Guildford Borough Council: Biodiversity Net Gain

Evidence Base for Policy Development: Biodiversity Net Gain Study for Approved Developments

On behalf of **Guildford Borough Council**

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Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU Office Address: Caversham Bridge House, Waterman Place, Reading, Berkshire RG1 8DN
T: +44 (0)118 950 0761
E: Reading.uk@stantec.com

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	Name	Position	Signature	Date
Prepared by:	Helen Evriviades MCIEEM Ryan Oakley MCIEEM Gemma Stubbs CGeog (GIS) FRGS	Senior Associate Ecologist Principal Ecologist (RiverMorph Accredited) Principal GIS Consultant	HE	October 2022
Reviewed by:	Kerry Elliott MCIEEM CEcol	Senior Associate Ecologist	KE	October 2022
Approved by:	Elaine Richmond MCIEEM CEcol	Director, Environment	ER	October 2022

For and on behalf of Stantec UK Limited

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Executive Summary

Guildford Borough Council (GBC) have commissioned Stantec to undertake this Study which applies the Defra Biodiversity Metric 3.1 (Panks *et al*., 2022) to three "real world" example development sites within the Borough which have recently achieved planning consent and are under construction. The Study includes consideration of developments associated with both brownfield and greenfield Sites.

The purpose of this Study is to provide additional evidence for the Guildford Borough Local Plan: Development Management Policies Examination; specifically to provide objective evidence regarding the implications of the proposed Policy P6/P7: Biodiversity in New Developments for the Study sites, in terms of Biodiversity Net Gain requirements. The proposed Policy P6/P7 includes a requirement for 20% Biodiversity Net Gain (as measured using the Defra Biodiversity Metric) for development types meeting certain criteria. This Study provides a comparison of anticipated National requirements (10% Biodiversity Net Gain) and GBC's proposed requirement (20% Biodiversity Net Gain) for each of the Study Sites, to feed into an understanding of the viability of GBC's proposed Policy P6/7.

The table below provides a summary of the Results from the Study Sites, providing a comparison of the Habitat Baseline Units for each of the sites and the Habitat Units required for 10% or 20% BNG for each Site. The main body of the report discusses outcomes for Linear Habitats (hedgerows and rivers) separately.

Study Site	On Site Habitat Baseline (Units)	Habitat Units Required for 10% BNG	Habitat Units Required for 20% BNG	On Site Habitat Proposed[1] (Units)	Off Site Habitat Units Required for 10% BNG	**Off Site Habitat Units Required for 20% BNG**	**Offset Habitat Unit difference between 10% and 20% BNG**
Just Tyres	0.0022	0.00242	0.00264	0.0974	0	0	**0**
Clockbarn Nursery	10.86	11.946	13.032	5.61	6.336	7.422	**1.086**
Keens Lane	16.60	18.26	19.92	16.43	1.83	3.49	**1.66**

Amber cells show where Biodiversity Unit requirements would not be met. Green cells provide the additional Biodiversity Unit requirements to meet a 10% or 20% Biodiversity Net Gain Requirement.

The Study found that a brownfield site of low baseline biodiversity value (Just Tyres) more than easily met and exceeded both a 10% and 20% Biodiversity Net Gain Target. The provision of relatively modest habitat creation as part of the proposed development was sufficient to vastly exceed any requirement for BNG, whether at 10% or 20%, given the low baseline biodiversity value. The other two Sites (Clockbarn Nurseries and Keens Lane) which were both green field sites would not have met the requirement either for 10% or 20% Biodiversity Net Gain based on the approved scheme designs. However, the forthcoming Biodiversity Net Gain requirement under both the Environment Act, 2021 and the proposed GBC policy P6/P7 allows for biodiversity offsetting through habitat creation and/or enhancement of habitats off-site, or purchase of Habitat units from third party providers (a mitigation bank), where Biodiversity Net Gain within a Site is not possible.

For the small greenfield site of relatively high baseline biodiversity value (Clockbarn Nurseries), this development would have required off-site Habitat Units to meet with either a 10% or 20% Biodiversity Net Gain requirement. The calculations of BNG requirements are made as a percentage of the baseline Biodiversity Unit value (i.e. 110% vs 120%). The Clockbarn example clearly demonstrates that an increase of BNG requirement from 10% to 20%, as proposed in Policy P6/P7, does not mean a doubling of Habitat Unit requirements. In the case of the Clockbarn example, there is just over a 1 Habitat Unit difference between the 10% and 20% BNG requirement.

[1] Habitat Units created and enhanced as per the designs approved through planning permission for the Proposed Development.

For Keens Lane, a larger greenfield site with habitats of lower intrinsic value than Clockbarn but with overall higher baseline habitat value due to its size, this development would also have required off-site Habitat Units to meet with either a 10% or 20% Biodiversity Net Gain requirement. However, the Keen's Lane off-set requirements are relatively small because the proposed development has applied the Mitigation Hierarchy for the scheme design and worked hard to retain habitats of higher value and deliver biodiversity value through the scheme design within the Site boundary.

These outcomes demonstrate clearly how application of the Biodiversity Metric supports delivery of the Mitigation Hierarchy. Those Sites which carefully consider biodiversity value and apply the Mitigation Hierarchy through development of the scheme design will minimize their off-set requirements for BNG. The ability to achieve Biodiversity Net Gain within a site will be a factor of the site's size, its baseline habitat value and space for biodiversity provision within the scheme design. A further conclusion that can be drawn from the results of the Study is that where an off-site off set is needed to achieve Biodiversity Net Gain, the Biodiversity Unit off-set requirement per dwelling will vary between sites, depending on the number of Biodiversity Units needed to meet the Biodiversity Net Gain requirement and the number of dwellings proposed for the site. These points would stand whether there were either a 10% or 20% Biodiversity Net Gain requirement, with a relatively small uplift in requirements to achieve 20% Biodiversity Net Gain.

1 Introduction

1.1 Background: Biodiversity Net Gain

1.1.1 There has been clear evidence presented of the intrinsic link between climate change and biodiversity loss and, conversely, how action to support biodiversity can also contribute towards action against climate change (Portner *et al.,* 2021). There is also clear global evidence for a biodiversity crisis, with biodiversity declining globally at rates unprecedented in human history and the rate of species extinctions accelerating (IPBES, 2019).

1.1.2 Responding to this crisis, Guildford Borough Council (GBC) have developed a proposed Development Management Policy P6/P7: Biodiversity in New Developments which includes a requirement for 20% Biodiversity Net Gain (as measured using the Defra Biodiversity Metric) for development types meeting certain criteria. Guildford Borough Council have commissioned Stantec to undertake this Study which applies the Defra Biodiversity Metric 3.1 (Panks *et al*., 2022) to "real world" example development sites within the Borough which have recently achieved planning consent and are under construction.

1.1.3 The purpose of this Study is to provide additional evidence for the Guildford Borough Local Plan: Development Management Policies Examination; specifically to provide objective evidence regarding the implications of the proposed Policy P6/P7: Biodiversity in New Developments for the Study sites, in terms of Biodiversity Net Gain requirements. A comparison of anticipated National requirements (10% Biodiversity Net Gain) and GBC's proposed requirement (20% Biodiversity Net Gain) is provided to feed into an understanding of the viability of GBC's proposals.

1.1.4 The National and Local context for biodiversity valuation and delivery through development for the proposed Policy P6/P7, and which provides a background to this Study, is described below.

National Context

1.1.5 The UK Government's Natural Environment White Paper: 'The Natural Choice: securing the value of nature' (HM Government, 2011) introduced several policies to conserve the environment. One policy included the system of accounting, termed 'biodiversity offsetting.'

1.1.6 In England, the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) sets out a broad framework of policies for the planning system in England and how they should be applied. Underpinning the framework is the principal aim of 'Sustainable Development' which is to be pursued through the fulfilment of interdependent economic, social and environmental objectives.

1.1.7 Chapter 15 of the NPPF details core policy principles with respect to conserving and enhancing the natural environment. Securing 'net gains' for biodiversity, in accordance with the Government's 'A Green Future; Our 25 Year Plan to Improve the Environment' paper is a key theme running through the Chapter, whereby planning decisions are required to contribute to and enhance the natural environment by "minimising impacts on and providing net gains for biodiversity". Chapter 15 of the NPPF also states that plans should "identify and pursue opportunities for securing measurable net gains for biodiversity". The Chapter also places planning decisions in the context of the mitigation hierarchy where, if impacts on biodiversity cannot be avoided, mitigated, or as a last resort compensated for, then planning permission should be refused.

1.1.8 The Environment Act 2021 received Royal Assent on 9th November 2021 and includes provision for a new mandatory requirement for proposed developments (which meet certain requirements) to provide 10% Biodiversity Net Gain. This requirement is not yet mandatory,

but it is anticipated that the 10% Biodiversity Net Gain (and requirement to measure this using the Biodiversity Metric 3.1, or its successor) will come into force when the Secretary of State makes a Regulation to do so; likely following a two year 'transition period' after the Environment Act came into force, i.e., from November 2023.

1.1.9 In addition, Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. Section 41 of the Act defines Habitats and Species of Principal Importance (HoPI or SoPI) to nature conservation in England which should be considered by all public bodies, including LPAs, when carrying out their Section 40 duties. 'Planning Practice Guidance for the Natural Environment' (Planning Portal 2014) and the British Standard for Biodiversity in Planning (BS 42020:2013) both recommend the system of biodiversity offsetting as an appropriate mechanism of delivering biodiversity compensation.

Local Context

1.1.10 The Guildford Borough Local Plan: Development Management Policies Submission Local Plan (June, 2022) sets out clearly the local biodiversity context, identifying Surrey as a comparatively biodiverse county and Guildford as one of its most biodiverse districts. The Local Plan also identifies that the decline in local biodiversity is even more pronounced in Surrey than the national decline. Surrey has historically suffered a high degree of habitat loss and fragmentation; the Surrey Nature Partnership's (SyNP) report, "The State of Surrey's Nature" estimates that 12% of the County's species have been lost, 21% are in decline and heading for local extinction, 15% are rare but stable and only 3% of rare species are recovering (Surrey Nature Partnership, 2019).

1.1.11 This information is presented as a context to a new Policy for Guildford Borough Council, as presented in the Guildford Borough Local Plan: Development Management Policies Submission Local Plan (June, 2022): Policy P6/P7: Biodiversity in New Developments which includes a policy requiring 20% Biodiversity Net Gain for development types meeting certain criteria. The proposed wording for Policy P6/P7 is provided in full at Appendix A.

1.1.12 The Regulation 19 consultation and the List of Matters and Questions provided by the Inspector for the Guildford Development Management Policies Examination includes questions around demonstrating the viability of Policy P6/P7; specifically, what would be the implications of a 20% increase in Biodiversity Net Gain on development viability and whether Policy P6/P7 is consistent with both national policy and the Local Plan: Strategy and Sites.

1.1.13 This study applies the Defra Biodiversity Metric 3.1 (Panks *et al*., 2022) to "real world" example sites which have been given permission in the context of existing planning policy requirements within the Borough. This study provides additional evidence for the Guildford Development Management Policies Examination.

1.2 Biodiversity Metric

1.2.1 Defra's Biodiversity Metric provides developers, planners and land managers with a tool to measure the biodiversity value of a site. The metric uses habitat features as a proxy measure for biodiversity which can be used to measure the “baseline” and “post-development” biodiversity value of a site through a numerical change in "Biodiversity Units" pre and post development[2]. The metric enables developers, design team members, and key stakeholders to see how they might be able to design a site in a way that increases its biodiversity value over time.

1.2.2 In the United Kingdom, the design and delivery of Biodiversity Net Gain in development sites is supported by industry guidance, including: Biodiversity Net Gain Good Practice Principles for Development (CIEEM, CIRIA, IEMA, 2016). The use of a Biodiversity Metric assumes the principles of the mitigation hierarchy have been adopted and used when developing measures to address impacts on biodiversity receptors. The principles of the mitigation hierarchy are that, in order of preference, impacts on biodiversity should be subject to avoidance, mitigation restoration, and compensation.

1.2.3 A Biodiversity Net Gain Assessment using a Biodiversity Metric can be used to demonstrate predicted biodiversity change by establishing the habitats (and condition) present within the Site before any development; and then setting out the proposed new habitat creation or enhancement of existing habitats. Biodiversity improvements on-site are preferable, but where this is not possible, or suitable for net gain, habitat creation or enhancements can be provided off-site. In this way the application of the Biodiversity Metric supports the application of the mitigation hierarchy.

1.3 Objectives of Study

1.3.1 This Study provides part of an Evidence Base for Guildford Borough Council’s proposed Development Management Policies Submission Local Plan Policy P6/7. The Study examines three recent and representative developments that have secured planning consent within Guildford Borough and, following confirmation of the approach to applying the Biodiversity Metric 3.1 to these sites, considers the following for each site:

- Considering the developments as approved, retrospectively determine the Biodiversity Metric 3.1 Outcome for each of these sites, referring to the baseline and proposed development as per the Ecological Assessment and scheme designs for the submitted planning application for each of these schemes.
- Confirm whether the sites provide a Biodiversity Net Gain based on the submitted designs, as measured by Biodiversity Metric 3.1 and the % Net Gain determined for each of the Broad Habitat Types (Habitats, Hedgerows, Rivers), where relevant.
- Where Biodiversity Net Gain of 10% or 20% is not achieved by the submitted designs, consider whether a better result would be been achievable for the proposed development through review of the design.

[2] Biodiversity Units are calculated using the size of a parcel of habitat and its quality. The metric uses habitat area (measured in hectares) as its core measurement, except for linear habitats (hedgerows, lines of trees, rivers and streams) where habitat length (measured in kilometres) is used. To assess the quality of a habitat, the biodiversity metric 3.1 scores each habitat parcel against their relative distinctiveness and condition. Furthermore, the metric also accounts for whether or not the habitat is sited in an area identified, typically in a relevant local strategy or plan, as being of strategic significance for nature. The Biodiversity Units are calculated by the Metric in the same way for both the baseline and post-development habitats. However, as new habitat is created, or existing habitat is enhanced in the post-development scenario, the difficulty and associated risks of doing so are considered by biodiversity metric 3.1 (Panks *et al.,* 2022).

- Determine and compare the Biodiversity Units which would be required for the proposed development to reach 10% or 20% Biodiversity Net Gain.
- Provide key conclusions which can be drawn from these worked examples that are relevant to the delivery of Biodiversity Net Gain through development.

2 Methods

2.1 Sites Considered in this Study

2.1.1 The following sites have been selected by GBC to be considered as part of this Study. It is understood that GBC selected these sites to provide a range of development types, including brownfield and greenfield development, from developments which have recently received detailed planning permission from Guildford Borough Council:

- Just Tyres 18/P/02100: Demolition of industrial buildings and construction of purpose-built student accommodation on a brownfield site in Guildford ("Just Tyres").
- Clockbarn Nurseries 19/P/00027: 75 dwellings on greenfield site at the edge of Send village ("Clockbarn Nurseries").
- Land at Keens Lane, Guildford 18/P/01014: 148 dwellings and care home on a greenfield site at the edge of Guildford ("Keens Lane").

2.2 Approach to the Application of Metric 3.1

2.2.1 Since construction had already commenced on these sites, the baseline habitat types and condition required for input to the Defra Biodiversity Metric 3.1 were determined based on information available from the planning application documents on the planning portal for these sites. That is, the on-site baseline value was taken from the habitat type and condition as described in the Ecological Assessment Reports submitted with the planning applications. The on-site post development habitats and condition were taken from the Masterplans, Landscaping Plans and Ecological Reports submitted with each of the planning applications for development, to determine the proposed habitat type and condition. A precautionary approach to pre- and post- development habitat type and condition has been adopted, based on the available information for each site.

2.2.2 The habitat classification system used for habitat areas for the purpose of this Report was the UK Habitat Classification (UKHab) system (Butcher *et al.,* 2020). This classification system is required to allow habitat information to be inputted directly into the Biodiversity Metric 3.1. Where present, hedgerows were mapped as linear features. In accordance with guidance, area habitats adjacent to hedgerows were mapped to the centre line of the hedgerow. The User Guide (Panks *et al.,* 2022) acknowledges this approach will result in a slight overestimation of the area and resulting Biodiversity Units generated by habitats adjacent to hedgerows. This effect however applies to both the baseline and post development scenarios. For all sites, the habitat condition for habitat parcels, and hedgerows was assessed based on the descriptions given in the reports submitted with each relevant planning application.

2.2.3 The River MoRPh (Modular River Physical) survey system was used to record baseline and post-development information, where rivers or streams were present within the site (or within 10m, as per guidance (Panks *et al.,* 2022)). The River MoRPH survey is the foundation level survey within a scaled hydromorphological assessment method known as the Modular River Survey that combines information gathered from three river units of different size (module, sub-reach, reach) based upon both primary field survey and secondary sources, e.g. remotely-sensed and map data. For the purposes of this Study, the information submitted with the planning application was reviewed, along with a review of data available via Lidar and the Environment Agency's website.

2.2.4 The "Urban Tree Helper" within the Biodiversity Metric 3.1 Tool was used to determine the baseline and proposed value of individual trees within the Sites. The User Guide (Panks *et al.,* 2022) describes that is it appropriate to use the "Urban Tree Helper" for individual trees outside of the urban environment. The "Urban Tree Helper" generates an assumed area

calculation for these individual trees based on their size and condition. The Biodiversity Metric 3.1 does not count the area generated by the Urban Tree Helper towards the total site area. The area of habitat underneath the individual tree (i.e. within habitat parcels) is therefore recorded as the relevant habitat type without excluding the individual tree area. This approach follows guidance provided in the User Guide (Panks *et al.,* 2022).

2.2.5 The strategic significance of the habitats within each site was determined through a review of the information that had been gathered from MAGIC and local records centres regarding Priority Habitats and designated sites as presented in these reports. Furthermore, a review of local biodiversity priority areas was undertaken using the GBC Interactive Planning Map[3] and reviewing the Surrey Nature Partnership's Biodiversity Opportunity Areas (SyNP, 2019).

2.2.6 Note that no weighting has been given to the suitability of habitats to support protected / notable species for any of the Sites. In accordance with the BNG Good Practice Principles. Protected species/notable species impacts and mitigation measures were addressed separately within reports submitted with each planning application, where relevant.

2.2.7 Because the mapping data available for the three sites was in pdf form only, the on-site baseline habitats and condition and on-site post development habitats and condition were digitised using GIS. This allowed the use of Natural England's Biodiversity Metric 3.1 GIS import tool. This tool enabled import of the GIS data directly into the Biodiversity Metric 3.1 Tool.

2.2.8 The following guidance, has been used when determining on-site baseline and post development habitat value and undertaking the Biodiversity Metric 3.1 calculations:

- The Biodiversity Metric 3.1: User Guide (Panks *et al.*, 2022a);
- The Biodiversity Metric 3.1: Auditing and accounting for biodiversity value: Technical Supplement (Natural England, 2022b).
- The Biodiversity Metric 3.1: Auditing and accounting for biodiversity value: Condition Assessment Sheets (in Natural England, 2022b).

2.3 Biodiversity Metric: Principles and Rules

2.3.1 The Biodiversity Metric Principles and Key Rules from the Biodiversity Metric 3.1 User Guide (Panks *et al*, 2022) are set out in Tables 2.1 and 2.2 below. These Principles and Key Rules are considered in the application of the Biodiversity Metric 3.1 to the three Study sites and the discussion of the outcomes.

Table 2.1: Biodiversity Metric 3.1 Principles

Biodiversity Metric 3.1 Principles
Principle 1: The metric does not change the protection afforded to biodiversity. Existing levels of protection afforded to protected species and habitats are not changed by use of this or any other metric. Statutory obligations will still need to be satisfied.
Principle 2: Biodiversity metric calculations can inform decision-making where application of the mitigation hierarchy and good practice principles (CIEEM, CIRIA, IEMA, 2016) conclude that compensation for habitat losses is justified.
Principle 3: The metric's Biodiversity Units are only a proxy for biodiversity and should be treated as relative values. While it is underpinned by ecological evidence the units generated by the metric are only a proxy for biodiversity and, to be of practical use, it has been kept deliberately simple. The numerical values generated by the metric represent relative, not absolute, values.

[3] https://maps.guildford.gov.uk/atSoloMap_planning.html - accessed August-October 2022

Biodiversity Metric 3.1 Principles
Principle 4: The metric focuses on typical habitats and widespread species; important or protected habitats and features should be given broader consideration. Protected and locally important species needs are not considered through the metric, they should be addressed through existing policy and legislation. Impacts on protected sites and irreplaceable habitats are not adequately measured by this metric. They will require separate consideration which must comply with existing national and local policy and legislation. Data relating to these can be entered into the metric, to give an indicative picture of the biodiversity value of the habitats present on a site, but this should be supported by bespoke advice.
Principle 5: The metric design aims to encourage enhancement, not transformation, of the natural environment. Proper consideration should be given to the habitats being lost in favour of higher-scoring habitats, and whether the retention of less distinctive but well-established habitats may sometimes be a better option for local biodiversity. Habitat created to compensate for loss of natural or semi-natural habitat should be of the same broad habitat type (e.g. new woodland to replace lost woodland) unless there is a good ecological reason to do otherwise (e.g. to restore a heathland habitat that was converted to woodland for timber in the past). Although the metric does not explicitly consider the biodiversity value provided by individual species, consideration should be given to locally relevant species interests when creating or enhancing habitats.
Principle 6: The metric is designed to inform decisions, not to override expert opinion. Management interventions should be guided by appropriate expert ecological advice and not just the Biodiversity Unit outputs of the metric. Ecological principles still need to be applied to ensure that what is being proposed is realistic and deliverable based on local conditions such as geology, hydrology, nutrient levels, etc. and the complexity of future management requirements.
Principle 7: Compensation habitats should seek, where practical, to be local to the impact. They should aim to replicate the characteristics of the habitats that have been lost, taking account of the structure and species composition that give habitats their local distinctiveness. Where possible compensation habitats should contribute towards nature recovery in England by creating 'more, bigger, better and joined up' areas for biodiversity. Through the strategic significance and spatial risk factors the biodiversity metric 3.1 places greater reward for habitat creation where it is strategically important and locally relevant.
Principle 8: The metric does not enforce a mandatory minimum 1:1 habitat size ratio for losses and compensation but consideration should be given to maintaining habitat extent and habitat parcels of sufficient size for ecological function. A difference can occur because of a difference in quality between the habitat impacted and the compensation provided. For example, if a habitat of low distinctiveness is impacted and is compensated for by the creation of habitat of higher distinctiveness or better condition, the area needed to compensate for losses can potentially be less than the area impacted. The metric calculates losses and gains by size as well as by Biodiversity Unit value or percentage. Note: consideration should be given to whether reducing the area or length of habitat provided as compensation is an appropriate outcome.

Table 1.2: BNG Version 3.1 Key Rules

Key Rules (Version 3.1)
Rule 1: Where the metric is used to measure change, Biodiversity Unit values need to be calculated prior to the intervention and post-intervention for all parcels of land / linear features affected.
Rule 2: Compensation for habitat losses can be provided by creating new habitats, or by restoring or enhancing existing habitats. Measures to enhance existing habitats must provide a significant and demonstrable uplift in distinctiveness and/or condition to record additional Biodiversity Units.
Rule 3: 'Trading down' must be avoided. Losses of habitat are to be compensated for on a 'like for like' or 'like for better' basis. New or restored habitats should aim to achieve a higher distinctiveness and/or condition than those lost. Losses of irreplaceable or very high distinctiveness habitat cannot adequately be accounted for through the metric.

Key Rules (Version 3.1)
Rule 4: Biodiversity Units generated by biodiversity metric 3.1 are unique to this metric and cannot be compared to unit outputs from versions 3.0, 2.0, the original Defra metric, or any other biodiversity metric. Furthermore, the three types of Biodiversity Units generated by this metric (for area, hedgerow and river habitats) are unique and cannot be summed, traded or converted.
Rule 5: It is not the area/length of habitat created that determines whether ecological equivalence or better has been achieved but the net change in Biodiversity Units. Risks associated with creating or enhancing habitats mean that it may be necessary to create or enhance a larger area of habitat than that lost, to fully compensate for impacts on biodiversity.
Rule 6: Deviations from the published methodology of biodiversity metric 3.1 need to be ecologically justified and agreed with relevant decision makers. While the methodology is expected to be suitable in the majority of circumstances it is recognised that there may be exceptions. Any local or project-specific adaptations of the metric must be transparent and fully justified.

2.4 Report Authors

2.4.1 The review of the baseline habitats, and habitats associated with the proposed development in order to determine the habitat parameters recorded in the GIS mapping and exported using the GIS import tool to the Defra Biodiversity Metric 3.1 was undertaken by an experienced ecologist who is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM), with more than twenty years' experience working as a consultant ecologist. Input was also sought from an experienced ecologist and full member of CIEEM who has undertaken training in the River MoRPh habitat classification, required to determine the input values for the River section of the Biodiversity Metric. The mapping of the habitat types, according to the habitat types and condition determined by the ecologist, was undertaken by an experienced Principal GIS Consultant. The analysis of the Biodiversity Metric 3,1 results, reporting and review were undertaken by experience ecologists who are full members of CIEEM.

3 Results and Discussion

3.1 Overview

3.1.1 The Biodiversity Metric 3.1 (macro-enabled Excel Workbook) for each site is provided, in addition to the reporting of the key outcomes in this section of the report. The Location of each of the Study Sites within Guildford Borough is presented in Appendix B. Note that Figures showing the habitat types and condition for the "baseline" and "post-development" for each site are presented in the Figures section of this report and are not repeated as embedded Figures in the Metric 3.1 itself.

3.2 Just Tyres, Guildford

3.2.1 The Just Tyres Site prior to development comprised buildings, hardstanding, scattered trees, and ruderal vegetation (Phlorum, 2018). Note the River Wey lies to the east of the proposed development but more than 10m from the application boundary and therefore the River part of the Defra Metric 3.1 is not used, in accordance with the User Guide (Panks *et al.,* 2022). Note also that a hedgerow is mentioned in the non-technical summary as being present within the site. However, the habitat mapping and habitat descriptions within the main body of the report do not include a hedgerow. It is therefore assumed that mention of the hedgerow in the non-technical summary is a typographic error.

3.2.2 The approved planning application proposed the loss of existing habitats and buildings from the site and the provision of a block of flats with small areas of planting including ground level planters to the building frontage and landscaping including formal landscaped gardens and grassland to the rear of the proposed flats (Ubu Design, 2018, 2019; Phlorum, 2018; Third Revolution Projects, 2018).

Baseline Assumptions: Just Tyres

3.2.3 The Biodiversity Metric 3.1 calculation for Just Tyres has been undertaken using baseline data collected by Phlorum and presented in their report (Phlorum, 2018). The information in Phlorum's report has been interpreted by Stantec, along with other baseline information, as described in Section 2, to provide the necessary information for the habitat baseline value calculation, following the UKHab classification.

3.2.4 Notes and assumptions associated with the habitat baseline for the Just Tyres Site are listed below. The baseline habitat mapping for Just Tyres using the UKHab typology is presented at Figure 1, with the Conditions of Habitats mapped and shown in Figure 2. Note the baseline mapping is presented adjacent to the proposed habitats in each Figure, for ease of direct comparison.

- The Just Tyres Site comprises a total area of 1335m^2 (0.135ha) consisting of 1330m^2 of Developed land; sealed surface. This includes the footprint of the building that was present in this site, and the hardstanding that surrounded it. The only other habitat area within the site was 5m^2 of ruderal/ephemeral habitat in two small parcels around the edge of the building.

- It should be noted that the development site is of a size suitable for the "small sites" metric but exceeds the number of housing units limit for that version of the Metric. Therefore, the Metric 3.1 has been used with the areas used consistently as m^2, rather than hectares (as the decimal places are too numerous in hectares). This means the habitat units in the Metric are shown 10000x more than reality throughout. However the % changes remain the same whether measured in m^2 or ha.

- Condition assessments within the Technical Guidance documents were used following the suitable condition assessment table. Condition assessments followed the criteria and descriptions within these documents.

- While the area of land is not located within the Local Plan or within Defra MAGIC Nature Improvement Areas it was classed as "Location ecologically desirable but not in local strategy" for its "strategic significance" due to the proximity of the Site to the corridor of the River Wey (just over 10m from the Site boundary).

3.2.5 Taking into account these assumptions, the calculated baseline value, i.e., the pre-development Habitat Biodiversity Units, using the Biodiversity Metric 3.1 for the Just Tyres Site was 0.0022 baseline habitat units (shown as 22 habitat units in the Metric 3.1 using m^2 and dividing by 10000 to determine Biodiversity Units that would be generated from ha area calculations). Note there are no hedgerow or river baseline units as these habitat types were not present in the site baseline.

Post-development Assumptions: Just Tyres

3.2.6 Notes and assumptions associated with the post-development habitat conditions are listed below. The post-development habitat mapping for the Just Tyres Site is presented in Figure 1, with the Conditions of Habitats mapped and shown in Figure 2. Note the baseline mapping is presented adjacent to the proposed habitats in each Figure, for ease of direct comparison between the baseline and proposed habitat types and condition.

- Complete loss of baseline habitat parcels to the proposed development.

- Creation of the following habitat types, providing a total area of 1335m^2:

- **Developed Land; sealed surface:** 960m^2 - this is the footprint of the block of flats that was proposed for the site and the footprint of other areas of hardstanding.

- **Modified Grassland:** 105m^2 – this is the footprint of grassland proposed to the rear of the property.

- **Ground Level Planters:** 10m^2 – this is the footprint of proposed ground level planters within the site

- **Vegetated Gardens:** 280m^2 – this is the footprint of the vegetated gardens that are proposed to the rear of the flats, adjacent to the existing greenspace alongside the River Wey.

- **Urban Trees**: trees are proposed to be planted within the Proposed Development area. However, given the positive result from the Metric 3.1 using the habitat parcels alone, the urban tree helper has not been employed in this case.

- Predicted **target condition** has been determined taking into account the Technical Supplement condition assessment criteria for each of the habitats being created. All of the above habitat types, with the exception of the grassland, fall within the "Urban" broad habitat type and as a result automatically fall into N/A for the Condition Assessment, following the Condition Assessment criteria for these habitat types. The Modified Grassland proposed for the site is assessed as moderate condition.

- Following the baseline rationale, the post-development habitats were classed as "Location ecologically desirable but not in local strategy" due to the proximity of the Site to the corridor of the River Wey (just over 10m from the Site boundary).

3.2.7 Taking into account these assumptions, the calculated on-site post-development Biodiversity Unit value, using the Biodiversity Metric 3.1 is 0.0974 habitat units (rounded) post development (shown as 973.85 habitat units in the Metric 3.1 using m^2 and dividing by 10000 to determine Biodiversity Units that would be generated from ha area calculations).

Summary of Results of the Biodiversity Metric including Net Biodiversity Change %: Just Tyres

3.2.8 A summary of the key findings of the Biodiversity Metric 3.1 for the Just Tyres site is shown below in Table 3.1.

Table 2.1: Summary of the Biodiversity Metric 3.1 Outcomes for Just Tyres

	On Site Baseline (Units)	On Site Post Intervention[4] (Units)	Total Net Change[5] (Units)	**Net Change (% Units)**
Habitats ($m^{2)}$	22	973.85	951.85	**4326.58%**
Habitats (ha)	0.0022	0.097385	0.095185	**4326.58%**

3.2.9 The Just Tyres proposed development more than easily meets and exceeds both a 10% and 20% Biodiversity Net Gain Target. The reason for the large positive net % change is because of the low baseline Biodiversity Unit value. Therefore, the provision of relatively modest habitat creation as part of the proposed development was sufficient to vastly exceed any requirement for BNG, whether at 10% or 20%. Note that the delivery of actual biodiversity Units remains low (0.095 units, rounding to two d.p.) and the large percentage change is just the result of the calculations for the Biodiversity Unit change made against a very low baseline value (0.0022 Units). The trading rules have been satisfied.

3.3 Clockbarn Nurseries, Send

3.3.1 The 2.35ha Clockbarn site prior to development comprised a former plant nursery which had fallen into disuse. The site contains a number of dilapidated greenhouses and polytunnels, which were for the most part filled with scrub, surrounded by bracken, further scrub and areas of grassland. Sections of hedgerows and tree lines were present around parts of the site boundary (Greenspace Ecological Solutions Ltd, 2018). Given the habitats present, the Habitat (parcels) and Hedgerow (linear features) sections of the Defra Metric 3.1 have been used for this site.

3.3.2 The approved planning application proposed the loss of all the habitat parcels and some hedgerows from the site. The proposed development included 75 houses, along with roads and pavements, private and communal greenspace; including private gardens, hedgerow and scrub planting, grassland planting and provision of trees in communal green spaces (The Noble Consultancy, 2018a, 2018b; Greenspace Ecological Solutions Ltd, 2019).

Baseline Assumptions: Clockbarn Nursery

3.3.3 The Biodiversity Metric 3.1 calculation for the Clockbarn Nursery site has been undertaken using baseline data collected by Greenspace Ecological Solutions Ltd and presented their report (Greenspace Ecological Solutions Ltd, 2018). The information in Greenspace Ecological Solutions' report has been interpreted by Stantec, along with other baseline information, as described in Section 2, to provide the necessary information for the habitat baseline value calculation, following the UKHab classification.

[4] Habitat units created and enhanced

[5] Difference between on-site post-intervention habitat units and on-site baseline value habitat units

3.3.4 Note and assumptions associated with the habitat baseline for the Clockbarn Nursery site are listed below. Baseline habitat mapping for the Clockbarn Nursery Site using the UKHab typology is presented at Figure 3, with the Conditions of Habitats mapped and shown in Figure 4. Note the baseline mapping is presented adjacent to the proposed habitats in each Figure, for ease of direct comparison.

- The Clockbarn Nursery Site comprises a total area of 2.35ha (rounded to two d.p) which includes 0.85ha of Modified Grassland, 0.63ha of bracken, 0.79ha of mixed scrub (inside former polytunnels and outside them) and 0.09ha developed land; sealed surface.
- Based on outputs from the "Urban Tree Helper", the area of individual trees within the site Habitat baseline (those outside of treelines and hedgerows) were also entered into the Metric. Because there was no tree information for the baseline, it was assumed on precautionary basis that these are native trees of medium size and moderate condition. Larger/more mature trees would reasonably have been noted in the Ecological Assessment.
- Hedgerows were also present around the Site perimeter. These included sections of native species rich hedgerow associated with a ditch or bank (0.17km), another section of native hedgerow (0.066km), with the remainder (0.395km) comprising sections of ornamental non-native hedgerows – mainly associated with the boundaries to adjacent properties.
- Condition assessments within the Technical Guidance documents were used following the suitable condition assessment table. Condition assessments followed the criteria and descriptions within these documents.
- The area of land is not located within the Local Plan or within Defra MAGIC Nature Improvement Areas and therefore was classed as "Area not in local strategy/no local strategy" in terms of Strategic Significance.

3.3.5 Taking into account these assumptions, the calculated baseline value, i.e. the pre-development Habitat Biodiversity Units, using the Biodiversity Metric 3.1 for the Clockbarn Nursery site was 10.86 Biodiversity Units. The baseline Hedgerow Biodiversity Units was 3.59 Biodiversity Units.

Post-development Assumptions: Clockbarn Nursery

3.3.6 Notes and assumptions associated with the post development habitat conditions area listed below. The post-development habitat mapping for the Clockbarn Nursery site is presented in Figure 3 with the Conditions of the proposed habitats mapped and shown in Figure 4. Note the baseline mapping is presented adjacent to the proposed habitats in each Figure, for ease of direct comparison between the baseline and proposed habitat types and condition.

- Complete loss of baseline habitat parcels to the proposed development. Retention of 0.086km of ornamental non-native trees and enhancement to 0.17km of native species-rich hedgerow, with the loss of the remaining hedgerows.
- Creation of the following habitat types, providing a total area (excluding urban trees) of 2.35ha (rounded to two d.p.):
  - **Developed Land; sealed surface:** 1.21ha - this is the footprint of the proposed houses, access road and private driveways/paths.
  - **Vegetated Gardens:** 0.84ha – this is the footprint of the proposed private gardens to the rear of the property and proposed shrub/planting beds in communal areas.

- **Modified Grassland:** 0.07ha – this is mapped as the grassland proposed along road verges and around car-parking areas.

- **Other Neutral Grassland**: 0.23ha – these are two areas within the site proposed for wildflower grassland sowing and management.

3.3.7 Predicted **target condition** for these habitat types has been determined taking into account the Technical Supplement condition assessment criteria for each of the habitats being created. For the habitat types, that fall within the "Urban" broad habitat type, these automatically fall into N/A for the Condition Assessment (developed land, sealed surface and vegetated garden). The other habitat types are proposed as Moderate Condition, following the Condition Assessment criteria for these habitat types and taking into account the proposed Landscape and Ecological Management Plan (LEMP) (Greenspace Ecological Solutions Ltd, 2019).

- **Urban Trees:** trees were proposed to be planted within the Proposed Development area. Fifty-six individual trees are proposed outside of the hedgerows and lines of trees. Using the Urban Tree helper these are recorded in the Metric to be proposed as 41 small trees and 15 medium trees of moderate condition, based on the species proposed, planting proposals and proposed location within the site.

- **Hedgerows**: 0.17km of hedgerow is proposed for enhancement through improved Condition based on the proposed management within the LEMP. A further 0.245km of hedgerow (a mix of native hedgerow and ornamental hedgerow) is proposed to be created around the site perimeter and around the perimeter of habitat parcels within the site. Moderate or Poor Condition has been assumed for these proposed hedgerows, dependent on their position within the site, with those in proximity to roads and other shared access species assumed to be able to achieve a lower Condition than those elsewhere.

- Following the baseline rationale the post-development habitat were classed as "Area not in local Strategy/no local strategy in terms of Strategic Significance".

3.3.8 Taking into account these assumptions, the calculated on-site post-development Habitat biodiversity unit value, using the Biodiversity Metric 3.1 was 5.61 Biodiversity Units. The post-development Hedgerow Biodiversity Units was 5.21 Biodiversity Units.

Summary Results of the Biodiversity Metric including Net Biodiversity Change %: Clockbarn Nursery.

3.3.9 A summary of the key findings of the Biodiversity Metric 3.1 for the Clockbarn Nursery site is shown below in Table 3.2.

Table 3.2 Summary of the Biodiversity Metric 3.1 Outcome for Clockbarn Nursery

	On Site Baseline (Units)	On Site Post Intervention[6] (Units)	Total Net Change[7] (Units)	**Net Change (% Units)**
Habitat Units	10.86	5.61	-5.26	**-48.38%**
Hedgerow Units	3.59	5.21	1.63	**45.31%**

*Amber cells show where Biodiversity Unit requirements would not be met. Green cells provide the additional Biodiversity Unit requirements to meet a 10% or 20% Biodiversity Net Gain Requirement.

[6] Habitats and Hedgerow Units created and enhanced

[7] Difference between on-site post-intervention habitat and hedgerow units and on-site baseline value habitat and hedgerow units

3.3.10 The Clockbarn Nursery Proposed Development would not meet a 10% or 20% Biodiversity Net Gain target for Habitat Biodiversity Units. However, the Proposed Development easily meets and exceeds both a 10% and 20% Biodiversity Net Gain Target for Hedgerow Biodiversity Units. Note that one of the published rules for the Biodiversity Metric is that the three types of Biodiversity Unit (Habitat, Hedgerow and River) are calculated in a unique way and therefore cannot be summed, traded or converted (Panks *et al.,* 2022) – see Key Rule 4, **Section 2.2** of this Study.

3.3.11 Furthermore, for the Clockbarn Nursery Site, the Trading Rules have not been met – principally because the habitats provided within the Proposed Development do not provide a Biodiversity Net Gain and result in a net loss of (-)48.38% Habitat Biodiversity Units. Consideration of the Habitat units lost and provided for this approved development is useful to consider, against the Habitat units which would be required to achieve Biodiversity Net Gain of 10% (as anticipated to be required through the Environment Act, 2021) or 20% (as proposed by GBC's proposed Policy P6/P7). This is set out in Table 3.3 below. Note that only Habitat units are considered in this example as the Hedgerow units already meet and exceed 20% Biodiversity Net Gain, as measured by Biodiversity Metric 3.1.

Table 3.3 Summary of the Biodiversity Unit Requirements for Clockbarn Nursery to Achieve 10% or 20% Biodiversity Net Gain.

On Site Habitat Baseline (Units)	Habitat Units Required for 10% BNG	Habitat Units Required for 20% BNG	On Site Habitat Proposed[8] (Units)	Off Site Habitat Units Required for 10% BNG*	**Off Site Habitat Units Required for 20% BNG***	**Offset Habitat Unit difference between 10% and 20% BNG**
10.86	11.946	13.032	5.61	6.336	7.422	1.086

*Note also that to meet Key Rule 3 (see Section 2.3) the off-site habitat units would need to be of same distinctiveness, or above of those lost.

**Amber cells show where Biodiversity Unit requirements would not be met. Green cells provide the additional Biodiversity Unit requirements to meet a 10% or 20% Biodiversity Net Gain Requirement.

3.3.12 Given the outcome from the Biodiversity Metric calculations for Clockbarn Nurseries, as summarised in Tables 3.2 and 3.3. above, it can be seen that the proposed development would have more than delivered against a 10% or 20% BNG requirement for hedgerows. However, whilst the development does provide Habitat within the Site, given its value of baseline habitats, small size and quantum of development, it falls short of achieving Biodiversity Net Gain within the Site. One of the published rules for the Biodiversity Metric is that the three types of Biodiversity Unit (Habitat, Hedgerow and River) are calculated in a unique way and therefore cannot be summed, traded or converted (Panks *et al.,* 2022). The Clockbarn Nurseries Site would therefore have required off-site Habitat Units to meet with either 10% or 20% Biodiversity Net Gain targets.

3.3.13 Another important point to note from the Clockbarn Nurseries Site is the difference between the 10% BNG and 20% BNG requirement. A 20% BNG Requirement is not double the 10% requirement. This is because the calculations are made as a percentage of the baseline Biodiversity Unit value (i.e. 110% vs 120%). This example clearly demonstrates that an increase of BNG requirement from 10% to 20%, as proposed in Policy P6/P7, does not mean a doubling of Habitat Unit requirements. In the case of the Clockbarn example above, there is just over a 1 Habitat Unit difference between the 10% and 20% BNG requirement.

[8] Habitats Units created and enhanced as per the designs approved through planning permission for the Proposed Development.

3.4 Keens Lane, Guildford

3.4.1 The 5.36ha Keens Lane Site prior to development comprised modified grassland fields in use as a horse paddock (the dominant habitat type within the site), mixed scrub, ponds, some scattered individual trees and some existing agricultural/commercial structures and outhouses including derelict buildings associated with a former horse-riding school. Lines of trees and native hedgerows were also present for some of the field boundaries and around the site perimeter. Furthermore, a small stream was present within the eastern part of the site, flowing northwards through the site and along its north-eastern boundary. The southern section of the stream within the site was culverted (ACD Environmental, 2018).

3.4.2 The approved planning application provides for 148 dwellings and a care home within the Site, along with associated roads, pavements and car parking. Proposed greenspace within the development includes private gardens, and public space which provides amenity grassland and areas of wildflower grassland to suit the habitat location. The existing pond and stream are retained and enhanced through the scheme design with the culverted section of the stream within the site being de-culverted and planted up with appropriate riparian planting. The proposals also include the creation of a new pond and the enhancement of, or provision of new hedgerows, on the site boundaries. The scheme design also provides proposed individual trees – both within public areas of greenspace and in the private gardens (ACD Environmental, 2018; Omega Partnership Limited, 2018; Murdoch Wickham, 2018).

Baseline Assumptions: Keens Lane

3.4.3 The Biodiversity Metric 3.1 calculation for the Keens Lane Site has been undertaken using baseline data collected by ACD Environmental and presented in their report (ACD Environmental, 2018). The information in ACD's report has been interpreted by Stantec, along with other baseline information, as described in Section 2, to provide the necessary information for the habitat baseline value calculation, following the UKHab classification.

3.4.4 Notes and assumptions associated with the habitat baseline for the Keens Lane are listed below. The baseline habitat mapping for the Keens Lane site using the UKHab typology is presented at Figure 5, with the Conditions of Habitats also mapped and shown in Figure 6. Note that the baseline habitat mapping is presented adjacent to the proposed habitats in each Figures, for ease of direct comparison.

- The Keens Lane Site comprises a total area of 5.36ha (rounding to two d.p.) which includes 4.6ha of modified grassland, 0.34ha of mixed scrub, 0.017ha of pond and 0.396ha of developed land; sealed surface.
- Based on outputs from the "Urban Tree Helper", the area of individual trees within the site Habitat baseline (those outside of treelines and hedgerows) were also entered into the Metric. For consistency of approach with other sites considered in this study, it was assumed on a precautionary basis that these are native trees of medium size and moderate condition based on descriptions within ACD's Report (ACD Environmental, 2018).
- Hedgerows were also present around the Site perimeter and around some of the boundaries of fields within the Site. These included Lines of Trees (0.278km), some of which were associated with a bank or ditch, and native hedgerows (0.678km), some of which were associated with a bank or ditch, some which had trees and some which were native species rich.
- The stream was also assessed using the River section of the Metric, with the length of the watercourse within the Site being recorded as 0.192km.

- Condition assessments within the Technical Guidance documents were used following the suitable condition assessment table. Condition assessments followed the criteria and descriptions within these documents.

- The area of land is not located within the Local Plan or within Defra MAGIC Nature Improvement Areas and therefore was classed as “Area not in local strategy/no local strategy” in terms of Strategic Significance.

3.4.5 Taking into account these assumptions, the calculated baseline value, i.e. the pre-development Habitat Biodiversity Units, using the Biodiversity Metric 3.1 for the Keens Lane Site was 16.60 Biodiversity Units. The baseline Hedgerow Biodiversity Units was 6.36 Biodiversity Units.

Post-development Assumptions: Keens Lane

3.4.6 Notes and assumptions associated with the post development habitat conditions area listed below. The post-development habitat mapping for the Keens Lane site is presented in Figure 5 with the Conditions of the proposed habitats mapped and shown in Figure 6. Note the baseline mapping is presented adjacent to the proposed habitats in each Figure, for ease of direct comparison between the baseline and proposed habitat types and condition.

- Loss of the baseline habitat parcels to the Proposed Development, with the exception of the pond which is retained and enhanced, the stream corridor, which is retained and enhanced, with a section de-culverted. Furthermore, some individual trees were retained within the scheme proposals, along with the majority of the lines of trees and hedgerows around the site perimeter which were retained and enhanced.

- Creation of the following habitat types:

  - **Developed Land; sealed surface:** 2.63ha - this is the footprint of the proposed houses, access road and private driveways/paths.

  - **Vegetated Gardens:** 1.80ha – this is the footprint of the proposed private gardens to the rear of the properties and proposed shrub/planting beds in communal areas.

  - **Modified Grassland:** 0.54ha – this is mapped as the grassland proposed on road verges and around communal areas of green-space.

  - **Other Neutral Grassland**: 0.35ha – these are areas within the site proposed for wildflower grassland sowing and management, associated with retained trees and hedgerows, the stream corridor and new pond.

  - **Ponds (Non-Priority Habitat):** 0.015ha

3.4.7 Predicted **target condition** for these habitat types has been determined taking into account the Technical Supplement condition assessment criteria for each of the habitats being created. For the habitat types that fall within the “Urban” broad habitat type, these automatically fall into N/A for the Condition Assessment (developed land, sealed surface and vegetated garden). The other habitat types are proposed as Moderate Condition, following the Condition Assessment criteria for these habitat types and taking into account the proposed Ecological Mitigation and Enhancements Plan within the Ecological Impact Assessment (ACD Environmental, 2018).

- **Urban Trees:** trees were proposed to be planted within the Proposed Development area. Ninety-six individual trees are proposed outside of the hedgerows and lines of trees. Using the Urban Tree helper these are recorded in the Metric to be proposed as 54 small trees and 42 medium trees of moderate condition, based on the species proposed, planting proposals and proposed location within the Site.

- **Hedgerows**: 0.53km of hedgerow is proposed for enhancement through improved Condition based on the Ecological Mitigation and Enhancement Plan. A further 0.658km of hedgerow (native species-rich hedgerow) is proposed to be created within the site. Good Condition has been assumed for these proposed hedgerows.

- **Rivers:** 0.07km of habitat creation (other Rivers and Streams) is proposed through the de-culverted of the small stream section which currently runs in culvert through the site. Moderate Condition has been assumed for this new section of stream.

- Following the baseline rationale the post-development habitat were classed as "Area not in local Strategy/no local strategy in terms of Strategic Significance".

3.4.8 Taking into account these assumptions, the calculated on-site post-development Habitat Biodiversity Unit value, using the Biodiversity Metric 3.1, was 16.43 units. The post-development Hedgerow Biodiversity Units was 13.22 biodiversity units. Lastly, the post-development River units was 1.04 Biodiversity Units.

Summary Results of the Biodiversity Metric including Net Biodiversity Change %: Keens Lane.

3.4.9 A summary of the key findings of the Biodiversity Metric 3.1 for the Keens Lane is shown below in Table 3.4.

Table 3.4 Summary of the Biodiversity Metric 3.1 Outcome for Keens Lane

	On Site Baseline (Units)	On Site Post Intervention[9] (Units)	Total Net Change[10] (Units)	**Net Change (% Units)**
Habitat Units	16.60	16.43	-0.17	**-1.01%**
Hedgerow Units	6.36	13.22	6.86	**107.82%**
River Units	0.86	1.04	0.18	**20.40%**

*Amber cells show where Biodiversity Unit requirements would not be met. Green cells provide the additional Biodiversity Unit requirements to meet a 10% or 20% Biodiversity Net Gain Requirement.

3.4.10 The Keens Lane Proposed Development would not meet a 10% or 20% Biodiversity Net Gain target for Habitat Biodiversity Units. The Proposed Development does however meet and exceed both a 10% and 20% Biodiversity Net Gain Target for Hedgerow Biodiversity Units and River Biodiversity Units. Note that one of the published rules for the Biodiversity Metric is that the three types of Biodiversity Unit (Habitat, Hedgerow and River) are calculated in a unique way and therefore cannot be summed, traded or converted (Panks *et al.,* 2022) – see Key Rule 4, **Section 2.2** of this Study.

3.4.11 Furthermore, for the Keens Lane Site, the Trading Rules have not been met – principally because the habitats provided within the Proposed Development do not provide a Biodiversity Net Gain and result in a net loss of (-)1.01% Habitat Biodiversity Units. Consideration of the Habitat units lost and provided for this approved development is useful to consider, against the Habitat units which would be required to achieve Biodiversity Net Gain of 10% (as anticipated to be required through the Environment Act, 2021) or 20% (as proposed by GBC's proposed Policy P6/P7). This is set out in Table 3.3 below. Note that only Habitat units are considered in this example as the Hedgerow units and River units already meet and exceed 20% Biodiversity Net Gain, as measured by Biodiversity Metric 3.1.

[9] Habitats, Hedgerows and Rivers Units created and enhanced

[10] Difference between on-site post-intervention habitat, hedgerow and river units and on-site baseline value habitat, hedgerow and river units

Table 3.5 Summary of the Biodiversity Unit Requirements for Keens Lane to Achieve 10% or 20% Biodiversity Net Gain.

On Site Habitat Baseline (Units)	Habitat Units Required for 10% BNG	Habitat Units Required for 20% BNG	On Site Habitat Proposed[11] (Units)	Off Site Habitat Units Required for 10% BNG*	**Off Site Habitat Units Required for 20% BNG***	**Offset Habitat Unit difference between 10% and 20% BNG**
16.60	18.26	19.92	16.43	1.83	3.49	1.66

*Note also that to meet Key Rule 3 (see Section 2.3) the off-site habitat units would need to be of same distinctiveness, or above of those lost.

**Amber cells show where Biodiversity Unit requirements would not be met. Green cells provide the additional Biodiversity Unit requirements to meet a 10% or 20% Biodiversity Net Gain requirement.

3.4.12 Given the outcome from the Biodiversity Metric calculations for Keens Lane, as summarised in Tables 3.4 and 3.5 above, the Study demonstrates that the proposed development would more than have delivered against a 10% or 20% BNG requirement for hedgerows and rivers. Habitat Units are provided within the Site but it falls short of achieving Biodiversity Net Gain. Biodiversity Net Gain may have been possible to achieve within this Site but likely only through the loss of development area. It is worth reiterating that one of the published rules for the Biodiversity Metric is that the three types of Biodiversity Unit (Habitat, Hedgerow and River) are calculated in a unique way and therefore cannot be summed, traded or converted (Panks *et al.,* 2022).

3.4.13 The Keens Lane Site would therefore have required off-site Habitat Units to meet with either 10% or 20% Biodiversity Net Gain targets. The overall off-set requirement however for either 10% or 20% Biodiversity Net Gain however is relatively small, because the proposed development had worked hard to retain habitats of higher value and deliver biodiversity value through the scheme design within the Site boundary. This results in 90% of a 10% BNG Requirement, or 82% of a 20% BNG requirement, being achieved within the Site through the existing scheme design. These outcomes demonstrate clearly how application of the Biodiversity Metric supports delivery of the Mitigation Hierarchy; those Sites which carefully consider biodiversity value in the scheme design will minimize their off-set requirements for BNG.

3.4.14 As for the Clockbarn example, the Keens Lane Site also demonstrates that the 20% BNG Requirement is not double the 10% requirement. This is because the calculations are made as a percentage of the baseline Biodiversity Unit value (i.e. 110% vs 120%).

[11] Habitats Units created and enhanced as per the designs approved through planning permission for the Proposed Development.

4 Conclusions

4.1 Summary Comparison of Results from the Study Sites.

4.1.1 The table below provides a summary of the Results from the Study Sites, providing a comparison of the Habitat Baseline Units for each of the sites and the Habitat Units required for 10% or 20% BNG for each Site.

Study Site	On Site Habitat Baseline (Units)	Habitat Units Required for 10% BNG	Habitat Units Required for 20% BNG	On Site Habitat Proposed[12] (Units)	Off Site Habitat Units Required for 10% BNG*	Off Site Habitat Units Required for 20% BNG*	Offset Habitat Unit difference between 10% and 20% BNG
Just Tyres	0.0022	0.00242	0.00264	0.0974	0	0	**0**
Clockbarn Nursery	10.86	11.946	13.032	5.61	6.336	7.422	**1.086**
Keens Lane	16.60	18.26	19.92	16.43	1.83	3.49	**1.66**

**Amber cells show where Biodiversity Unit requirements would not be met. Green cells provide the additional Biodiversity Unit requirements to meet a 10% or 20% Biodiversity Net Gain Requirement.

4.1.2 The summary table above from the Study sites and the descriptions of the specifics for each of the sites help to illustrate a number of key points relevant to the future application of the Biodiversity Metric 3.1 to proposed development sites and Biodiversity Net Gain requirements.

4.2 Key Points from the Study Relevant to Biodiversity Net Gain Policy

Habitat Unit Requirement Comparison - 10% vs 20%

4.2.1 A 20% Biodiversity Net Gain is not double 10% Biodiversity Net Gain. This is because the calculations are made as a percentage of the baseline Biodiversity Unit value (i.e. 110% vs 120%). This is demonstrated by the results from both Clockbarn Nurseries and Keen's Lane: There was just over a 1 Habitat Unit difference (17% increase) between the 10% and 20% BNG requirement for Clockbarn Nurseries. The Habitat Unit difference between the 10% and 20% BNG requirement for Keens Lane was 1.66 Habitat Units. The relatively small difference between the 10% and 20% off-set requirement for Keens Lane is largely due to the provision of the majority of the Habitat Units required (for either 10% or 20% BNG target) within the Site. This also links to the key point below on the Mitigation Hierarchy.

Mitigation Hierarchy Reinforcement

4.2.2 Use of the Biodiversity Metric 3.1 clearly supports and reinforces the application of the mitigation hierarchy. Avoidance of impacts on higher value habitats and seeking to enhance and/or create habitats of ecological value within a scheme design will result in a better Metric outcome for a site than if such matters are not taken into consideration. This is clearly demonstrated by Just Tyres which is able to deliver such a high Biodiversity Net Gain for the site, mainly because the baseline Habitat Biodiversity Unit value of the site was very low. It follows that for many brownfield sites of low ecological value, similar positive outcomes will likely be possible, with the BNG requirement being relatively easy to incorporate into a

[12] Habitats created and enhanced as per the designs approved through planning permission for the Proposed Development.

scheme design. It is acknowledged that not all brownfield sites are of low ecological value and for smaller brownfield or greenfield sites with a higher baseline Habitat Unit value (such as Clockbarn Farm) it will likely always be difficult to achieve Biodiversity Net Gain on-site because of the limits of site size.

4.2.3 For slightly larger sites with lower baseline habitat values, such as Keen's Lane, it is likely that even where BNG (of 10% or 20%) is not possible to meet within the Site, the overall off-set requirement is likely to be relatively low where the Mitigation Hierarchy is employed in the development of the scheme. The overall off-set requirement for either 10% or 20% Biodiversity Net Gain for Keens Lane is relatively small, because the proposed development had worked hard to retain habitats of higher value and deliver biodiversity value through the scheme design, within the Site boundary. This demonstrates clearly how application of the Biodiversity Metric supports delivery of the Mitigation Hierarchy; those Sites which through careful planning and consideration of biodiversity value in planning will always minimise their off-set requirements to meet BNG targets.

Off-Site Off Setting to Achieve Biodiversity Net Gain

4.2.4 As described above, the Keens Lane site Proposed Development already clearly has worked hard to retain and enhance the habitats of highest ecological value within the site, showing that the principles of the mitigation hierarchy have already been applied to the development of the proposals, in the absence of a requirement to measure Biodiversity Net Gain using the Metric tool. However, for Keens Lane to achieve Biodiversity Net Gain on site would likely require a reduction of the number of proposed dwellings in favour of additional areas of habitat enhancement and/or creation. Acknowledging that this would likely affect the viability of the proposed development given the relatively small size of the site, the forthcoming Biodiversity Net Gain requirement under both the Environment Act, 2021 and the proposed GBC policy P6/P7 allows for biodiversity offsetting through habitat creation and/or enhancement of habitats off-site, or purchase of Habitat units from third party providers (a mitigation bank).

4.2.5 The Biodiversity Metric 3.1 also provides for the ability to calculate the off-site off set requirements, also measured in Biodiversity Units. It should be noted that the off-site baseline value also needs to be considered; the mitigation bank will need to be provided within the off-site area through habitat creation and enhancement to create the Biodiversity Units for trading. Habitat trading rules must also be met, with losses of habitat from the proposed development site to be compensated for with habitats of the same or higher distinctiveness. The Metric also correctly favours off-site offsetting close to the location of the impact. There are both ecological and social drivers for off-site habitat to be provided close to where losses occur: e.g. to avoid depleting biodiversity in local areas or to recognise the cultural ecosystem services provided to a local community. For this reason, the Biodiversity Metric penalises proposals where the off-site habitat is located at distance from the site of impact. The off-site habitats delivered within the local planning authority or the same National Character Area are favoured by the Metric, with a "Spatial Risk Multiplier" applied to off-site habitat delivery outside such areas (Panks, *et al.,* 2022).

Habitat Unit Requirement Per Dwelling

4.2.6 A further conclusion that can be drawn from the results of the Study is that where an off-site off-set is needed to achieve Biodiversity Net Gain, the Biodiversity Unit off-set requirement per dwelling will vary between sites, depending on the number of Biodiversity Units needed to meet the Biodiversity Net Gain requirement and the number of dwellings proposed for the site. For example, for Clockbarn Nursery the 6.336 Habitat Biodiversity Unit requirement to achieve 10% BNG, divided by the proposed 75 dwellings would be 0.084 Habitat Units per dwelling. A 7.422 Habitat unit requirement to achieve 20% BNG, divided by the 75 dwellings would be 0.099 Habitat Units per dwelling. For Keens Lane the 1.83 Habitat Unit requirement to achieve 10% BNG, divided by the proposed 148 dwellings (excluding the care home), would be 0.0124 Habitat Units per dwelling. A 3.49 Habitat Unit requirement to achieve 20% BNG, divided by the proposed 148 dwellings, would be 0.024 Habitat Units per dwelling. These calculations

again demonstrate the relatively small difference between the anticipated mandatory 10% BNG requirement and the proposed 20% BNG requirement for GBC.

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6 Figures

BASELINE

POST DEVELOPMENT

Walnut Tree Close

Site Boundary

Baseline Habitat Type

- Existing Tree
- 17, Ruderal/Ephemeral
- u1b, Developed land; sealed surface

Site Boundary

Post Development Habitat Type

- Existing Tree
- Newly Planted Tree
- 1140, Ground level planters
- 231, Vegetated garden
- g4, Modified Grassland
- u1b, Developed land; sealed surface

Stantec

Client: GUILDFORD BOROUGH

GUILDFORD BOROUGH COUNCIL BIODIVERSITY POLICY SUPPORT

Just Tyres Baseline and Post Development Habitat

0 10 20 m

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
Baseline Habitat Survey undertaken by Phlorum on the 31st of August 2018. Data digitised from Report 18_P_02100-Preliminary_Ecological_Appraisal-1219745.pdf

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Figure 01	Rev A

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BASELINE

POST DEVELOPMENT

Walnut Tree Close

Site Boundary

Baseline Habitat Condition

Existing Tree

Moderate

N/A - Other

Site Boundary

Post Development Habitat Condition

Existing Tree

Newly Planted

Moderate

N/A

Stantec

Client

GUILDFORD BOROUGH

GUILDFORD BOROUGH COUNCIL BIODIVERSITY POLICY SUPPORT

Just Tyres Baseline and Post Development Habitat Condition

0 10 20 m

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
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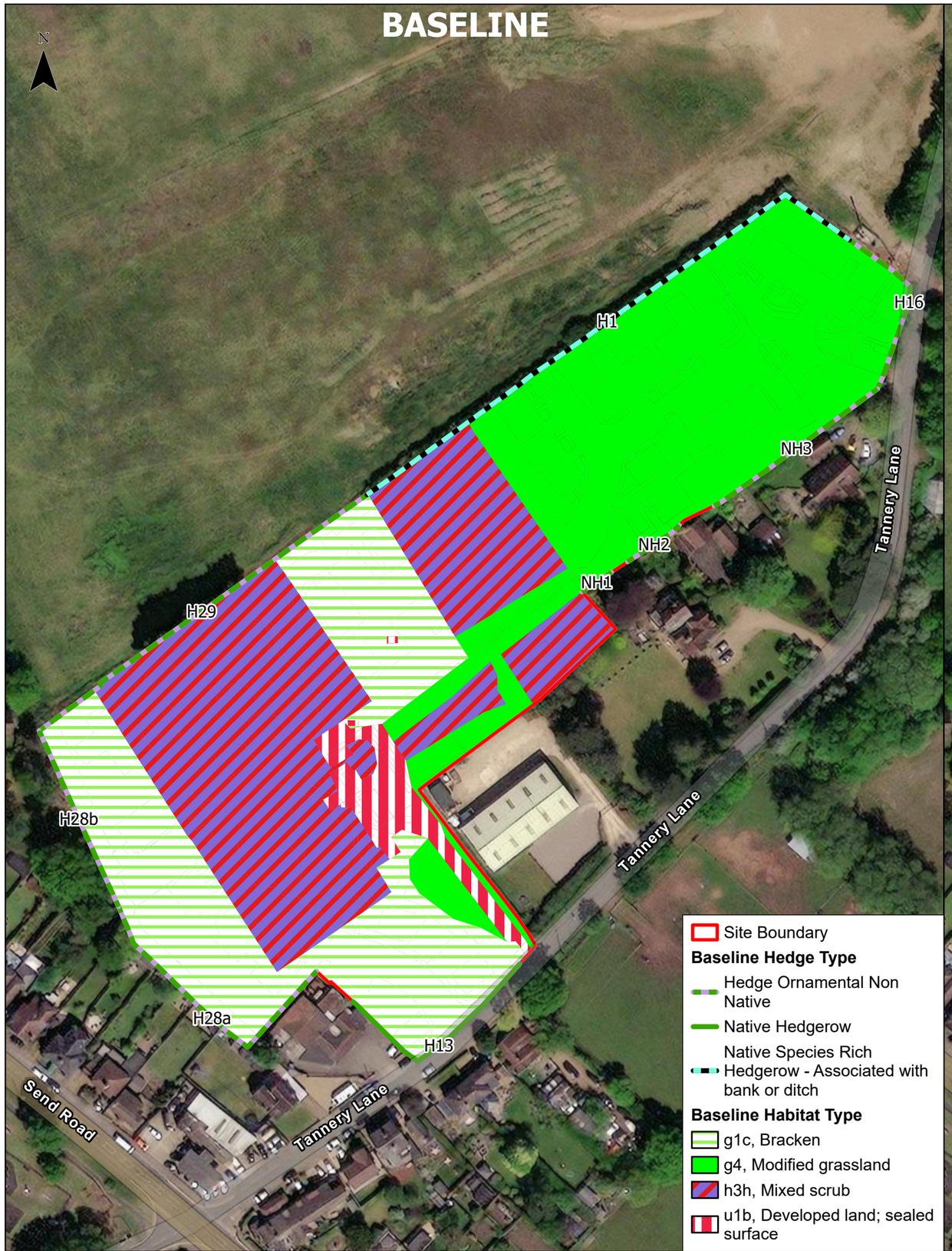
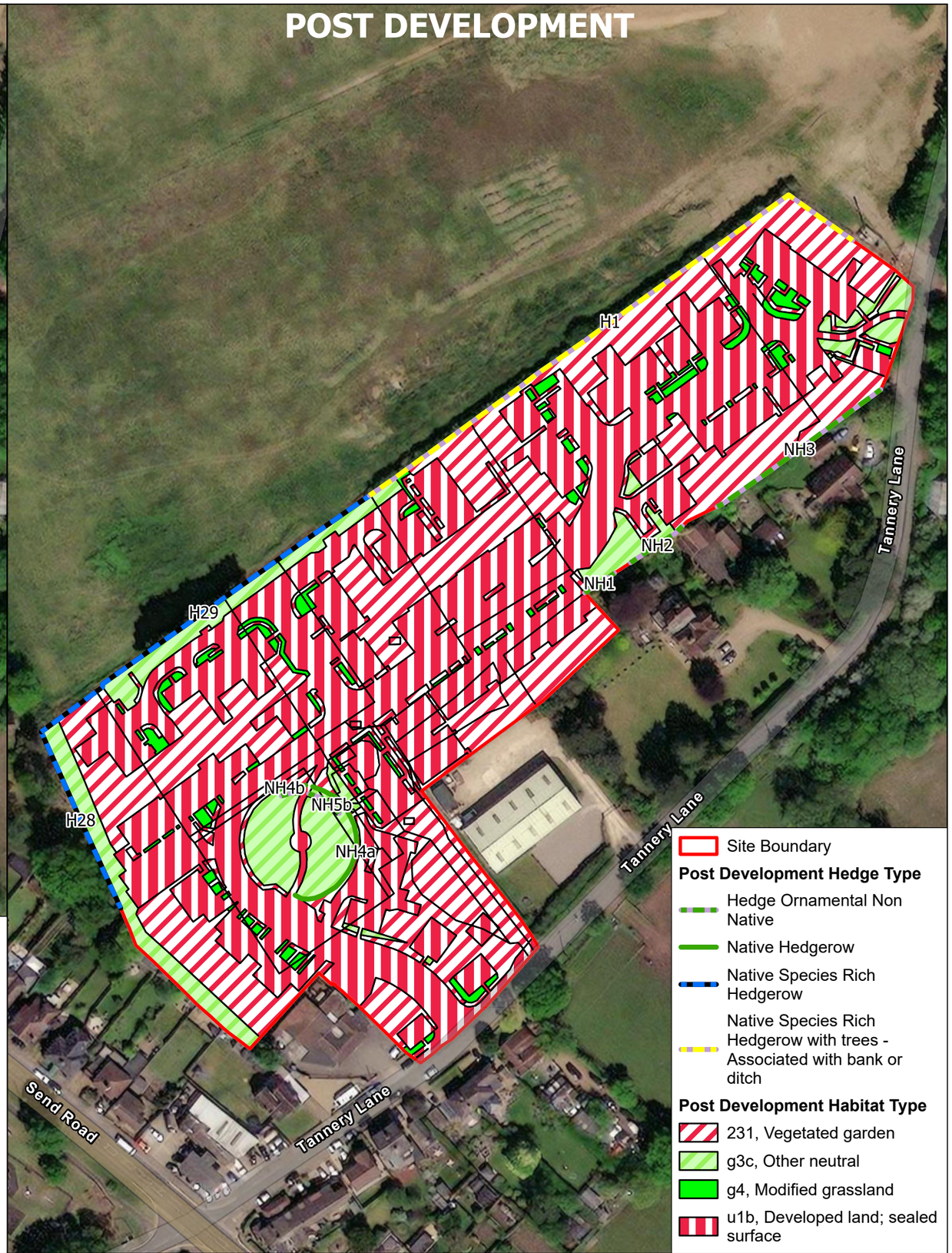


POST DEVELOPMENT



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Client: GUILDFORD BOROUGH

GUILDFORD BOROUGH COUNCIL BIODIVERSITY POLICY SUPPORT

Clockbarn Baseline and Post Development Habitat

0 50 100 m

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
Baseline Habitat Survey undertaken by Phlorum on the 31st of August 2018. Data digitised from Report 18_P_02100-Preliminary_Ecological_Appraisal-1219745.pdf

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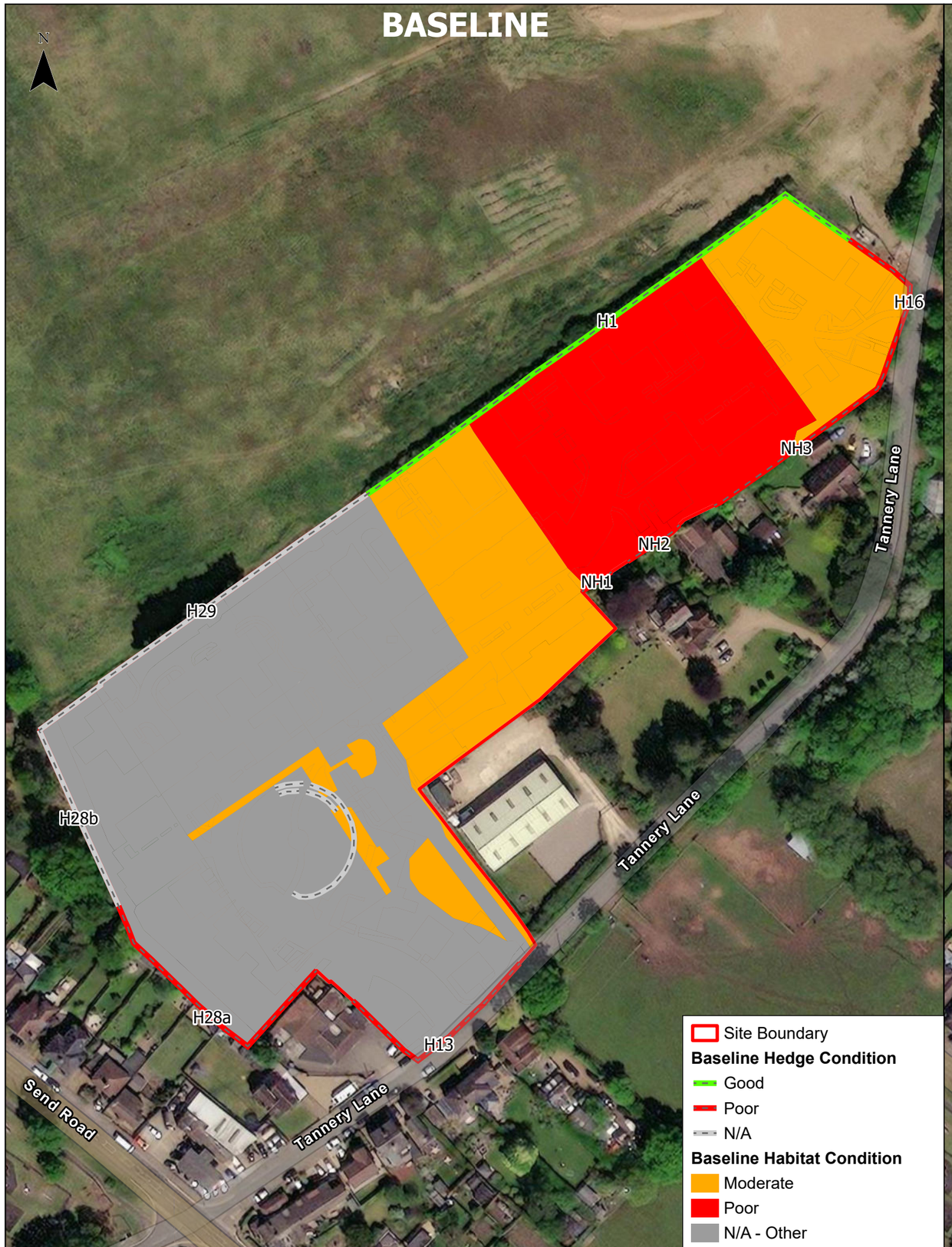

POST DEVELOPMENT

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GUILDFORD BOROUGH COUNCIL BIODIVERSITY POLICY SUPPORT

Clockbarn Baseline and Post Development Habitat Condition

0 50 100 m

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
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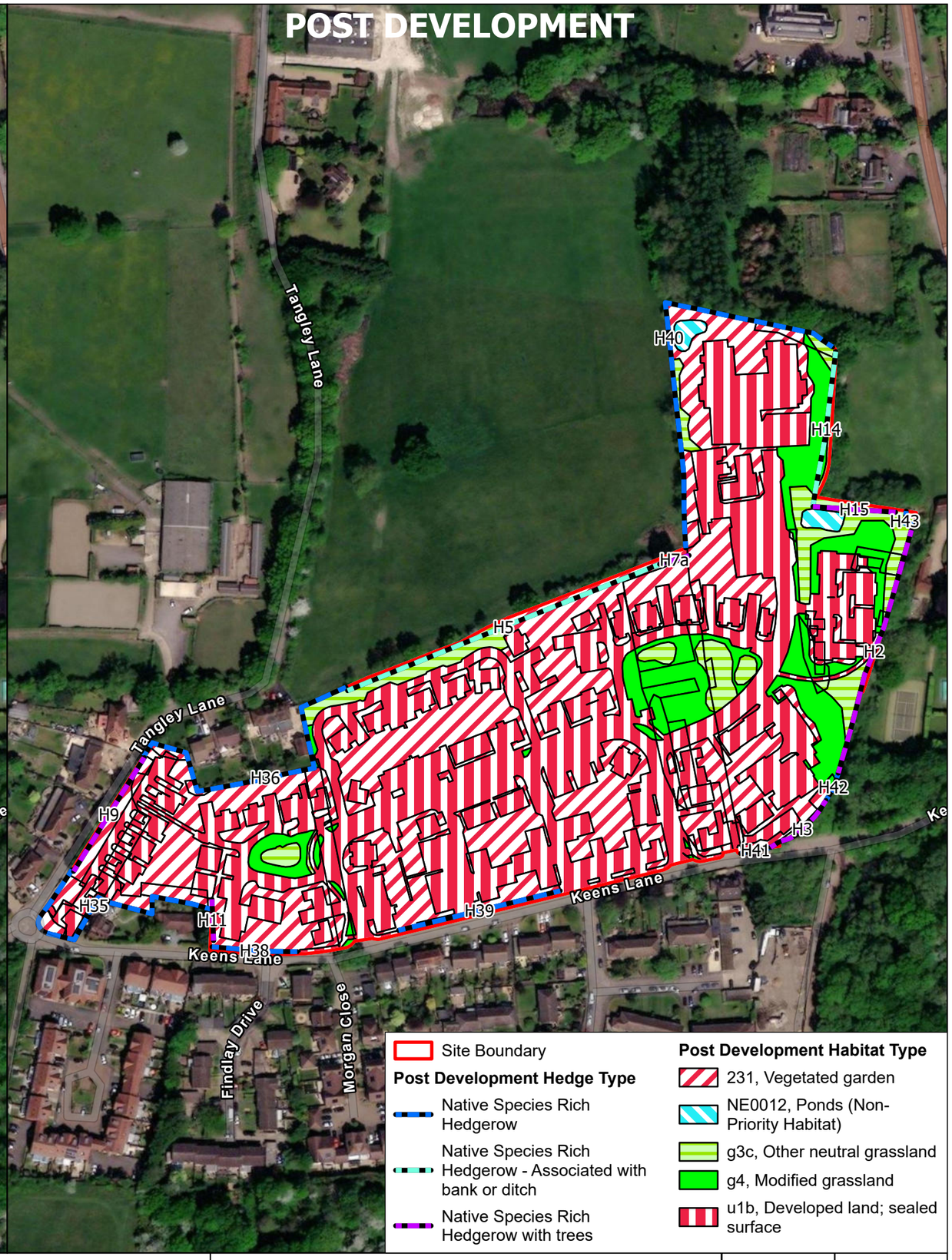
POST DEVELOPMENT



Site Boundary

Baseline Hedge Type

- Line of Trees
- Line of Trees - Associated with bank or ditch
- Native Hedgerow - Associated with bank or ditch
- Native Hedgerow with trees
- Native Species Rich Hedgerow with trees

Baseline Habitat Type

- 17, Mixed scrub
- NE0012, Ponds (Priority Habitat)
- g4, Modified grassland
- u1b,Developed land; sealed surface

Site Boundary

Post Development Hedge Type

- Native Species Rich Hedgerow
- Native Species Rich Hedgerow - Associated with bank or ditch
- Native Species Rich Hedgerow with trees

Post Development Habitat Type

- 231, Vegetated garden
- NE0012, Ponds (Non-Priority Habitat)
- g3c, Other neutral grassland
- g4, Modified grassland
- u1b, Developed land; sealed surface

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Keens Lane Baseline and Post Development Habitat

0 100 200 m

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
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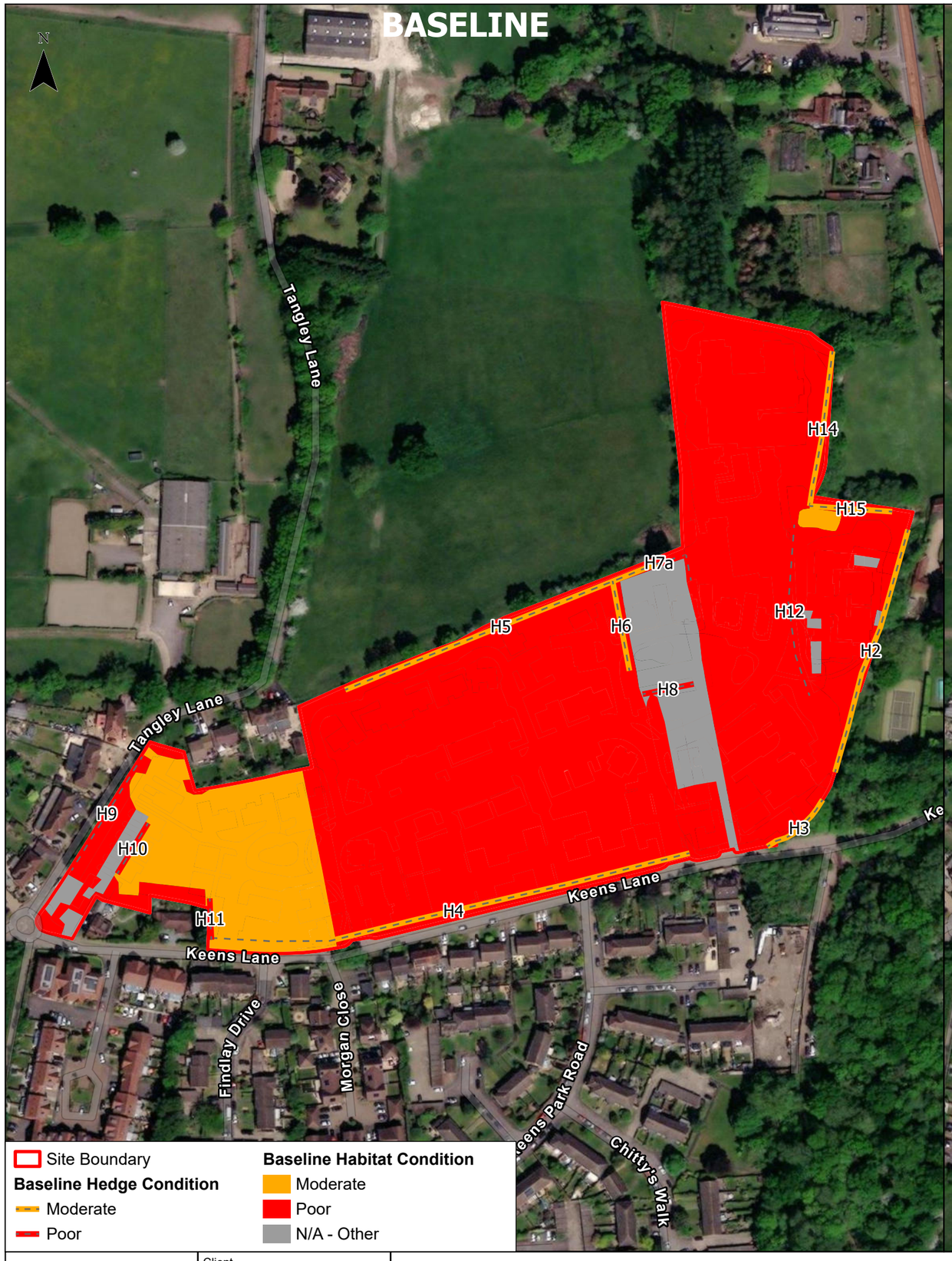

Site Boundary

Baseline Hedge Condition
- Moderate
- Poor

Baseline Habitat Condition
- Moderate
- Poor
- N/A - Other

POST DEVELOPMENT

Site Boundary

Post Development Hedge Condition
- Good
- Moderate

Post Development Habitat Condition
- Moderate
- N/A
- N/A - Other

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Keens Lane Baseline and Post Development Habitat Condition

0 100 200 m

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
Baseline Habitat Survey undertaken by Phlorum on the 31st of August 2018. Data digitised from Report 18_P_02100-Preliminary_Ecological_Appraisal-1219745.pdf

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Appendix A Policy P6/P7: Biodiversity in New Developments.

General principles

1) Development proposals, including those exempt from minimum biodiversity net gain standards, are required to seek maximum biodiversity gain and to follow the mitigation hierarchy.

2) Development proposals within or adjacent to a Biodiversity Opportunity Area (BOA) are required to: a) contribute towards the achievement of the objectives of the BOA as set out in the relevant BOA policy statement (and its successor revision documents); b) protect and enhance designated and priority habitats and species within the BOA; and c) improve habitat connectivity across and/or into the BOA.

3) In addition to the BOAs, biodiversity measures are required to align with and deliver the Local Nature Recovery Strategy (to be prepared) and take account of other national, regional and local biodiversity strategies.

4) Major development proposals are required to set out plans for long term management and maintenance of on-site biodiversity. Planting schemes, landscaping and water management

5) Planting and landscaping schemes, open spaces, Sustainable Drainage Systems (SuDS) and Natural Flood Management measures are expected to incorporate species, habitats and management regimes that provide best biodiversity benefit as set out in BOA policy statements and other strategies.

6) Tree canopies are expected to be retained and new tree planting is expected to focus on the creation of new connected tree canopies and/or the extension of existing canopies, unless doing so would adversely impact on sensitive species or habitats. Tree planting schemes are expected to provide resilience in terms of climate, disease and ageing, incorporating large species with long lifespans where opportunities arise.

7) Planting schemes are expected to use UK sourced, native species, unless imported strains of native species would offer greater resilience and are free from disease. Measures on building structures

8) Development proposals are required to include appropriate features in or on building structures that support nature, will last for the lifetime of the development and will cater for appropriate species and habitats.

Site design

9) Development proposals are expected to be designed to create areas of new habitat and provide appropriate links and corridors between new and existing habitats, avoiding and reversing fragmentation and species isolation. Development sites and built features are expected to be permeable for wildlife.

10) In areas where invasive species are present, site design should not facilitate their spread. Where invasive species are present on development sites, they should be eradicated, or controlled where eradication is not possible. Planting schemes must not include invasive plants.

11) Major development proposals are expected, and minor development proposals are encouraged, to deliver measures that promote a sense of community ownership of green spaces and habitats.

Biodiversity Net Gain

12) Qualifying development proposals are required to achieve a biodiversity net gain of at least 20 per cent, or the advised national minimum amount, whichever is greater, measured using the national biodiversity net gain calculation methodology.

13) Biodiversity net gain is not a requirement on previously developed land, unless it supports at least one protected or priority species population or habitat, or an assemblage of species with an otherwise demonstrably high biodiversity value. Where these are present, a measurable net gain for those features is required.

14) Biodiversity gains are required to be delivered in a manner that is consistent with the biodiversity policies in this plan and LPSS 2019 Policy ID4: Green and Blue Infrastructure so that measures are focused on local priorities and will provide the best biodiversity value.

15) New habitats and habitat improvements that contribute towards the achievement of biodiversity net gain are required to be secured and maintained for at least 30 years, or a period of time set out in national policy or legislation if this is greater.

16) Where the applicant is unable to provide the gains on-site, provide the gains off-site or fund gains off-site on third-party sites, a justified and proportionate financial contribution to fund off-site measures will be secured.

17) Development proposals for the creation of biodiversity sites will be supported where these are well located and will be appropriately managed in order to align with local, regional and national strategies and provide best biodiversity value.

Appendix B Site Location Plans

Figure A – Just Tyres Site Location Plan

Figure B – Clockbarn Nurseries Site Location Plan

Figure C – Keens Lane Site Location Plan

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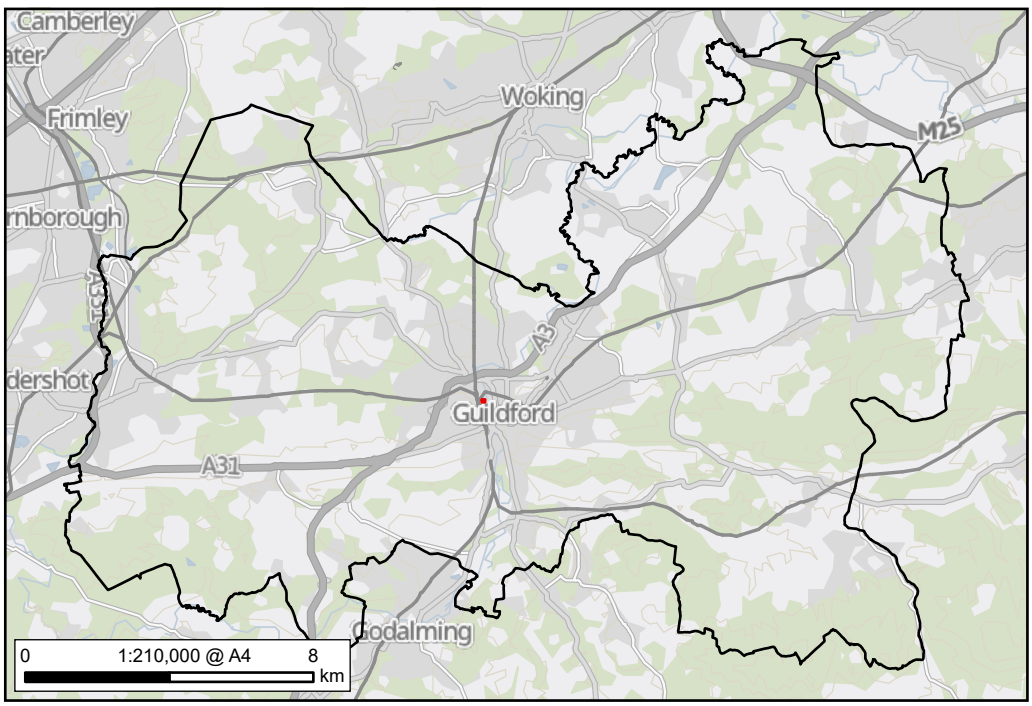

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GUILDFORD BOROUGH COUNCIL BIODIVERSITY POLICY SUPPORT

Just Tyres Site Location Plan

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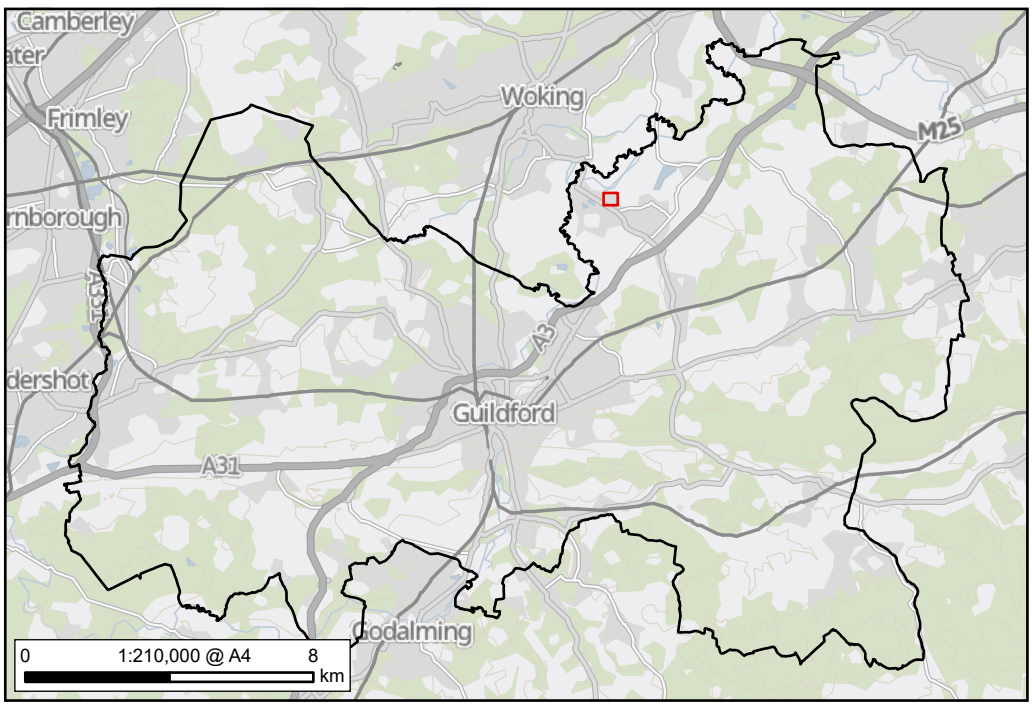
Figure A | Rev A



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Clockbarn Nurseries Site Location Plan

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Figure B | Rev A

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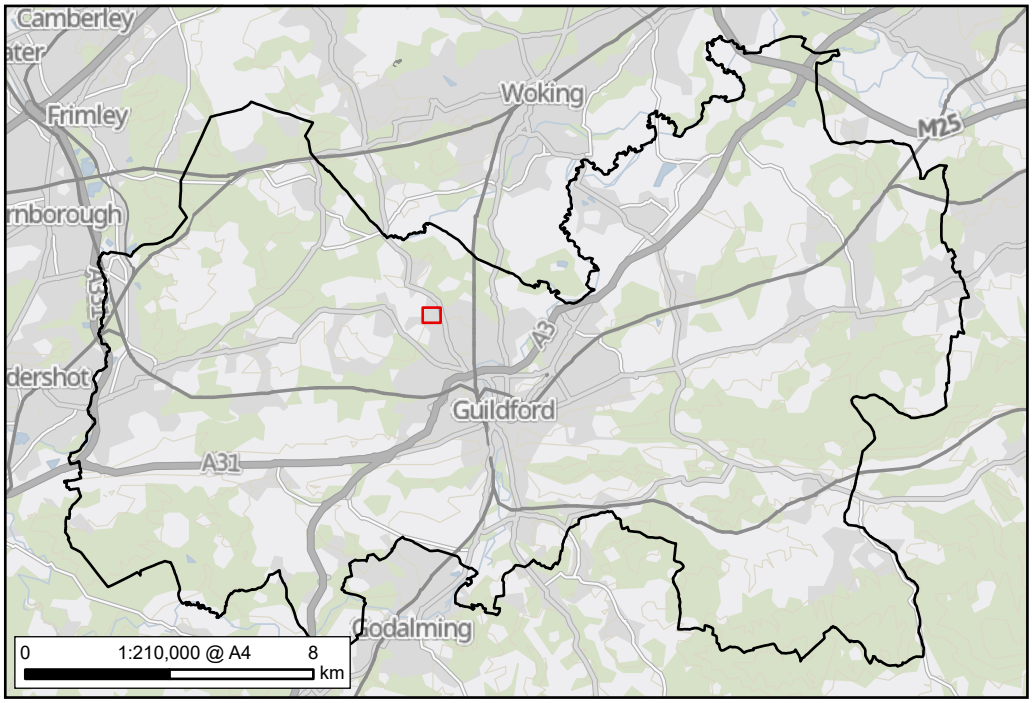

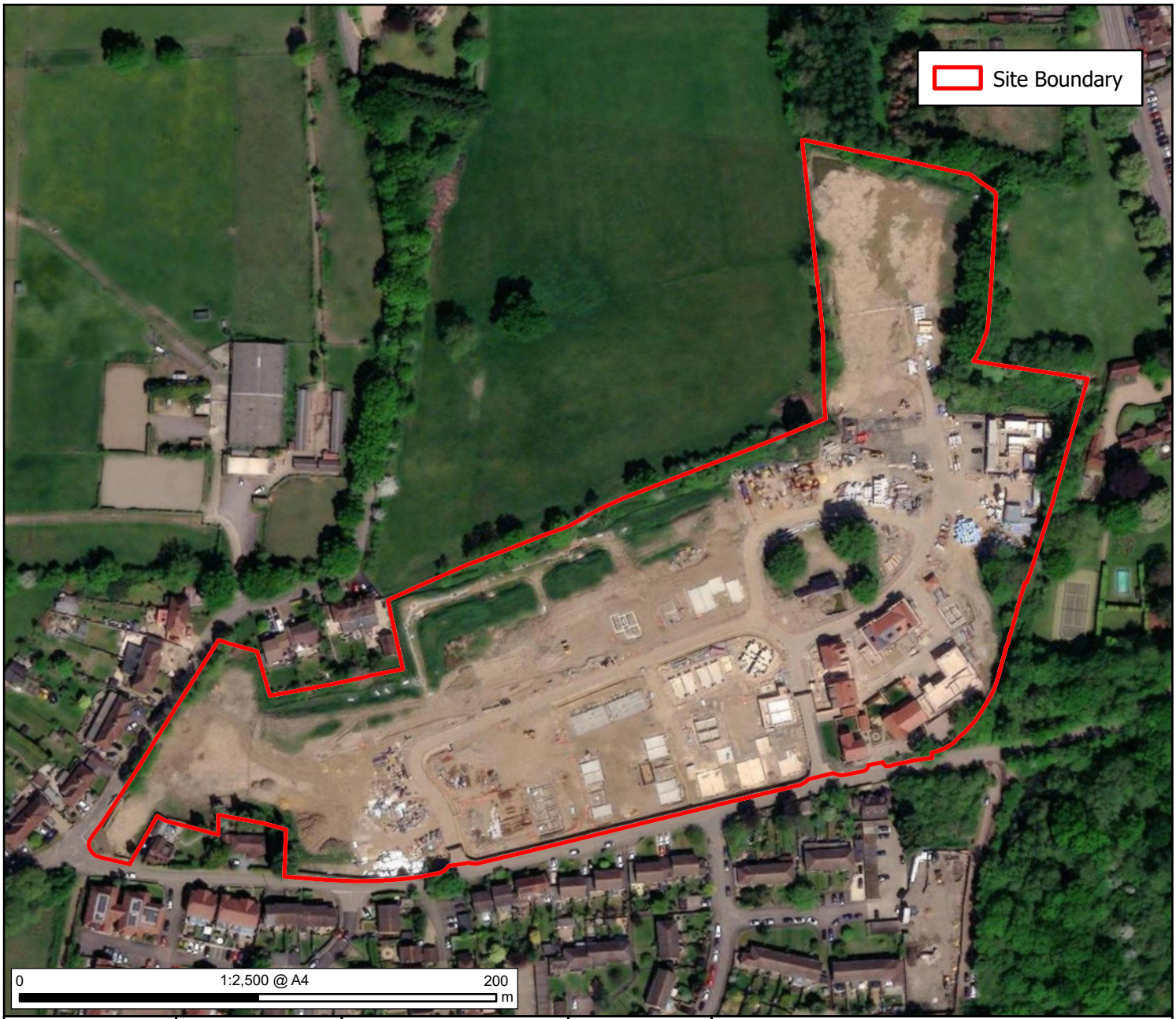

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GUILDFORD BOROUGH COUNCIL
BIODIVERSITY POLICY SUPPORT
Keens Lane Site Location Plan

N

Figure C | Rev A