CHALK STREAM ASSESSMENT

PROPERTY SPHERE LIMITED

LAND ADJACENT TO LAKE LANE
BARNHAM, BOGNOR REGIS,
WEST SUSSEX

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REF: 23054

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EXECUTIVE SUMMARY

This document has been compiled in relation to the proposed development of the site at Lake Lane, in Barnham, West Sussex and provides an assessment of impacts of the proposals on a chalk stream located to the north and east of the development area. The chalk stream is designated as a priority habitat and therefore a targeted assessment is required to assess potential impacts posed by the scheme to enable mitigation to be devised to ensure that there are no significant negative impacts on the stream in the long-term. Proposals are to construct seven new residential dwellings with associated parking and landscaping. Access will remain as existing; from the south of the site. Boundary features, including trees, areas of grassland in the north and east of the site, to include the chalk stream, will be retained.

The salient points of the assessment are as follows:

- The site is in a semi-rural location within the northern extent of Barnham in the Arun District of West Sussex, extending over approximately 0.4ha and dominated by a horse grazed field. A short length of chalk stream (S1) formed part of the eastern boundary of the site; extending for approximately 35m from the north-eastern corner of the site before extending off-site to the east. This section of drainage channel fed the main channel of the chalk stream located approximately 165m to the north-west. S1 supported poor water quality at the time of the assessments; due mainly to overshading by trees and scrub and also likely to be as a result of enrichment of the water column from run-off from the grazed field.
- Due to the presence of a Habitat of Principal Importance within the site, the site has been assessed as part of the original Preliminary Ecological Appraisal, as being of importance at a **local scale**, with the section of chalk stream extending along the eastern site boundary providing a supporting function to the wider chalk stream extending to the north and east.
- The proposals will result in a series of direct and indirect impacts as a result of both the construction and operational phases of the development. Potentially significant impacts include increased levels of dust and surface water run-off during construction that may negatively impact the associated chalk stream together with increased surface water run-off during the operational phase.

- A series of mitigation measures to include use of dust screens and water catchment measures to reduce run-off into the adjacent water course should be implemented and detailed within a Construction Environment Management Plan to guide works during the construction phase. A detailed drainage strategy has been compiled for the operational phase in order to control any increased levels in surface water, increasing water holding capacity within the site through the creation of an attenuation pond and installation of an attenuation tank to enable suspended sediments to settle prior to water reaching the adjacent watercourse. Additional planting of shrubs and trees throughout retained habitats in the north and east of the site will also help to reduce surface water run-off in proximity to the stream channels.
- Providing a series of mitigation measures are put in place at the site during both the construction and operational phases, the effects of the proposed development on the chalk stream are **not likely to be significant** in the long-term.
- Through the implementation of a series of mitigation measures during the construction and operational phases of the works, combined with long-term management of the habitats at the site, the proposed scheme has the opportunity to enhance the retained habitats to include the on-site section of chalk stream.
- Further details regarding recommended mitigation measures, to include habitat enhancement measures are provided in the Recommendations section of the report.

1 INTRODUCTION

Background

1.1 CT Ecology Limited was commissioned by Property Sphere Limited to assess the impact of the proposed works on the chalk stream, a habitat of principal importance, to the north and east of the development area within land adjacent to Lake Lane in Barnham, West Sussex (hereafter referred to as "the site").

1.2 This report has been compiled in accordance with current guidelines (British Standard 42020:2013 Biodiversity. Code of Practice for Planning and Development, 2013 and CIEEM, 2013 & 2016) and has been informed by the Preliminary Ecological Appraisal undertaken at the site in October 2023 (CT Ecology 2023), an associated desk study, consultations with the local record centre (SxBRC, 2023 and 2024) and the current proposed drainage strategy compiled for the site (GTA Civils and Transport Ltd. 2024).

1.3 The purpose of the assessment was:

- to provide baseline information on the chalk stream (and any associated feeder channels) in proximity to the site (where access was possible);
- to identify the potential direct and indirect impacts on the chalk stream as a result of the works;
- to devise suitable mitigation where impacts have been identified in order to minimise impacts on the chalk stream and the associated feeder channels; and
- to provide recommendations for enhancement.

1.4 A series of linear watercourses are within the immediate vicinity of the site (circa 250m), these are collectively designated as a chalk stream which extends to the north and east of the site. An associated channel bounds the site to the north as well as a discrete section of a channel extending part way along the eastern site boundary (within the north-east corner). Chalk streams fall within the category 'Rivers & Streams' UK BAP broad habitat type; which are a Section 41 priority habitat under the Natural Environment and Rural Communities (NERC) Act[1].

1.5 A duty is placed on public authorities including local authorities, to consider priority habitats and species and help halt the loss of biodiversity within their jurisdiction, and where possible, enhance it. This is designed to encourage effective management of biodiversity in the wider environment and extends from internationally protected sites and species to sites and species of local importance.

1.6 The current definition for Rivers and Streams UK BAP broad habitat type is as follows: *'This habitat type includes a very wide range of types, encompassing all natural and near-natural running waters in the UK (i.e. with features and processes that resemble those in 'natural' systems). These range from torrential mountain streams to meandering lowland rivers. Numerous factors influence the ecological characteristics of a watercourse, for example geology, topography, substrate, gradient, flow rate, altitude, channel profile, climate, catchment features (soil, land use, vegetation, etc.). Human activities add to this complexity. In addition most river systems change greatly in character as they flow from source to sea or lake. Although various classifications and typologies for rivers exist, none is considered adequate for identifying a discrete but comprehensive series of specific priority types against the criteria. Consequently a broad 'rivers' priority habitat has been adopted by the UK BAP, which includes the existing priority habitat, chalk rivers*' (JNCC 2011).

1.7 Chalk streams are globally rare freshwater systems characterised by a shallow, wide channel cross-section and they tend to have relatively stable water temperatures due to groundwater inputs from chalk aquifers, which warm their surface waters in winter and also have a cooling effect in summer months (Mackey and Berrie 1991).

[1] UK Bap habitats are a UK-habitat classification prepared by the UK Biodiversity Group that classifies all terrestrial and freshwater habitats in the UK into 37 broad habitat types. UK BAP Priority Habitats are a range of semi-natural habitat types that were identified as being the most threatened and requiring conservation action. The original Priority Habitat list was created between 1995 and 1999 and revised in 2007. The list of Priority Habitats has been used to help draw up statutory lists of habitats of principal importance for the conservation of biodiversity in England, Scotland, Wales and Northern Ireland. The suite of habitats of principal importance for the conservation of biodiversity (formerly Priority Habitats) nest into the defined Broad Habitat Types.

Development Proposals

1.8 Proposals are to construct seven new residential dwellings with associated parking and landscaping. Boundary features, including trees and the drainage channel along the east of the site, will be retained as part of the proposals.

Site Description

1.9 The application site measures approximately 0.4ha and is within a semi-rural location within the northern extent of Barnham in the Arun District of West Sussex at National Grid Reference SU969 047. The site was dominated by grassland, used for grazing horses, with the grassland divided into a series of paddocks, together with areas of bare ground. A single building was present in the south-east extent together with areas of boundary scrub, tall ruderal vegetation and scattered trees. A stream extended part way along the eastern site boundary.

1.10 A commercial plant nursery is to the north with residential properties and associated gardens bounding the site in all other directions. Access was via an access track, shared with residential properties, extending to Lake Lane to the south. A railway line (the south coast main line) is located beyond Lake Lane, approximately 360m to the south.

1.11 In the wider surrounds, commercial nurseries and agricultural fields dominate the landscape together with residential properties. A series of interconnected drainage channels are to the north and east. The centre of Bognor Regis is approximately 6km to the south-west and the A27 is approximately 2km to the north.

2 METHODOLOGY

Field Survey and Assessment

2.1 Field data was obtained from the initial ecological walkover conducted at the site on 04th October 2023. Additional site visits were undertaken throughout 2024 in relation to targeted protected species surveys being carried out at the site. During this time, additional information was collected in relation to the chalk stream and associated feeder channels to the north and east of the site within a 250m radius. Information provided by the local records centre was also used to inform the assessment (SxBRC, 2023 and 2024), together with aerial imagery and desk-based resources.

2.2 The assessment was undertaken Carly Teague, a suitably qualified ecologist with over 16 years' experience as a professional ecologist. The chalk stream (and any associated feeder channels) was described and mapped (Appendix A). Scientific names are given after the first mention of a species, thereafter, common names only are used. Nomenclature follows Stace (2010) for vascular plant species.

2.3 The methodology for assessing impacts on the priority habitat has been adapted from the Habitat Regulations Assessments guidance, developed as from the European Community (EC) Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (92/43/EEC) and UK Habitat Regulations for schemes which may affect European Sites. Within this report, potential negative impacts on the priority habitat (the chalk stream) are identified and an assessment made regarding the possible likely effects. If no notable effects on the quality or long-term ecological functionality of the stream are predicted then the impact can be classed as Not Significant. If effects are considered to be detrimental to the functionality of the stream or uncertainty exists then the impact is classed as Significant, applying the precautionary principle whereby mitigation is required in order to reduce the scale of the impact in order to ensure the proposals do not have any significant negative impact on the functionality and quality of the chalk stream in either the short-term or the long-term.

3 BASELINE CONDITIONS

3.1 The chalk stream was located to the north and east of the site, to aid the assessment, based on different conditions being supported throughout the stream, this water body was sub-divided into five sections (within a 250m radius of the site). These are described in the table below.

Table 3.1: Chalk Stream Descriptions

Reference	Priority habitat	Description	Distance (and direction) from site
S1	Yes-Chalk Stream (SxBRC 2023)	A short section of a stream formed the north-eastern boundary of the site. The stream extended for approximately 35m along the eastern site boundary before extending perpendicular to the site; further east. The channel was narrow; approximately 0.25m wide and water was flowing south to north with a low water level at the time of each survey. The banks were relatively steep. The channel was heavily shaded by overhanging scrub. Leaf litter was evident throughout the channel. Aquatic vegetation was restricted to fine-leaved water dropwort (*Oenanthe aquatica*) which was sparsely distributed along the channel. Ruderal vegetation had developed along the banks. This channel fed into S4 to the north and was fed from S3 to the east.	On eastern boundary of site.
S2	Yes-Chalk Stream	A section of stream (circa 55m) extending from S1 and culverted under an access track to join S3 to the east. The stream flowed east to west into S1. This channel was largely obscured by dense bramble (*Rubus fruticosus* agg.) scrub, bracken (*Pteridium aquilinum)* and ruderal vegetation. Aquatic vegetation was absent where the channel could be viewed, with the channel reaching a maximum of 0.25m in width.	Adjacent to east, extending further east from the site
S3	Yes-Chalk Stream	A section of stream (circa 160m within the surveyed area but extending further east) culverted under an access road to join S2 to the west. This section of the chalk stream supported the best example of chalk stream habitat compared to the other sections	170m east (at its closest point)

		included within the current assessment. The stream supported a steady flow of clear water, extending along the boundary of a grassland field. The channel measured approximately 0.25m in width and was relatively unshaded with a small number of small willows along the northern bank. The substrate comprised a mix of stoney substrate together with more loamy sections. Aquatic vegetation comprised a mixture of submerged and emergent species including water dropwort, willowherbs (*Epilboium* sp.), pondweed (*Potemogeton* sp.), gypsywort (*Lycopus europaeus*) and duckweeds (*Lemna* sp.). Vegetation formed scattered clumps along the watercourse. The banks supported gentle gradients, dominated by grassland with areas of scattered scrub along the northern bank. The water flowed west to east.	
S4	Yes-Chalk Stream	A heavily shaded section of the stream, culverted along much of its length before reaching S5. The channel was a maximum of -0.25m wide. Aquatic vegetation appeared to be absent and the channel was heavily shaded along its length by hawthorn (*Crataegus monogyna*) and bramble scrub. The banks were steep sided, dominated by bare earth. Leaf litter was evident in the channel which supported a low water flow at the time of the assessments. Water was flowing east to west.	5m north
S5	Yes-Chalk Stream	The widest section of the chalk stream, with the channel reaching circa 0.5m in width, where access was possible. The water was flowing north-east to south-west. The channel bed was dominated by a stoney substrate. Aquatic vegetation was absent, where the channel could be viewed, although overhanging bankside scrub was dominant throughout the channel.	75m north-west at its closest point

3.2 The local records centre (Sussex Biodiversity Records Centre) was consulted for information regarding the specific location of the chalk stream to inform the assessment in 2023 and 2024. An extract from their report is provided below. The chalk stream is shown by the coloured, hatched, line with the site shown by a red star. Although the mapping resolution is broad, the route of the chalk stream can be matched with the drainage channels when on the ground. Although appearing to extend through the site on the SxBRC map below, the stream actually extends to the north of the site (off-site) before dog-legging south to follow the eastern boundary of the site for a short distance (on-site for approximately 35m) and then continuing off-site to the east.

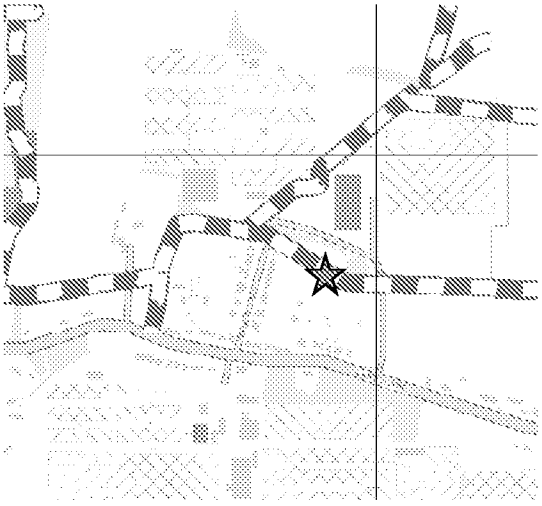

Figure 1: Location of the Chalk Stream. Source: SxBRC, 2024.

4 EVALUATION AND IMPACTS

Evaluation

4.1 The series of interconnected drainage channels to the north and east of the site are designated as a 'chalk stream' which is a Section 41 priority habitat under the Natural Environment and Rural Communities (NERC) Act. A duty is placed on public authorities including local authorities, to consider priority habitats and species to assist with halting the loss of biodiversity, and where possible, enhance it.

4.2 The application site in its entirety covered an area of approximately 0.4ha. A short length of chalk stream (S1) formed part of the eastern boundary of the site; extending for approximately 35m from the north-eastern corner of the site before extending off-site to the east. This section of drainage channel fed the main channel of the chalk stream located approximately 165m to the north-west. S1 supported poor water quality at the time of the assessments due mainly to overshading and also likely due to enrichment of the water column from run-off from the grazed field to the west.

4.3 Due to the presence of a Habitat of Principal Importance within the site, the PEA assessed the site as being of importance at a **local scale**, with the section of chalk stream extending along the eastern site boundary providing a supporting function to the wider chalk stream which extends to the north and east.

Impact Assessment

4.4 This section serves to assess all potential direct and indirect impacts on the priority habitat likely to arise as a result of the works. These have been divided into construction and operational impacts and are assessed in the first instance in the absence of mitigation.

Table 4.1: Construction Impacts without Mitigation

Describe any likely direct or indirect impacts to the chalk stream arising as a result of:	Is the Impact Significant/Not Significant? Why?
Loss of site/feature/reduction in habitat	There will be no losses to the chalk stream or a reduction in the extent the chalk stream as a result of the works. The section of chalk stream that bounds the eastern site extent (S1) together with the associated land to the immediate west of the drainage channel will be retained and incorporated into the design proposals. The wider development site does not provide any supporting habitat for the chalk stream. Construction works will be temporary in nature, anticipated

	to extend over a period of 18-24 months. There will be no loss in site/reduction in habitat associated with the chalk stream. **Loss of site/reduction in habitat is Not Significant.**
Degradation - Dust	Potential sources of increased dust during construction will be from the movement of vehicles, site preparation, excavation and road surfacing activities. Dust arising from these activities will be of short duration however increased levels of dust may result within S1 to the east of the working area. Trees and scrub will serve to provide a dust barrier to the remainder of the drainage channels to the north and east although increased levels of suspended sediment within S1 will be transported downstream to the north, potentially impacting S4 and S5. **Dust is Significant, resulting in direct and indirect impacts on the chalk stream.**
Degradation- Increased run-off/sediment loading	Potential sources of increased run-off during construction will be from excavation works, run-off from exposed ground, movement of vehicles, storage/use of materials, washing of machinery. Pollution could take the form of general site waste, building materials, silt; and/or the release of hydrocarbons or chemicals (fuel/oil spills) into the water column. Increased levels of run-off arising from construction activities will be of short duration however increased levels of run-off in turn may result in increased sediment loading /pollutants within the water column within S1 to the east of the working area and via the existing outflow connecting the site to S4. Areas of trees and scrub bounding the site to the north and beyond S1 to the east will serve to provide a natural barrier to run-off in these directions although increased levels of sediment within S1 and S4 will be transported downstream to the north, potentially impacting S5. The risk of an increase in levels beyond the baseline are more likely to arise during the wetter months although levels are more likely to be significant in terms of impacting the ecology of the chalk stream during the summer months when water volumes are at their lowest and pollution events are more concentrated. **Increased run-off is Significant, resulting in direct and**

	indirect impacts on the chalk stream.

Table 4.2: Operational Impacts without Mitigation

Describe any likely direct or indirect impacts to the chalk stream arising as a result of:	Is the Impact Significant/Not Significant? Why?
Degradation - Increased run-off/sediment loading/pollution	Post development, the site will experience an increased volume of surface water run-off when compared to baseline conditions, generated through the creation of impervious surfaces throughout the site as part of the development. In turn, the surface water may support pollutants through increased vehicle use at the site together with the presence of residential dwellings. Increased levels of run-off arising during the operational phase will be permanent and likely to increase during wetter months. With pollutant levels within the water column being more significant during the summer months when water volumes are at their lowest. Increased levels of run-off will directly impact the water column within S1 to the east of the working area and via the outflow connecting the site to S4. Areas of trees and scrub bounding the site to the north and beyond S1 to the east will serve to provide a natural barrier to run-off in these directions although increased levels of run-off/suspended sediment within S1 and S4 will be transported downstream to the north, potentially impacting S5. In turn degradation to the steam may also impact its value to grass snakes as a foraging resource, known to be in the locality including within the application site. **Increased run-off is Significant, resulting in direct and indirect impacts on the chalk stream.**
Degradation - Litter	Increased human activity at the site post development may result in increased levels of litter within S1 and fly tipping adjacent to it although based on the small number of plots to be constructed levels of litter/fly tipping is not anticipated to increase significantly. Trees, scrub and associated boundary fencing will restrict access to adjacent sections of the stream from the site itself. Some litter, depending on its form, could

	potentially be transported downstream to the north, potentially impacting S4 and S5. **An increased in the level of litter is Not Significant.**

4.5 This section serves to assess all potential direct and indirect impacts on the priority habitat likely to arise as a result of the works with mitigation measures implemented.

Table 4.3: Construction Impacts with Mitigation

Describe any likely direct or indirect impacts to the chalk stream arising as a result of:	Is the Impact Significant/Not Significant? Why?
Degradation - Dust	A Construction Environmental Management Plan will be compiled to guide construction activities at the site, detailing precautionary measures to minimise construction impacts on the adjacent water courses. A dust screen will be installed prior to the start of any site preparation works adjacent to retained habitats to the east to protect the retained stream (S1) and associated bank from increased levels of dust. This will be monitored and maintained throughout the construction period and repaired as required. **Providing proposed mitigation is implemented Dust is Not Significant.**
Degradation - Increased run-off/sediment loading	Specific measures to address potential increases in run-off will be devised and included within the associated Construction Environmental Management Plan. This will be compiled to guide construction activities at the site, detailing precautionary measures to minimise construction impacts on the adjacent water courses. Methods of work will be devised to ensure surface water is not contaminated in order to reduce the risk of increased levels of silt within S1. Measures should include but not be limited to: The use of silt fences around the northern and eastern boundaries of the proposed working area. These should be made from geotextiles in order to reduce silt transport. Run-off could be collected in temporary, isolated, ditches, allowing the suspended solids to settle before disposal. Alternatively, a sump or similar could be used to reduce

	surface water flowing off-site. This could be discharged to the foul sewer or taken off-site by a tanker. Retaining grassland and scrub habitat in the north of the site together with the boundary scrub and trees, along with boundary vegetation to the east of the development area will serve as a natural sink for run-off, filtering out pollutants prior to water reaching S4 to the north of the site and S2 and S3 to the east of the site. Plant and wheel washing will be carried out in a designated area of hard standing over 10 metres from the northern and eastern site boundaries. It may be necessary to have separate (temporary) drainage area for the plant and wheel washing, depending on the location. The site storage compound will be located at the entrance in the south, away from the adjacent water courses. Spill kits will be kept on-site and any spillages of fuel or oil will be dealt with immediately to reduce the risk of leaching into the adjacent stream. Throughout construction, temporary and permanent access roads will be brushed or scraped to reduce dust and mud deposits in order to reduce silt levels within any road run-off. Where an increased level of run-off is anticipated i.e. through the installation of temporary access roads etc. ditches could be installed adjacent to the roads to capture run-off and allow for sediments to settle out. Suitable fencing must also be installed around the perimeter of the working area to ensure materials and machinery do not encroach into adjacent retained habitats including boundary features and the adjacent stream. **Providing mitigation is implemented, as outlined in this section, increased run-off is Not Significant.**

Table 4.4: Operational Impacts with Mitigation

Describe any likely direct or indirect impacts to the chalk stream arising as a result of:	Is the Impact Significant/Not Significant? Why?
Degradation - Increased run-	A drainage strategy has been designed for the scheme,

off/sediment loading/pollution	taking into account the on-site stream in addition to the wider network of channels adjacent to the site. The drainage strategy incorporates a series of sustainable drainage measures in order to control surface water runoff by slowing flows and allowing adequate settlement of sediments prior to water being discharged. The drainage measures will minimise diffuse pollution arising from surface water run-off, minimise the risk of pollution to groundwater and maintain the natural flow regime of the adjacent stream. The drainage strategy plan is appended to this report however the full drainage strategy document and the associated Drainage Strategy Plan (GTA Civils and Transport 2024) should be referred to. Details regarding the Sustainable Urban Drainage Measures are provided below. An attenuation pond (capacity: 73.7m³) will be created and an attenuation tank (capacity:102.6m³) will be installed, to hold surface water, fed by surface road gullies and associated drains in order to store water on-site to enable sediments to settle out of the water column. Land drains have been included to convey any underground spring water to the NW corner between Plots 6 and 7. The existing outflow in this corner of the site will also be repaired and upgraded as part of the development. As a result of the drainage strategy, runoff into S1 will be controlled, with road gullies intercepting surface water along the length of S1. Although the development will lead to larger area of impervious surfaces, the on-site water capture off-sets the anticipated increase in volume of surface water run-off, to include capacity for a 1 in 30-year flood event. Existing surface water run-off from the grazed field is likely to support an increased level of nutrients, leached from the field and associated manure pile which in turn are likely to lead to a degree of enrichment of the adjacent chalk stream, with nutrients flowing from S1 and S4 to the wider stream. This enrichment has the potential to result in negative impacts to the associated stream channels. The level of nutrient enrichment would be significantly reduced post development as a result of change in land use, and the integration of on-site water storage systems. Strategic tree and shrub planting will also help to further minimise surface water run-off. A mixture of shrubs and trees should be planted within retained habitats in the north and east of the site, including within grassland between the development and S1 to the east. These specimens should be suitable for the area and include a proportion of native species. These must then be managed as part of any

	subsequent long-term management plan implemented for the site. **Providing mitigation is implemented, as outlined in this section, increased surface water run-off is Not Significant.**

4.6 Providing a series of mitigation measures are put in place at the site for the construction and operational phases, the effects of the proposed development on the chalk stream are **not likely to be significant** in the long-term.

5 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

5.1 The site is in a semi-rural location within the northern extent of Barnham in the Arun District of West Sussex. The site is bounded to the north by a commercial plant nursery with residential properties and associated gardens bounding the site in all other directions. In the wider surrounds, commercial plant nurseries and agricultural fields dominate the landscape together with residential properties.

5.2 The application site extends over approximately 0.4ha, dominated by a horse grazed field. A short length of chalk stream (S1) formed part of the eastern boundary of the site; extending for approximately 35m from the north-eastern corner of the site before extending off-site to the east. This section of drainage channel fed the main channel of the chalk stream located approximately 165m to the north-west. S1 supported poor water quality at the time of the assessments; due mainly to overshading by trees and scrub and also likely to be as a result of enrichment of the water column from run-off from the grazed field.

5.3 Proposals are to construct seven new residential dwellings with associated parking and landscaping however design proposals had not been finalised at the time of the survey. Boundary features, including trees, areas of grassland and the associated chalk stream, will be largely retained.

5.4 Due to the presence of a Habitat of Principal Importance within the site, the site has been assessed as being of importance at a **local scale**, with the section of chalk stream extending along the eastern site boundary providing a supporting function to the wider chalk stream extending to the north and east.

5.5 The proposals will result in a series of direct and indirect impacts as a result of both the construction and operational phases of the development. Potentially significant impacts include increased levels of dust and surface water run-off during construction that may negatively impact the associated chalk stream together with increased surface water run-off during the operational phase. A series of mitigation measures to include use of dust screens and water catchment measures to reduce run-off into the adjacent water course should be implemented and detailed within a Construction Environment Management Plan to guide works during the construction phase. A detailed drainage strategy has been compiled for the operational phase in order to control any increased levels in surface water, increasing water holding capacity within the site through the creation of an attenuation pond and installation of an attenuation tank to enable suspended sediments to settle prior to water reaching the adjacent watercourse. Additional planting of shrubs and trees throughout retained habitats in the north and east of the site will also help to reduce surface water run-off in proximity to the stream channels.

5.6 Providing a series of mitigation measures are put in place at the site for the construction and operational phases, the effects of the proposed development on the chalk stream are **not likely to be significant** in the long-term.

5.7 Development also provides the opportunity to enhance the section of stream within the site in the long-term which is currently degraded due to a lack of management. Through the implementation of a series of mitigation measures during the construction and operational phases of the works, combined with long-term management of the habitats at the site, the proposed scheme has the opportunity to enhance the retained habitats to include the on-site section of chalk stream.

5.8 Further details regarding recommended mitigation measures, to include habitat enhancement measures are provided below.

Recommendations

Construction Environmental Management Plan

5.9 A CEMP should be compiled to guide construction works. This must detail specific measures to safeguard the adjacent stream to include measures to reduce dust and surface water run-off, both of which have been identified as posing a particular risk of negatively impacting the ecological value of the chalk stream.

Sustainable Drainage

5.10 This document has been informed by the associated drainage plan which has been compiled for the site (GTA Civils and Transport 2024) and this must be implemented as part of the scheme. Construction of the attenuation pond must be carried out in consultation with the project ecologist to ensure the pond is created to maximise its potential as a wildlife pond as well as providing a water holding function. This must also be constructed in accordance with the recommendations made in relation to reptiles (CT Ecology 2024).

Management Plan

5.11 A 10-year management plan should be compiled for the site, specifically in relation to the retained boundary habitats and associated features incorporated into the final scheme layout. This must be passed to any subsequent management company and reviewed after the initial 10-year period. This must include targeted prescriptions to manage the attenuation pond, stream, associated grassland, trees and shrubs together with any targeted protected species enhancement measures such as log piles and bird and bat boxes. The management plan must include details on timings for specific works along with the frequency of the management task. Specific management of the stream must include periodic thinning of adjacent trees/scrub, de-silting of the channel, as required, and removal of litter from the site.

Habitat Enhancement

5.12 New development offers the opportunity for ecological enhancement. Outline recommendations for post development planting are provided below. Recommendations made in the initial PEA (CT Ecology 2023) should also be referred to and specific enhancement measures pertaining to reptile and bats have been provided in the associated protected species surveys reports produced for the site which should also be referred to.

Post Development Landscaping

5.13 Post development landscaping should be carefully designed with biodiversity in mind. Wildlife planting should be integral to the soft landscape plans and should include native species and/or species of recognised wildlife value[2]. The use of nectar-rich and berry producing plants will attract a wider range of insects, birds and mammals. Species should be carefully selected to ensure they are suitable for the area.

5.14 Good horticultural practice should be utilised, including the use of peat-free composts, mulches and soil conditioners, native plants with local provenance and avoidance of the use of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

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[2] For example, The Royal Horticultural Society (RHS) Perfect for Pollinators Scheme https://www.rhs.org.uk/science/conservation-biodiversity/wildlife/encourage-wildlife-to-your-garden/plants-for-pollinators and the joint RHS/Wildlife Trust's Gardening with Wildlife in Mind Database http://www.joyofplants.com/wildlife/home.php

5.15 Boundary scrub and trees will be retained and additional planting should be carried out around site boundaries to enhance these boundaries features, where possible. Retained scrub should be enhanced through planting of additional native shrub species to encourage a more diverse species composition. Trees and scrub should also be planted in the north and east of the site to buffer the chalk stream from the new plots and to also increase water holding capacity of the soil.

6 REFERENCES

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Appendix A
Chalk Stream Survey Map

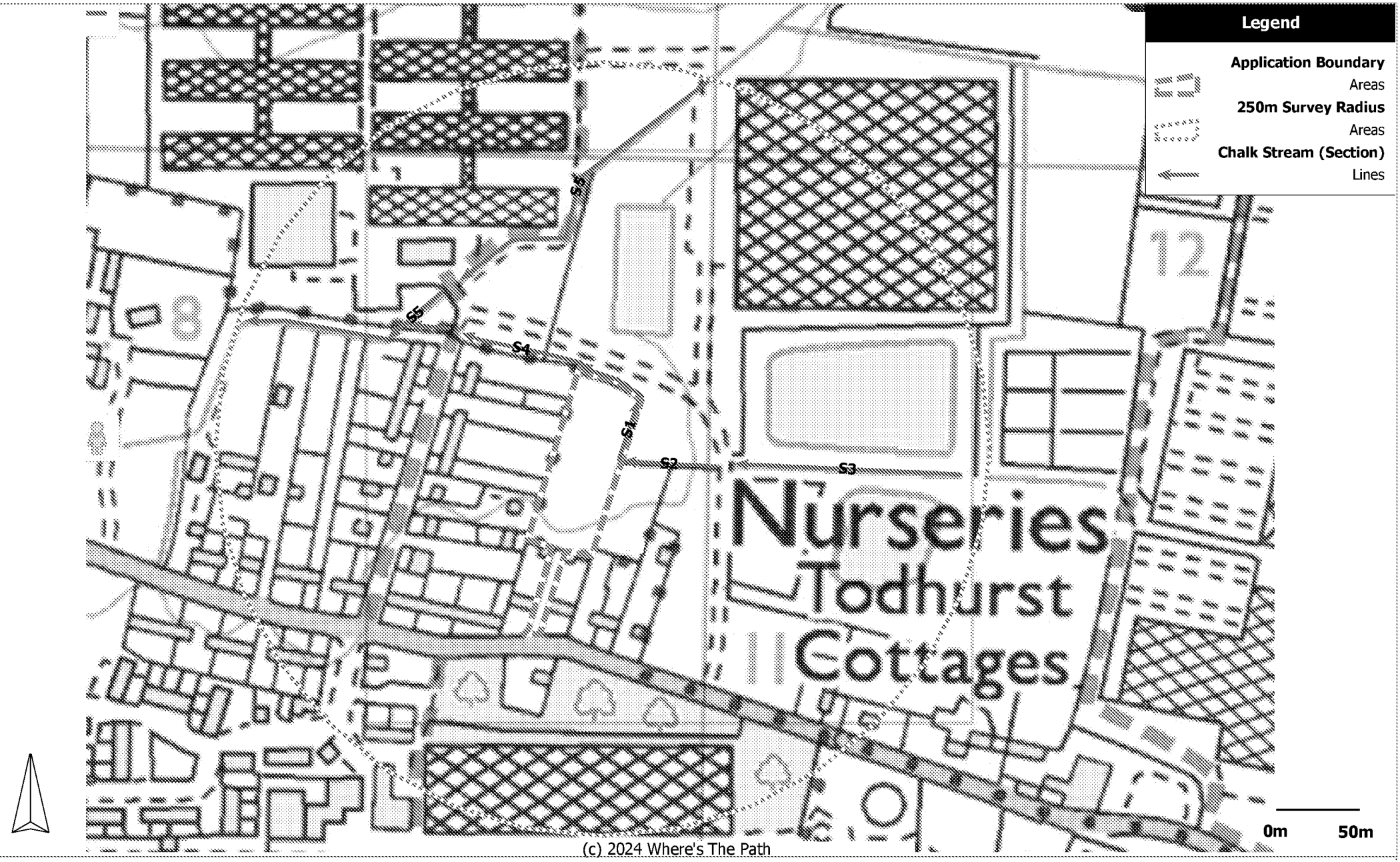

Figure 2: Land Adjacent to Lake Lane Chalk Stream Survey Map

Drawn by: CT
Date: 22/10/2024
Scale: See Map

CT Ecology

Appendix B
Photographs

Photograph 1: S1 (on-site)	
Photograph 2: S2. Looking west.	
Photograph 3: S3. Looking east.	

Photograph 4: S4. Looking due south.	
Photograph 5: S5. Looking north-east.	

Appendix C
Drainage Plan

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.

2. Prior to commencement of works the contractor shall provide co-ordinated and dimensioned installation drawings and calculations and allow 10 working days for gta's checking procedure prior to proceeding with those works or the ordering of materials.

3. Tender or billing drawings shall not be used for construction or the ordering of materials.

4. Do not scale. All dimensions and levels to be site confirmed.

5. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements

6. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

7. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.

KEY

- Existing foul water drain
- Surface water drain
- Land drain
- Foul drain
- Foul rising main
- Filter drain
- ExFSMH — Existing foul sewer manhole
- FMH — Foul manhole
- SCP — Surface water catchpit manhole
- FIC — Foul inspection chamber
- SIC — Surface water inspection chamber
- PPCP — Surface water catchpit inspection chamber
- RG — Road gully
- Cellular Storage
- Overland flow route for exceedance events

ABBREVIATIONS

BL	BASE LEVEL
CL	COVER LEVEL
ExFSMH	EXISTING FOUL SEWER MANHOLE
FIC	FOUL INSPECTION CHAMBER
FFL	FINISHED FLOOR LEVEL
FMH	FOUL MANHOLE
FWD	FOUL DRAIN
IL	INVERT LEVEL
LLFA	LEAD LOCAL FLOOD AUTHORITY
MH	MANHOLE
PN	PIPE NUMBER
PPCP	PLASTIC CATCHPIT
RG	ROAD GULLY
SIC	SURFACE WATER INSPECTION CHAMBER
SL	SUMP LEVEL
SWD	SURFACE WATER DRAIN
TL	TOP LEVEL

DESIGN NOTES

1. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 45%.

2. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

3. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.

4. CONTRACTOR TO ALLOW FOR NEW FOUL WATER SEWER CONNECTION INTO PUBLIC SEWER.

DESIGN ADDITIONS TO REDUCE IMPACTS ON THE LIDSEY WASTE WATER CATCHMENT

1. WATER BUTTS TO BE INSTALLED ON RAINWATER DOWNPIPES.

2. USE OF JOINT SEALANT OR MASS CONCRETE CHAMBER SURROUNDS TO PREVENT INFILTRATION.

3. USE OF BOLT DOWN SEALED CHAMBER COVERS TO PREVENT SURFACE WATER INUNDATION.

Rev	Amendments	Date	Dsn	Chk
P4	Updated to latest site layout. Ditch shown with easement. Land drainage shown	20.09.24	JR	MR
P3	NOTES ON WATER BUTTS AND SEALED SEWERS ADDED.	04.03.24	JR	MR
P2	REVISED TO LATEST SITE PLAN. DISCHARGE POINT TO DITCH CHANGED.	23.02.24	JR	MR
P1	INITIAL ISSUE	15.12.23	AE	MR

Status: PRELIMINARY

Client: PROPERTY SPHERE LTD

Architect: FOLKES ARCHITECTS

Project: LAKE LANE BARNHAM

Title: DRAINAGE STRATEGY

Date: DECEMBER 2023 | Scale @ A0: 1:200

Clients Ref. | Project Ref.: 12188

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Drawing Number: 12188-1101 | Rev.: P4