in particular the vital importance of the green upper catchment to regulate flow and reduce pollution. SuDS, notwithstanding, more pollution will be going into the River Mole – a river which is already under stress and where steps ought to be being taken to reduce the stress. This does not conform with one of the objectives for sustainable development which is to 'improve the environment'.
- 6.4 The precarious state of Water Companies, coupled with their inadequacies in climate preparation, undermines confidence in the success of their 25-year masterplans. These plans anticipate accommodating additional wastewater flows through "technically achievable limits without clarifying implementation or adaption strategies. The past decade's lack of climate adaptation action foreshadows further spills, fines, and deteriorating water treatment quality and aging infrastructure ill-equipped for rapid climate change impacts. Incorporating growth into this scenario jeopardizes nature and societal resilience." (SC report to SWO)

- 6.5 While the proposals might conform to the 'letter of flood risk' for example by ensuring that residences are above the 100 year + climate change allowance flood level, the location remains unsuitable for development due to the close proximity to potential flooding and the considerable uncertainties tied to climate change risk.
- 6.6 An exception test should meticulously consider whether any presumed benefits of this development can genuinely outweigh the substantial risks posed to inhabitants by establishing housing in this hazardous location, risks that will significantly increase with climate change.
- 6.7 Inconsistencies in adopted climate change allowances and their steadily increasing trend compound uncertainties about the safety of this location for residents over the 100 year life of the development. The site's vulnerability to fluvial and surface water flooding renders it unsuitable and non-resilient, breaching the NPPF requirement for developments to remain flood safe throughout their timespan.
- 6.8 The development plan for HA2 fails to consider the multifaceted challenges presented by climate change and inadequate wastewater management. In a future marked by heightened risks of drought and extreme weather events, along with unresponsive water companies, unrestricted development is indefensible. The burden of proof lies with stakeholders to demonstrate a sustainable and robust improvement in managing water quality before any further development can be considered sound and responsible. These uncertainties raise significant issues about deliverability of the strategic allocations.
- 6.9 The expansion of urban areas amplifies the urban heat island effect, culminating in elevated temperatures and compounding the challenges posed by drought conditions. Even with SuDS in place the loss of natural water regulating elements such as grassland, hedgerows, woodlands and the compaction of associated soils, will significantly intensify the stress on the river catchment during drought and periods of low flow.

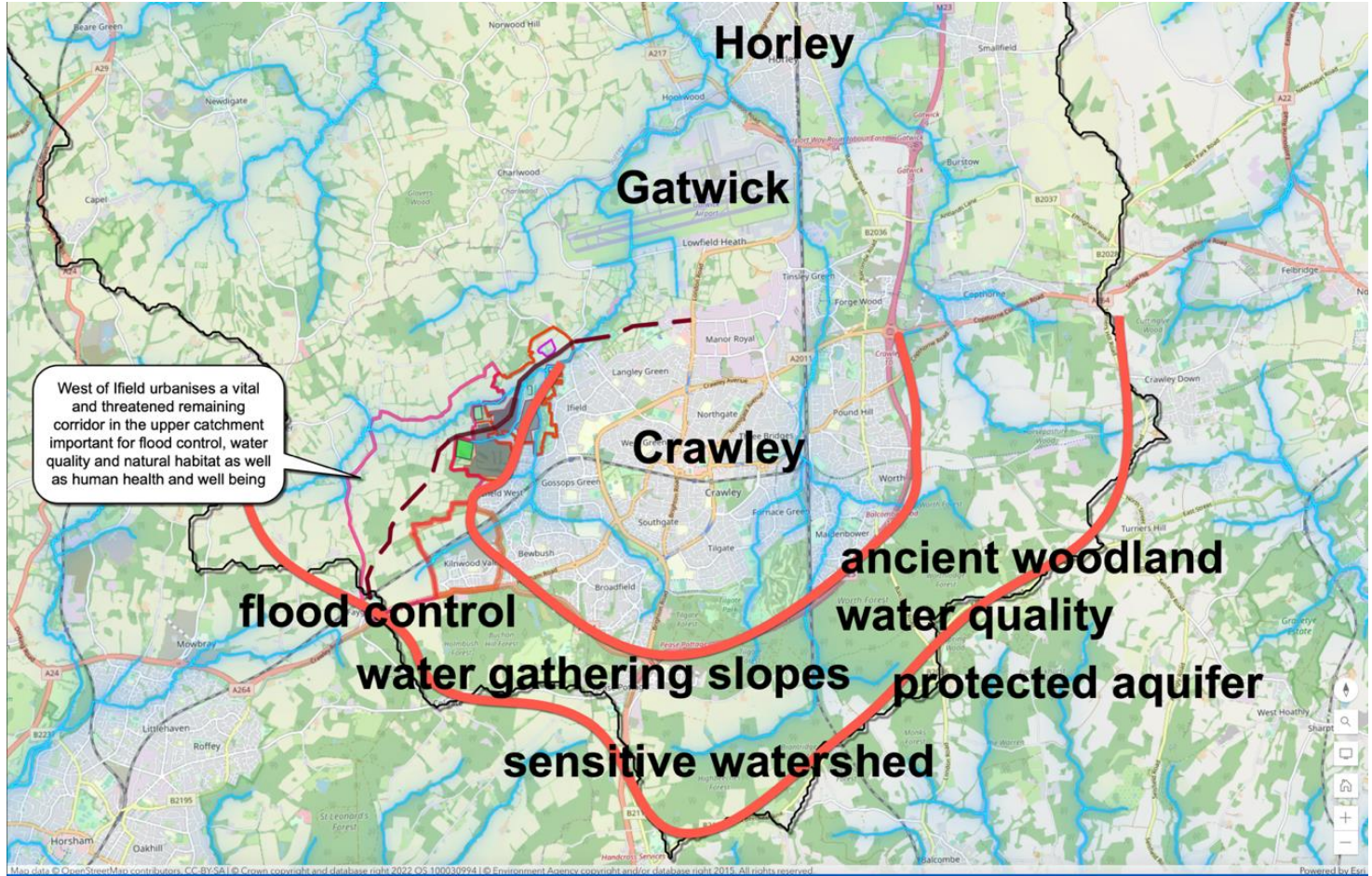
7 Conclusion

- 7.1 Strategic Policy HA2, West of Ifield, contains too many unresolved issues related to water supply, wastewater management, flood, and to the protection of water quality in waterbodies, to reliably achieve compliance with HDC strategic policies 9, 10, 11.
- 7.2 Notwithstanding the conclusions of a recent technical *note* "*The results have shown a range of theoretical scenarios which achieve differing levels of progress towards water neutrality but which all include significant challenges. In order to achieve 100% water neutrality within the district a significant funding pool and associated 'delivery plan' would be required, along with more stringent local policy requirements within the Local Plan which would require developers to incorporate reuse technologies within all new homes, regardless of the size of the development*"⁷, there are no guidance within the policies or reference to any "reuse technologies".
- 7.3 The impact on the receptor river, the River Mole has not been adequately addressed and the work of the River Mole River Watch group shows that it needs to be.

⁷ Horsham-LP_Water-Neutrality-Technical-Note-March 2021by Aecom

- 7.4 The necessary requirements for a site-specific flood risk assessment, including sequential and exception tests have not yet been completed. Policy HA2 allows for these to be done in the future – and by so doing is deferring key evidence. Given the scale of the site, these should have been done prior to the site going into the plan.
- 7.5 The impacts of climate change have not yet been modelled for the site, except in the allowances being made for floor height.
- 7.6 The Evidence Base indicates that matters related to water supply, wastewater treatment and flooding will require longer term investment which is not currently in place and may not be in place in the plan period.
- 7.7 Consequently, the absence of agreements with other Authorities and the risk to delivery of the allocations in the plan due to the outstanding issues identified in this report, the Regulation 19 version of the Horsham Local Plan fails the soundness tests as set out in paragraph 35 of the NPPF.

Appendix 1 The position of the site (both 3,000 and 10,000) in the Upper Mole Catchment Area.



Appendix 2 Relevant flood assessment of locations near the HA2 site (source UMFRA)

Area	Fluvial flood Risk	Surface water flood risk	Reservoir Inundation
Langley Green	Langley Green is bounded by the River Mole to the north and south west, and Gatwick Stream to the east. A large proportion of Gatwick Airport is identified to be at risk of fluvial flooding, located within Flood Zones 2 and 3.	Mapping shows vast areas of high surface water flood risk across Gatwick Airport, which corresponds to the characteristic low topography of the area. A large area of ponding is predicted at the western end of the two runways where Crawler's Brook joins the River Mole – the mapped flood risk here may partially be caused by lack of representation of the culvert under the runways.	
Ifield	Fluvial flood risk in Ifield is limited to open areas surrounding Ifield Brook, which flows along the western boundary. The majority of the ward is located in Flood Zone 1	Mapping identifies high surface water flood risk in the open areas surrounding Ifield Brook, along the western boundary of the Ifield catchment. A relatively wide area of high surface water flood risk is also identified in the centre of Ifield, flowing along Ifield Drive and Warren Drive.	Inundation from Ifield Mill Pond, may affect areas surrounding Ifield Brook.
Rusper (contains HE2)	Small areas of Rusper are at risk of fluvial flooding from the River Mole and Mans Brook. However, areas of Flood Zones 2 and 3 are generally restricted to open areas surrounding the watercourses. Limited sections of Prestwood Lane, Ifield Avenue, Ifield Green, Lambs Green Road and Rusper Road are at risk.	Rusper is characterised by expansive areas of high surface water risk. Risk is identified in the open areas surrounding all main rivers and ordinary watercourses in Rusper.	Rusper is characterised by expansive areas of high surface water risk. Risk is identified in the open areas surrounding all main rivers and ordinary watercourses in Rusper.
Bewbush	Fluvial flood risk to the neighbourhood is low, with areas situated in Flood Zones 2 and 3, limited to undeveloped corridors running alongside Creasy's Brook, Douster Brook and Spruce Hill Brook.	Mapping shows areas of high surface water flood risk across Bewbush. Flow pathways follow surface topography, generally flowing along roads, before pooling in open areas around Ifield Brook and Ifield Mill Pond.	Inundation from Douster Pond and Fish Pond, south of Bewbush, may affect central and northern areas.

Appendix 3 Ifield is known as a 'wet spot'



Stumbleholme Farm 1 Jan 2020 TQ 228 368 – part of 10,000 site



Ifield Court Farm at TQ 244 375 footpaths surface water in winter 1 November 2022



Ifield Village Green in Conservation Area. 16 Jan 2015 TQ 249 378



View looking west from Ifield Green to the fields on Ifield Court Farm (the West of Ifield strategic site). Close to Stafford Bridge. Midday 24th December 2013



Inundation at The Gables Nursing Home in Ifield Green. 24th December 2013 Ambulance crews called. TQ 253 384



Flood Ifield Brook Meadows 3 December 2023 The flood plain taking the flood. TQ247378

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