Project Saracen

Scoping Report

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1 INTRODUCTION

Overview

1.1 The purpose of this report is to inform and facilitate a request for a Scoping Opinion from Broxbourne Borough Council (BBC) in accordance with Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017 (referred to hereafter as the 'EIA Regulations').

1.2 This scoping report outlines the structure, content and scope of the Environmental Statement (ES) to be submitted with a forthcoming outline planning application for a development on land at Maxwells Farm West, Great Cambridge Road, Cheshunt ('the site'). It has been prepared by RPS on behalf of the applicant, STX-A10 Ltd.

1.3 The site is located to the northwest of the junction of the A10 Great Cambridge Road and B198 Lieutenant Ellis Way on land known as Maxwells Farm West. The entirety of the site lies within the BBC administrative boundary. An indicative redline plan of the land is provided at Figure 1. It should be noted that the redline boundary may be subject to some changes as the project progresses and the planning application is prepared.

Figure 1: Indicative Redline Plan

1.4 The proposed development will encompass approximately 19 hectares (ha) of land made up of two main developments located either side of a central spine road. To one side, a data centre area will be developed in a parkland setting, with a transformer station located on site. To the other, the second area will be reserved for B1/B2/B8 uses. Provision will be made for the existing Maxwell West trading estate and the proposed Rush Meadow development area to be accessed from the spine road.

1.5 The proposed development is further described in Section 2 of this Scoping Report, with a parameter plan which defines the limits of the outline development and which will be assessed through the Environmental Impact Assessment (EIA) process and reported in the ES.

1.6 Maxwells Farm West is part of the wider Park Plaza Development Area which has been identified as a strategic location for economic development within the emerging local plan documents. Recently, News International has built a major printworks and logistics centre on Park Plaza South and a Travelodge has been built on part of Park Plaza North fronting the A10.

Environmental Impact Assessment

The Purpose of Environmental Impact Assessment

1.7 EIA is a process for ensuring that the likely significant effects of a new development on its immediate and surrounding environment are fully identified and taken into account before that development is allowed to proceed.

1.8 The Ministry of Housing, Communities & Local Government's (MHCLG) Planning Practice Guidance[1] states that the purpose of EIA is:

"to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process."

1.9 The proposed development falls within category 10(b) of Schedule 2 of the EIA Regulations, which is applicable to any 'Urban development project', although could also be classed under 10(a) 'Industrial estate development projects'.

1.10 This broad EIA category (10(b)) includes *"the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas"* but is also commonly applied to other mixed use, residential and commercial developments in both rural and urban settings.

1.11 The proposed development exceeds all relevant thresholds for Schedule 2 developments of this type, namely:

i. The development includes more than 1 hectare of urban development which is not dwelling-house development; and

ii. The overall area of the development exceeds 5 hectares.

1.12 Schedule 2 developments are only 'EIA development' where they have the potential to give rise to likely significant effects on the environment by factors such as their nature, size and location.

1.13 The main stages of the EIA, culminating in the compilation of a full ES and associated technical appendices, are as follows:

- Scoping Report issued to the Local Planning Authorities (LPA) and the statutory consultees for comment and to seek agreement on the coverage of the EIA, proposed assessment methodologies and ES structure;
- Ongoing liaison with relevant consultees and agencies;

- Completion of desk studies and surveys to establish the environmental baseline for different topics; reviewing and updating previous assessments that have been undertaken for the site;
- Ongoing iteration of the development Masterplan in light of the EIA findings, consultation responses and inclusion of inherent 'design mitigation' measures.
- Finalise the Masterplan, Parameter Plans and Development Specification;
- Final assessment of the proposed development and determination of impact significance, mitigation and residual impacts; and,
- Submission of ES with planning application.

Scoping

1.14 This report accompanies a request for a Scoping Opinion submitted under Regulation 15(1) of the EIA Regulations.

1.15 In accordance with Regulation 15(2), this report contains:

i. A plan sufficient to identify the land;

ii. A brief description of the nature and purpose of the development, including its location and technical capacity;

iii. An explanation of the likely significant effects of the development on the environment; and

iv. Such other information or representations as the person making the request may wish to provide or make.

1.16 The opportunity to include additional information beyond the minimum requirements of the EIA Regulations has been taken in order to provide the local planning authorities, statutory consultees and other stakeholders with a better understanding of the proposed approach to the EIA process, the various technical assessments being undertaken and the intended structure of the ES.

1.17 Scoping is an important, though optional, exercise undertaken to focus the EIA and resultant ES on likely significant environmental effects and to avoid the unnecessarily complicated examination of minor (insignificant) issues. In particular, environmental statements should not be scoped so widely as to become unnecessarily long and cumbersome and, as such, less relevant and less useful for their intended purpose, i.e. to inform the decision makers of the main and likely significant environmental effects of proposed development, accounting for availability and effectiveness of mitigation and enhancement measures.

1.18 This matter is addressed by the Government's Planning Practice Guidance (PPG) on EIA:

"Whilst every Environmental Statement should provide a full factual description of the development, the emphasis should be on the "main" or "significant" environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionate and not be any longer than is necessary to assess properly those effects. Where,

for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered."

1.19 Scoping is an ongoing process, with formal consultation undertaken by the local authority with the statutory bodies (i.e. Natural England, Historic England, Environment Agency, Highways Authority etc.) regarding the proposed technical, geographic and spatial scope of the EIA upon receipt of the Scoping Report. The local authority should then issue their Scoping Opinion at the end of the five-week statutory period.

1.20 During this time, the Applicant and their technical team will continue to undertake informal consultation with relevant consultees themselves, to ensure that any queries on the scope of the EIA can be addressed beforehand and that the Scoping Opinion is based on the most recent discussions and understanding of the proposed development and its likely effects. Moreover, any relevant matters raised by members of the public and/or other stakeholders during the public consultations in September will be responded to in the ES, as appropriate.

Requirements of an Environmental Statement

1.21 As required by Regulation 18(3) of the EIA Regulations, the ES will include *"at least"*: a description of the development proposals; likely significant effects of the development proposals on the environment; a description of measures envisaged to avoid, prevent or reduce likely significant adverse effects; and, a description of reasonable alternatives studied by the Applicant. The requirements of Regulation 18(3) are detailed in full within Schedule 4, which is replicated in Table 1 below.

Table 1: Specified Information to be contained within an ES

	Regulation 18(3) – Specified Information
1.	Description of the development, including in particular: a. description of the location of the development; b. a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; c. a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; d. an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.
2.	A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

	Regulation 18(3) – Specified Information
3.	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
4.	A description of the factors specified in Regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.
5.	A description of the likely significant effects of the development on the environment resulting from, inter alia: a. the construction and existence of the development, including, where relevant, demolition works; b. the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; c. the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; d. the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); e. the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; f. the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; g. the technologies and the substances used.
6.	The description of the likely significant effects on the factors specified in Regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the relevant environmental protection objectives established at the national and EU level.
7.	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
8.	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

	Regulation 18(3) – Specified Information
9.	A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
10.	A non-technical summary of the information provided under paragraphs 1 to 8.
	A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.

Source: EIA Regulations 2017

Structure of this Report

1.22 The remainder of this report is structured as follows:

- Section 2: Overview of the proposed development;
- Section 3: The proposed approach to the EIA Methodology;
- Section 4: Overview of the proposed EIA Technical Chapters;
- Section 5: Topics to be 'scoped in' for inclusion within the ES;
- Section 6: Topics proposed to be 'scoped out' of the ES; and
- Section 7: Summary and conclusions.

2 OVERVIEW OF THE PROPOSED DEVELOPMENT

Site Description

2.1 The site itself comprises a large open arable field, of approximately 19 ha, traversed by a surfaced path to the south of the site. The site is bound by: New River, a man-made waterway to the west, with St Mary's Church of England High School further to the west; the Bury Green residential area to the north west of the site; the B198 Lieutenant Ellis Way and an area known as Rush Meadow to the south; the A10 dual carriageway to the east; and the small industrial estate of Maxwells West and Goff's Churchgate Academy to the north.

2.2 An initial illustrative masterplan has been prepared for the site which proposes a scheme made up of two main development areas located either side of a central spine road. To one side, a data centre area which will be developed in a parkland setting, with a transformer station located on site. To the other, the second area will be reserved for B1/B2/B8 uses. Provision will be made for the existing Maxwell West trading estate and the proposed Rush Meadow development area to be accessed from the spine road.

2.3 Theobalds Grove overground station is the nearest station, located approximately 800m to the south east of the site. Cheshunt railway station is located 1.5km to the north east, and Cuffley station is located 4km to the west. These stations are along the Greater Anglia, Great Northern and London Overground railway line services, which provide trains to key London interchanges such as London Liverpool Street and Old Street.

2.4 The nearest bus stops are located north of the site along College Road, approximately 650m from the north of the site. These stops have two bus routes, numbers 242 and 251, with one bus running approximately every 10-20 minutes. There are also bus stops located approximately 850m to the east of the site, along the B176 Crossbrook Street, providing access to additional bus routes 410, 310 and L2.

Current Land Use

2.5 The site comprises undeveloped, former agricultural land. Historical mapping indicates that the site has historically comprised rural land.

2.6 The site is situated in a semi-rural location and surrounded by agricultural land to the north, dual carriageways to the south and east, and the New River (a canalised watercourse), and school sports pitches to the west. The wider area comprises urban settlement, agricultural land and pockets of broadleaved woodland.

Summary of Environmental Sensitivities

2.7 The following key sensitive receptors and environmental constraints have been identified within the vicinity of the site. The ES will particularly focus on identifying the effects of the construction and operation of the proposed development on these receptors:

- Cheshunt secondary school, approximately 250m to the north of the site;

- The New River, located to the west of the site. The New River is an artificial waterway, opened in 1613 to supply London with fresh drinking water taken from the River Lea and from Chadwell Springs and, originally, Amwell Springs, as well as other springs and wells along its course;
- Cedars Park and Theobalds Palace (a Scheduled Monument) are located to the south east of the site.
- Turnford & Cheshunt Pits Site of Special Scientific Interest (SSSI), approximately 1.5km northeast of the proposed site;
- Lee Valley SPA and Ramsar site is approximately 1.5km northeast of the proposed site;
- Other ecological receptors within or in close proximity to the site, including hedgerows, woodland and grasslands;
- The closest Grade II listed building is found on Albury Farm, approximately 150m to east of the site.
- Local social and community services, including secondary schools, GP services and hospitals;
- Existing businesses north east of the proposed development;
- St Mary's C of E High School and users of the school playing fields immediately to the west of New River;
- Residential receptors of the Bury Green area to the immediate north west of the site;
- Users of the local network of bridleways, public footpaths, other access routes and cycle routes around the site, principally to the west and south of the site including the footpath route connecting St Mary's C of E High School with the Paul Cully footbridge across the A10; and
- Sensitive receptors that would be introduced to the site under the proposals, including site workers.

The Proposed Development

Overview of Development

2.8 It is proposed that the development will include the following principal land uses as shown in the illustrative masterplan (Fig. 2) and computer-generated images (Fig.3):

- A data centre area developed in a parkland setting;
- Transformer station located on site;
- Development areas will be reserved for B1/B2/B8 uses;
- Open space, integral landscape scheme and drainage requirements; and

- Associated vehicular and other access routes.

2.9 It is envisaged that maximum building heights will be up to approximately 16m. Maximum heights will be defined for each land use parcel and these final heights will be depicted on a parameter plan submitted with the planning application and assessed within the ES.

Landscape and Drainage

2.10 A landscape scheme that relates to local landscape character will be provided within the proposed development to enhance the ecological value of the site, illustrated in Figure 2. This will include framework tree planting along the boundaries of the site, swales and green areas. Further details will be provided within the ES and in other documentation supporting the planning application.

Utilities

2.11 A utilities assessment is currently being undertaken to be submitted alongside the outline planning application. This has consisted of utilities checks for all the relevant utilities providers with regards to possible mains diversions, new supplies, layouts and infrastructure capacity checks to determine whether there will be a need for off-site works to facilitate the proposed development.

2.12 The development includes a transformer station located on site. This will generate and provide its own electricity for the site, alongside emergency power generators.

2.13 It is proposed a fuel storage tank circa.400 tonnes will be located on site to supply the emergency power generation.

2.14 Information will become available as the designs and the negotiations with the utilities companies progress and may include running new infrastructure in the public highway, either to divert around the site or to reach utility substations/larger infrastructure in the surrounding area.

2.15 Thames Water will need to undertake modelling work to confirm necessary improvements required to accommodate the development, however, this will not be required until detailed design stage, when the exact design of units proposed, and layout of the site are agreed.

Figure 2: Illustrative Masterplan

Figure 3: Computer Generated Images (CGI) for the proposed site

Parameters

2.16 The description of the proposals contained within the ES must be sufficient to enable the requirements of the EIA Regulations to be fulfilled, specifically to enable the likely significant effects of the proposed development to be identified. As an outline application, the precise detail of the layout, scale, appearance, and landscape scheme (with the exception of the principle points of access to the site) will be subject to approval at the reserved matters stage. However, an illustrative masterplan (as shown in Figure 2) will accompany the planning application to illustrate how the scheme might be configured and built out.

2.17 It is the intention that certain development parameters and key development principles will be approved at the outline planning stage to guide and inform future reserved matters applications. It is likely that for the outline stage, a development zone will be specified in the ES. This will set out maximum and minimum parameters within which the development would be built-out, rather than determining a proposed shell and location of specific buildings. A worst-case impact scenario can then be determined, before being refined at reserved matters stage.

2.18 A Design Code will be drawn up to assure the quality and consistency of the design at the subsequent reserved matters and construction stage. This Code will define minimum standards for site layout (e.g. typology, parking, boundary, set back, height and frontage character) and provide a materials palette appropriate for each character area. The Code will be described further in the Design and Access Statement (DAS) submitted with the outline planning application.

2.19 The Applicant will submit a number of parameter plans with the outline planning application in order to define the limits of what can be built and where. These parameters will in turn form the basis of the assessments contained within the ES.

2.20 It is envisaged that these parameter plans, and associated figures will include the following:

- Site Location Plan (red line boundary);
- Land Use Plan (with limits of deviation extent of proposed character areas);
- Maximum Building Heights (set to meters above ordnance datum (mAOD));
- Access and Movement Plan (for all modes of transport); and
- Landscape and Open Space Plan (including location and extent of all strategic landscape features, including ponds, indicative locations of drainage, and existing landscape features, e.g. trees and hedgerows, to be retained/removed).

2.21 It should be noted that the EIA will be a 'multi-stage process', whereby the environmental effects and mitigation can, if necessary, be further defined and tested at the reserved matters stage. This will ensure that the assessment of environmental effects responds to the additional detail as it comes forward.

Consultation

2.22 In the lead up to the planning application and throughout the development design, a programme of consultation will continue to be undertaken with BBC and Hertfordshire County Council

(HCC), together with statutory and non-statutory consultees and with members of the public. Further technical consultation will also be undertaken as part of the ongoing EIA process, including with Natural England, Thames Water and the Environment Agency.

2.23 A summary of relevant consultation will be presented in the introductory sections of the ES. This will provide details of any environmental issues raised and provide an audit trail of how the EIA process has responded to these. Consultation that is specific to particular topics will be reported, where relevant, within the corresponding chapters of the ES.

3 EIA METHODOLOGY

Relevant Planning Policy and Guidance

3.1 The proposed development is located within the jurisdiction of BBC. The following planning policy and guidance is relevant to the proposed development:

- National Planning Policy Framework (NPPF) (July 2018)[1;]
- Government PPG on EIA (2014)[1];
- Broxbourne Local Development Scheme (June 2017)[2];
- Draft Broxbourne Local Plan 2018-2033[3];
- Other relevant supplementary planning documents and guidance;
- Institute of Environmental Management and Assessment (IEMA) Guidelines for environmental impact assessment[4];
- The Planning Inspectorate - 'Using the Rochdale Envelope' (Advice Note 9, April 2012); and
- Topic specific guidance and assessment criteria, where appropriate.

EIA for an Outline Planning Application

3.2 In accordance with the 'Rochdale Envelope' approach[i], whilst developers are not precluded from having a degree of flexibility in how a scheme may be developed, the EIA for the outline elements of the application must assess different options by considering the maximum and, where appropriate, minimum parameters of the scheme in terms of scale, height, floorspace and other matters. These parameters will be set out within the Parameter Plans listed in Section 2, with detailed plans being produced in respect of the proposed site accesses (for which full planning permission is required).

3.3 In addition to the Parameter Plans, a number of indicative plans will be provided within the ES and DAS, including an Indicative Phasing Plan. These will present 'reasonably likely' scenarios to inform the EIA but are not fixed parameters for which approval is sought at this stage.

Summary of the EIA Process

3.4 The EIA process comprises the following:

- Baseline surveys, modelling and assessment;

[i] The 'Rochdale Envelope' arises from the following cases: R. v Rochdale MBC ex parte Milne (No. 1) and R. v Rochdale MBC ex parte Tew [1999] and R. v Rochdale MBC ex parte Milne (No. 2) [2000]. The judgments in these cases describe the principle that one may set clearly defined parameters for development, which, when taken with development proposals set at an appropriate level of detail, may allow for environmental assessment to take place of those proposals. This allows the detail of the development to come forward within those parameters at a point after the assessment has taken place.

- Consideration of local, regional and national planning policies, guidelines and legislation relevant to the EIA process, in particular those applicable to sustainable urban development projects;
- Ongoing iteration of the Masterplan in light of the EIA findings and inclusion of inherent 'embedded mitigation' measures;
- Finalise associated Parameter Plans;
- Final assessment of Parameter Plans and determination of impact significance, mitigation and residual impacts; and
- Complete and submit the ES with the planning application, including a Non-Technical Summary of the ES as required within Regulation 2 (1) Schedule 4 of the 2011 EIA Regulations.

3.5 With respect to identifying the likely significant environmental effects associated with the proposal, the ES will give due consideration to a range of potential effects associated with construction, occupation and operation of the development, both beneficial and adverse, which could be deemed to be 'significant' on the basis of:

- the value/ importance of the resources and receptors that could be affected by the construction and operation of the development;
- the predicted magnitude of environmental change and/or impact experienced by these resources and receptors, accounting for their size, duration and spatial extent; and
- options for avoiding, reducing, offsetting or compensating for any potentially significant adverse effects and the likely effectiveness of such mitigation measures.

3.6 Subsequent sections of this EIA Scoping Report set out the range of topics and detailed issues which are proposed to be considered in the EIA, whilst the principal/ common considerations of the EIA are described below.

Assessment Scenarios

3.7 The proposed assessment scenarios comprise:

- The existing baseline, which has been informed by surveys undertaken during in 2018 and against which the proposed development effects will be considered;
- The assessment of the construction phase activities, which will also include the consideration of necessary site enabling work activities; and
- The final completion of the scheme, estimated to be 2025.

3.8 These three development milestones represent the main assessment scenarios that will be considered within the EIA and reported in the ES.

3.9 The ES will include provision of an Indicative Phasing Plan; however, the phasing of the proposed development may be subject to variance beyond those key assessment scenarios identified and as such, consideration will be given to whether any change to this phasing could give rise to materially different or significant environmental effects.

Consideration of Alternatives

3.10 In accordance with Schedule 4 of the EIA Regulations, the ES will contain:

A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects .

3.11 The Government PPG on EIA states at paragraph 035 that:

"Where alternative approaches to development have been considered, the Environmental Statement should include an outline of the main alternatives studied and the main reasons for the choice made, taking into account the environmental effects".[1]

3.12 Potential alternatives can be broadly grouped into the following categories:

- Alternative sites;
- Alternative land uses;
- Alternative processes; and
- Alternative development layouts.

3.13 No alternative site which is in the control of the Applicant and which could deliver the same type of development has been identified. As a data centre, the consideration of alternative 'processes' is also not directly applicable. The ES will therefore focus on a qualitative assessment of the alternative designs which will summarise the progression of the Masterplan for the site and how environmental considerations have influenced the overall design process. A summary of the main alternatives considered, such as alternative plan form layouts, and building heights will be presented, together with the justification for the selection of the final design.

3.14 As part of this consideration of alternatives, the ES will also consider a 'Do Nothing' scenario, which will describe the environmental and socio-economic conditions at the site were the proposed development not to occur.

Assessment of Significance

3.15 Prevailing good practice suggests that environmental impacts should be considered in terms of the importance, value or sensitivity of receptors and the predicted scale, or magnitude, of the potential effects. The significance of potential impacts should then be determined through consideration of respective sensitivity and magnitude.

3.16 The assessment of significance within the ES will be considered using a common scale, being described as either '**major**', '**moderate**', '**minor**' or '**negligible**' (which also includes neutral or no impact outcomes).

3.17 Where legal or otherwise definitive impact thresholds do not exist, the method for ascribing significance is left to the judgement of the topic specialists informed by best practice guidance within their professional discipline. Where methodologies have been adapted from specific

industry recognised guidelines (e.g. Landscape Institute and Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines), this methodology will be set out in the respective chapters of the ES or the accompanying technical appendices.

3.18 Following their identification, all significant effects will be classified on the basis of their nature and duration as follows:

- **Beneficial** – effects that have a positive influence on receptors and resources;
- **Adverse** – effects that have a negative influence on receptors and resources;
- **Temporary** – effects that persist for a limited period only (due for example, to particular construction activities taking place for a short period of time);
- **Permanent** – effects that result from an irreversible change to the baseline environment (e.g. land-take) or which persist for the foreseeable future (e.g. noise from regular or continuous operations or activities);
- **Direct** – effects that arise from the impact of activities that form an integral part of the proposed development (e.g. direct employment and income generation) and which occur at the same time and place;
- **Indirect** – effects that arise from the impact of activities that do not explicitly form part of the proposed development (e.g. off-site infrastructure upgrades to accommodate the development), which may occur later in time and/or are geographically remote from the site, but are nonetheless reasonably foreseeable and measurable;
- **Secondary** – effects that arise as a consequence of an initial effect of the proposed development (e.g. induced employment elsewhere); and
- **Cumulative** – effects that can arise from a combination of different effects at a specific location or the interaction of different effects over different periods of time.

Consideration of Cumulative Effects

3.19 Under the EIA Regulations, the requirement for considering cumulative schemes has been restricted to 'cumulation' with other existing development and/or approved development'.

3.20 In their response to the technical consultation on EIA thresholds, MHCLG stated that urban development projects below the revised EIA screening thresholds *"will not be likely to have significant effects either alone or in combination with other projects because of their nature, location or impact"*. On this basis, the consideration of cumulative effects has been limited to those projects where:

- the development includes more than 1 hectare (site area) of urban development which is not dwelling house development; or
- the development includes more than 150 dwellings; or
- the overall area of the development exceeds 5 hectares.

3.21 In accordance the PPG on EIA, only those schemes with planning permission need to be considered in the cumulative impact assessment.

3.22 The spatial scope of the potential cumulative schemes has been considered and those consented developments located within 3km of the site that meet the criteria above have been identified. This distance has been informed by the transport assessment approach which has reviewed the surrounding transport network and identified that schemes located between the Turnford junction on A10 to junction 25 turnoff on the M25 could have the potential for cumulative traffic effects.

3.23 It is considered that schemes identified using the above criteria will sufficiently address the potential for cumulative ('in combination') effects on air quality, noise, transport, socio-economics, landscape and visual, biodiversity and the water environment.

3.24 For the remaining technical areas of cultural heritage (archaeology) and ground conditions (contamination), these are considered site-specific and therefore do not have the potential to give rise to cumulative effects.

3.25 Apart from considering the specific schemes identified below, future developments in the local area will be accounted for in two ways:

- through the application of the traffic model (TEMPRO) growth factors when considering future baseline traffic flows. The TEMPRO database calculates growth based on housing and employment projections for the local area. Consequently, it will inherently include any schemes already accounted for within housing and employment projections and so will constitute a conservative assessment; and
- for socio-economic considerations, through the use of publicly available evidence from surrounding local authorities and other stakeholders on the future baseline for education and healthcare capacity.

3.26 The following committed development, which has not yet begun construction, will be considered as part of the cumulative effects assessment. Further schemes may be added to this list if identified by BBC and others.

Table 2: Summary of Cumulative Schemes to be Considered within the ES

Scheme address	Planning reference	Site area	Distance from site
Britannia Nurseries, Bryanstone Road, EN8 7NB	07/13/0158/0	4.5ha	1.8km

3.27 Intra-cumulative effects will also be considered within the ES. This will take the form of a matrix identifying the sensitive receptors and the different effects arising from the proposed development experienced at each – for example, an individual receptor close to the site boundary may be affected by noise and visual effects.

Structure of the Environmental Statement

3.28 There is no defined structure for an ES, provided that it meets the requirements outlined in Regulation 18(3) of the EIA Regulations. This section sets out the proposed structure for the ES.

Volumes of the ES

3.29 The ES will be presented in three separate parts:

- **Volume 1** will be the main volume of the ES and will describe: the proposals, the alternative options considered, the baseline environmental conditions, the likely significant effects of the development, the proposed mitigation measures and the residual (remaining) environmental effects following the implementation of mitigation measures.
- **Volume 2** will contain the technical appendices, which comprise the technical guidance, reports, figures and data that have informed the assessments contained in Volume 1.
- **Volume 3** will contain the Transport Assessment (TA). This will be included as a separate Volume of the ES due to the large size of the document.
- A **non-technical summary (NTS)** will be produced of the information contained in Volumes 1 and 2 to describe the scope, methodology, results and conclusions of the ES in a concise form which is readily understandable to non-specialists.

3.30 The proposed structure of Volume 1 (the main volume of the ES) is presented in Table 3.

Table 3: Proposed Structure of Volume 1 of the ES

Chapter		Content
	Glossary & Abbreviations	List of abbreviations and glossary of terms (to be included before Chapter 1).
1.	Introduction	Scheme background; scheme context; explanation of EIA and the EIA Regulations; the structure of the ES; information on the project team and chapter authors; where to view hard copies of the ES; details on how to comment, what the determination period is etc.
2.	EIA Methodology	Approach to EIA process, including: consultation, responses received and how/where issues have been addressed within the ES, discussion of issues scoped out of the EIA, structure of technical chapters and approach to assessment of residual impact significance
3.	Site Description & Development Proposals	Description of site and the wider study area; description of the elements of the development relevant to the assessment of its possible effects on the environment, including phasing, associated development etc.
4.	Alternatives & Design Evolution	Outline of the alternatives considered by the Applicant and the Design Team, including alternative layouts, land uses, residential unit numbers and densities.

5.	Construction Environmental Management	Describes the construction strategy, including indicative phasing of the works, and the proposed mitigation measures to be adopted through the Construction Environmental Management Plan (CEMP).
6-11.	Technical chapters	Detailed assessment of each environmental topic area scoped in to the EIA i.e. Socio-Economics, Transportation and Access, Air Quality, Noise and Vibration, Landscape and Visual Impacts and Biodiversity.
12.	Cumulative Effects	Assessment of cumulative effects of the proposed development with other identified committed schemes, on key receptors, and assessment of intra-cumulative effects.
13.	Residual Effects Summary & Conclusions	Residual effects of the development, the mitigation measures proposed and how these are to be secured.

Structure of the Technical Chapters

3.31 The technical chapters of the ES will be structured as set out below.

Introduction

3.32 The introduction will provide a brief summary of what is considered in the chapter and will state the author and/or relevant technical contributor (Note: a full statement of competency for the whole EIA team will be provided in Volume 2 of the ES, as required by the EIA Regulations). Where appropriate, it will describe the assumptions and limitations related to the assessment of that topic and any constraints to undertaking the assessment.

Planning Policy and Legislative Context

3.33 This section will provide details of any relevant legal considerations or standards for the impact assessment, together with national, regional and local policy and Industry guidance that has informed the assessment.

Assessment Methodology and Significance Criteria

3.34 This section will provide details of:

- the methodology, technical, spatial and geographic scope of the assessment, with reference to any published methodological standards, professional guidelines and best practice that are particular to the topic.;
- the comments raised during scoping/ consultation process and a commentary on how the comments have been addressed within the assessment;
- how baseline conditions have been assessed (e.g. site visits, surveys, review of publicly available data) and the scale of sensitivity and magnitude adopted within the assessment;

- how significance has been assessed (e.g. whether a matrix or some other approach has been adopted);
- any associated development (i.e. development which is required to facilitate the development but does not form part of the planning application, such as off-site utilities works) that is relevant to the assessment; and
- any assumptions or limitations.

Baseline Conditions

3.35 This section will take the form of a table that provides a list of:

- the key receptors that have been identified;
- a brief description of those receptors;
- the sensitivity attributed to each receptor; and
- where further details can be found within the relevant technical appendices.

Assessment of Effects

3.36 This section will present the assessment of potential effects/ impacts that are predicted to occur during the construction and operation of the proposed development. The assessment will include:

- The activities and physical elements of the development that are likely to give rise to particular effects, together with a more detailed description of such activities or elements where this would aid the reader's understanding of the assessment;
- The receptor(s) that are likely to be affected;
- Any specific embedded mitigation measures that have already been incorporated into the design of development in order to avoid or minimise the environmental effects (i.e. 'design mitigation');
- The impact (including consideration of any embedded mitigation measures);
- The magnitude, duration, reversibility, and overall significance of the impact, prior to further mitigation; and
- Whether further mitigation is required.

Further Mitigation and Monitoring

3.37 This section will include details of:

- The phase during which the mitigation or enhancement measures will be implemented;
- The mitigation and/or enhancement measure(s) being proposed;
- How each measure will be secured and when it will be triggered;

- The magnitude of the effect post-mitigation; and
- Whether the post-mitigation effect is adverse or beneficial.

Residual Effects and Conclusions

3.38 This section will be tabulated, and include details of:

- The residual effect following the implementation of mitigation/ enhancement measures; and
- The significance of the effect and whether it is adverse or beneficial, short, medium or long-term, direct or indirect, permanent or temporary, and reversible or irreversible.

Cumulative Effects

Inter-cumulative Effects

3.39 This section will include the following details:

- A description of whether any of the identified cumulative schemes are likely to result in inter-cumulative effects for the specific topic area under consideration and for each effect:
  - the phase during which it may arise;
  - the receptor(s) likely to be affected;
  - any additional measures that are required to mitigate the identified effect; and
  - the significance of the effect and whether it is adverse or beneficial, short-, medium- or long-term, direct or indirect, permanent or temporary, and reversible or irreversible.

Intra-cumulative Effects

3.40 This section will detail the intra-project effects of different types of impact (for example impact interactions arising from noise, dust and visual impacts during construction on particular sensitive receptors) from the proposed development.

Competent Experts

3.41 Regulation 18(5) of the EIA Regulations states that:

"In order to ensure the completeness and quality of the environmental statement –

a) The developer must ensure that the environmental statement is prepared by competent experts; and

b) The environmental statement must be accompanied by a statement from the developer outlining the relevant expertise and qualifications of such experts."

3.42 Table 4 sets out each of the technical consultant organisations that have contributed to this scoping report and will be undertaking the technical assessments to support the ES and

planning application. These consultant organisations are considered to be 'competent experts' in their respective disciplines. CVs for the individual technical consultants from those organisations responsible for each technical chapter will be included within Volume 2 of the ES, along with a full statement of competency for each company and author involved within the EIA process.

Table 4: Technical Consultant Organisations and Relevant Topics

Technical Topic	Consultant Organisation	Consultant Website
EIA Methodology & Approach	RPS Group	http://www.rpsgroup.com/
Socio-Economics	RPS Group	http://www.rpsgroup.com/
Landscape & Visual Impact Assessment	The Landscape Partnership	http://www.thelandscapepartnership.com/
Transportation & Access	Vectos	http://www.vectos.co.uk/
Air Quality	RPS Group	http://www.rpsgroup.com/
Noise & Vibration	RPS Group	http://www.rpsgroup.com/
Biodiversity	JFA Environmental Planning	http://www.jfa.co.uk/

4 PROPOSED SCOPE OF THE ES

4.1 This section considers the potential significant environmental effects of the proposed development and therefore the technical topics proposed for inclusion within the ES. It should be noted that no significant (major) adverse effects are anticipated at this time, accounting for the adoption of suitable mitigation measures. However, this will need to be confirmed through the EIA process.

4.2 Table 5 summarises the proposed scope of the EIA and outlines the following technical topics to be:

- **'Scoped In'** for detailed consideration within a dedicated chapter of the ES, as significant environmental effects are considered likely prior to mitigation, or, inadequate information existed at the point to of writing this Scoping Report to definitively conclude that no significant effects would occur;
- **'Scoped Out'** of further assessment as part of the EIA, as it is considered unlikely for these topics to exhibit significant environmental effects. In some cases, however, further information on these topics is required to satisfy other planning requirements. For such topics, the requisite information will be appended to the ES or submitted as a stand-alone document to accompany the planning applications (e.g. within the DAS).

Table 5: Proposed Approach to the Topics Scope of the ES

Topics to be Scoped In to the ES	Topics to be Scoped Out of the ES
Socio Economic Effects	Ground Conditions and Contamination
Transportation and Access	Built Heritage
Air Quality	Daylight, Sunlight and Overshadowing
Noise and Vibration	Wind
Landscape and Visual Effects	Climate Change
Biodiversity	Human Health
	Archaeology
	Water Resources
	Agriculture and Soils
	Waste Management
	Major Accidents and Disasters

5 SCOPED IN TOPICS

Socio-Economics

Context

5.1 The assessment of the potential socio-economic effects will include consideration of the following potential effects:

- Employment generated during the construction phase;
- Loss of existing uses on site;
- Employment generated within the new uses, considering the gross employment as well as 'net additional' above existing employment levels on-site; and
- Spending impacts from increased new employees.

Baseline Conditions

5.2 A detailed assessment of the baseline conditions will be considered as part of the socio-economic assessment. This will include a review of the local demographic, social and economic characteristics of the area surrounding the development.

5.3 The local area will be put into context against the wider district (BBC) and county (Hertfordshire) profile. The built form of the site is located within the Rosedale and Bury Green ward within BBC. However, as the site is located adjacent to the Cheshunt South and Theobalds Ward, this will also be considered.

5.4 This assessment will draw on publicly available sources as well as information provided by the Applicant.

5.5 As set out in the Section 2 of this Scoping Report, there are a small number of businesses located to the north east corner of the site. The baseline section will include a breakdown of these businesses and what their main function involves.

5.6 The baseline provision and capacity of infrastructure such as sports/ leisure facilities will also be set out within the socio-economic assessment.

Key Issues and Requirement for Assessment

5.7 The development will have a range of socio-economic effects during the construction and occupation phases. This development will be delivered over a series of phases. However, as this application will be an outline application, there will not be a detailed phased assessment set out within the socio-economic assessment. Instead, the assessment phases will include construction phase, initial year of operation and final completion of the scheme. The key impacts arising from the proposed development will be the effect of jobs, both loss of existing (if any) and generation of new, and, the impact of housing delivery and new population.

5.8 The likely sensitive receptors in the local area are considered to be:

- Existing and future local businesses and employees;
- Existing local residents; and
- Local community facilities.

5.9 The finding of the assessment will be provided in the Socio-Economics chapter within the main ES volume.

Non-significant Issues Related to Socio-economics

5.10 The EIA Regulations require the consideration of the potential effects on climate change and human health where significant effects are likely to occur. The assessment should be proportionate to the project being considered.

5.11 Several environmental factors are considered to experience variations in the future due to climate change. These include the increase in the mean average air temperature, increase in average annual precipitation, and wind speed and total cloud cover could slightly decrease.

5.12 These changes are not considered to have a significant effect upon the sensitive receptors within a socio-economic context. Therefore, potential effects related to climate change are not considered to be relevant to the assessment of socio-economics effects.

5.13 The socio-economic aspects of the scheme (provision of jobs and population), could potentially give rise to indirect beneficial effects on human health. In particular, greater access to adequate recreational open space may be positively correlated with good health. However, these effects will be uncertain and not easily measurable. Moreover, the incidence of any such health effects will be very widely dispersed through marginal changes to the wider employment markets, and so the effect is not significant at this level.

5.14 The potential effects of a new development on the health of new and existing workers would be largely determined by the way the development's buildings and spaces are used, as well as lifestyle factors which cannot be accurately quantified or controlled at the planning stage. These wider factors sit outside of the scope of planning and EIA.

Assessment Methodology

5.15 The socio-economic assessment will, wherever possible, be appraised against relevant national standards such as those provided by Homes England (which replaced the Homes and Community Agency (HCA) in January 2018). Where no standards exist, professional experience and judgement will be applied and justified.

5.16 The socio-economic ES chapter will provide a relevant summary of planning policy and guidance at the local (Rosedale and Bury Green ward), wider impact area (Cheshunt South and Theobalds Ward), Borough (BBC) and regional (Hertfordshire) level.

5.17 The assessment of socio-economic baseline conditions and potential impacts will utilise a number of methodologies, data sources and assumptions. These are set out below:

- The socio-economic baseline will be established using:
  - 2011 Census Data[5];

- Business Register and Employment Survey (BRES) (2016)[6];
- Indices of Multiple Deprivation (IMD) (2015);
- Claimant Count Data (2018);

- Site preparation and construction employment impacts will be assessed using the Construction Industry Training Board (CiTB) Labour Forecasting Tool;
- Operational employment impacts will be assessed using the Homes England standard job density for commercial floorspace;
- Estimates of spending by newly introduced residents will be calculated using the Office for National Statistics (ONS) average annual household expenditure on goods and local services;
- Local spending by those working on-site will be calculated based on a daily expenditure assumption;
- Availability of primary healthcare facilities in the local area will be assessed by using published National Health Service (NHS) data. This information will be compared with the projected new population in the development to estimate the likely effect of the development on primary healthcare facilities; and
- Provision of open space and child play space will be assessed in line with local policy requirements.

5.18 Any mitigation measures required to address any likely adverse effects will be identified through the assessment. Mitigation, if required, could include the on-site provision of facilities or services to meet additional demand, or off-site mitigation through financial contributions via the Community Infrastructure Levy (if adopted following the Local Plan) and/ or the Section 106 agreement.

5.19 An assessment will also be undertaken of the cumulative schemes set out in Table 2.

Transportation and Access

Context

5.20 The proposed development will generate additional traffic on the local and strategic road network. Traffic will be generated during the construction phase and the proposed development will also generate traffic during the operational phase with individuals commuting to the workplace.

Baseline Conditions

5.21 The site is currently unused arable land, there are 11 local businesses sited outside the red line boundary north east of the development. Therefore, only vehicle movements from the north east section of Maxwells Farm West exist.

5.22 Access to Maxwells Farm West is provided from the A10 (Great Cambridge Road). The A10 in the proximity of the site is a dual carriageway with a 40mph speed limit. The A10 runs

northbound towards Cambridge and southbound to Central London. From the southbound A10 the M25 can be accessed via Junction 25. The access to Maxwells West is a simple give way junction onto the northbound carriageway of the A10, comprising a left-in/left-out arrangement. Therefore, vehicles entering and exiting the site are required to travel northbound on the A10. There is no access/egress to/from the southbound carriageway. The southbound carriageway can be accessed by taking a left turn at the signalised junction where the B198 (College Road) intersects the A10. From here Lieutenant Ellis Way should be taken travelling southbound where it intersects the A10 and the southbound carriageway can be accessed.

5.23 The application site is located approximately 1.2km (or approximately 14 minutes to walk) from the nearest neighbourhood centre (Theobalds Grove, High Street). The site is former agricultural land use therefore there are limited pedestrian access routes. There are no footways directly from the access points of the application site on the northbound carriageway of the A10. On the southbound carriageway of the A10 a street lit footway is available which provides access to a footbridge to cross the A10 which leads to a network of footpaths (Cheshunt FP012, FP013 and FP016). These footpaths lead to the surrounding residential areas of Bury Green and Cheshunt.

5.24 Towards the southern end of the site there is a relatively new shared footway/cycleway that runs east to west across the site. At the western end, this facility connects to St Mary's Church of England High School and Sixth Form, and to the bridge over the A10 to connect to Cheshunt Football Club to the east. It then connects to a wider network of public footpaths that provide access to the Churchgate residential area. Bus stops on College Road can be accessed via the footpath alongside New River and the bus stops at Theobald's Grove rail station via the shared footway cycleway that routes alongside Theobald's Lane. This route along Theobald's Lane also provides access to the Theobald's Grove Rail Station. From this station 2 trains per hour run in each direction to London Liverpool Street and Cheshunt.

5.25 It is clear the site benefits from good local bus and rail services providing frequent services into Central London and to Cambridge. Cycleways and footways provide links to neighbourhood centres and both bus and rail stations.

5.26 The collection of baseline traffic data, as described below, has been completed and this will allow baseline traffic conditions to be assessed in detail.

Key Issues and Requirement for Assessment

5.27 Vehicle trip generation during the construction phase will be short-term and temporary. It is considered that potential impacts can be managed through the implementation of mitigation measures, which will be detailed within the Construction Traffic Management Plan (CTMP) and outlined in *Chapter 5: Construction Environmental Management* within the main ES volume. Such measures will include the appropriate management of any on-site compounds, careful phasing of works to ensure that vehicle movements are spread out over time, careful management of vehicle routeing and the use of appropriate call up or slot booking processes. On the basis that these measures are implemented, impacts are not anticipated to be significant.

5.28 As a result of the proposed commercial related floorspace it is expected that traffic flows within the local and strategic highway network will increase slightly during the operation of the scheme. This will particularly apply to the A10 and B198 corridors, and routes to the M25 and hence it is

proposed that a Transportation and Access chapter will be included within the main volume of the ES. Traffic flow data will also be used to inform the air quality and noise impact assessments.

5.29 A Transport Assessment (TA) will be prepared and submitted alongside the planning application. In accordance with the local authorities' application requirements, it will be agreed whether the TA will form a stand-alone planning application document, have a section of relevant environmental information included as a technical appendix within Volume 2 of the ES, or be appended in its entirety to the ES in Volume 3 to avoid considerable duplication.

5.30 As advised by PPG on Travel Plans, Transport Assessments and Statements, the TA will be accompanied by a Framework Travel Plan (TP) for the proposals. The Framework TP will be prepared to increase awareness of the potential for travel by more environmentally-friendly modes available to future residents, employees and visitors to the site. The TP will introduce a package of physical and management measures that will assist travel by sustainable modes and reduce private car mileage.

Assessment Methodology

5.31 The TA will consider the effect of increased traffic on the surrounding road network, particularly with respect to the operational capacity of key junctions during network peak hours. It will also consider opportunities for employees and visitors to use the public transport network and the pedestrian and cycling network, along with the potential for upgrades and enhancements to these. The detailed scope of the TA will be agreed with BBC and Highways England via a separate scoping exercise.

5.32 Traffic surveys have been completed in order to assess the existing traffic flows from Maxwells Farm West. These include 7- day Manual Classified Turning Count surveys. Surveys of existing data centre sites were presented, and vehicle trip rates derived.

5.33 An Initial Transport Appraisal has been undertaken which considers the transport implications of the proposed development of the site and provides additional information that Hertfordshire County Council (HCC) requested during pre-application discussions. In summary the main conclusions were:

- The site is considered to be in an accessible location and its accessibility would be improved by the proposed masterplan;
- The site accesses would safely accommodate the traffic associated with the proposed development;
- There are significant benefits of the proposed new access onto Lieutenant Ellis Way by removing U-turning on the A10 and reducing traffic, including HGVs, using local roads through residential areas;
- The proposed site access does not prejudice the future access into Park Plaza West;
- There are no offsite highway implications of the proposed development.

5.34 Junction capacity modelling using Junctions9, TRANSYT and/or Linsig will be undertaken on key junctions identified and agreed with BBC. This will demonstrate the proposed

development's traffic impact upon the existing junctions and indicate the level of traffic that can be accommodated. Where and/or if required, highway improvements will be assessed and recommended.

5.35 An assessment of the opportunities for sustainable modes of travel to nearby amenities, services and facilities will be undertaken. This may refer to census data to determine the existing modal choice and travel distances. The mitigation strategy for the site will include enhancements to the existing and surrounding sustainable transport network as considered appropriate to mitigate the development. This is expected to include improvements to local walking and cycling facilities and support for a bus link between the site and key destinations. The TP will be developed which will review other sustainable transport measures, including support for home working, car sharing initiatives and on-site car club for example.

5.36 Consideration will also be given to the potential cumulative traffic impact of the proposed scheme alongside other developments within the area. These schemes have been discussed with highway and planning officers and will be incorporated within the TA through the application of suitable growth factors and / or explicit traffic flow numbers from available TAs.

5.37 To evaluate and quantify the likely significant transport effects of the development, significance criteria will be adopted. The overall significance of effect for each potential transport impact will be derived through cross referencing the sensitivity of receptors, and the likely magnitude of the transport impact upon each of them.

Air Quality

Context

5.38 The proposed development has the potential to affect local air quality, primarily through traffic generation during both the construction and operational phases of the development and fugitive dust emissions generated during the construction phase.

Baseline Conditions

5.39 BBC has designated seven Air Quality Management Areas (AQMAs) due to high levels of nitrogen dioxide (NO_2) pollution from road traffic. The proposed development site is partially within AQMA No. 6, which covers the Great Cambridge Road (A10) near Theobalds Lane junction up to the Brookfield Centre (B156 Flyover and B156/A10 Slip Road). The site is approximately 800m west of the second closest AQMA which covers the Monarchs Way/Winston Churchill Way Roundabout. The neighbouring London borough of Enfield has designated a borough-wide AQMA that is approximately 900 m south of the proposed development.

5.40 The impact of additional traffic generated by the proposed development upon air quality within the AQMAs will therefore need to be determined within the ES.

Potential Impacts

5.41 Potential impacts on local air quality to be considered in the ES are as follows:

- Impacts upon sensitive receptors from dust and emissions generated during the proposed construction activities;

- Temporary increases in traffic-generated emissions associated with construction related vehicles operating on the site and/or on the local road network;
- Temporary changes in local air quality from operation of emergency generators used on site; and
- Long-term changes in local air quality particularly in relation to NO_x, PM_{10} and $PM_{2.5}$ levels, due to emissions from vehicles associated with the operation of the completed development.

5.42 The Turnford & Cheshunt Pits Site of Special Scientific Interest (SSSI), Lee Valley Special Protection Area (SPA) and Lee Valley RAMSAR site are all within 2 km of the Application site. It may, therefore, be necessary to include an assessment of the impact of the development on these habitats if road traffic increases significantly on a road within 200m of these protected wildlife sites.

Assessment Methodology

5.43 The air quality assessment will cover the elements recommended in the NPPG. Consultation will take place with BBC's Environmental Health Officer regarding the approach to the assessment, modelling methodology and assessment scenarios. The approach to the assessment will be consistent with the Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning for Air Quality document, the IAQM Guidance on the assessment of dust from demolition and construction and, where relevant, Defra's Local Air Quality Management Technical Guidance: LAQM.TG16. It will include the key elements listed below:

- An assessment of the existing air quality in the study area (existing baseline) and prediction of the future air quality without the development in place (future baseline), using official government estimates from Defra, publicly available air quality monitoring data for the area, and relevant BBC Air Quality Review and Assessment documents;
- a qualitative assessment of likely construction-phase impacts with mitigation and controls in place; and
- a quantitative prediction of the future operational-phase air quality impact with the development in place (with any necessary mitigation), focusing on the impacts of the development traffic on the local area including any effects on the AQMAs.

5.44 To inform the background concentrations used within the assessment, the results of local monitoring and the 2015 Defra background concentration maps would be used. The assessment would not assume reductions in background concentrations and emissions in future years to reflect the findings of recent research.

5.45 For the construction phase, an assessment of risk of nuisance dust effects will be undertaken using the IAQM *Guidance on the assessment of dust from demolition and construction.* Generic mitigation measures would be recommended, designed to control dust nuisance effects and emissions during construction, consistent with the level of risk. The implementation of appropriate mitigation measures should reduce the residual dust effects to a level categorised as "*not significant*".

5.46 Existing air pollution levels at locations around the site will be predicted using the detailed dispersion model, ADMS-Roads, with a view to verifying and, if necessary, adjusting model input parameters and correcting the model output.

5.47 Future air pollution levels at existing receptors around the site will be predicted using ADMS-Roads in the first fully operational year, without and with the proposed development.

5.48 The significance of the illustrated effects will be determined using professional judgement and criteria definitions from the EPUK & IAQM Land-Use Planning & Development Control: Planning for Air Quality document.

5.49 Should initial results of the assessment show any adverse air quality effects arising from the proposed development, generic mitigation measures to improve air quality during the operational phase will be recommended.

Noise and Vibration

Context

5.50 Noise is a general term that is used to characterise unwanted sound. Loudness is related to both sound pressure and frequency, both of which can be measured. The response of the human ear is not constant over all frequencies and it is therefore usual to weight measured frequencies to the approximate human response using the 'A' weighted decibel (dB(A)). When related to a change in noise, a change of 10 dB(A) would represent a doubling or halving of loudness, whilst a change of 3 dB(A) is considered to be just perceptible[7].

5.51 The proposed development has the potential to increase noise at receptors on and in the vicinity of the site during the construction phase (noise associated with construction traffic, plant and machinery) and operational phase (noise associated with an increase in road traffic, proposed fixed plant and the activity of site users).

5.52 The nearest noise and vibration sensitive receptors (NSRs) have been identified as houses around Tudor Close Churchgate to the northwest, and more isolated houses off Theobalds Lane to the southeast. To the west is situated St Marys Church of England High School, whose playing fields extend to New River.

5.53 Some vibration effects may occur dependent on the construction methodology chosen, for instance piling. This will be determined by the ground conditions and the loading of buildings on site. Any impacts would be mitigated though best practicable means and measures as set out in British Standard BS 5228:2009- Code of Practice for Noise and Vibration Control on Construction and Open Sites, any vibration effects are not likely to be considered significant.

5.54 Subject to the outcome of the Noise Impact Assessment, it is considered that noise effects from the proposed development are likely capable of being controlled through appropriate design and/or mitigation if required, although none has been assumed so far. It is therefore unlikely that the cumulative impact of the site will result in a significant environmental impact with regards to noise or vibration.

Baseline Conditions

5.55 A desk-based investigation establishes the nearest NSRs and estimates the impact that the proposed development may have. It is considered that by assessing, and if necessary mitigating, any noise impact from the proposed development at the closest receptors, that there would be no greater effect at any other noise sensitive receptors. Baseline noise measurements have been undertaken from site, at locations representative of the two residential areas. The surveys logged data from 20th July to 24th July 2018 (Friday to Tuesday) and full data will be provided within the EIA.

Key Issues and Requirements for Assessment

5.56 The proposed development has the potential for noise effects on existing and proposed receptors including:

- Noise and vibration during demolition and construction works including plant and machinery, and construction traffic affecting existing receptors surrounding the site; and
- Noise from plant, such as the impacts of potential cooling ventilation plant associated with the data centre, as well as the new transformer station located on site, on existing and new receptors.

5.57 Based on a review of the proposed development as a Data Centre, it is considered that the main sources of operational noise will likely be from fixed cooling and ventilation plant, with minimal numbers of car or HGV movements. These activities are considered to constitute standard industrial noise sources but are likely to be low-level and continuous, and, as such, will not be particularly distinct in character. Any electrical generation associated with provision of emergency power, would only operate under exceptional circumstance or scheduled testing, and is excluded from the assessment.

5.58 The transformer station located on the site may be subject to further study to ensure operational noise levels emitted are within the acceptable limits on nearby receptors; the closest potentially being residential houses off Theobalds Lane.

5.59 By virtue of the nature of construction activities, noise will be generated during the construction phase. However, with the implementation of mitigation measures, which will be detailed in the CEMP, and adherence to good practice guidance as outlined in British Standard (BS) 5228 Part 1, significant impacts through construction noise and vibration on existing local residents and future residents in earlier development phases, are not anticipated. Measures that will be put in place include: controlled working hours for noisy activities, localised acoustic mitigation and the use of relevant Personal Protective Equipment (PPE) for site workers.

5.60 The operation of the proposed development would not generate significant levels of vibration. The control of any operational vibration source would ensure that no vibration was perceptible beyond the site boundary. It is therefore proposed to scope out vibrational effects from the operational assessment.

5.61 The implementation of standard mitigation measures such as effective silencing measures of noise sources and appropriate acoustic design/specification of fixed plant will be considered, where necessary.

Assessment Methodology

5.62 In order to characterise the existing baseline noise environment so as to inform our assessment, results from the two unattended surveys at the nearest NSRs will be analysed. Measured data takes into account of weather conditions during the survey, in order to obtain representative baseline ambient and background noise levels, commensurate with the requirements of British Standard (BS) 4142:2014[8] '*Methods for rating and assessing industrial and commercial sound'*.

5.63 The noise assessment will present an assessment of noise effects from the proposed development in accordance with BS 4142:2014 and relevant national and local planning policy. In accordance with the assessment procedure set out in the Standard, noise from a worst case 1 hr period during the day (07:00 – 23:00 hrs) and 15-minute period during the night (23:00 – 07:00 hrs) will be predicted at the NSRs. This assessment will consider the expected duration, frequency and onset of the noise impact.

5.64 If considered appropriate to assess specific internal and external noise levels, noise level criteria specified in BS 8233:2014[9] and 6472:2008[10], Pro PG Guidance[11], `World Health Organisation (WHO) Guidelines[12] may be used. Vibration will be assessed against the levels given in or those advised by the local authorities.

5.65 Any change in road traffic noise levels, at a selection of relevant receptors, will be assessed using the standard methodology outlined in the Calculation of Road Traffic Noise (CRTN)[13]. The assessments will utilise baseline data with development traffic data provided by PBA in the format of 18-hour annual average weekday flows (AAWT), % HGV and average speed. Road traffic noise levels will be assessed based on a range of relevant guidance including the 'Design Manual for Roads and Bridges: 2011'[14].

5.66 Construction noise at key receptors will be predicted in line with British Standard (BS) 5228: Noise and Vibration Control on Construction and Open Sites, which provides industry accepted guidance on calculating noise and vibration arising from selected construction activities and the use of different plant.

Landscape and Visual Assessment

Context

5.67 The proposed scheme would introduce buildings in an area of landscape where there are currently greenfield and lower level warehouse buildings to the north east of the site. Introducing buildings to this area would contrast with the existing landscape. Whilst residential areas within the vicinity of the proposed development are confined to the northwest of the site, these receptors, as well as users of the local roads and footpath/bridleway network will experience changes to their existing views. It is therefore proposed that a landscape and visual impact assessment (LVIA) is included in the ES.

5.68 An initial Zone of Theoretical Visibility (ZTV) study has been undertaken on a bareground and obstructions basis utilising publicly available Lidar data. The ZTVs have been tested on site and confirm that the site is relatively well contained visually. To test the sensitivities surrounding the site, a further ZTV will be conducted out to 5km, this will capture the sensitive receptors namely the Lea Valley, Cheshunt Park and Cedars Park. This is deemed as more than sufficient within

which to identify any potentially significant effects, with the principal focus being on effects upon landscape and visual receptors.

Baseline Conditions

5.69 The site is largely flat, with a gentle fall from the north-west at approximately 32m AOD to 27m AOD at the south-east corner. The land cover comprises a large open arable field, traversed by a surfaced path to the south of the site.

5.70 Within the local context of the site, views are largely restricted to the existing local urban context of Cheshunt, that of the residential areas and school buildings that form the suburbs of Bury Green, Churchgate and Waltham Cross to the west, north and east. Views from the south are largely contained and/or filtered by the woodland and mature tree belts associated with Broom Hills, Cheshunt Country Club, Cedars Park and highway roadside vegetation. The existing and proposed extension to Park Plaza employment area and proposed Park Plaza West, set out in the emerging Local Plan, would create further visual enclosure to the south of the site, once developed.

5.71 There are no statutory or local landscape designations that cover the site. The local designation of Albury Landscape Protection Zone, to the east of the A10 and beyond the site, is an area of farmland that is protected from development in order to create a green wedge. Two further areas are designated for their open space, leisure, sport and recreation provision and lie further to east and south-east. The Cheshunt Club provides sporting facilities, whilst Cedars Park provides public open space, recreation facilities, walks, gardens and an arboretum. A Tree Preservation Order covers part of the adjoining land of Rush Meadows to the south of the site. Future development within the site is not expected to directly affect these local designations, but there may be some indirect landscape and visual effects, depending on the location and scale of the proposed development

5.72 The landscape character of the site and surrounding landscape is defined within the Broxbourne Landscape Character Assessment, October 2008. The site falls within Landscape Character Type (LCT) E: River Valley Floodplain – Farmland, and Landscape Character Area (LCA) E1: Bury Green. The landscape character sensitivity is assessed as low, with landscape condition being moderate to poor, with evidence of decline of the mature and intact hedgerows. Visual sensitivity is considered to be moderate, due to open views across the landscape, but with low intervisibility with adjoining LCTs. Consequently, the LCT is assessed as having some capacity to accommodate change.

5.73 The following National and Local Plan policies and policy documents (amongst others) would be considered as part of the assessment.

- National Planning Policy Framework (NPPF);
- National Planning Practice Guidance (NPPG); and
- Broxbourne's Draft Local Plan (November 2017).

Key Issues and Requirement for Assessment

5.74 The proposed scheme would have direct and indirect effects on both landscape character (including its features and elements) and upon visual receptors and visual amenity during both its construction and operational phases.

5.75 These effects would include the following:

- **Direct landscape effects** – the proposed development would change the existing land cover and land use throughout its construction and operational phases on the proposal site itself.
- **Indirect landscape effects** – the proposed development, through its change in land cover and land use, would have the capacity to change the perception and appreciation of the landscape within character areas from which the proposed development is visible and/or audible. This may lead to indirect effects upon other, outlying areas of landscape not directly impacted by the proposed development; and
- **Views available to visual receptors and general visual amenity** – when compared to the existing baseline, the new built form of the proposed development will give rise to changes in local views, especially local or near distance views throughout both its construction and operational phase. Impacts upon visual receptor groups will principally include those upon local road users; users of the various public footpaths, bridleways, cycle routes and access tracks; local residents and workers; and pupils and staff at the local schools.

Assessment Methodology

5.76 The methodology for the assessment would be based on the guidance within the 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA) – published by the Landscape Institute and the Institute of Environmental Management and Assessment (3rd Edition 2013). It will include a description of the existing landscape, the characteristic views and identify all relevant visual receptor groups (baseline conditions) along with a description of the proposed development.

5.77 The design of appropriate mitigation measures to better integrate the proposed development within its landscape setting and the local visual environment so as to reduce any potentially adverse landscape and visual effects will be an integral element of the EIA process. Mitigation proposals will be developed throughout the assessment process and be embedded within the proposals.

Biodiversity

Baseline Conditions

5.78 The site under consideration for screening has been the subject of an initial Ecological Appraisal, completed in May 2018 (Appendix 1). This found that there were no ecological resources likely to be significantly harmed were the development to proceed.

5.79 For the purposes of reporting, key designations for nature conservation have been identified within a 2km study area of the site.

5.80 Four statutory designations are located within the 2km study area and are set out in Table 6.

Table 6: International and national statutory designations within 2km

Name	Reason for Designation	Distance from site (km/m)
Lee Valley SPA	Used over winter by: bittern Botaurus stellaris, 6 individuals representing at least 6.0% of the wintering population in Great Britain. Also supports populations of European importance of the following migratory species in the winter: gadwall Anas strepera, 515 individuals representing at least 1.7% of the wintering Northwestern Europe population. Shoveler Anas clypeata, 748 individuals representing at least 1.9% of the wintering Northwestern/Central Europe population.	1.6km NE
Lee Valley RAMSAR	The Lee Valley comprises a series of embanked water supply reservoirs, sewage treatment lagoons and former gravel pits along c. 24 km of the valley. These waterbodies support internationally and nationally important numbers of birds. The site also contains a range of wetland and valley bottom habitats, both man-made and semi-natural, which support a diverse range of wetland fauna and flora.	1.6km NE
Turnford & Cheshunt Pits SSSI	Important to breeding, migrating and wintering birds, aquatic flora and invertebrate fauna.	1.6km NE

5.81 There are ten non-statutory sites within the 2km of the application:

- New River Site of Importance for Nature Conservation (SINC) - *runs adjacent to the site;*
- Broom Hills Local Wildlife Site (LWS) - *0.42km;*
- Temple Bar Meadow (LWS) - *0.61km;*
- Burygreen Plantation (LWS) - *0.65km;*
- Booney Grove Wood by B198 (LWS) - *1.14km;*
- Meadow N. of Barrow Lane (LWS) - *1.37km;*

- Albury Fields (LWS) - *1.61km;*
- Old Rush Field, Broadfield Farm (LWS) - *1.62km;*
- Thistly Marsh and Area W. of Cheshunt Marsh (LWS) - *1.63km;*
- Meadow S. of Rosedale Sports Ground North (LWS) - *1.88km.*

5.82 Strips of poor semi-improved grassland are present along the boundaries of the site. A 5m strip of poor semi-improved grassland along the New River was also noted. This rises to an embankment 2m high towards the south. Tall ruderals are presents on the slope of the embankment. Plant species comprise barren brome, Yorkshire fog (Holcus lanatus), stinging nettle (Urtica diocia), red dead-nettle (Lamium purpureum), bristly oxtongue (Picris echioides), spear thistle (Cirsium vulgare), creeping thistle (Cirsium arvense) and broad-leaved dock. While there is a somewhat greater diversity of species, its limited extent and position adjacent to intensively farmed land limits its biodiversity value. Therefore, his habitat has been assessed as having site level biodiversity value.

5.83 Small patches of scattered scrub and trees were recorded in both fields, located predominately on the site boundaries. Species include ash *(Fraxinus excelsior)*, hawthorn *(Crataegus monogyna)*, *(Quercus rubra)*, elder *(Sambucus nigra),* bramble *(Rubus fruticosus* agg.*)* and oak *(Quercus rubra)*. While this is a semi-natural habitat, it is limited in extent and is relatively isolated, reducing its biodiversity value. Therefore, this habitat has been assessed as having site level biodiversity value.

5.84 There is one waterbody on-site, a pond on the eastern boundary in a 4m deep man-made depression surrounded by a mix of scattered scrub and willow Salix sp. on the surrounding banks. This habitat has been assessed as having site level biodiversity value.

5.85 The site also falls adjacent to the New River, the entire section adjacent to the site is canalised, with a strip of poor semi-improved grassland habitat adjacent to it. A stream - Theobald's Brook- also borders the site to the south running through the thin strip of broadleaved woodland. These habitats have been assessed as having Local biodiversity value. While the New River is poor quality riparian habitat, the interface of the four habitat types increase this portion of the site's capacity to support a diversity of species.

5.86 No Schedule 9 WCA invasive species were found during the Ecological Appraisal.

5.87 All nesting birds are protected under the Wildlife and Countryside Act 1981, while birds on Schedule 1 of the WCA are additionally protected from disturbance. Records indicate that the site has been previously used by golden plover (Pluvialis apricaria), an Annex 1 species of the Bird Directive, these records date between 2011-2012. One greylag geese Anser and a small number of Canada geese Branta canadensis were seen foraging on-site during the Ecological Appraisal. Neither of these are Annex 1 species; however, the greylag goose is an Amber listed Bird of Conservation Concern. The Canada goose is an introduced species.

5.88 The site is unlikely to support populations of bats. The boundary vegetation and the watercourses are also likely to remain unaffected by the development. A landscape and habitat restoration scheme can improve habitat connectivity and foraging habitat for bats. Artificial lighting may however spill into these habitats, causing an adverse effect on bat commuting and

foraging behaviour. As the use of the site by bats is negligible this is unlikely to occur and thus does not require mitigation.

Key Issues and Requirement for Assessment

5.89 A Landscape and Ecological Management Plan (LEMP) will accompany the ES, the Biodiversity Chapter within the ES will highlight the key areas of this plan. This will ensure that the development maximises its biodiversity value. Such a plan would identify species and habitats of importance in the site and regional context. Much of the site will be retained undeveloped and areas of habitat can be restored and created. This could form a condition to any approved planning application.

5.90 The site has potential to enhance the opportunities for feeding and resting for bird species related to the Lee Valley SPA/Ramsar site. While no direct impacts are expected from development, retained areas could be enhanced.

5.91 Historic use by over-wintering birds was found during the desk study, and some use by migrating waterfowl was found in May 2018. Such enhancements can be incorporated into the LEMP and provide a positive benefit to the designated site.

5.92 The proposed ponds on site can be enhanced by planting it up with suitable aquatic and marginal native species, as can the proposed balancing ponds. This can form part of the LEMP. In addition, the measures listed below can form part of a CEMP to avoid indirect effects on the New River, and Theobald's Brook.

Assessment Methodology

5.93 The Ecological Impact Assessment will be undertaken following the methodology set out in Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland. This will address likely impacts, both positive and negative, on designated sites, habitats and species.

5.94 Ecological receptors will be evaluated in terms of their importance at different geographical scales, as well as the protection afforded to them by national and local legislation, policy and biodiversity strategies. The assessment will consider direct and indirect impacts as a result of construction and operation phases, and, assess the effects in combination with the identified cumulative developments in the surrounding area.

5.95 The assessment will include details of mitigation, compensation and enhancement measures and will consider the residual impacts of the development proposals.

5.96 In general, the proposed development would result in the loss of only low ecological value habitat - areas of land that are currently farmed. It would result in little direct loss of habitats of any greater value than the agricultural land.

5.97 Importantly, the nature of the proposed development means that a notable increase in habitat can potentially increase biodiversity substantially, in line with the NPPF. It would be expected that reserved matters would include details of a landscape scheme, and the requirement for both a CEMP and LEMP. These will include measures outlined within the ecological appraisal, leading to habitats and species present being protected from harm during construction and ecological benefits would ensue.

6 SCOPED OUT TOPICS

Archaeology

Baseline Conditions

6.1 An Archaeological desk-based assessment (Appendix 2) has been undertaken for the Land at Maxwells Farm West, Broxbourne, in Hertfordshire.

6.2 In terms of relevant designated heritage assets, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

6.3 In terms of relevant local designations, a small part of the north-eastern corner of the study site lies within an Area of Archaeological Interest (AAI), as defined by BBC, for the recorded remains of a Second World War gun emplacement.

6.4 Based on the available evidence, the study site is considered to have a low potential for archaeological evidence dating from the Mesolithic, Neolithic, Iron Age, Roman, Medieval and post-Medieval periods, and a low to moderate theoretical potential for evidence of Palaeolithic and Bronze Age activity.

6.5 Past post-depositional impacts, in the form of agricultural activities, can be considered to have had a widespread, moderate impact on any below ground archaeological remains.

6.6 In view of the identified archaeological potential and past post-depositional impacts, the development can be considered unlikely to have a widespread, negative impact on any identified below ground archaeological evidence.

6.7 The BBC Local Plan 2005 (Policy HD2) requires the results of Archaeological Evaluation to be submitted with any planning application on sites of known archaeological interest, or sites likely to possess, or be adjacent to archaeological interest.

6.8 However, due to the nature of the adjacent AAI (WWII Gun Emplacement) and the low perceived archaeological potential and significance of likely archaeological remains at the site, it is considered that in this instance archaeological evaluation may not be required as the site is deemed as low archaeological value. An ES chapter is therefore not required.

Water Environment (Flood Risk, Drainage and Water Quality)

Context

6.9 For the purposes of this scoping report, flood risk and drainage are considered in the context of the following:

- Flood risk: fluvial, surface water, groundwater and sewers flooding.
- Drainage: surface and foul water; and
- Water quality: ecological and chemical status.

Baseline Conditions

6.10 The site is bounded to the west by New River (canal) which is identified as an artificial watercourse, which historically provided fresh drinking water to London. A further watercourse, Theobolds Brook, is located adjacent to the southernmost boundary of the site. Theobolds Brook generally flows in an easterly direction before appearing to discharge into Trinity Marsh Ditch. which eventually discharges into the River Lea.

6.11 Reference to the EA 'Flood Map for Planning Rivers and Sea' indicates the majority of the site lies within a Flood Zone 1; whereby the risk of fluvial and tidal flooding is considered to be low (annual probability of less than 1 in 1,000) all uses of land are appropriate in this zone. For sites of 1 hectare or more, developers are required to undertake a site-specific Flood Risk Assessment

6.12 Consideration must be given to the proposed use of the site. In accordance with the NPPF, the Proposed Development would be considered 'Less Vulnerable' and would therefore be appropriate within Flood Zone 1.

6.13 It is proposed to undertake a Flood Risk Assessment (FRA) that will support the planning application for the Proposed Development. The FRA will be undertaken in accordance with the NPPF (2012) and accompanying PPG (2016).

6.14 The Environment Agency's Surface Water Flood Map indicates that a surface water flow path flows across the central and north western area of the site. A further potential overland flow path is located within the southern portion of the site. It is likely that management of these identified surface water flow paths will be required as part of the proposed development.

6.15 Reference to the Borough of Broxbourne Level 1 Strategic Flood Risk Assessment, published in May 2016, identifies that the surface water flow paths occur during the 1 in 1,000 year surface water event. During the 1 in 100 year event, limited areas of the site, located adjacent to the eastern boundary and in the south eastern corner, are shown to be impacted by surface water flooding. Consultation is currently on-going with HCC, who act as the Lead Local Flood Authority (LLFA), to determine the most appropriate approach for the management of the identified overland flow paths.

Key Issues and Requirements for Assessment

6.16 In addition to the above, the Flood Risk Assessment will also consider the risk of flooding from all other sources including sewers, groundwater and flooding from artificial sources.

6.17 At present the site is occupied by greenfield land, therefore surface water run-off is likely to increase as a result of the proposed development. Defra's Non-Statutory Technical Standards require major developments to achieve a greenfield run-off rate. A Conceptual Surface Water Drainage Strategy will be included as part of the Flood Risk Assessment. This will identify the required surface water run-off rate, attenuation volumes to achieve this rate, proposed storage techniques and the proposed outfall location. The Conceptual Surface Water Drainage Strategy will also include the consideration of Sustainable Drainage Systems (SuDS) that can be incorporated into the proposed development, with consideration given to the drainage hierarchy. The strategy will also consider the treatment of surface water run-off to ensure that

there is no detrimental impact on the receiving watercourse. In addition, maintenance of the proposed SuDS techniques will also be considered.

Assessment Methodology

6.18 Based on the above, it is considered that no dedicated ES Chapter will be required on Water Environment, although a standalone FRA will be submitted as part of the Planning Application.

6.19 The scope and content of the FRA will be reviewed by the relevant local authority technical officers and the EA. The assessment will be undertaken in accordance with the guidance listed in section 3.1 of this scoping report and the following additional documents:

- Environment Agency FRA Guidance Note;
- Department of Communities and Local Government 'Flood risk and Coastal Change – Site Specific Flood Risk Assessment' (2012); and
- Environment Agency 'Flood Risk Assessments: Climate Change Allowances' (2017) [28]; and

6.20 The FRA will contain the following:

- A review of EA flood maps to identify sources of flooding that may affect the site and how the risk of flooding to the site can be mitigated;
- A surface water drainage strategy that will aim to limit surface water discharge from the site to the rates agreed with the EA and local authorities;
- A consideration of the overall volume of surface water discharge from the site; and
- A suitable allowance for an increase in the intensity of rainfall predicted as a result of climate change.

Ground Conditions and Contamination

Baseline

6.21 A site visit was conducted in June 2018 and subsequently the Phase 1 Preliminary Risk Assessment produced in July 2018 (Appendix 3). It was noted during this visit that the site comprised undeveloped, former agricultural land that had gone to seed. No buildings or structures were observed on the site at the time of the walkover.

6.22 Maxwells West industrial estate/business park to the northeast was observed during the site walkover to comprise 11 units. These were indicated to be occupied by Pensworth Dairy (Units 1 to 3, in use as a depot), Salvo 1968 Ltd (Units 4 to 6, in use as a depot), Loaded Imports (Unit 7), DAC Wholesale (flooring and artificial grass wholesaler in Unit 8), T.W. Parker Ltd (a timber merchant and moulding manufacturer in Unit 9), The Revival Company (fire and flood restoration company in Unit 10) and Summit Furniture (Unit 11).

6.23 Only limited access to the industrial estate/business park could be gained during the site walkover and no significant above or below ground storage of hazardous substance was observed within those areas that could be observed.

6.24 According to EA data, the site is not indicated to be located within a groundwater Source Protection Zone (SPZ). There are also no records of any active licensed groundwater abstractions within 1km of the site.

6.25 No significant effects are anticipated as a result of the fields being used as former agricultural land.

6.26 Whilst a stand-alone chapter on ground conditions is not proposed within the main ES volume, it is anticipated that a geotechnical investigation would be included as a planning condition. The assessment will be undertaken due to the limited information available for the site itself. The investigation will provide information on ground conditions and data for the assessment of geotechnical properties of strata underlying the site prior to redevelopment, with the aim of ensuring that suitable and safe conditions are achieved for the proposed end-use. Should any contamination be found, it is accepted that remediation measures will need to be completed before construction work can begin on site.

6.27 Consideration will be given to the site's conceptual model including geology, hydrology, hydrogeology and the geo-environmental conditions (including issues associated with soil gases, chemicals within site soils and groundwater). A range of impacts associated with the design, construction and operation of the proposed development will be considered.

6.28 Mitigation measures relating to the use of appropriate PPE will be listed within Chapter 5: Demolition Programme and Construction Environmental Management of the main ES volume.

Built Heritage

6.29 A 1km search area was established to identify all designated built heritage receptors that had the potential to be affected by the proposed development. Within this search area there are 28 listed buildings, of which all are Grade II listed. The closest of these are at Albury Farm, approximately 140m from the site; a Grade II listed section of wall on the north side of Albury Farmhouse garden. There are no conservation areas within the vicinity of the site.

6.30 BBC has adopted a local list, which was last revised in December 2011. A smaller search radius of 500m was used, due to the hierarchy of locally listed buildings, with one locally listed building identified within the search radius.

6.31 It has been found that the site and the proposed development do not form part of the setting of any of the designated heritage receptors and any of the majority of the non-designated heritage receptors.

6.32 Therefore, it has been found that the proposed development will have no effect on the value of any heritage receptors. There will be no effect to the setting or value of any designated built heritage receptors.

6.33 It is, therefore, concluded that the proposed development will result in no effect to the surrounding built heritage receptors and there is no potential for any significant effects to built heritage. As such built heritage can be scoped out of the EIA process.

Waste Management

6.34 The proposed development would produce waste from the site preparation/construction phase as well as during the life of the site in its operational phase.

6.35 The site has limited vegetation and therefore, no significant amounts of organic waste are anticipated to arise from this stage of development.

6.36 Construction waste will arise from the construction of the proposed development, associated infrastructure and highways improvements which would predominantly comprise inert wastes. However, non-inert waste, such as timber, plastic, plasterboard, insulation, packaging, etc would also arise from the fit-out stage.

6.37 Waste produced during the life of the site would be varied in nature and would be generated on an on-going basis from residential and commercial uses.

6.38 Effects upon waste infrastructure capacity during the site preparation and construction phase are dependent upon the volumes of waste produced and the available existing and future capacity for its management. Significant effects would arise if there was insufficient management capacity for the predicted levels of waste arisings.

6.39 Good waste management practices will be set out within Chapter 5: Demolition Programme and Construction Environmental Management of the ES. The DAS will set out measures for operational recycling and waste management which will be refined at the reserved matters stage. The Sustainability Statement submitted with the planning application will also set out principles around good construction and operational waste management practices.

6.40 Therefore, it is considered that the proposed development will not give rise to potential significant effects as a result of waste and this can be suitably addressed in the documents set out above.

Daylight, Sunlight and Overshadowing

6.41 Daylight, sunlight and overshadowing assessments are typically undertaken with reference to BRE standards. Daylight, sunlight and overshadowing effects are principally associated with tall buildings or developments in highly urbanised/developed environments.

6.42 The building heights proposed across the site, are not considered to have the potential to significantly affect sunlight or daylight levels either at new receptors brought to the site under the proposals or at those existing in the vicinity of the site, either alone or in combination with other permitted or reasonably foreseeable developments. It is therefore proposed that sunlight, daylight and overshadowing be scoped out of further consideration in the EIA.

Wind

6.43 Assessments of wind microclimate focus on pedestrian comfort and safety and are typically undertaken with reference to the Lawson Comfort Criteria. Significant effects on wind microclimate are principally associated with tall buildings or developments in highly urbanised/developed environments.

6.44 Proposed building heights across the site are not expected to be significant. The building heights proposed are not considered to have the potential to significantly alter the wind microclimate within the site or at sensitive receptors outside the site boundary, either alone or in combination with other permitted or reasonably foreseeable developments. It is therefore proposed that wind microclimate be scoped out from further consideration within the EIA.

Climate Change

6.45 It is proposed that climate change is not assessed as a separate technical chapter of the ES. Where climate change is relevant to a technical assessment (e.g. flood risk, ecology and air quality) this will be stated and taken into account within the respective ES chapter/report.

6.46 A summary of key climate change projections within the UK and modelled climate variables specific to the application site are as follows:

- Summers will become hotter and drier;
- Winters will become milder and wetter;
- Soils will become drier on average;
- Snowfall and the number of very cold days will decrease;
- Sea levels will rise; and
- Storms, heavy and extreme rainfall, and extreme winds will become more frequent.

6.47 Where relevant, the following will be considered in each of the technical chapters/reports within the context of the outlined climate change projections:

- The vulnerability of the baseline environment to projected changes;
- The vulnerability and resilience of the proposed development to climate change; and
- The effect of the proposed development within the context of climate change.

6.48 If climate change does not affect the assessment of the technical discipline, this will be stated.

6.49 An assessment of greenhouse gas (GHG) emissions are also proposed to be scoped out from assessment within the ES on the basis that, through the implementation of proposed sustainable design features, which will be outlined in the Sustainability Statement and Energy Strategy accompanying the planning application, the scheme will not result in any significant environmental effects in relation to GHGs.

6.50 It is also proposed that such considerations as emissions associated with the size of the supply chain and use profile of construction materials, unregulated emissions during the operational phase and emissions associated with the construction of the development are addressed during the reserved matters stage, at which point a suitable level of design development will have progressed such that these aspects can be suitably captured and addressed.

6.51 A BREEAM (Building Research Establishment's Environmental Assessment Method) communities' pre-assessment has been completed to inform design development of the proposed development. In association with the sustainability standards reported in the

Sustainability Statement, key measures such as responsible sourcing or materials, embodied energy and lifecycle assessment will all be considered, as appropriate, to ensure that GHG for these aspects are suitably addressed.

6.52 The Energy Strategy will consider regulated emissions during the operational phase. However, as appropriate during the reserved matters stage unregulated emissions may also be considered.

6.53 Given the proposed incorporation of sustainable design standards and principles within the Sustainability Statement and the provision of an Energy Strategy, it is considered that the proposed development is unlikely to result in significant impacts related to GHG emissions.

Human Health

6.54 It is proposed that a separate technical chapter covering Human Health is scoped out of the ES on the basis that a number of other technical chapters already address the potential implications on human health from the proposed development (e.g. socio-economics, transport and access, air quality and noise) based on human health tolerances or through the consideration of policy requirements and targets promoting healthier behaviours (e.g. active travel such as cycling and walking).

6.55 Where relevant, it will be stated within each ES chapter/report how the respective technical assessment takes these factors into consideration. Relevant literature or studies, which draw upon the human health outcomes anticipated as a result of the use of these targets, will be referenced. These assessments will consider these effects against the significance criteria set for each topic of assessment.

6.56 The indirect human health effects are already considered comprehensively in the EIA as a whole where their assessment has been identified as being proportionate and/or potentially requiring mitigation. For example, with regard to air quality and noise, the limit values are informed by guidelines set by the World Health Organisation (WHO) and therefore, the WHO Air quality and Noise guidelines would be referenced with regard to the potential impacts on human health.

6.57 The inclusion of the requirement to consider human health effects in the EIA Regulations is met by the robust assessment of the following topics: socio-economics, transport and access, air quality and noise rather than having a separate human health assessment.

Agriculture and Soils

6.58 The majority of the site was previously used as arable land. This was contracted out externally and farmed alongside larger fields to the south of Lieutenant Ellis Way (approximately 24ha). This contract has now expired and has been deemed insufficient for farming. With the cost to secure the necessary machinery to grow crops on site, the 19ha site alone is not economically viable for a self-sustaining business. Additionally, the southern area of the site, south of the Public Right of Way (PRoW), has been vacant for many years and is bi-annually managed to remove weeds – it has been determined that there is limited ecological value on this area of land.

6.59 The combined loss of the 19ha of agricultural land could be deemed as minor significance at a local scale. However, as the land is currently unused and is not economically viable as a

singular asset, the loss of this land from agricultural purpose is not deemed to be significant. Furthermore, the proposed development will create better use of the current land by providing additional employment opportunities within the locality and surrounding area.

6.60 It is noted that this change in land use has already been accepted by BBC by virtue of its allocation for development within its draft Local Plan.

6.61 Accordingly, it is not considered necessary to include a chapter on agriculture and soils in the ES.

Risk of Major Accidents and/or Disasters

6.62 In the absence of recognised guidance on this subject in the context of EIA, a range of sources providing guidance related to the topic has been reviewed, including:

- Cabinet Office National Risk Register (NRR) of Civil Emergencies 2017 Edition[15];
- UK Government Emergency Response & Recovery Guidance[16]; and
- International Federation of Red Cross & Red Crescent Societies Disaster and Crisis Management Guidance[17].

6.63 A disaster can be defined as "*a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins".*[18] An accident can be defined as *"an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury*".[19]

6.64 In terms of natural disasters, for example, it is considered that the likelihood of an earthquake with a magnitude sufficient to cause damage to buildings and/or loss of life occurring and impacting the site is extremely low. The topography of the site is also not considered to be sufficiently steep such that a major mass movement disaster could arise.

6.65 The potential major accidents and/or disasters that are considered relevant to this site and proposed development will be addressed in the design of the proposed development and covered within other technical ES chapters if necessary as outlined below:

- Road safety – Traffic and Transport. In addition, junction designs will be subject to a Stage 1 Safety Audit;
- Flooding – Flood Risk Assessment and Drainage Strategy. In addition, the climate change allowances will be considered within the drainage design; and
- Utility system failure – Appropriate design of the scheme. Fuel storage on site will comply with the Environment Agency Guidance on 'Oil storage regulations for businesses', as well as The Petroleum (Consolidation) Regulations 2014.This will ensure safe and responsible storage.

6.66 Accordingly, it is not considered necessary to include a separate chapter on major accidents or disasters in the ES.

7 SUMMARY & CONCLUSIONS

Request for a Scoping Opinion

7.1 This report is a request for a scoping opinion under Regulation 15(1) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

7.2 In accordance Regulation 15(3), should the local authorities consider that they have not been provided with sufficient information to adopt a scoping opinion, they should notify the person making the request of the points on which they require additional information.

List of Consultees

7.3 Copies of this scoping report are to be circulated to the following:

- Local Authority (BBC) Technical Officers including:
  - Planning Officer;
  - Environmental Health Officer;
  - Tree Officer;
  - Recreation and Business Manager;
  - Landscape/Conservation Advisor.
- Local Lead Flood Authority (LLFA);
- Natural England;
- Environment Agency;
- Historic England; and
- Any other officers as required.

Period for Adopting Scoping Opinion

7.4 As per Regulation 15(4), the local authorities shall now consult with the applicant and the consultation bodies and adopt their scoping opinion within 5 weeks of receiving this request.

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APPENDIX 1: INITIAL ECOLOGICAL ASSESSMENT

Ecological Assessment

Maxwell's Farm,

Maxwell's Farm West, Broxbourne

STX-A10 Ltd

JFA Ref: HER 2116

May 2018

JFA Environmental Planning
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JFA Environmental Planning

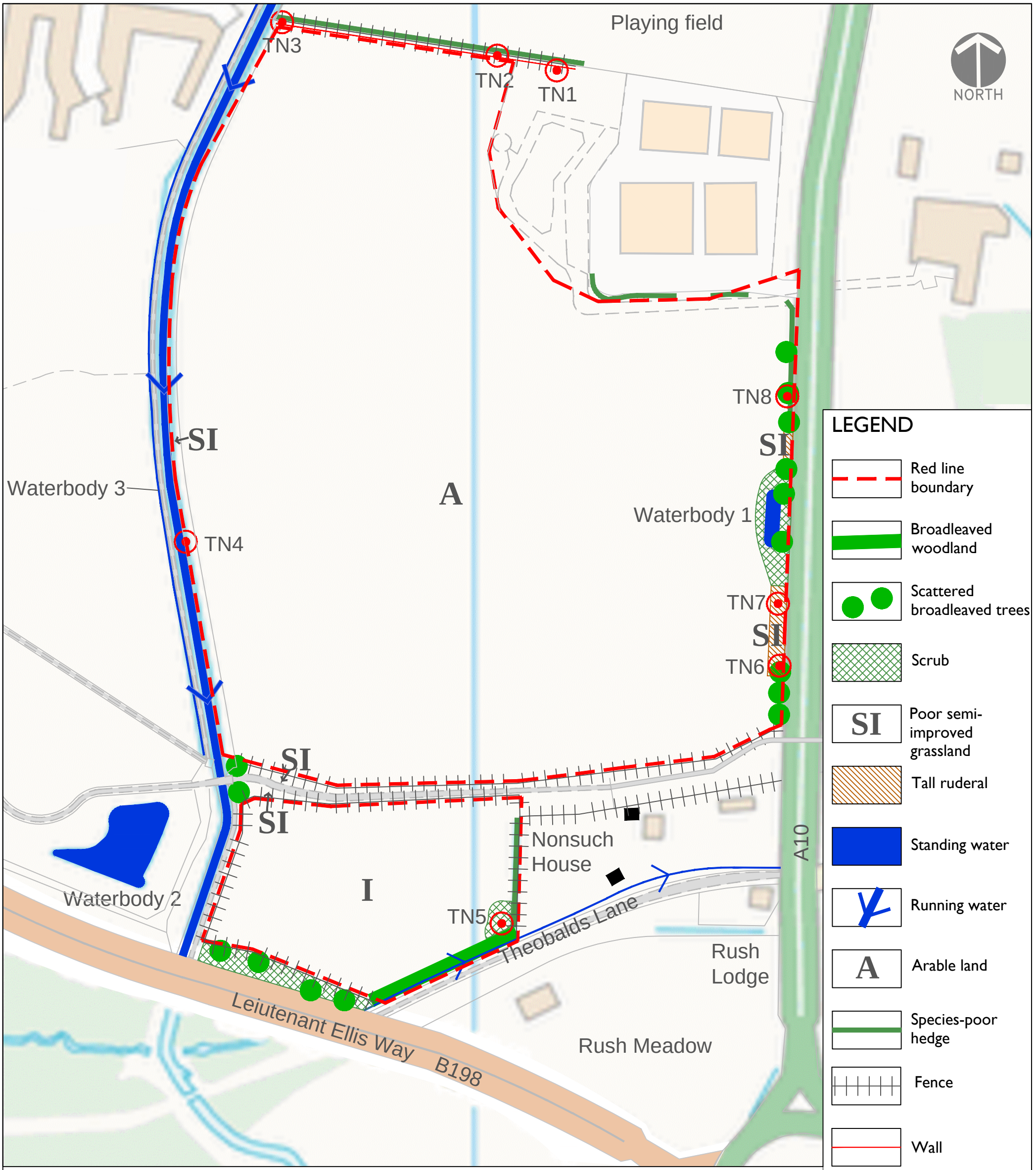
BRINGING NATURE TO THE HEART OF DESIGN

Contents

Figures

Appendices

Client	Woodhall Properties Ltd
Date	9th May 2018
Status	Draft for Client Review
Author	Calum Wallace BSc (Hons), Ecologist
Checked	Cassie Todd BSc (Hons), MCIEEM, Principal Ecologist



Target Notes:

TN1 - 0.5m high brick wall, that has numerous small crevices offering some reptile potential
TN2 - Mammal pushunder under fence
TN3 - Mammal pushunder under fence
TN4 - An embankment rises up from the arable field to meet the river. This is non-existent at the northern end of the field but gradually increases towards the south with approximately a 2m difference in levels.
TN5 - Rubble pile, potential reptile refuge
TN6 - Old birds nest in tree
TN7 - Embankment adjacent to A10 layby, rat burrows present
TN8 - Old bird's nest in hedgerow

JFA Environmental Planning
BRINGING NATURE TO THE HEART OF DESIGN
Evegate Park Barn, Evegate Business Park, Smeeth, Ashford, Kent, TN25 6SX
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Drawing title
PHASE 1 HABITAT PLAN

Project name
Maxwells Farm, Cheshunt

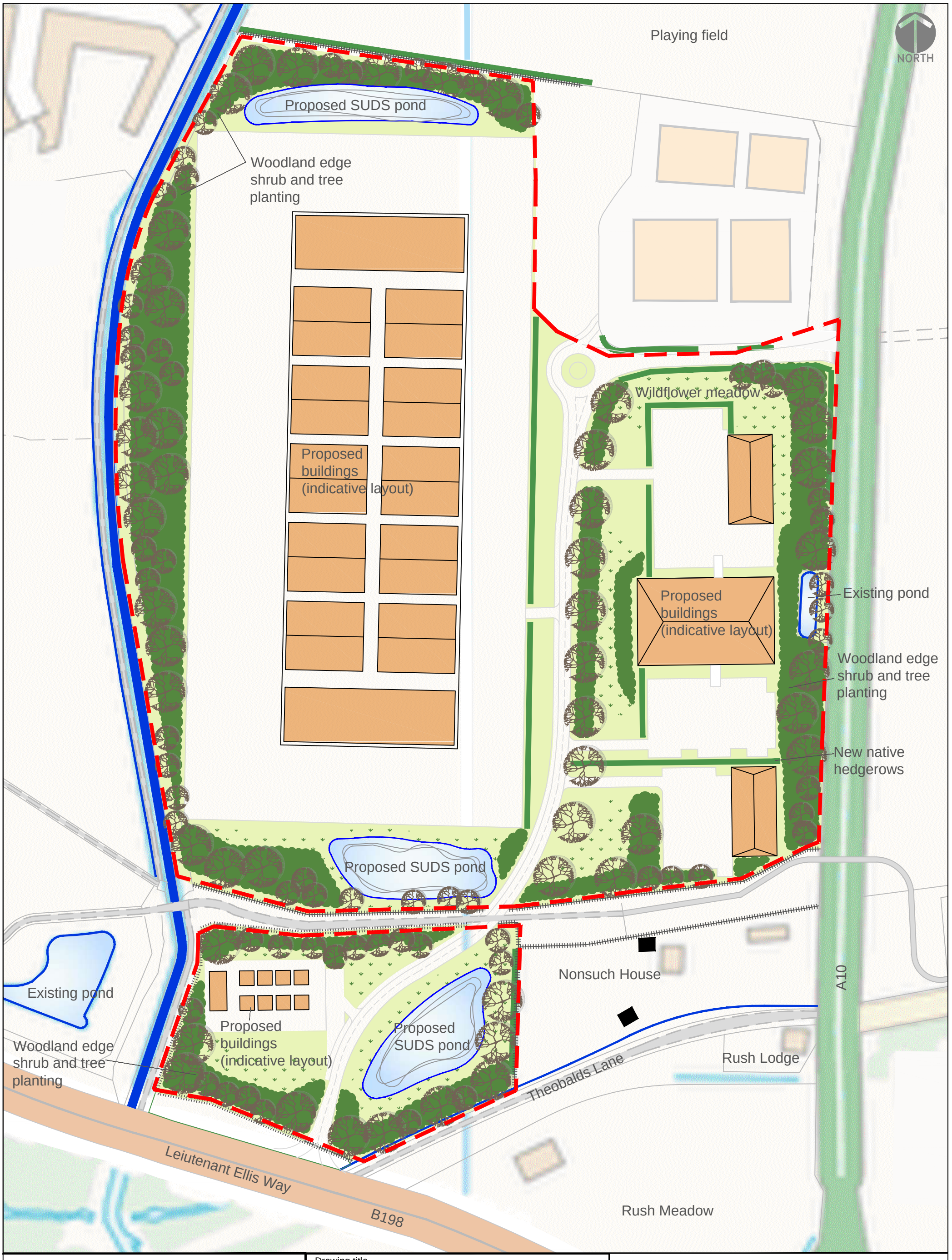
Client
Clive Thompson

-

Rev	Date	Description	Drwn /Chkd by

Job number	Drawing number	Rev
HER 2116	**Figure 01**	-

Scale	Drawn by	Checked by	Date
NTS@A3	NB	EB	Apr 2018



JFA Environmental Planning

BRINGING NATURE TO THE HEART OF DESIGN

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Drawing title
HABITAT CREATION PROPOSALS

Project name
Maxwells Farm, Cheshunt

Client
Clive Thompson

-

Rev	Date	Description	Drwn / Chkd by

Job number	Drawing number	Rev
HER 2116	**Figure 02**	-

Scale	Drawn by	Checked by	Date
Approx 1:2000 @A3	NB	JC	May 2018

1.0 Executive Summary

1.1 Woodhall Properties Ltd commissioned JFA Environmental Planning to undertake an Ecological Assessment in support of a planning application for a Data Centre. Accordingly, a desk study was completed and the site was surveyed during May 2018.

1.2 The site was found to support habitats that are common and widespread and of relatively low ecological value with limited potential to support protected species. The dominant habitats comprise arable land and improved grassland. A small area of broadleaved woodland, a species-poor hedge, scattered trees, semi-improved grassland and a pond were recorded on the site boundaries.

1.3 A great crested newt survey conducted in April 2018 confirms that this species is absent from the site and any potential habitat (ponds) within 250m. No other protected / notable species which could be material to the planning application were found, with no suitable habitat and no evidence of their presence being recorded during the site visit.

1.4 Impacts on designated sites, habitats and protected / notable species are not expected provided the recommended mitigation and enhancement measures can be incorporated as part of a Landscape and Environmental Management Plan.

1.5 The development proposed can provide notable enhancement measures, specifically for the broadleaved woodland, hedge, scattered trees, the New River, Theobald's Brook, a pond, and for species which may use the site boundaries i.e. reptiles, birds, bats, hedgehog and small mammals.

2.0 Introduction

Background

2.1 JFA Environmental Planning (herein referred to as JFA) were commissioned by Woodhall Properties Ltd to undertake an Ecological Assessment (EA) of Maxwell's Farm, Broxbourne, herein referred to as 'the site'. This report will support an outline planning application for development of a Data Centre. The EA comprises an Ecological Appraisal and a great crested newt presence / likely absence survey. The report os structure to include all the relevant information in the main body, with ancillary and supporting material such as planning policy and site data in Appendices.

Site Location & Description

2.2 The site is located at Maxwell's Farm West, Great Cambridge Rd, Cheshunt, Waltham Cross EN8 8XH. The central Ordnance Survey Grid Reference for the site is TL 350 014 and it measures c. 15.6 ha. The site is situated in a semi-rural location and surrounded by agricultural land to the north, dual carriageways to the south and east, and the New River (a canalised watercourse), and school sports pitches to the west. The wider area comprises urban settlement, agricultural land and pockets of broadleaved woodland.

Objectives

2.3 The objectives of this EA are to:

- Complete a desk study to gather information on designated sites, habitats, protected and notable species within the study area.
- Map the habitats on-site and identify any that are protected or notable.
- Identify dominant plant species for each habitat and any invasive plant species on-site.
- Assess the potential of each habitat to support protected or notable species.
- Survey for protected species that maybe affected by the development proposal.
- Identify any ecological constraints to the development proposal and where appropriate, recommend further surveys, mitigation and enhancement measures.

Legislation & Planning Policy

2.4 The legislation and planning policies relevant to this assessment are listed in Appendix I.

3.0 Methodology

Desk Study

3.1 Natural England's MAGIC database was accessed for information on statutory sites designated for nature conservation within a 5km radius of the site. Consideration for Natura 2000 sites was extended to a 10km radius where the potential risk of impact to such sites may extend over a wider area. Such sites include Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

3.2 Several records centres were contacted for information on non-statutory sites and protected/notable species records within 2km of the site. The centres contacted include the Hertfordshire Environmental Records Centre (HERC), the Greenspace Information for Greater London (GIGL), and the Hertfordshire and Middlesex Bat Group (HMBG).

Ecological Appraisal

3.3 Principal Ecologist Elizabeth Burtenshaw BSc (MCIEEM) and Ecologist Ben Rogers BSc (Hons) undertook a site visit on the 19th of March 2018. The survey involved recording and mapping habitat types and ecological features. The survey was undertaken with reference to the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and the *Handbook for Phase I Habitat Survey* (JNCC, 2010). The dominant plant species for each habitat were recorded, and features of interest were target noted on a Phase I Habitat Map (see Figure 1). Hedges on-site were also evaluated for their importance under the Hedgerows Regulations 1997.

Great Crested Newts

Habitat Suitability Index (HSI)

3.4 Two ponds and a ditch located within 250m of the site were assessed for great crested newt potential using the Habitat Suitability Index described in Advice Note 5 (ARG UK, 2010). The waterbodies are shown on the Phase 1 habitat map (Figure 1). All other waterbodies were ruled out from the assessment due being dry at the time of survey or due to the presence of barriers for newt dispersal e.g. dual carriage ways. The HSI results were used to determine if environmental-DNA (e-DNA) sampling was required.

e-DNA Sampling

3.5 Elizabeth Burtenshaw (great crested newt licence number: 2015-17943-CLS-CLS) and Calum Wallace BSc (Hons) Ecologist and took water samples from all three waterbodies for e-DNA testing on the 16th April 2018.

3.6 e-DNA can predict with confidence the recent presence of GCN in a waterbody. Twenty water sub-samples were collected from locations evenly spaced around all three waterbodies on the following a standard method (Briggs et al., 2014). The e-DNA samples were boxed and sent for laboratory analysis on the same day. Analysis was undertaken by SureScreen Scientifics' Laboratory, Morley Retreat, Church Lane, Morley, Derbyshire. DE7 6DE.

Assessment Methodology

3.7 The Chartered Institute of Ecology and Environmental Management (CIEEM) (2016) method for the assessment of biodiversity value was applied to the findings of the survey. In accordance with this method, this report has used the following categories to value ecological features:

- International – Natura 2000 sites or areas with biodiversity value at a European level;
- National - Sites of Special Scientific Interest (SSSI) or areas with biodiversity value to England;
- Regional - of biodiversity value to the south-east;
- County - Sites of Nature Conservation Interest areas with biodiversity value to the county;
- District - of biodiversity value to the district;
- Local - of biodiversity value within approximately 5km of the proposed site; and,
- Site - of biodiversity value within the Proposed Site and its immediate surroundings.

4.0 Limitations

4.1 Ecological Appraisals can be undertaken throughout the year; however, the results of the survey can only provide an overview of the likelihood of protected/notable species occurring on the site. Further surveys are recommended where appropriate.

4.2 The great crested newt e-DNA survey was completed within the correct timeframe for this type of survey and no limitations were experienced. A wintering bird survey is recommended

as part of the Landscape and Ecological Management Plan. This will inform potential impacts and mitigation for the Lee Valley SPA / Ramsar.

Statutory Sites

4.3 Statutory sites designated for nature conservation within the vicinity of the site are provided in Table 1. The site falls in a SSSI IRZ. According to the SSSI criteria the LPA must consult Natural England for any non-residential developments in zones that are outside existing settlements/urban areas where the development footprint exceeds 1ha. These criteria apply to this planning application.

Table 1 – Internationally important sites within 5km and nationally important sites within 2km of the application site

Site Name	Distance & Direction (km)	Area (ha)	Reason for Designation
Lee Valley SPA	1.6km Northeast	451.30	Used over winter by: bittern *Botaurus stellaris*, 6 individuals representing at least 6.0% of the wintering population in Great Britain. Also supports populations of European importance of the following migratory species in the winter: gadwall *Anas strepera*, 515 individuals representing at least 1.7% of the wintering Northwestern Europe population. Shoveler *Anas clypeata*, 748 individuals representing at least 1.9% of the wintering Northwestern/Central Europe population.
Lee Valley Ramsar	1.6km Northeast	451.30	The Lee Valley comprises a series of embanked water supply reservoirs, sewage treatment lagoons and former gravel pits along c. 24 km of the valley. These waterbodies support internationally and nationally important numbers of birds. The site also contains a range of wetland and valley bottom habitats, both man-made and semi-natural, which support a diverse range of wetland fauna and flora.
Turnford & Cheshunt Pits SSSI	1.6km Northeast	174.41	Important to breeding, migrating and wintering birds, aquatic flora and invertebrate fauna.
Wormley-Hoddesdonpark Woods SAC	4.5km Northwest	335.99	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli.

Non-Statutory Sites

4.4 Non-statutory sites designated for nature conservation that are located within 2km of the application site are provided in Table 2 below.

Table 2 – Non-statutory sites within 2km of the application site

Site Name	Distance & Direction (km)	Area of Site (ha)	Reason for Designation
New River Site of Importance for Nature Conservation (SINC)	Runs adjacent to the site	30.41	Supports a range of aquatic plants, as well as fish, water birds (i.e. kingfishers) and amphibians.
Broom Hills Local Wildlife Site (LWS)	0.42km	5.45	Old secondary woodland, woodland indicators.
Temple Bar Meadow LWS	0.61km	2.31	Grassland indicators.
Burygreen Plantation LWS	0.65kmk	7.93	Old secondary woodland, woodland indicators.
Bonney Grove Wood by B198 LWS	1.14km	4.0	Old secondary woodland, woodland indicators.
Meadow N. of Barrow Lane LWS	1.37km	1.79	Grassland indicators.
Albury Fields LWS	1.61kmk	6.42	Grassland indicators.
Old Rush Field, Broadfield Farm LWS	1.62m	4.98	Grassland indicators.
Thistly Marsh and Area W. of Cheshunt Marsh LWS	1.63km	12.64	Buffers a SSSI.
Meadow S. of Rosedale Sports Ground North LWS	1.88km	3.84	Grassland indicators.

Habitats

4.5 See Figure 1 for the Phase 1 Habitat Map. A full list of plant species recorded in each habitat on-site can be found in Appendix II.

Arable Land

4.6 The northern field mostly comprises arable land dominated by wheat (*Triticum aestivum)*. Other species recorded include spear thistle *(Cirsium vulgare)*, white clover *(Trifolium repens)* and white dead-nettle *(Lamium abum).* The field has a regularly cut to ground level c. 4m wide margin around its perimeter. This habitat has been assessed as having the lowest biodiversity value, due to its use for intensive arable agriculture.

Improved Grassland

4.7 The southern field is improved grassland dominated by barren brome (*Anisantha sterilis* with spear thistle, broadleaved dock (*Rumex obtusifolius*) and creeping buttercup (*Ranunculus repens*) also present. This field is cut at intervals, maintaining a fairly uniform sward.

4.8 This habitat has been assessed as having Site level biodiversity value within the site, similar to the arable land on site.

Poor Semi-Improved Grassland & Tall Ruderals

4.9 Strips of poor semi-improved grassland are present along the boundaries of the site. A 5m strip of poor semi-improved grassland along the New River was also noted. This rises to an embankment 2m high towards the south. Tall ruderals are presents on the slope of the embankment. Plant species comprise barren brome, Yorkshire fog *(Holcus lanatus)*, stinging nettle *(Urtica diocia)*, red dead-nettle *(Lamium purpureum)*, bristly oxtongue *(Picris echioides)*, spear thistle *(Cirsium vulgare)*, creeping thistle *(Cirsium arvense)* and broad-leaved dock. While there is a somewhat greater diversity of species, its limited extent and position adjacent to intensively farmed land limits its biodiversity value. Therefore, his habitat has been assessed as having Site level biodiversity value.

Scattered Trees & Scrub

4.10 Small patches of scattered scrub and trees were recorded in both fields, located predominately on the site boundaries. Species include ash *(Fraxinus excelsior)*, hawthorn *(Crataegus monogyna)*, *(Quercus rubra)*, elder *(Sambucus nigra),* bramble *(Rubus fruticosus* agg.*)* and oak *(Quercus rubra)*. While this is a semi-natural habitat, it is limited in extent and is relatively isolated, reducing its biodiversity value. Therefore, this habitat has been assessed as having Site level biodiversity value.

Broadleaved Woodland

4.11 A thin strip of broadleaved woodland on an embankment makes up the south east boundary. Horse chestnut *(Aesculus hippocastanum)* was dominant with small patches of ivy *(Hedera helix).* Due to the small size of the woodland, this habitat has been assessed as having Site level biodiversity value, for reasons similar to the valuation of the scattered trees and scrub habitat on site.

Hedgerows

4.12 Species-poor hedges were noted on the eastern boundary of both fields, with the largest hedge stretching c. 100m along the northern boundary of the site. Each section of hedge is dominated by a single species. Species comprise Leyland cypress *(x Cupressocyparis leylandii),* hawthorn *(Crataegus monogyna)*, beech *(Fagus sylvatica)* and common elm *(Ulmus procera)*. The hedges are unlikely to be important under the Hedgerow Regulations

1997 due to their lack of native woody species. This habitat has been assessed as having Site level biodiversity value.

Waterbodies

4.13 There is one waterbody on-site, a pond on the eastern boundary in a 4m deep man-made depression surrounded by a mix of scattered scrub and willow *Salix* sp. on the surrounding banks. This habitat has been assessed as having Site level biodiversity value.

4.14 The site also falls adjacent to the New River, the entire section adjacent to the site is canalised, with a strip of poor semi-improved grassland habitat adjacent to it. A stream - Theobald's Brook- also borders the site to the south running through the thin strip of broadleaved woodland. These habitats have been assessed as having Local biodiversity value. While the New River is poor quality riparian habitat, the interface of the four habitat types increase this portion of the site's capacity to support a diversity of species.

Protected / Notable Species

4.15 Protected and notable species records returned by the three records centres are provided below.

Table 3 – Greenspace Information for Greater London Records (GIGL, 2018)

Common Name	Latin Name	Total No. Records	Distance (km) & Direction of Nearest Record	Year of Nearest Record
Great crested newt	*Triturus cristatus*	1	1.8km Southwest	2013
Slow-worm	*Anguis fragilis*	1	1.5km Southwest	2011
Daubenton's bat	*Myotis daubentonii*	1	0.7km West	2009
Natterer's bat	*Myotis nattereri*	3	0.7km West	2009
Soprano pipistrelle	*Pipistrellus pygmaeus*	4	0.5km West	2009
Long-eared bat sp.	*Plecotus* sp.	1	0.7km West	2008
Bats	Vespertilionidae	3	0.7km West	2008
Small heath	*Coenonympha pamphilus*	3	1.0km resolution	2008
Wormwood	*Cucullia absinthii*	1	10km resolution	2009

Table 4 – Hertfordshire Environmental Records Centre Records (HERC, 2018)

Common Name	Latin Name	Total No. Records	Distance (km) & Direction of Nearest Record	Year of Nearest Record
White-letter hairstreak	*Satyrium w-album*	3	0.05 southwest	2012
Small heath	*Coenonympha pamphilus pamphilus*	2	1.84 northwest	2015
European eel	*Anguilla anguilla*	1	1.92 northeast	2011
Bullhead	*Cottus gobio*	1	1.90 northeast	2015
Grass snake	*Natrix natrix*	1	1.84 southeast	2015
Common lizard	*Zootoca vivipara*	2	1.90 northeast	2016
Otter	*Lutra lutra*	1	1.95 southeast	2009
Water vole	*Arvicola amphibius*	14	1.28 west	2016
Common pipistrelle	*Pipistrellus pipistrellus*	1	1.10 northeast	2011
Soprano pipistrelle	*Pipistrellus pygmaeus*	1	1.10 northeast	2011
Natterer's bat	*Myotis nattereri*	2	0.45 south	2008

Table 5 – Hertfordshire and Middlesex Bat Group Records (HMBG, 2018)

Common Name	Latin Name	Total No. Records	Distance (km) & Direction of Nearest Record	Year of Nearest Record
Common pipistrelle	*Pipistrellus pipistrellus*	18	0.14 south	2014
Soprano pipistrelle	*Pipistrellus pygmaeus*	16	0.10 south	2014
Nathusius' pipistrelle	*Pipistrellus nathusii*	4	0.15 south	2014
Long-eared sp.	*Plecotus* sp.	2	0.45 northwest	2014
Natterer's bat	*Myotis nattereri*	4	0.63 southwest	2011
Daubenton's bat	*Myotis daubentonii*	5	0.15 south	2012
Noctule bat	*Nyctalus noctula*	3	0.15 south	2012

Invasive Species

4.16 No Schedule 9 WCA invasive species were found during the Ecological Appraisal.

White-Clawed Crayfish

4.17 No records for white-clawed crayfish were returned and the New River is canalised adjacent to the site preventing burrowing of crayfish. The site is therefore considered to hold negligible potential for white-clawed crayfish. No further surveys or mitigation are recommended.

Great Crested Newt (GCN)

4.18 The GCN is listed as a European Protected Species (EPS) under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. One GCN record within 1.8km of the site was returned. Pond 1 is located on-site on the east boundary of the northern field. It received an HSI score of 0.66 i.e. average suitability for GCN. Pond 2 and Ditch 3 are both located off-site and received an HSI score of 0.78 & 0.72 respectively i.e. good suitability for GCN. Refer to Figure 1 for the waterbody locations and Appendix III for the full HSI results. As the HSI results were above 0.5 for all three water-bodies, e-DNA testing was carried out to determine presence / likely absence of GCN. A negative result was returned for all three water-bodies meaning that GCN are likely to be absent from the site. No further surveys or mitigation for GCN are required.

Reptiles

4.19 All reptiles are legally protected from killing and injury under the Wildlife and Countryside Act 1981 (as amended). One record of slow worm, two records of common lizard and one for grass snake were returned. All records are all at least 1.5km away from the site. The edges of the fields offer some limited potential for reptiles. Hedgerows, strips of woodland, patches of scattered scrub, occasional rubble piles and the derelict wall (0.5m high) on the northern boundary offer some limited sheltering potential. There are also basking opportunities within the strips of poor semi-improved grassland on the field margins. Due to the limited habitat areas, and the nature of the development (e.g. footprint well away from possible reptile habitat), no further surveys are recommended, however precautionary measures for reptiles have been included in the next section.

Birds

4.20 All nesting birds are protected under the Wildlife and Countryside Act 1981, while birds on Schedule 1 of the WCA are additionally protected from disturbance. Records indicate that the site has been previously used by golden plover *(Pluvialis apricaria),* an Annex 1 species of the Bird Directive, these records date between 2011-2012. One greylag geese *Anser anser* and a small number of Canada geese *Branta canadensis* were seen foraging on-site during the Ecological Appraisal. Neither of these are Annex 1 species, however the greylag goose is an Amber listed Bird of Conservation Concern. The Canada goose is an introduced species. The hedges, trees and woodland provide suitable bird nesting and foraging habitat for common and widespread birds. The arable land and grassland may provide suitable habitat for wintering birds.

Bats

4.21 All British species of bat and their roosting sites are legally protected under UK and European law (the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Species and Habitats Regulations 2017, respectively). A total of 44 bats have been recorded within the search area between 2012-2014, between 0.1km-1.1km from the site. Species include common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared sp., Daubenton's bat and Natterer's bat (see Tables 3-5). The site has potential as a bat commuting corridor due to the presence of the New River adjacent to the northern field. However, the trees and small area of woodland on-site are relatively isolated from wider suitable habitat and there are no suitable features for roosting bats. Due to the 1) lack of potential bat roosts, 2) the general lack of sheltered and other linear habitats, and 3) the footprint of the proposed development, no bat surveys are recommended. If lighting is to be provided around the New River, and/or boundary vegetation, a precautionary method has been outlined in the next section.

Badgers

4.22 Two push-throughs potentially were noted along the fence of the northern field. These can be created by badgers, but also by foxes and domestic animals. There were no field signs of badgers around the push-throughs, and the lack of other badger field signs such as hair, pathways, latrines, setts and footprints mean that is unlikely that badgers use the site.

Dormice

4.23 No records of dormice (*Muscardinus avellanarius*) were returned. The site is also located in a region which supports only scattered populations of dormice (Bright *et al*., 2006). The hedges on-site also lack connectivity to suitable habitat in the wider area. Due to these limitations Dormice are unlikely to use the site. Therefore, no further survey is recommended.

Otters

4.24 One record for European otter *(Lutra lutra)* was returned c. 1.95km from the site. The nearest potential otter habitat is the New River, which is canalised with no trees along this section of the river, reducing potential for this species. No otter field signs such as holts, couches, spraints, footprints or feeding remains were recorded along the New River adjacent to the site during an incidental survey, therefore, no further survey for otter is recommended.

Water Voles

4.25 Fourteen records of European water voles *(Arvicola amphibious)* within 1.28km of the site were returned. The section of the river adjacent to the site is canalised, reducing potential for this species. No water vole field signs such as latrines, burrows, cut vegetation or feeding lawns were recorded along the New River adjacent to the site during an incidental survey. Therefore, no further survey for water vole is recommended.

Other Protected / Notable Species

4.26 One record for European eel *(Anguilla anguilla)* was returned from within 1.92km of the site. As the New River will not be directly affected by the development there is no need for further surveys at this time.

4.27 The site holds potential for hedgehog *Erinaceus europaeus* within the hedges and semi-improved grassland, and brown hare *Lepus europaeus* over much of the site. Further action for these species has therefore been recommended in the next section.

5.0 Impacts

Designated Sites

5.1 There are no habitats within the site that serve as qualifying features of the nearby designated sites, nor does the site does support the habitat preferences of the species associated with these designated sites. Impacts on designated sites via the New River are not expected due to it flowing southward away from in these areas. Theobald's Brook however does flow immediately to the south of the Lee Valley SPA / Ramsar site, 1.8km downstream from the site. Direct impacts are unlikely to arise due to the distance of the designated sites from the application site. The development is also unlikely to indirectly affect any designated site due the nature of the proposals. Impacts on designated sites resulting from recreational disturbance are therefore not expected.

Habitats

5.2 No specific further action is required for the arable land, scrub, improved and semi-improved grassland. These habitats are of low ecological value and not considered an ecological constraint except where they may support protected species, as discussed in Section 7.

5.3 The only habitats of ecological value include the broadleaved woodland, hedges, trees, a pond and the New River. These however can be retained as part of the development proposals. Enhancements and mitigation for these habitats are discussed below.

Broadleaved Woodland, Hedges & Trees

5.4 The current layout indicates that these habitats will be retained with only small number of trees requiring removal for access on the southern boundary. Damage to tree roots and vegetation may however result from construction activities if a tree protection plan is not put in place. This would lead to long-term loss of the more mature and biotically diverse habitat on the site, as mature woodland is not easily replaced.

Pond, The New River & Theobold's Brook

5.5 The current layout shows the pond and watercourses being retained. Impacts may however arise from construction activities degrading water quality and this their habitat quality. This could affect this habitat type and its concommittant species, but measures can be taken to prevent this.

Protected / Notable Species

5.6 Schedule 9 WCA plants, crayfish, great crested newts, roosting bats, badgers, dormice, otter and water vole have been screened out from the assessment due to habitat unsuitability and no evidence found of their presence on-site during the site visits. Protected/notable species that could be affected by the development include nesting birds, reptiles, foraging/commuting bats, hedgehogs and hare. Potential impacts in the absence of mitigation for these species are discussed below.

Reptiles

5.7 Much of the boundary vegetation suitable for reptiles is likely to be retained, however heavy machinery / vehicles may incidentally injure/kill reptiles during construction if appropriate fencing (e.g. Heras) is not used to protect these areas. Measures should therefore be undertaken to ensure that no harm comes to any reptile during the construction phase. This may be accomplished by means of a Construction Environmental Management Plan (CEMP) which can be made a condition of planning approval.

Birds

5.8 Inappropriately timed removal of woody habitats or long grassland may lead to damage of actively used bird nests and harm to birds/eggs/offspring. As for reptiles, harm to birds can

be avoided by implementing a CEMP and this can be enforced by means of a planning condition. Additional tree planting will provide enhanced foraging and nesting opportunities for birds, which is considered an enhancement.

Foraging & Commuting Bats

5.9 The site is unlikely to support populations of bats. The boundary vegetation and the watercourses are also likely to remain unaffected by the development. A landscape and habitat restoration scheme can improve habitat connectivity and foraging habitat for bats. Artificial lighting may however spill into these habitats, causing an adverse effect on bat commuting and foraging behaviour. As the use of the site by bats is negligible this is unlikely to occur and thus does not require mitigation.

Other Species

5.10 Incidental killing/injury during construction and minor habitat loss affecting other notable species such as hare, hedgehog and other wildlife can be prevented by implementation of a CEMP. This can form part of Reserved Matters.

6.0 Further Work, Mitigation & Enhancement Recommendations

6.1 A Landscape and Ecological Management Plan (LEMP) is recommended to ensure that the development maximises its biodiversity value. Such a plan would identify species and habitats of importance in the site and regional context. Much of the site will be retained undeveloped and areas of habitat can be restored and created. This can form a condition to any approved planning application. Figure 2 illustrates a potential Habitat Enhancement Plan for the site. Balancing ponds cann provide additional aquatic habitat, with a mixture of permanent and ephemeral waterbodies adding to habitat diversity. Additional terrestrial habitat can be provided as part of the landscape strategy which will be a condition of planning permission.

6.2 In addition, a CEMP can also be provided to incorporate measures to protect species/retained habitats from harm during construction. This can also be implemented via a planning condition.

Designated Sites

6.3 The site has potential to enhance the opportunities for feeding and resting for bird species related to the Lee Valley SPA/Ramsar site. While no direct impacts are expected from development, retained areas could be enhanced, as outlined in Figure 2. Historic use by over-

wintering birds was found during the desk study, and some use by migrating waterfowl was found in May 2018. Such enhancements can be incorporated into the LEMP, and provide a positive benefit to the designated site.

Broadleaved Woodland, Hedges & Scattered Trees

6.4 These habitats can be enhanced as part of the development if the following measures are implemented:

- Retain these habitats where possible and protect during construction with Heras fencing in line with Trees in Relation to Design, Demolition and Construction – Recommendations BS5837:2012 (British Standards Institution, 2012); and
- Replant any trees and hedges lost to the development with native specimens of local provenance.

New River, Theobald's Brook & the Pond

6.5 The pond can be enhanced by planting it up with suitable aquatic and marginal native species, as can the proposed balancing ponds. This can form part of the LEMP. In addition, the measures listed below can form part of a CEMP to avoid indirect effects on the New River, Theobald's Brook and the pond:

- Adhere to the (former) Environment Agency Pollution Prevention Guidelines;
- Maintain at least a 7m distance from the bank of the river and any construction activities i.e. using Heras fencing;
- Store materials, vehicles, and fuel in a designated secure place away from the river;
- Damp down and reduce potential sources of dust (e.g. from sweeping);
- Use drip trays to prevent leaks;
- Provide fuel tank bunds and spill kits;
- Regularly maintain fuel pumps and standing plant;
- Secure the site during construction to prevent vandalism;
- Appropriately train all construction staff; and
- Report any environmental incidents.

Reptiles

6.6 Reptile habitat can be enhanced by:

- Installing Heras fencing along the site boundaries to prevent vehicles and machinery from harming reptiles and damaging habitat.

- Creating log piles using logs from any tree-felling and placing these in tall grassland along the northern site boundary.
- Maintaining a swathe of infrequently cut grassland along a site boundary to provide undisturbed habitat for reptiles. The swathe should be a minimum of 3m wide and sown with a suitable seed mix.

Birds

6.7 The following measures can be incorporated into either the CEMP or LEMP to protect birds and their habitat during construction and to enhance the retained area of the site:

- Clear any woody habitats and the semi-improved grassland between September and February (inclusive) to avoid the nesting bird season. Alternatively, an ecologist should check the potential nesting habitat immediately before any clearance scheduled during the nesting season (March to August inclusive). Any active nests identified must be retained in situ with a suitable buffer until the ecologist confirms that the chicks have fledged and the nest is no longer active.
- The installation of four Schwegler 1SP Sparrow Terraces onto new building and native tree planting using species that bear fruit would lead to a significant positive impact on birds by providing additional nesting and foraging opportunities.
- A winter bird survey in accordance with Bird Monitoring Methods (Gilbert et al., 1998) is recommended to assess any impacts of the development on the wintering birds. This survey and any associated mitigation will be implemented as part of the LEMP.

Bats

6.8 The development of the site can benefit bats and their habitat by incorporating the following:

- Minimise external lighting and do not illuminate the boundary vegetation watercourses. Aim the light to illuminate only the immediate area required by using as sharp a downward angle as possible. Use a shield or hood to control or restrict the area to be lit to limit “light spillage” on the site.
- Native tree planting along the New River and eastern boundary that links with the existing hedges on-site.
- Install four bat boxes/tubes on the new buildings e.g. Schwegler 1FR Schwegler bat tube (integrated) and/or 1WQ bat box.

Other Species

6.9 Specific measures to protect species small mammals include:

- Maintaining a tall grassy 3-5m buffer around edges of the development where suitable to provide habitat connectivity;
- Installing any new fences with either a 15cm tall gap along the base or provide hedgehog links (15cm x 15cm holes at the base) at 10m intervals to allow mammals to move freely within the site and wider habitats.
- Providing a hedgehog house in a sheltered location e.g. at the base of a hedge or in tall grassland on a boundary, away from any existing or proposed roads.
- Avoiding use of slug pellets in any soft landscaping.

General Site Measures

6.10 Use these precautionary measures to ensure wildlife generally are protected from harm:

- Stop works and seek advice from an appropriately qualified ecologist if any protected species are found during site clearance or construction.
- . Clear the grassland, ruderals, and scrub between October and February (the hibernation period), or after precautionary strimming. This will protect reptiles and amphibians which may be using ponds/waterbodies/habitat on or near the site.
- Directionally strim the grassland out towards the boundaries down to 10cm. Leave the arisings for 24 hours to enable any amphibians or reptiles to leave area before ground clearance. This reduces the quality of the habitat and the risk of harming wildlife during works.
- Cover any trenches, holes or deep pits overnight, or use secured planks to allow any animals that fall in to escape during construction. A member of staff should check the site at the end of each working day to ensure that these provisions to protect nocturnal species (such as hedgehog).
- Store materials off the ground on pallets to prevent amphibians or reptiles from taking refuge under them. No temporary standing water should be left on the site, which could be used by amphibians.

7.0 Conclusion

7.1 The development proposed would result in the loss of only low ecological value habitat, areas of land that are currently farmed. It would result in little direct loss of habitats of any

greater value than the agricultural land. Importantly, the nature of the development that is proposed can provide a notable increase in habitat and potentially increase biodiversity substantially, in line with the NPPF. It would be expected that reserved matters would include details of a landscape scheme, and the requirement for both a CEMP and an LEMP. If these include and expand on the measures outlined above in Section 7, then habitats and species present would be protected from harm and ecological benefits would ensue.

8.0 References

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Appendix I – Legislation & Planning Policy

This section summarises the legislation which is relevant, in ecological terms, to this assessment, i.e. legislation relevant to species present or potentially present within the field survey area is included here along with legislation relevant to protected sites in the vicinity.

The following legislation is relevant to the environmental aspects of the site and has guided the scope of work undertaken in order to reasonably identify potential constraints.

Protected Sites

Statutory Protected Sites

Special Protection Areas (SPAs) are areas of the most important habitat for rare (listed on Annex I o the EC Birds Directive) and migratory birds within the European Union. SPAs are areas which have been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within European Union countries. SPAs are protected under the Conservation of Habitats and Species Regulations 2017. This legislation requires any developments likely to have significant effect upon a European Protected Site to be assessed for its implications on the site's conservation status. This is undertaken through a Habitat Regulation Assessment (HRA).

Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended)

Ramsar sites are designated under the Convention on Wetlands of International Importance, in 1971. Originally intended to protect sites of importance as waterfowl habitat, the Convention has broadened its scope over the years to cover all aspects of wetland conservation and wise use, recognising wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. They generally receive legal protection through also being designated as SPAs or SSSIs. Ramsar sites are also regarded as European Protected Sites in terms of HRAs.

Sites of Special Scientific Interest (SSSI) provide full statutory protection for the best examples of the UK's flora, fauna, geological, or physiographical features. SSSIs are notified under the Wildlife and Countryside Act 1981 (as amended). Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000. They are designated in England by

Natural England, who have powers to prevent damaging operations within and around the site. There is an obligation upon land owners and relevant authorities to notify Natural England if any activity they undertake may impact upon the conservation status of a SSSI. Prior permission from Natural England for the activity must be obtained.

Non-Statutory Protected Sites – Sites of Importance for Nature Conservation (SINCs) / Local Wildlife Sites (LWSs)

SINCs /LWSs are designated at a county level on account of their value for wildlife. These receive a measure of protection through local planning policies. The aim is to protect sites from land management changes which may lessen their nature conservation interest and to encourage sensitive management to maintain and enhance their importance.

Protected/Controlled Species

European Protected Species (EPS)

EPS include all bat species. All EPS in England are fully protected through inclusion within Schedule II of the Conservation of Habitats and Species Regulations 2017. This legislation makes it an offence to deliberately capture, kill, injure or disturb an EPS. It is also an offence to damage or destroy a breeding site or resting place of these species. For the purposes of this legislation disturbance has been defined as that likely:

- To impair their ability:

(i) To survive, breed or reproduce, or to rear or nurture their young; or

(ii) To hibernate or migrate.

- To affect significantly the local distribution or abundance of that species to which they belong.

It may be possible to apply for a licence from Natural England to allow activities that would otherwise be an offence under these Regulations.

Wildlife and Countryside Act 1981 (as amended)

The main piece of national legislation which protects animals, plants, and in some cases their habitats in England is the Wildlife and Countryside Act 1981 (as amended).

All wild birds receive protection from being intentionally killed, injured or taken damage. It is also an offence to destroy a wild bird nest (whilst being built or in use) or its eggs. Species listed on Schedule

1 of The Act receive further protection which makes it an offence to intentionally or recklessly disturb these species while building a nest, or in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird.

All bat species are protected from being intentionally or recklessly disturbed whilst using a place of rest or shelter and/or from being obstructed from entering such a place. No licences are available for the purposes of development for offences under the Wildlife and Countryside Act 1981 (as amended). Some offences are subject to a number of defences including if the disturbance was the '*incidental result of a lawful operation that could not reasonably have been avoided*'.

The Countryside Rights of Way Act 2000 (as amended)

This legislation makes it an offence to cause reckless (and therefore not necessarily intentional) disturbance or damage to wild birds and their eggs or nests.

Local Planning Policy

The following policies from the Local Plan Amendments of the Broxbourne Local Plan in 2017 are relevant to the site:

Policy NEB1: General Strategy for Biodiversity NEW POLICY

I. Development proposals will be expected to apply the mitigation hierarchy of avoidance, mitigation and compensation.

II. Development proposals should result in net gains to biodiversity wherever possible.

III. The Council will seek the creation of new networks of biodiversity, as well as the extension, enhancement and active management of existing sites.

IV. Opportunities to connect habitat fragments through the creation of stepping stones, using built form, vegetation or green areas will be assessed as part of all relevant applications.

V. When granting permission, the Council will impose conditions or seek planning obligations that secure appropriate management regimes to deliver biodiversity gain in perpetuity.

Protected Species

A number of legally protected species and their habitats occur throughout the Borough. An up to date list of Species and Habitats of Principle Importance, designated as such under the Natural Environment and Rural Communities Act 2006, can be viewed on the Government website. Where there is a reasonable likelihood that protected species, or the habitats upon which they depend, may be

negatively affected by a development proposal, planning applications will not be validated until survey information has been submitted that shows the presence (or otherwise) and extent of the species or habitat over the course of the year.

Mitigation Hierarchy

- Avoidance, mitigation and compensation activities to manage adverse impacts from development on biodiversity form a hierarchy. Avoidance is the preferred option and must be considered first. If avoidance is not possible, or if residual adverse effects remain, mitigation of the effects can be scoped. If avoidance and mitigation do not address all the adverse effects, compensation or offsetting measures may be appropriate.

- The success of compensation measures can be very variable and carry a degree of uncertainty. For this reason, compensation is normally only acceptable as a las resort. Compensation for a lost habitat will not make an unacceptable development acceptable. Biodiversity offsetting is not designed to be applied to priority habitats.

Ecological Survey Standards

- In order to accurately determine the impacts of development on biodiversity, precise ecological assessment by suitably qualified people, will be required. Survey and mitigation measures will be expected to conform to the following principles: Ecological surveys must consider: what features are present; ecological value of these features; how features are affected by the development and how adverse impacts will be avoided, mitigated or compensated so that there is a net gain to biodiversity. Survey methodology and reporting must be conducted in accordance with British.

- The submission of ecological information must be in accordance with British Standard 42020: Biodiversity – Code of Practice for Planning and Development. Unauthorised deviation from these survey standards will not be accepted. Environmental records searches are to be supplied in support of planning applications.

- Where European Protected Species Mitigation Licenses (EPSML) are required, answers to the 3 tests of the license must be supplied at the time of submission of the application. Failure to do so will result in applications being refused because the Council will not be able to fulfil its statutory function under the Conservation of Habitats and Species Regulations 2010.

Biodiversity Impact Calculator

- The DEFRA and NE endorsed Biodiversity Impact Calculator (BIC, Environment Bank 2014, v2) has been designed to quantify the value of biodiversity (in terms of habitats) in a consistent, transparent, and objective way. This mechanism is considered to be an appropriate method to determine ecological value and deliver net ecological gain.
- If biodiversity losses resulting from a development cannot be avoided (by locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission will likely be refused.

Small Biodiversity Measures for Big Biodiversity Gains

Many species rely on gaps in houses, barns and other man-made structures for reproduction. Modern housing standards virtually eliminate opportunities for these species. Where appropriate, the Council will seek features for biodiversity within developments. Simple inexpensive measures can result in significant gains such as, integrated bat roost cavities, integrated swift or house martin boxes. Such features will be expected to be built in to suitable structures rather than provided as vulnerable, isolated and temporary boxes.

Native Species

The use of locally appropriate native species will be encouraged for all applications.

Wildlife Sites

The Habitats Regulations require the highest levels of protection for internationally designated wildlife sites. The Borough of Broxbourne includes the internationally designated Broxbourne-Hoddesdon Woods complex, a Special Area for Conservation (SAC) and the Lee Valley Special Protection Area (SPA) and Ramsar sites along the River Lee. The nature conservation and geological interest of internationally designated sites are not permitted to be harmed by development unless they meet the criteria listed below.

- Local Wildlife Sites are identified by the Hertfordshire Local Wildlife Sites Partnership, coordinated by the Herts and Middlesex Wildlife Trust. Local Wildlife Sites (LWS) are considered to be of significance for wildlife in at least a district context. There are currently 35 Local Wildlife Sites in the Borough of Broxbourne.
- Distinction will be made between the hierarchy of international, national, locally designated and non-designated sites so that the level of protection afforded is consistent with their status.

<u>Policy NEB2: Wildlife Sites</u>

Internationally and Nationally Designated Wildlife sites

I. Development which would harm the nature conservation or geological interest of an internationally or nationally important wildlife site, as shown on the Policies Map, will not be permitted unless:

(a) it is required in connection with the management or conservation of the site; or

(b) there are imperative reasons of overriding public interest for the development; and

(c) there is no alternative to the development.

Compensation for the harm will be required.

Locally Designated Sites of Wildlife Value

II. Development on, or which negatively affects, a Local Wildlife Site or Local Nature Reserve, as shown on the Policies Map, will not be permitted unless:

(a) local development needs significantly outweigh the nature conservation value of the site; and

(b) the development provides appropriate avoidance or mitigation, and as a last resort compensation measures, to offset any detriment to the nature conservation interest on the site.

Green Infrastructure

- The NPPF describes Green Infrastructure as "a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities". Green infrastructure also includes river corridors and water systems (also known as blue infrastructure).
- The protection and enhancement of biodiversity assets is dependent on robust networks of Green Infrastructure (GI) which facilitate movement and genetic exchange. Green Infrastructure should buffer existing habitats to minimise disturbance, ensure permeability for wildlife through and around development, and provide sufficient habitat to support target species, independent of its connective function.
- Street trees, gardens, waterways, public parks and open spaces all contribute to urban green infrastructure. Green Infrastructure contributes significantly to cleaning and cooling the air, preventing flooding, providing 'stepping stones' for wildlife, and for recreational activity and enjoyment.

- It is important that changes to the Borough's urban environment contribute to the wider GI network. Development should be planned to avoid habitat loss and fragmentation, and opportunities sought to improve ecological connectivity, including through the creation, restoration and enhancement of linking habitats and 'stepping stones' through the landscape. The Council will also maximise opportunities to increase movement throughout the Borough and enhance public access to the rights of way network, and open and green spaces.

Policy NEB2: Green Infrastructure

I. The Local Plan will create a diverse, linked network of multi-functional green infrastructure. The network will be protected and enhanced for its biodiversity, recreational, accessibility, health benefits and landscape value, and for the contribution it makes towards combating climate change.

II. Development proposals should:

(a) Avoid the loss, fragmentation or functionality of any component of the green infrastructure network, including within the built environment, such as access to urban waterways;

(b) Maximise opportunities for extensions, additions and improvements to the green infrastructure network;

(c) Maximise opportunities for urban greening through landscaping, the planting of street trees and restoration of channelised or culverted watercourses where possible;

(d) Consider opportunities to enhance connections and extensions to footpaths, bridleways or rights of way where appropriate opportunities exist.

III. Contributions towards local green infrastructure projects will be sought where appropriate. If providing green infrastructure as part of a development contribution, applicants should detail how it will be maintained in the long term.

See also polices on SuDS, Water and the New River Green Chain

Information for Applicants

SuDS requirements, if carefully planned, may offer a unique opportunity for applicants to fulfil any green infrastructure requirements.

Monitoring and Review

The Council will monitor new GI and habitat creation to ensure that it develops as expected. Any green infrastructure and habitat created carries with it a degree of uncertainty as to success of the final outcome. To mitigate against this eventuality, additional measures may be required if the space has not developed as anticipated at the time of granting the permission. Permissions will contain a review clause to this effect.

Biodiversity & Landscaping

Careful Landscaping design can have significant positive effects on wildlife. Landscaping schemes will be expected to maximise opportunities for wildlife. Ecologically appropriate native species will be expected in such schemes, of local provenance where possible.

Policy NEB3: Landscaping and Biodiversity in New Developments

I. Proposals for new development must submit details on how existing landscaping will be protected, enhanced and integrated into the development.

II. New landscaping must be well planned taking into consideration:

(a) the outlook and amenity of existing and future residents,

(b) the safety of inhabitants,

(c) the practicalities of future management and maintenance,

(d) opportunities for biodiversity creation, and

(e) street scene and character.

III. Landscaping schemes should ensure that there is no residual land, which no one takes responsibility for, such as on the edge of development sites or house plots.

IV. New developments must make connections to biodiversity features and habitat networks outside of the site, particularly through the use of a strong landscape framework and green infrastructure to strengthen and widen wildlife corridors.

V. Landscaping schemes should maximise their benefits to biodiversity by using locally appropriate native species wherever possible.

VI. Integrated features for wildlife e.g. Swift, House Martin and bat boxes should be incorporated into all suitable buildings.

Information for Applicants

- Tree planting schemes where the primary purpose is to provide ecological enhancement should look to maximise diversity of species. Species selected should be suited to local soil conditions and use appropriate vegetation communities consistent with National Vegetation Classification (NVC). Naturalistic tree planting should not be in straight lines.

- The establishment and management regimes of naturalistic planting schemes are critical to their success. Development proposals will need to contain details of how the schemes will be managed and monitored and outline a process for addressing any deficiencies in achieving the planned scheme.

Trees & Hedgerows

- Mature trees and hedgerows can make a significant contribution to biodiversity and appearance of the local area. Trees and hedgerows play a crucial role in softening the hard materials and lines of built up areas.

- Ancient woodland, and aged and veteran trees outside woodland areas have a particularly important role to play in providing habitat for a range of species. Aged trees, as a consequence of their rarity and physical condition, can harbour large numbers of rare and threatened species.

- Mature Trees can make a significant contribution to the local area. Many mature or rare trees will be protected under a Tree Preservation Order (TPO). The Council aims to protect those trees and ancient hedgerows by ensuring that they are only removed in exceptional circumstances and replacement provision made. This will help to maintain the overall amenity of the Borough. Where appropriate, the Council will make new orders where trees or hedgerows are considered worthy of protection.

<u>Policy NEB4: ANCIENT WOODLAND, Protected Trees and Hedgerows</u>

I. Development proposals which would result in the loss or deterioration of ancient woodland; or aged or veteran trees found outside ancient woodland; will not be permitted unless the need for, and benefit of, the development in that location is wholly exceptional.

II. Applicants who wish to fell, top or lop protected trees or remove protected hedgerows should demonstrate that:

(a) the tree or hedgerow is dead, dying, diseased or dangerous and in need of work on public safety and/or environmental grounds; and/or

(b) removal of the tree or hedgerow is essential for the proper development of a site; or

(c) work is required for general maintenance or up-keep of the tree(s).

II. Replacement planting will be required if permission is granted to fell protected trees or hedgerows. Replacement specimens should be where possible of an equivalent size and of similar species, in the same or most suitable location and in sympathy with local landscape character. The Council will seek replacement with two trees if they are of a lesser species or size than the removed tree.

Information for Applicants

The Council will seek to ensure that the requirements of the Hedgerow Regulations are followed at all times. Developers should familiarise themselves with these requirements and address any issues in their planning applications.

Appendix II – Plant Species List

Poor Semi-improved Grassland & Tall Ruderals		**Arable**	
Stinging nettle	*Urtica diocia*	Wheat	*Triticum sp.*
Red dead-nettle	*Lamium purpureum*	Spear thistle	*Cirsium vulgare*
Ground ivy	*Glechoma hederacea*	Dandelion	*Taraxacum officinale*
Herb Robert	*Geranium robertianum*	Perennial ryegrass	*Lolium perenne*
Dovesfoot cranesbill	*Geranium molle*	White clover	*Trifolium repens*
Common mallow	*Malva sylvestris*	White dead nettle	*Lamium abum*
Broad-leaved dock	*Rumex obtusifolius*	Oil-seed rape	*Brassica napus var. oleifera*
Common field speedwell	*Veronica persica*	Cleavers	*Galium aparine*
Ribwort plantain	*Plantago lanceolata*	Creeping buttercup	*Ranunculus repens*
Groundsel	*Senecio vulgaris*		
Spear thistle	*Cirsium vulgare*	**Scattered Trees /Scrub**	
Creeping thistle	*Cirsium arvense*	Ash	*Fraxinus excelsior*
Red fescue	*Festuca rubra*	Hawthorn	*Crataegus monogyna*
Yorkshire fog	*Holcus lanatus*	American Red oak	*Quercus rubra*
Pendulous sedge	*Carex pendula*	Elder	*Sambucus nigra*
Cocksfoot	*Dactylis glomerata*	Bramble	*Rubus fruticosus agg.*
Cow parsley	*Anthriscus sylvestris*	**Broadleaved Woodland**	
Cleavers	*Galium aparine*	Horse chestnut	*Aesculus hippocastanum*
Violet sp.	*Viola sp.*	Ivy	*Hedera helix*
Hogweed	*Heracleum sphondylium*	**Hedgerows**	
Yarrow	*Achillea millefolium*	Leyland cypress	*Cupressocyparis*
Lords and Ladies	*Arum maculatum*	Hawthorn	*Crataegus monogyna*
Bristly oxtongue	*Picris echioides*	Beech	*Fagus slyvatica*
Barren brome	*Anisantha sterilis*	Elder	*Sambucus nigra*
Garlic mustard	*Alliaria petiolate*	Common elm	*Ulmus procera*
White dead nettle	*Lamium abum*		
Perennial ryegrass	*Lolium perenne*		
Dandelion	*Taraxacum officinale*		

Appendix III – Habitat Suitability Index Results for GCN

	Waterbody 1	**Waterbody 2**	**Waterbody 3**
Pond Location	A	A	A
Pond Area (m^2)	150	1920	200
Pond drying	Rarely	Never	Sometimes
Water quality	Poor	Good	Moderate
Shade (%)	50	1	1
Waterfowl	Absent	Minor	Minor
Fish	Absent	Minor	Absent
Pond count	4	4	4
Terrestrial habitat	Moderate	Good	Moderate
Macrophytes (%)	0	40	90
HSI score	0.66	0.78	0.72
Pond suitability for GCN	**Average**	**Good**	**Good**

APPENDIX 2: ARCHAEOLOGICAL DESK BASED ASSESSMENT

CgMs HERITAGE
PART OF RPS

ARCHAEOLOGICAL DESK BASED ASSESSMENT

Land at Maxwells Farm West, Broxbourne, Hertfordshire

May 2018

Local Planning Authority:
Broxbourne Borough Council

Site centred at:
TL 35030 01438

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EXECUTIVE SUMMARY

Land at Maxwells Farm West, Broxbourne, in Hertfordshire, has been considered for its below ground archaeological potential.

In terms of relevant designated heritage assets, no World Heritage Sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

In terms of relevant local designations, a small part of the north-eastern corner of the study site lies within an Area of Archaeological Interest (AAI), as defined by Broxbourne Borough Council for the recorded remains of a Second World War gun emplacement.

Based on the available evidence, the study site is considered to have a low potential for archaeological evidence dating from the Mesolithic, Neolithic, Iron Age, Roman, medieval and post-medieval periods, and a low to moderate theoretical potential for evidence of Palaeolithic and Bronze Age activity.

Past post-depositional impacts, in the form of agricultural activities, can be considered to have had a widespread, moderate impact on any below ground archaeological remains.

Redevelopment proposals were not available at the time of writing, however, these are likely to include converting the site into commercial or industrial use.

In view of the identified archaeological potential and past post-depositional impacts, the development can be considered unlikely to have a significant or widespread, negative impact on any identified below ground archaeological evidence.

The Broxbourne Borough Council's Local Plan 2005 (Policy HD2) requires the results of Archaeological Evaluation to be submitted with any planning application on sites of known archaeological interest, or sites likely to possess, or be adjacent to archaeological interest.

However, due to the nature of the adjacent AAI (WWII Gun Emplacement) and the low perceived archaeological potential and significance of likely archaeological remains at the site, it is considered that in this instance archaeological evaluation could follow the granting of consent secured by a suitable worded planning condition.

1.0 INTRODUCTION AND SCOPE OF STUDY

1.1 This archaeological desk-based assessment has been prepared by Tony Brown and edited by Matthew Smith of CgMs Heritage (part of RPS), on behalf of STX A10.

1.2 The subject of this assessment, also referred to as the study site, is land at Maxwells Farm West, Broxbourne, Hertfordshire. The site is approximately 17.7ha in extent and is centred on National Grid Reference TL 35030 01438 (Fig. 1). The site's boundaries are formed by the A10 to the east, the B198 and a parcel of land beyond the proposed development to the south, the New River to the west, and playing fields associated with Goffs Churchgate Academy to the north. Albury Farm is situated immediately beyond the north-eastern corner of the site.

1.3 STX A10 have commissioned CgMs Heritage (part of RPS) to establish the archaeological potential of the study site, and to provide guidance on ways to accommodate any archaeological constraints identified.

1.4 In accordance with relevant policy and guidance on archaeology and planning, and in accordance with the 'Standard and Guidance for historic environment desk based assessments' (Chartered Institute for Archaeologist, 2017), this assessment draws together the available archaeological, topographic and land-use information in order to clarify the archaeological potential of the site.

1.5 The assessment comprises an examination of evidence in the Hertfordshire Historic Environment Record (HER), considers the results of nearby archaeological investigations, incorporates published and unpublished material and charts historic land-use through a map regression exercise.

1.6 As a result, the assessment enables relevant parties to assess the significance of archaeological assets on and close to the site, assess the potential for hitherto undiscovered archaeological assets and thus enable potential impacts on assets to be identified along with the need for design, civil engineering or archaeological solutions.

2.0 PLANNING BACKGROUND AND DEVELOPMENT PLAN FRAMEWORK

2.1 Legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Acts of 1983 and 2002.

2.2 In March 2012, the government published the National Planning Policy Framework (NPPF), which replaced previous national policy relating to heritage and archaeology (PPS5: Planning Policy Statement 5: Planning for the Historic Environment). The NPPF Planning Practice Guidance was published online 6th March 2014 and last updated 22nd February 2018 (http://planningguidance.planningportal.gov.uk).

2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England in 2015: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment. The second edition of GPA 3: The Setting of Heritage Assets was published in December 2017.

2.4 Section 12 of the NPPF, entitled Conserving and enhancing the historic environment provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 12 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment
- Conservation of England's heritage assets in a manner appropriate to their significance, and
- Recognition of the contribution that heritage assets make to our understanding of the past.

2.5 Section 12 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 128 states that planning decisions should be based on the significance of the heritage asset and that the level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.

2.6 Heritage Assets are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. They include designated heritage assets (as defined in the NPPF) and assets identified by the local planning authority during the process of decision-making or through the plan-making process.

2.7 Annex 2 also defines Archaeological Interest as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.

2.8 A Designated Heritage Asset comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area. As set out in the accompanying heritage assessment, no designated assets are affected by the proposal.

2.9 Significance is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

2.10 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance, and make the interpretation publically available. Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced, and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take

into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

2.11 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets (which include World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas)
- Protects the settings of such designations
- In appropriate circumstances seeks adequate information (from desk based assessment and field evaluation where necessary) to enable informed decisions
- Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.

2.12 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

2.13 Planning guidance is provided by Broxbourne Borough Council's Local Plan 2005, adopted in December 2005, containing the following policies relating to archaeological and historical assets:

HD1 EFFECT OF DEVELOPMENT ON NATIONALLY IMPORTANT SITES AND MONUMENTS

PLANNING PERMISSION WILL NOT BE GRANTED FOR DEVELOPMENT WHICH WOULD ADVERSELY AFFECT THE SITE OR SETTING OF NATIONALLY IMPORTANT ARCHAEOLOGICAL REMAINS, WHETHER SCHEDULED OR UNSCHEDULED.

HD2 REQUIREMENTS FOR EVALUATION OF HERITAGE ASSET

APPLICANTS FOR DEVELOPMENT ON, OR ADJACENT TO, SITES OF KNOWN ARCHAEOLOGICAL INTEREST OR SITES BELIEVED TO POSSESS POTENTIAL ARCHAEOLOGICAL SIGNIFICANCE, WILL BE REQUIRED TO SUBMIT THE RESULTS OF AN ARCHAEOLOGICAL FIELD EVALUATION PRIOR TO DETERMINATION OF ANY APPLICATION FOR DEVELOPMENT.

HD3 PRESERVATION OF HERITAGE ASSET

(I) WHERE THE COUNCIL CONSIDERS THAT ARCHAEOLOGICAL SITES OR MONUMENTS OF LOCAL IMPORTANCE AND THEIR SETTINGS ARE LIKELY TO BE AFFECTED BY DEVELOPMENT, PHYSICAL PRESERVATION IN SITU WILL BE THE PREFERRED OPTION. THE DECISION WHETHER TO PRESERVE IN SITU WILL BE MADE ON THE BASIS OF THE INTRINSIC IMPORTANCE OF THE REMAINS AND.

THE POSSIBILITY OF PRESERVATION IN SITU THROUGH THE CAREFUL DESIGN, LAYOUT AND SITING OF NEW DEVELOPMENT. WHERE PRESERVATION IN SITU IS NOT MERITED, PLANNING PERMISSION MAY BE SUBJECT TO CONDITIONS AND/OR A LEGAL AGREEMENT REQUIRING THAT PROVISION BE MADE FOR THE INVESTIGATION AND RECORDING OF THE REMAINS AND PUBLICATION OF A REPORT OF FINDINGS PRIOR TO COMMENCEMENT OF THE DEVELOPMENT.

(II) THE COUNCIL WILL:

(A) SEEK TO SECURE THE APPROPRIATE MANAGEMENT AND PRESENTATION OF ARCHAEOLOGICAL SITES AND THEIR SETTINGS AS PART OF THE GRANT OF PLANNING PERMISSION FOR DEVELOPMENT;

(B) ENSURE DESIGNS FOR DEVELOPMENT IN THE VICINITY OF ARCHAEOLOGICAL REMAINS ARE SYMPATHETIC TO THE SETTING OF THE REMAINS; AND REQUIRE THE DEVELOPER TO ALLOW OBSERVATION OF GROUNDWORKS

(WHERE THE COUNCIL CONSIDERS THAT PHYSICAL PRESERVATION OF ARCHAEOLOGICAL REMAINS IN SITU IS NOT MERITED, TAKING INTO ACCOUNT THE IMPORTANCE OF THE REMAINS AND OTHER MATERIAL CONSIDERATIONS, PLANNING PERMISSION MAY BE SUBJECT TO CONDITIONS AND/OR AGREEMENTS REQUIRING THE DEVELOPER TO SECURE APPROPRIATE PROVISIONS FOR THE INVESTIGATION AND RECORDING OF THE ARCHAEOLOGICAL REMAINS AND THE PUBLICATION OF THE RESULTS. WHERE APPROPRIATE, THE COUNCIL WILL SEEK TO SECURE THE ENHANCED MANAGEMENT AND PRESENTATION OF ARCHAEOLOGICAL SITES AND THEIR SETTINGS.)

(III) ADDITIONALLY THE COUNCIL WILL:

(A) SEEK TO SECURE THE ENHANCEMENT, MANAGEMENT AND PRESENTATION OF ARCHAEOLOGICAL SITES AND THEIR SETTINGS AS PART OF THE GRANT OF A PLANNING PERMISSION FOR DEVELOPMENT;

(B) ENSURE DESIGNS FOR DEVELOPMENT IN THE VICINITY OF ARCHAEOLOGICAL REMAINS ARE SYMPATHETIC TO THE SETTING OF REMAINS; AND

(C) REQUIRE THE DEVELOPER TO ALLOW OBSERVATION OF GROUND WORKS.

2.14 The emerging Broxbourne Local Plan 2018-2033 was submitted for independent examination in March 2018, with a view to supersede the Local Plan 2005. The following policy is included in the Local Plan 2018-2033, relating to the historic environment:

POLICY HA1: GENERAL STRATEGY FOR THE HISTORIC ENVIRONMENT

I. THE COUNCIL WILL SEEK TO ENSURE THAT DEVELOPMENT NOT ONLY AVOIDS HARM, BUT ALSO IMPROVES THE SETTING OF BROXBOURNE'S HISTORIC ENVIRONMENT, AND BETTER REVEALS THE SIGNIFICANCE OF HERITAGE ASSETS.

II. TO ACHIEVE THIS, THE COUNCIL WILL:

- **CARRY OUT A BOROUGH-WIDE CHARACTERISATION STUDY;**
- **INVESTIGATE THE USE OF ARTICLE 4 DIRECTIONS IN CONSERVATION AREAS;**
- **IMPROVE SIGNAGE RELATING TO HERITAGE ASSETS, AND**
- **SEEK TO INCREASE PUBLIC ACCESS TO THE HISTORIC ENVIRONMENT AND HERITAGE ASSETS WHERE-EVER POSSIBLE.**

2.15 In terms of relevant designated heritage assets, as defined above and as shown on Figure 2, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

2.16 In terms of relevant local designations, a small part of the north-eastern corner of the study site lies within an Area of Archaeological Interest, as defined by Broxbourne Borough Council, focussed on the remains of a Second World War anti-aircraft gun emplacement (Fig. 2).

2.17 In line with existing national, strategic and local planning policy and guidance, this desk based assessment seeks to clarify the sites archaeological potential and the need or otherwise for additional mitigation measures.

3.0 GEOLOGY AND TOPOGRAPHY

3.1 Geology

3.1.1 According to the British Geological Survey website (accessed 21 May 2018), the underlying bedrock geology at the study site is mapped as London Clay Formation – Clay, Silt and Sand – having formed approximately 48 to 56 million years ago in the Palaeogene Period.

3.1.2 Superficial drift deposits of Enfield Silt Member – Clay and Silt – are mapped over the majority of the study site, having formed up to 2 million years ago in the Quaternary Period. Kempton Park Gravel Member – Sand and Gravel – is mapped over the south-east corner of the site, also having formed in the Quaternary Period.

3.1.3 Site specific geotechnical information is provided by a single borehole recorded at the southern boundary of the study site. This recorded 3.35m of silty/sandy clay and gravel, overlying 1.25m of clayey sandy gravel, which in turn overlaid 1.5m of silty/sandy clay and gravel (BGS, 2018).

3.2 Topography

3.2.1 The site lays largely level at c. 31m aOD (above Ordnance Datum), with a slight slope towards the eastern boundary, at c. 29m aOD. A shallow depression lies at the centre of the site, slightly sloping towards the eastern boundary.

3.2.2 No water courses or standing bodies of water are known to be present on the study site. However, the western boundary is formed by the New River and part of the southern boundary is formed by a drain. The banks of the New River stand higher than the adjacent level of the study site (Plate 2).

3.2.3 The study site lays c. 1.8km west of the River Lea Navigation.

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND, INCLUDING AN ASSESSMENT OF SIGNIFICANCE

Timescales used in this report:

Prehistoric		
Palaeolithic	900,000 -	10,000 BC
Mesolithic	10,000 -	4,000 BC
Neolithic	4,000 -	1,800 BC
Bronze Age	1,800 -	800 BC
Iron Age	800 -	AD 43

Historic		
Roman	AD 43 -	410
Anglo-Saxon/Early Medieval	410 -	1066
Medieval	1066 -	1485
Post-medieval	1486 -	1799
Modern	1800 -	Present

4.1 Introduction

4.1.1 What follows is a consideration of find spots within a 1.25km radius, hereafter referred to as the "study area", held on the Hertfordshire Historic Environment Record (HER), together with a map regression exercise charting the history of the site from the 16th century until the present day.

4.1.2 In terms of relevant designated heritage assets, as defined above in Section 2 and as shown on Figure 2, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

4.1.3 In terms of relevant local designations, a small part of the study site lies within an Area of Archaeological Interest, as defined by Broxbourne Borough Council, focussed on the remains of a Second World War anti-aircraft gun emplacement (Fig. 2).

4.1.4 In general, the HER entries within the study area are characterised by post-medieval development, with a particular focus within Theobalds Park and Theobalds Palace. There is also a background of Roman and medieval occupation to the north and south of the study site, albeit more limited in extent than the post-medieval evidence.

4.1.5 The map sequence, together with a review of documentary sources, demonstrates that the study site remained undeveloped and in use as agricultural land, with a period of inclusion in the royal Theobalds Park, throughout its recorded history and into the present.

4.1.6 This chapter reviews the available archaeological evidence for the site and the archaeological/historical background of the general area, and, in accordance with NPPF, considers the potential for any as yet to be discovered archaeological evidence on the site.

4.1.7 Chapter 5 subsequently considers the site conditions and whether the proposed development will impact the theoretical archaeological potential identified below.

4.2 Early Prehistoric: Palaeolithic and Mesolithic

4.2.1 The Palaeolithic period represents the period of human activity leading up to the end of the last Ice Age, and the emergence of anatomically modern human beings. Little is known about the lifestyles and activities of these people, as the only survivable direct evidence comes from the stone tools that have been recovered, often relocated from their original deposition locations by erosion and water movement, and from rare skeletal fragments and faunal remains.

4.2.2 Several flint handaxes, flakes, a rough scraper and a cleaver, attributed to the Palaeolithic period, were discovered in a gravel pit c. 1km north from the study site, sometime before 1892 (HER Ref. 2090).

4.2.3 A further flake was encountered c. 450m north-west from the study site at Pengelly Pit, presumably another gravel or sand pit (HER Ref. 2077).

4.2.4 The location of the study site, on the gravel terraces of the River Lea, in addition to the recovery of relevant artefacts from nearby gravel sequences, present a moderate theoretical potential for encountering further Palaeolithic remains, if gravel is encountered during the development.

4.2.5 The study site is located on the edge of the River Lea floodplain, which, aside from providing freshwater, would have provided valuable faunal and floral resources for early prehistoric communities. On this basis there is a low potential for the discovery of the occasional stray Mesolithic flint artefact that has been lost or deliberately discarded, however, these are likely to be of local interest only.

4.2.6 Numerous flint artefacts have been discovered within the ploughsoil of a field c. 750m south from the study site, including several of Mesolithic date (HER Ref. 30982).

4.2.7 Further Mesolithic findspots have been recorded at Turnford, north-west of the study area on the west banks of the River Lea (Thompson & Hunns, 2003). This suggests that Mesolithic activity may have been more concentrated on the banks and marshes of the Lea, beyond the vicinity of the study site.

4.2.8 Predicting the presence or absence of early prehistoric remains is a difficult and problematic process. Accordingly, in view of the suitable geological horizon and relevant findspots recorded in the HER, the theoretical potential for encountering further occasional Palaeolithic evidence at the site can be considered moderate. The potential for Mesolithic evidence can be considered as low.

4.3 Later Prehistoric: Neolithic, Bronze Age and Iron Age

4.3.1 From around 4000 BC, the mobile hunter-gathering economy of the Mesolithic gradually gave way to a more settled agriculture-based subsistence. The pace of woodland clearance to create arable and pasture-based agricultural land varied regionally and locally, depending on a wide variety of climatic, topographic, social and other factors. The trend was one of a slow, but gradually increasing, pace of forest clearance.

4.3.2 The only evidence of the Neolithic period within the study area are a number of scattered flint tools recovered from ploughsoil c. 750m south from the study site (HER Ref. 30982).

4.3.3 Two Neolithic axes are recorded slightly beyond the study area, north from the study site (Thompson & Hunns, 2003).

4.3.4 Two foci of Late Bronze Age settlement have been recorded within the study area. An archaeological evaluation c. 900m south from the study site encountered 16 ditches and more amorphous features, and a four-post structure with isolated pits. These represent a possible small farmstead, with associated field systems and stock enclosures (HER Ref. 12839).

4.3.5 The second possible area of settlement, situated c. 600m west from the study site and dated to the Late Bronze Age or Early Iron Age, revealed two pits containing several

sherds of pottery. Further residual sherds were recovered from nearby later features (HER Ref. 18280).

4.3.6 Further Bronze Age settlement has been documented at Turnford, c. 3km north-east from the study site, and a leaf-shaped sword at Rammey Marsh Lock, c. 2.8km south-east (Thompson & Hunns, 2003).

4.3.7 By the 1st millennium, i.e. 1000 BC, the landscape was probably a mix of extensive tracts of open farmland, punctuated by earthwork burial and ceremonial monuments from distant generations, with settlements, ritual areas and prominent, enclosed locations reflecting an increasingly hierarchical society.

4.3.8 The Iron Age presence within the study area, aside from the potential pottery sherds aforementioned, is comprised solely of the findspot of a single coin, c. 300m north from the study site (HER Ref. 22935).

4.3.9 Evidence of Iron Age settlement has been recorded at Turnford (Thompson & Hunns, 2003), c. 3km north-east from the study site.

4.3.10 Contrary to the apparent lack of evidence for the Iron Age in the study area and in the environs of Cheshunt, the several Roman farmsteads recorded within the area are believed to have Late Iron Age origins (*Ibid*).

4.3.11 As with the earlier prehistoric periods, the Lea floodplain and the subsequent development of marsh land would have produced rich faunal and floral supplements to the standard diet at the time. It is also probable that the marsh edge meadows would have been utilised as grazing meadows during the later prehistoric period. Such agrarian activities would have left slight ephemeral traces on the landscape including the occasional chance find accidentally lost or deliberately discarded. Archaeological assets of this type, if present, would be of local significance. Evidence also indicates that the river edges were favoured for settlement during the later prehistoric periods.

4.3.12 The study site's distance from the river, and the paucity of relevant remains within the HER for the study area, suggest a low potential for evidence of the Neolithic and Iron Age being encountered at the study site.

4.3.13 However, in view of the nearby evidence of Bronze Age settlement, the spatial relationship between these two sites and the study site, the limited historical impact on the site, and the absence of archaeological investigation into the site's immediate

environs, there is a low to moderate, theoretical potential of encountering further Bronze Age remains at the study site.

4.4 **Roman**

4.4.1 Ware, c. 13km north from the study site, is recorded as a nucleated Roman settlement, with archaeological evidence in support of this interpretation. This settlement developed as a convenient resting-place along Ermine Street, connecting London and York, passing within c. 400m west from the study site (HER Ref. 9271).

4.4.2 The root of the Old English placename for Cheshunt, *ceaster funta*, has been interpreted to originate in the Latin *castra fontis*, meaning "an edifice associated with water", such as a spring, font, or fountain (Thompson & Hunns, 2003).

4.4.3 Three Roman amphora handles (HER Ref. 2965) and a coin from the reign of Constantine (307-337 AD; HER Ref. 2957) were encountered c. 550m north-west and c. 450m south-west from the study site, respectively, alongside Ermine Street. A 2nd century lead ingot was discovered near to the coin findspot (Thompson & Hunns, 2003).

4.4.4 An additional coin findspot has been recorded c. 150m south from the study site (PAS, 2018).

4.4.5 A small number of abraded Roman pottery sherds were recovered c. 750m south from the study site, likely resulting from manuring (HER Ref. 6265).

4.4.6 An almost complete Roman *mortarium* was discovered c. 1.1km north-east from the study site (HER Ref. 2968).

4.4.7 Further Roman pottery sherds were encountered c. 400m south-east from the study site, alongside medieval pottery in later contexts (HER Ref. 17187).

4.4.8 A 4th century hoard is documented as being discovered in 1904 "in the neighbourhood of Cheshunt" (Thompson & Hunns, 2003).

4.4.9 The most substantial evidence of Roman settlement within the study area was recorded c. 600m south-east from the study site, comprising two boundary ditches containing small amounts of 1st-2nd century AD pottery sherds (HER Ref. 9636). Theses ditches may have formed the parallel sides of an enclosure.

4.4.10 A co-axial route, running east-west to a conjectured crossing over the River Lea, is believed to intersect Ermine Street to the north-west of Churchgate, c. 920m north-west from the study site. Although no Roman remains are included in the HER in the immediate vicinity of this location, crossroads present a well-supported theoretical location for settlement during this period, with associated farmsteads occupying the hinterland.

4.4.11 Beyond the information provided by the HER, Cheshunt is documented as a Roman roadside settlement, possibly relating to either the crossroads identified above, the crossing of the Lea, or both (Thompson & Hunns, 2003). An area of settlement is suggested alongside Ermine Street, c. 2.6km north from the study site, stretching northwards.

4.4.12 The available evidence does not suggest an area of Roman settlement within the study site or its immediate vicinity. Its proximity to Ermine Street presents a potential for stray findspots, however, the overall potential for encountering archaeological evidence of the Roman period can be considered as low.

4.5 **Anglo-Saxon and Medieval**

4.5.1 The Anglo-Saxon, or early medieval, period is sparsely represented within the study area.

4.5.2 A findspot of a Saxon spearhead is recorded c. 800m north-west from the study site (HER Ref. 304), and an iron scramasax in Rammey Marsh, c. 2.8km south-east (Thompson & Hunns, 2003).

4.5.3 A site of occupation in the late Saxon and early Norman period (10th-12th centuries) was encountered c. 800m south from the study site, comprising postholes representative of a longhouse or hall, intercutting pits, ditches, and a clamp kiln (HER Ref. 16278). Field boundaries and artefacts within suggested occupation into the 13th century (HER Ref. 12840).

4.5.4 An earthwork known as “Above and Below Bank”, running through Theobalds Park and barely distinguishable in 1912, is believed to have once formed the boundary between Mercia and Essex (Page, 1912).

4.5.5 Cheshunt had developed as a large manorial estate by the time of the 1086 Domesday Survey, the moated manor situated c. 750m north from the study site (HER Ref.

6049; 11842). Medieval features and evidence, c. 150m west from the manor site, were likely contemporary (HER Ref. 12618).

4.5.6 The early 15th century Church of St Mary in Churchgate, c. 750m north from the study site, further suggests the core of the medieval settlement (HER Ref. 315). A priest is documented in Cheshunt in the Domesday Survey, suggesting a church from at least this time (Thompson & Hunns, 2003). The Survey also records ten merchants in residence, suggesting the importance of Cheshunt on an early medieval trade route (Page, 1912).

4.5.7 A further medieval moated site, Half Mote Manor, is recorded c. 900m north from the study site (HER Ref. 80; Scheduled Monument 1012163). The findspot of an iron and silver dagger is associated with this site (HER Ref. 1124).

4.5.8 Additional moated sites are recorded c. 900m east from the study site (HER Ref. 11843) and c. 800m south (HER Ref. 2959). Fieldwalking c. 220m west of the later site produced a quantity of medieval pottery sherds (HER Ref. 6266).

4.5.9 A medieval pit, containing locally-produced pottery sherds dated to 1150-1250, was recorded c. 300m west from the study site (HER Ref. 11970). Two further pits containing 13th-14th century pottery sherds were recorded c. 600m west from the study site (HER Ref. 18281).

4.5.10 The findspot of a medieval coin is recorded c. 150m south from the study site (PAS, 2018).

4.5.11 The enclosure date of the deer park Cheshunt Park, north from the study site, is unknown, however, it is not recorded before 1339 (Thompson & Hunns, 2003; Fig. 3).

4.5.12 The available evidence indicates that the study site lay within roughly equal distance of four medieval manors, suggesting that the site itself belonged to one or several of these during the medieval period. Little evidence has been encountered within the immediate vicinity of the site. Consequently, the archaeological potential for settlement evidence dating to these periods can be considered as low, although the potential for evidence of land division may be regarded as low to moderate.

4.6 Post-medieval and Modern

4.6.1 Evidence of the post-medieval period within the study area largely focusses on the construction of the New River (HER Ref. 5999) and Theobalds Park (HER Ref. 2961).

4.6.2 The manor at Theobalds, first mentioned in 1441 (Page, 1912) was purchased by Sir William Cecil in 1564, close to the highway from London, who also acquired several neighbouring estates (Thompson & Hunns, 2003), and visited occasionally by Elizabeth I. Saxton's map of 1579 (Fig. 3) places the study site between Theobalds (labelled contemporarily as *Theball*) and Cheshunt (*Chesthunt*). Cheshunt Park, an enclosed deer park, is depicted to the north.

4.6.3 Theobalds was exchanged in 1607, to come under the ownership of James I. The 9-mile brick wall surrounding Theobalds Park remains in small sections to the north-east and north-west of the study site, demonstrating that the study site itself fell entirely within the eastern limits of the park (HER Ref. 4274; 4275). The central manor house was greatly expanded, to become Theobalds Palace (List Entry No. 1005250).

4.6.4 In 1608-1613, the New River was constructed, bringing water from a spring, situated between Hertford and Ware, to London. An old course of the New River is recorded as crossing part of the northern boundary of the study site (HER Ref. 31529), representing one of several loops in the river which were removed in 1852 (Thompson & Hunns, 2003).

4.6.5 During the Commonwealth in the mid-17th century, royal estates, including Theobalds, were seized and dismantled. The palace was partially pulled down, the perimeter wall quarried for building material, and much of the timber of the park cut down for naval shipbuilding. The land is also described as being parcelled out for agricultural use (Thompson & Hunns, 2003). The result of this redistribution can be seen in Dury & Andrew's 1766 Map of Hertfordshire (Fig. 4), depicting the study site and surrounding landscape as large, enclosed fields, with occasional wealthy estates scattered throughout. Although the ruins at Theobalds were partially rebuilt in the 18th century into four houses making up Theobalds Square (HER Ref. 15632), small parts of the earlier palace remain in situ (HER Ref. 89, 9618, 15631, 16869). The study site at this time likely belonged to a Mr Beanton.

4.6.6 Cheshunt and its immediate environs did not experience the same degree of economic growth during the 18th century, as compared to other Hertfordshire settlements near to the London-Cambridge coaching route. Rather, the neighbourhood became

inhabited by wealthy Londoners, benefiting from the parcelled out remains of Theobalds Park.

4.6.7 An example of the reuse of the Theobalds estate is given by the establishment of the large farmstead Theobalds Park Farm and Temple House (HER Ref. 10051, 10245, 11554, 18496, 18497), situated c. 600m south and south-west from the study site, during the 17th or 18th century. A later 18th century plan of the study site places the site across several, relatively small, enclosed fields. The surrounding landscape is likewise arranged (Fig. 5).

4.6.8 The 1801 census recorded the population of Cheshunt, including Waltham Cross, at 3,173, inhabiting 587 houses (Thompson & Hunns, 2003). An early 19th century map shows a much reduced Theobalds to the south-west of the study site. The site itself remains agricultural land and a former subsidiary course of the New River is shown to the immediate north (Fig. 6).

4.6.9 The 1842 Cheshunt Parish Tithe Map and accompanying apportionments list document the use of the fields comprising the study site as a mixture of arable and meadow land (Fig. 7).

4.6.10 The modern expansion of Cheshunt took place largely form the 1880s, with the growth of the nursery gardening industry (Thompson & Hunns, 2003).

4.6.11 The railway links from London arrived at Cheshunt in 1840 and at Theobalds Grove in 1891, the latter having developed as a commuter suburb (HER Ref. 5547).

4.6.12 The 1897-1899 Ordnance Survey (Fig. 8) demonstrates the assimilation of the former smaller plots of land comprising the study site into one large central plot, and a smaller plot each to the north and south of this. The presence of a footbridge over the New River suggests the establishment of the footpath remaining to the present, currently dividing the smaller southern part of the study site from the larger northern part.

4.6.13 Cedars Park was formed in the 20th century from the remnants of Theobalds Park and the ornamental gardens of the later Theobalds Square, from which only one house remains: The Cedars (HER Ref. 15725).

4.6.14 During the first quarter of the 20th century, small-scale gravel extraction had taken place slightly to the east of the study site (HER Ref. 31110), indicating the presence of

Kempton Park Gravel Member relatively close to the surface in this location. A large part of Cedars Park had also been given over to nursery farming, possibly during the intensification of farming and production during the First World War (Fig. 9). The study site itself remained in use as agricultural land.

4.6.15 The location of a Second World War heavy anti-aircraft gun emplacement, to the immediate west of Albury Farm, has resulted in the designation of the surrounding area as an Area of Archaeological Interest, by Broxbourne Borough Council (HER Ref. 10096). The emplacement lies on the northern boundary of the study site, and is characterised by the concrete remains immediately surrounding the gun itself, with the remaining outworks having been demolished.

4.6.16 The 1944 crash site of an American Liberator bomber is recorded within the study site's boundaries (HER Ref. 30406).

4.6.17 The study site has remained in use as agricultural land throughout the 20th and 21st centuries (Figs. 9-13, Plates 1-3). A visit on 10th May 2018 noted the site as lying fallow.

4.6.18 A track is present running east-west across the north part of the study site between 1972 and 2006, relating to an earlier field boundary (Figs. 10 & 11).

4.6.19 A small collection of temporary structures are present in a 2006 aerial photograph, situated in the south-western corner of the study site (Fig. 12). These have been removed by 2010, although a similar collection is present slightly to the north in the 2011 LiDAR plot (Fig. 14).

4.6.20 Documentary and cartographic evidence demonstrates that the study site lay within agricultural land, comprising pasture and arable land, for much of its recorded history. The exception to this was the c. 45 year period when it formed a small part of the royal estate of Theobalds Park. Accordingly, the potential for encountering significant archaeological evidence from the post-medieval and modern periods at the study site can be considered low, and any evidence is likely to comprise boundary ditches and other agricultural activity and be of local significance only.

4.7 Undated

4.7.1 The HER records cropmarks c. 900m south from the study site, possibly relating to the nearby medieval manor or 16th century ornamental gardens of Theobalds Park (HER Ref. 10052).

4.7.2 Additional undated cropmarks are evident across the study site in the 2011 LiDAR plot (Fig. 14), relating closely to 18th and 19th century field boundaries (Figs. 5-7).

4.8 Assessment of Significance

4.8.1 Paragraph 128 of the NPPF states that planning decisions should be based on the significance of the heritage asset, and that the level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal on the significance of that asset.

4.8.2 In terms of relevant designated heritage assets, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

4.8.3 In terms of relevant local designations, a small part of the north-eastern corner of the study site lies within an Area of Archaeological Interest (AAI), as defined by Broxbourne Borough Council for the recorded remains of a Second World War gun emplacement (Fig. 2). Related remains are unlikely to survive in the study site, as a result of agricultural activity.

4.8.4 Based on the available evidence, the study site can be considered to have a low potential for archaeological evidence dating from the Mesolithic, Neolithic, Iron Age, Roman, medieval and post-medieval periods, and a low to moderate theoretical potential for evidence of Palaeolithic and Bronze Age activity. Any such remains are likely to be of local significance only, unless encountered in substantial quantities or exemplary quality.

5.0 SITE CONDITIONS, THE PROPOSED DEVELOPMENT AND IMPACT ON ARCHAEOLOGICAL ASSETS

5.1 Site Conditions

5.1.1 The study site comprises c. 17.7ha, across two fields: a larger, northern field and a smaller, southern field (Fig. 1, Plates 1 & 3). The two fields are divided by a wide public footpath/cycle track.

5.1.2 A visit on 10th May 2018 noted that the site lay fallow.

5.2 Proposed development

5.2.1 Definitive redevelopment proposals were not available at the time of writing, however, these are likely to include converting the site into commercial or industrial use. The proposed development plan (Fig. 15) was subject to change at the time of writing, and is illustrative only.

5.3 Impact on Archaeological Assets

5.3.1 The proposed development boundary would not impact any designated archaeological or heritage assets.

5.3.2 In terms of relevant local designations, a small part of the north-eastern corner of the study site lies within an Area of Archaeological Interest (AAI), as defined by Broxbourne Borough Council for the recorded remains of a Second World War gun emplacement (Fig. 2).

5.3.3 Broxbourne Borough Council's Local Plan 2005 (Policy HD2) requires archaeological evaluation prior to the granting of planning permission when an AAI is present on or adjacent to an application site. However, due to the low perceived overall archaeological potential at the site, and low probability of the presence of remains relating to the relevant AAI being encountered, the proposed development is unlikely to have a significant archaeological impact.

5.3.4 The proposed development has the potential to have a negative impact on as yet unknown below ground archaeological remains.

5.3.5 Overall, the potential for encountering archaeological evidence at the study site can be considered as low for all periods of past human activity. A low to moderate theoretical potential has been identified for evidence of Palaeolithic and Bronze Age activity.

6.0 SUMMARY AND CONCLUSIONS

6.1 Land at Maxwells Farm West, Broxbourne, in Hertfordshire has been considered for its below ground archaeological potential.

6.2 In terms of relevant designated heritage assets, no World Heritage sites, Scheduled Monuments, Historic Battlefield or Historic Wreck sites are identified within the study site or its immediate vicinity.

6.3 In terms of relevant local designations, a small part of the north-eastern corner of the study site lies within an Area of Archaeological Interest (AAI), as defined by Broxbourne Borough Council for the recorded remains of a Second World War gun emplacement.

6.4 Based on the available evidence, the study site is considered to have a low potential for archaeological evidence dating from the Mesolithic, Neolithic, Iron Age, Roman, medieval and post-medieval periods, and a low to moderate theoretical potential for evidence of Palaeolithic and Bronze Age activity.

6.5 Past post-depositional impacts, in the form of agricultural activities, can be considered to have had a widespread, moderate impact on any below ground archaeological remains.

6.6 Redevelopment proposals were not available at the time of writing, however, these are likely to include converting the site into commercial or industrial use (Fig. 15).

6.7 In view of the identified archaeological potential and past post-depositional impacts, the development can be considered unlikely to have a widespread, negative impact on any identified below ground archaeological evidence.

6.8 The Broxbourne Borough Council's Local Plan 2005 (Policy HD2) requires the results of Archaeological Evaluation to be submitted with any planning application on sites of known archaeological interest, or sites likely to possess, or be adjacent to archaeological interest.

6.9 However, due to the nature of the adjacent AAI (WWII Gun Emplacement) and the low perceived archaeological potential and significance of likely archaeological remains at the site, it is considered that in this instance archaeological evaluation could follow the granting of consent secured by a suitable worded planning condition.

SOURCES CONSULTED

1. **General**

British Library
Hertfordshire Archives and Local Studies
Hertfordshire Historic Environment Record
Portable Antiquities Database

2. **Internet**

http://archaeologydataservice.ac.uk/
http://bombsight.org/bombs
http://www.britainfromabove.org.uk/
http://www.british-history.ac.uk/
https://finds.org.uk/database/
https://www.historicengland.org.uk/listing/the-list
http://planningguidance.planningportal.gov.uk
http://discovery.nationalarchives.gov.uk

3. **Bibliographic**

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Historic England. July 2015b. Historic Environment Good Practice Advice in Planning: 2 Managing Significance in Decision-Taking in the Historic Environment. Unpublished document.

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Margary, I. D. 1955. *Roman Roads in Britain*. London: Phoenix House.

Mills, A. D. 2011. A Dictionary of British Place Names. Oxford: Oxford University Press.

Page, W. (ed.). 1912. 'Parishes: Cheshunt', in *A History of the County of Hertfordshire: Volume 3*. London: Victoria County History.

Thompson, I. & Hunns, T. 2003. Cheshunt: Extensive Urban Survey Project Assessment Report. Unpublished report.

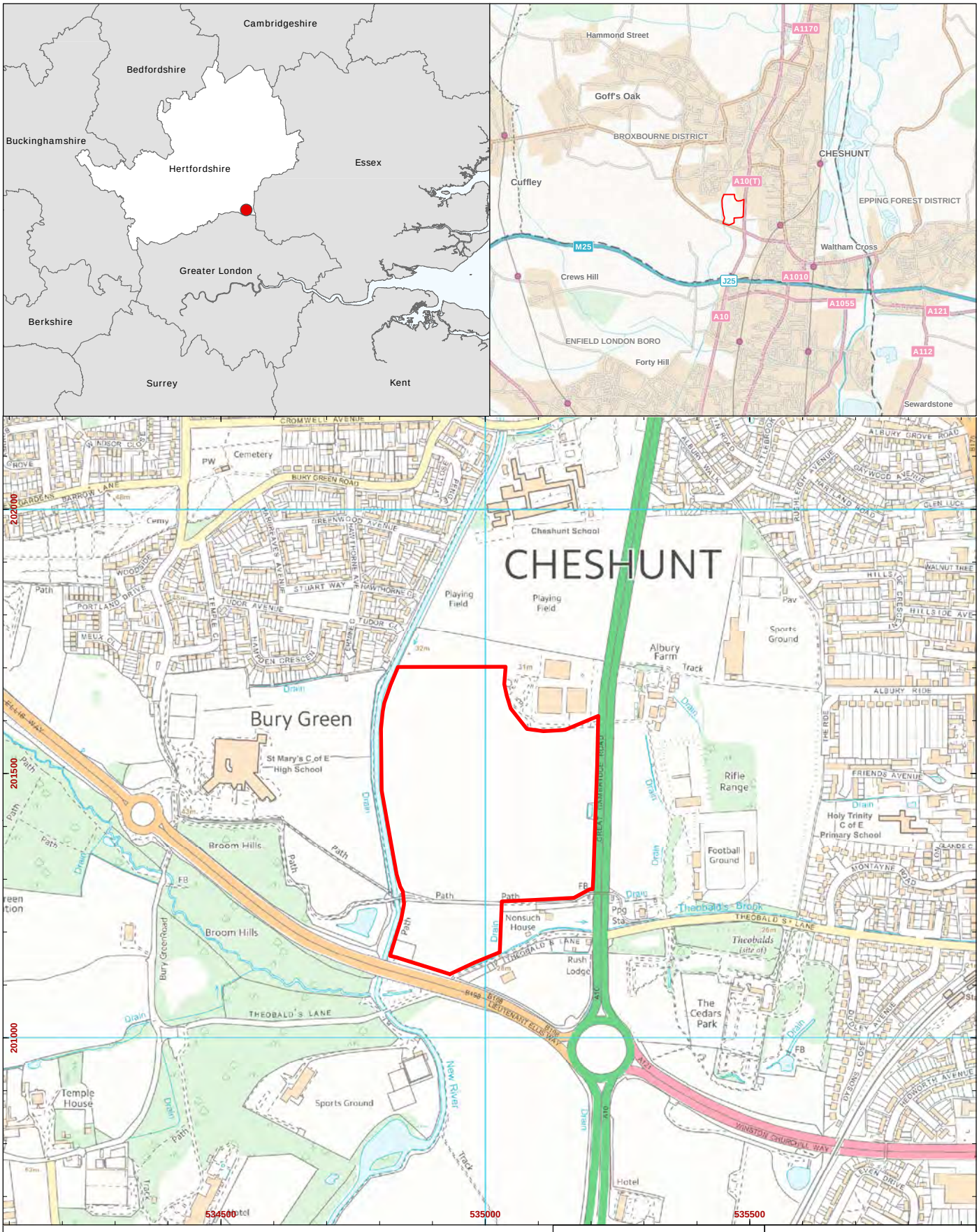
4. **Cartographic**

1579 Saxton
1766 Dury and Andrew
1785 Unknown author
1807 Crawter (original)
1842 Cheshunt Parish Tithe Map

1897-1899 Ordnance Survey
1920-1921 Ordnance Survey
1972 Ordnance Survey

5. **Aerial Photographs**

2000 Aerial Image (Google Earth)
2006 Aerial Image (Google Earth)
2017 Aerial Image (Google Earth)



Site Boundary

N

Scale at A4: 1:10,000

0 250m

CgMs HERITAGE PART OF RPS

Figure 1:
Site Location

CgMs HERITAGE PART OF RPS

Site Boundary

Search Radius 1.25km

Designated Assets:

Scheduled Monument

Listed Building

Conservation Area

Non-Designated Assets:

Alert Area

Area of Archaeological Interest

HER Record (Point)

PAS Find Spot

Find Spot

Monument

Landscape

Building

HER Record (Line)

Monument

HER Record (Polygon)

Monument

Building

Previous Archaeological Work:

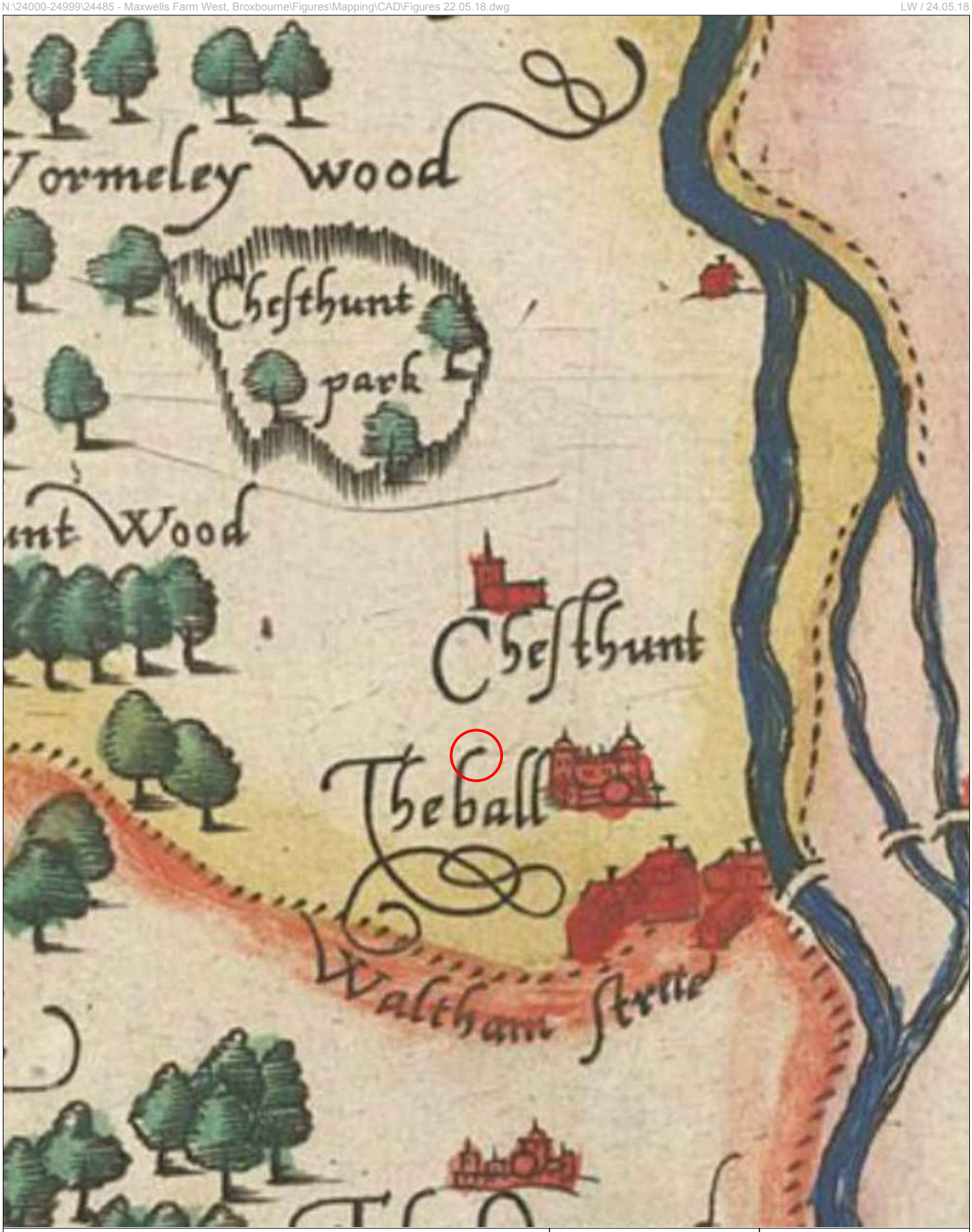
HER Event (Point)

N

Scale at A3: 1:10,000

0 300 m

Figure 2: Hertfordshire HER Plot



Approximate Site Location

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 3:
1579 Saxton's
Hartfordiae Comitatus

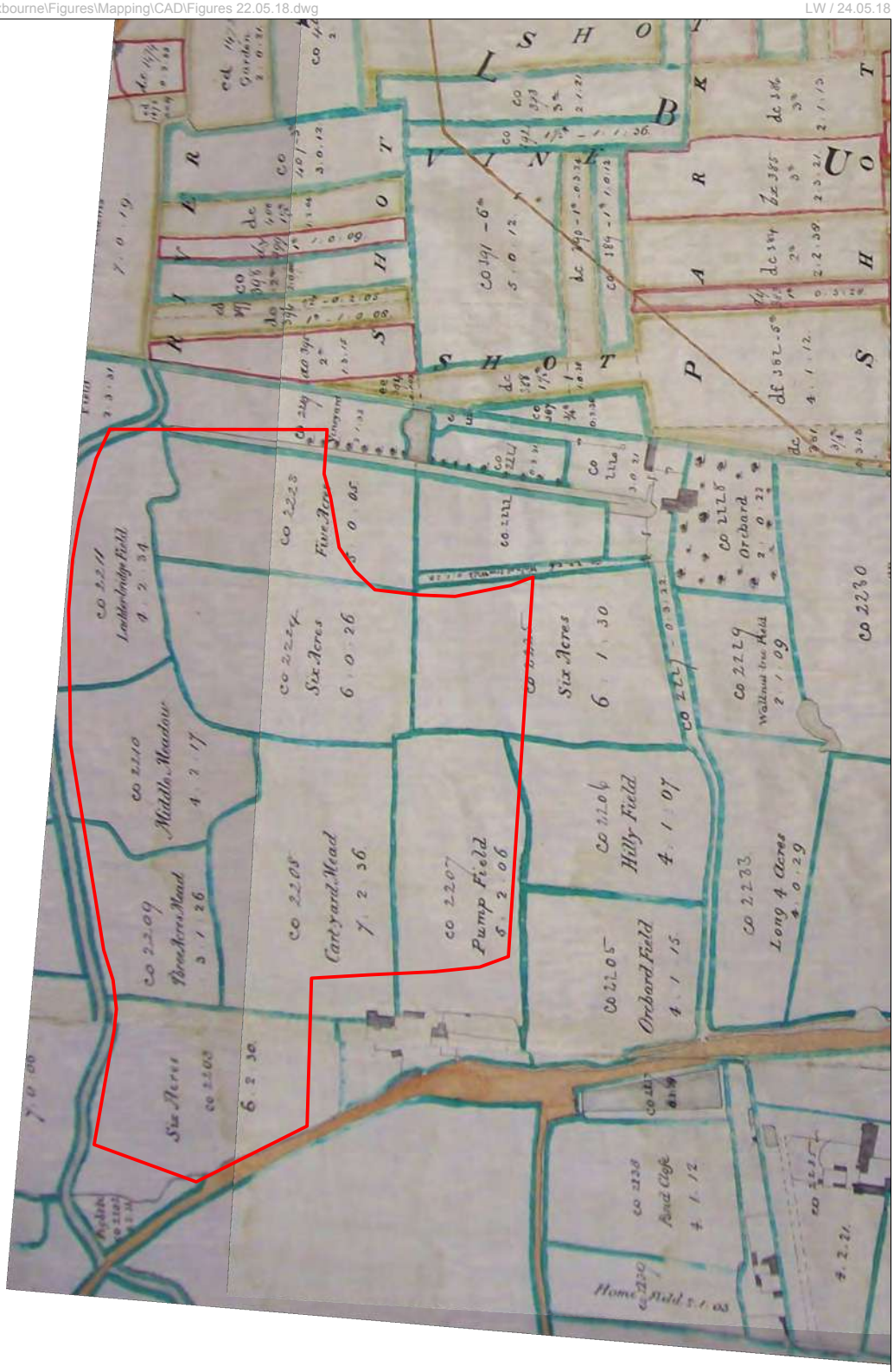
Approximate Site Location

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 4:
1766 Dury and Andrew's
Map of Hertfordshire



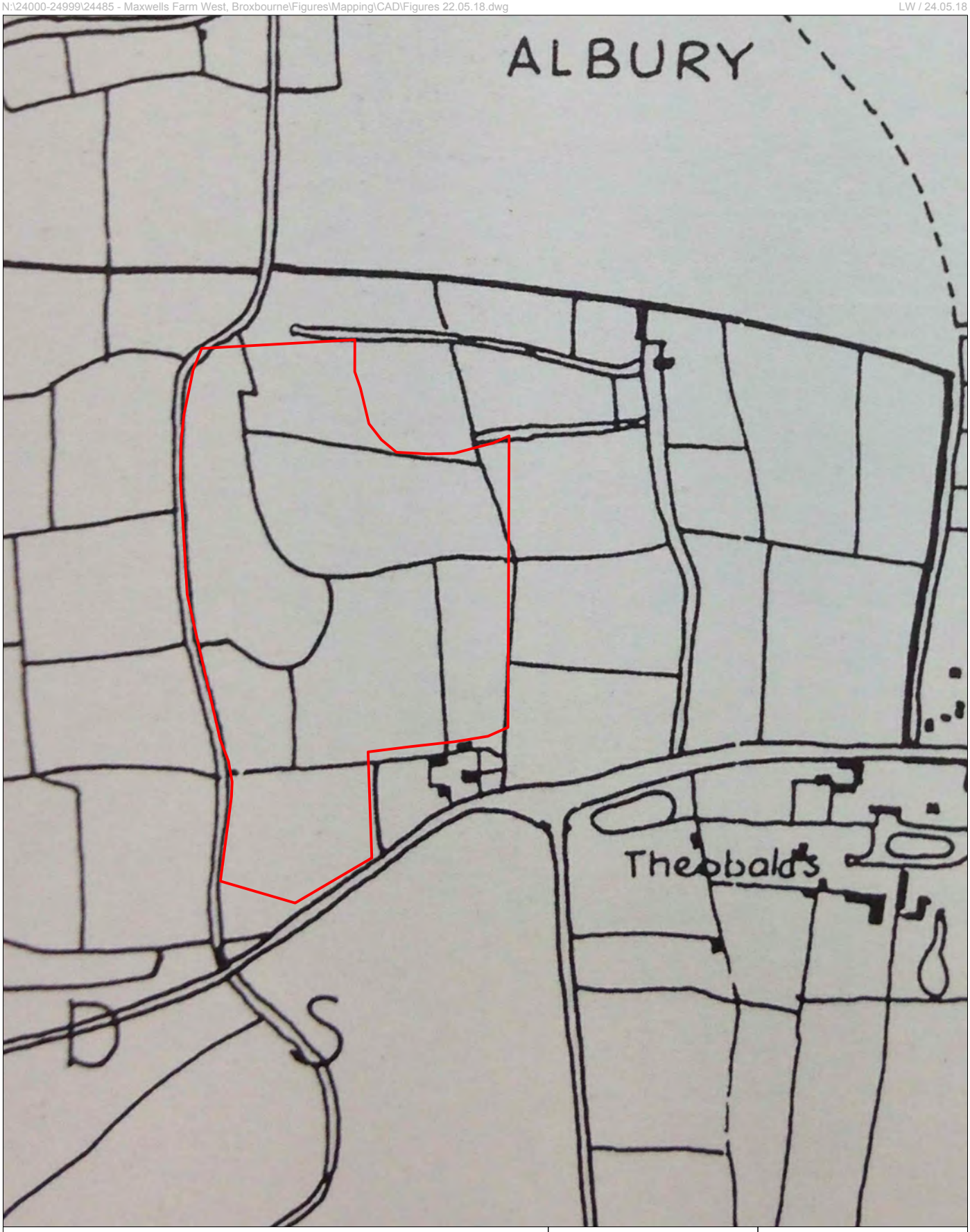
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 5:
1785 Plan of the Liberty and Manor of Cheshunt



Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
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Figure 6:
1807 Cheshunt, based on original by Crawter

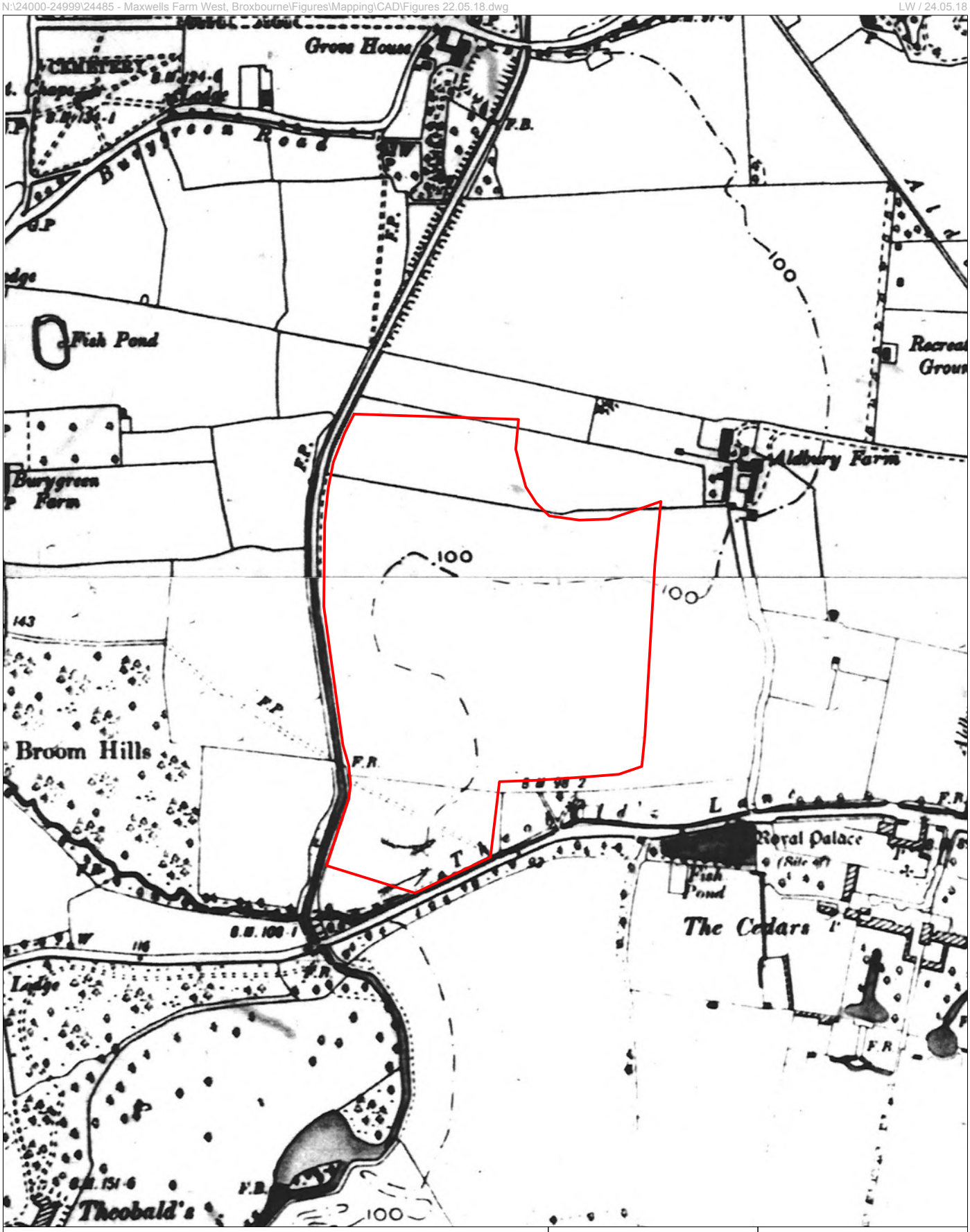
Site Boundary

N

CgMs HERITAGE
PART OF RPS

Not to Scale:
Illustrative Only

Figure 7:
1842 Cheshunt
Parish Tithe Map



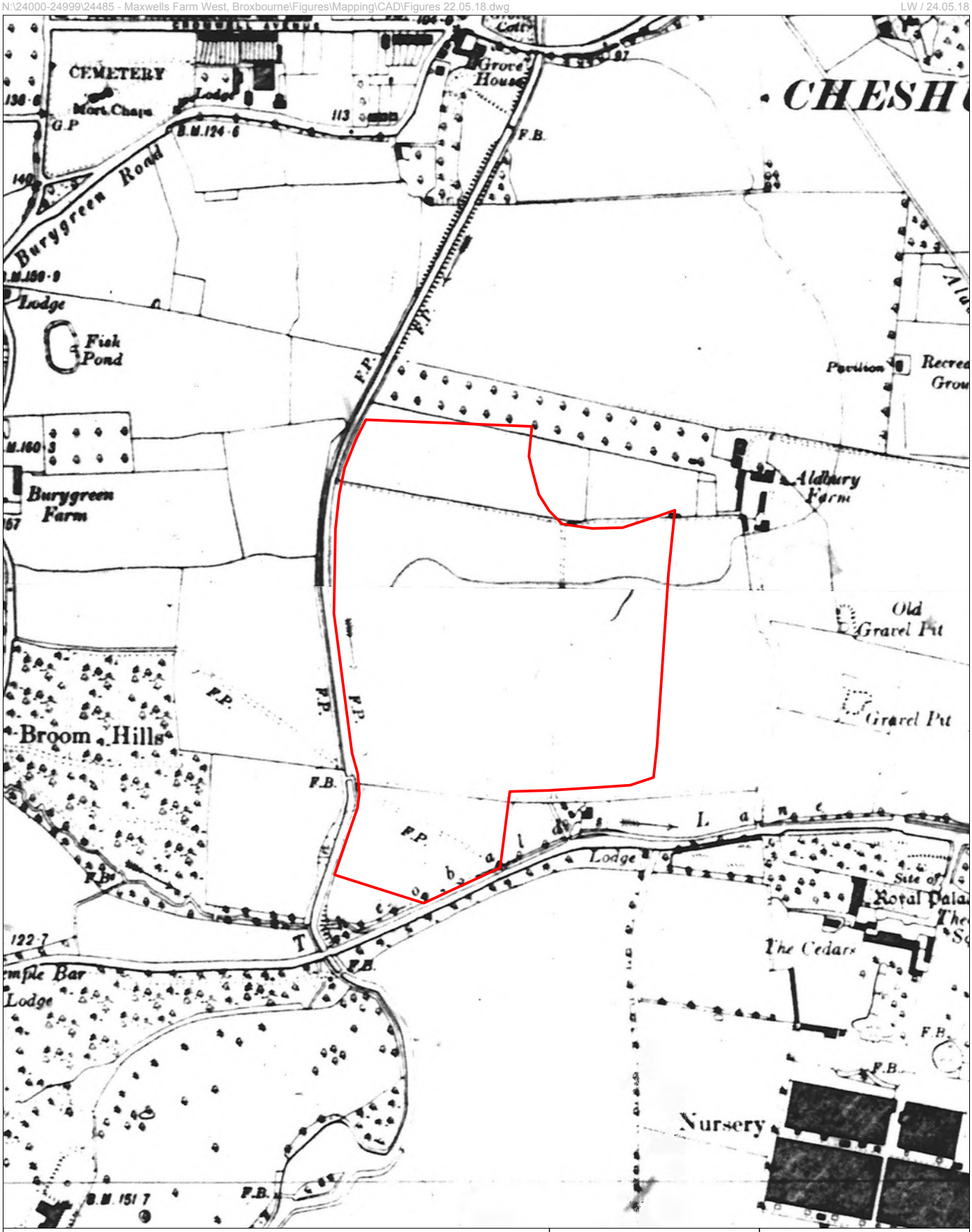
Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
PART OF RPS

Figure 8:
1897-1899
Ordnance Survey



Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
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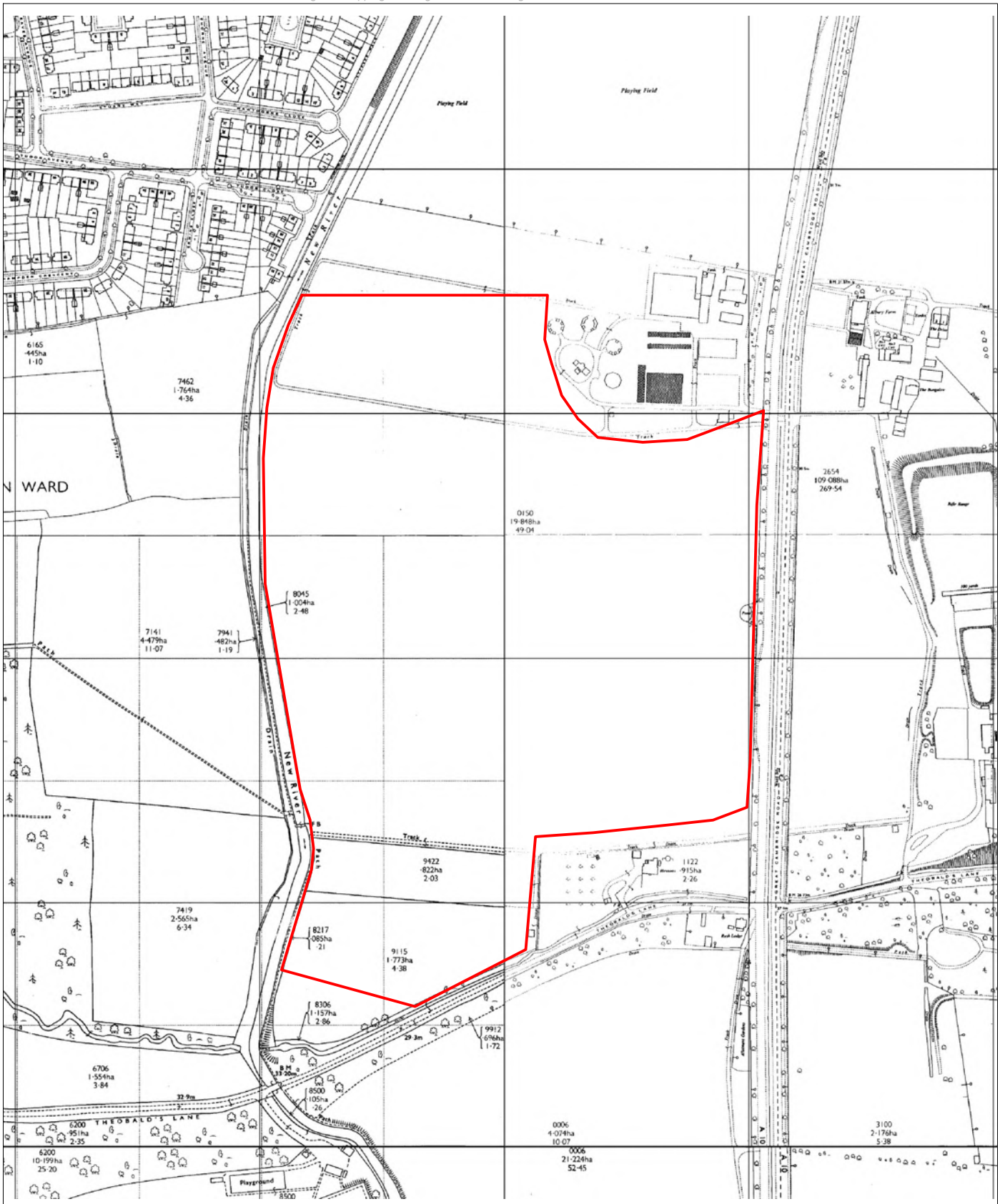
Figure 9:
1920-1921
Ordnance Survey



Site Boundary

N

Not to Scale:
Illustrative Only

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Figure 10:
1972
Ordnance Survey

Site Boundary

N

CgMs HERITAGE
PART OF RPS

Not to Scale:
Illustrative Only

Figure 11:
2000 Aerial Image

Site Boundary

N

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PART OF RPS

Not to Scale:
Illustrative Only

Figure 12:
2006 Aerial Image

Site Boundary

N

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PART OF RPS

Not to Scale:
Illustrative Only

Figure 13:
2017 Aerial Image

CgMs HERITAGE PART OF RPS

Site Boundary

LiDAR DATA

Source:
Environment Agency

Data Type: DSM

Resolution: 50cm

Date Captured:
11/03/2011

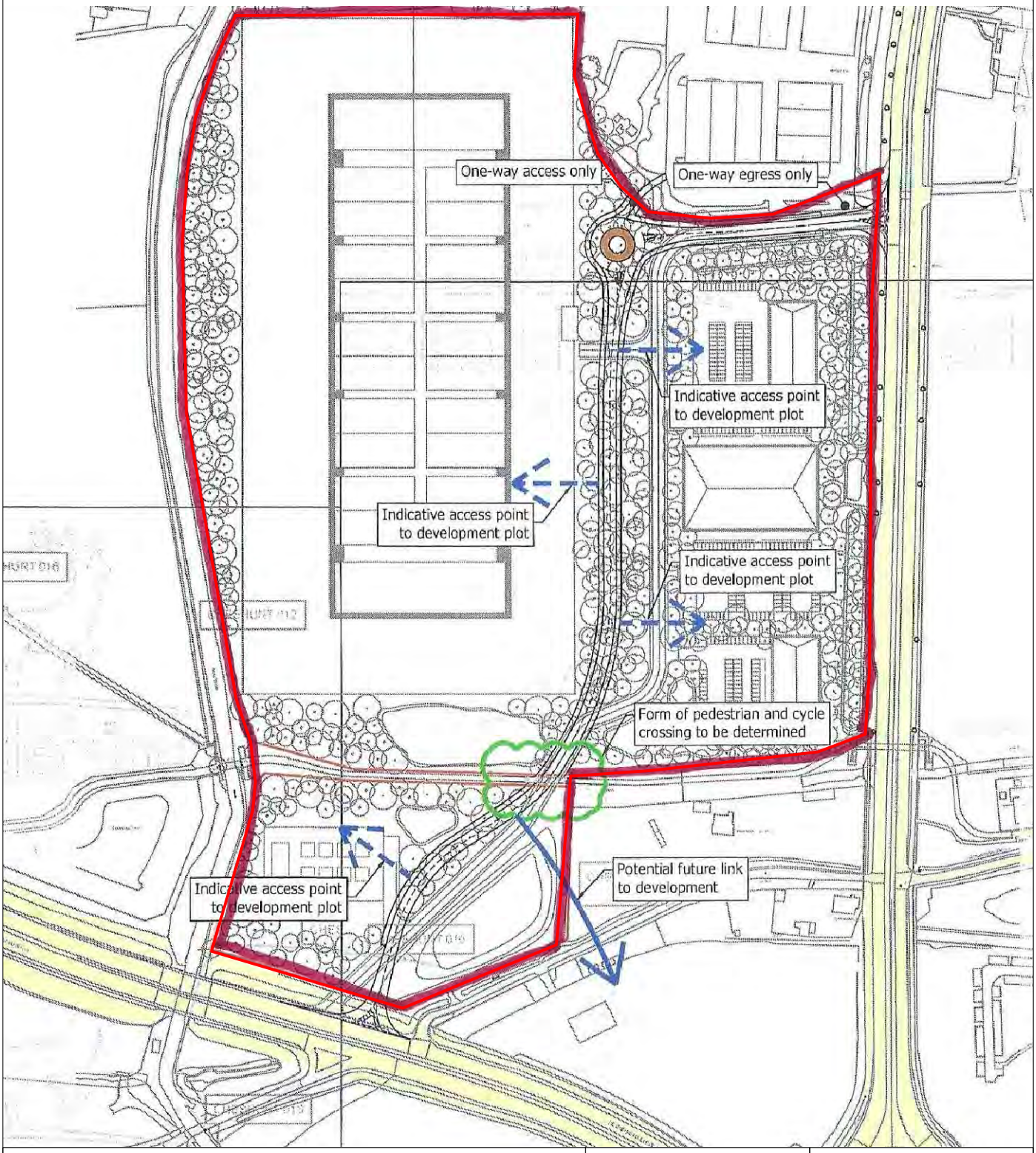
Direction
of Illumination

N

Scale at A3: 1:4,000

0 100m

Figure 14:
LiDAR Plot



Site Boundary

N

Not to Scale:
Illustrative Only

CgMs HERITAGE
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Figure 15:
Proposed Development

Plate 1: View of site, from South-west facing North-east

Plate 2: View of western boundary of site with the New River, from South-west

Plate 3: View of southern part of site, from North-west facing South-east

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APPENDIX 3: PHASE 1 PRELIMINARY RISK ASSESSMENT

MAXWELLS FARM WEST
BROXBOURNE, HERTFORDSHIRE

PHASE 1 PRELIMINARY RISK ASSESSMENT

FOR

STX – A10 LTD

July 2018

Our Ref: HLEI61767/001R

RPS
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Report Status:	Draft	
Project Reference:	HLEI61767	
	Name:	**Signature:**
Report Author:	Liz Holland	
Technical Reviewer:	Jim Lightbown	
Date:	July 2018	

CONTENTS

EXECUTIVE SUMMARY

RPS Consulting Services Ltd (RPS) was commissioned by STX – A10 Ltd to undertake a Phase 1 Preliminary Risk Assessment for Maxwells Farm West, Broxbourne, Hertfordshire. The report has been commissioned to support an outline planning application for the proposed redevelopment of the site to comprise a data centre.

Site History

Historical mapping indicates that the site has historically comprised rural land.

Two plant nurseries were located within 20m of the site from at least 1873 to c.1914. Given the time elapsed, these are not considered to represent potentially significant sources of contaminants of concern. A number of additional historical potentially contaminative land uses have been identified, however, given that they were located over 100m from the site, they are not considered to represent a potential risk to the site. Four recorded licensed or known historical inert landfill sites are indicated to be present within 500m of the site. The nearest of these is located approximately 100m to the east of the subject site.

On Site and Surrounding Land Use

At the time of the walkover, the site comprised undeveloped, former agricultural land. Given that the site has not previously been developed, it is considered unlikely that a significant thickness of Made Ground will be present beneath the site.

Current surrounding land uses include Maxwells West industrial estate/business park located adjacent to the northeast of the site.

Environmental Setting

The site is located within a predominantly rural area.

The majority of the site is indicated to be underlain by an Unproductive Stratum relating to the Enfield Silt Member, although this stratum is indicated to be absent in the southeast of the site. This stratum is indicated to be underlain by the Kempton Park Gravel Member (classified as Secondary A Aquifer). The site is not indicated to be located within a groundwater Source Protection Zone (SPZ).

A pond is indicated to be present in the east of the site. Theobalds Brook and a land drain are indicated to be present along part of the southern boundary of the site. The New River runs adjacent to the west of the site, however, at the time of the site walkover the water level within the canalised New River was observed to be higher than the surrounding area, suggesting that any groundwater beneath the site is unlikely to be in hydraulic continuity with the river.

Outline Conceptual Site Model

An outline conceptual site model (CSM) has been derived on the basis of the desktop study and site reconnaissance. Based on current redevelopment plans, the proposed surface cover at the site will comprise building cover, hardstanding and areas of soft landscaping. In areas of the site covered by buildings or hardstanding the risks to future on site human health receptors via the pathways of dermal contact and ingestion will be mitigated. However, in areas of soft landscaping these pathways could still be active. Furthermore, there would be the potential for the airborne off-site migration of soil/dust from these areas. There is the potential for ground gas and volatile contaminants of concern in soil and/or groundwater (if present) beneath the site to impact future site users via the inhalation pathway in indoor areas. However, it should be noted that no potentially significant sources of contaminants of concern have been identified on site.

Groundwater within granular horizons of the Made Ground (if present) may constitute a potential pathway for the on or off-site migration of contaminants of concern. The geological conditions beneath the site may restrict the lateral and/or vertical migration of any contaminants of concern (if present).

Potential contaminants of concern associated with current land uses in the vicinity of the site also have the potential to migrate onto site via groundwater. However, given the likely absence of Made Ground beneath the site and the limited permeability of the Enfield Silt Member (comprising clay and silt), any lateral migration of shallow groundwater is likely to be confined to the Kempton Park Gravel Member.

Given the presence of landfill sites within the vicinity of the subject site, there is the potential for ground gases to migrate onto site and impact future site users via the inhalation pathway in indoor areas.

Recommendations

The outline CSM produced upon completion of the desk study assessment has identified a limited number of potential pollutant linkages that may be active upon the redevelopment of the site, mainly associated with the historical landfills in the vicinity of the site. The Local Authority has previously identified this as a potential issue for investigation/mitigation on an adjacent site and will therefore likely require assessment of this as part of any future redevelopment of the site. A geotechnical investigation is likely to be required to provide information on ground conditions and data for the assessment of geotechnical properties of strata underlying the site prior to redevelopment. It would be considered prudent to include limited environmental sampling of soil, groundwater and ground gas as part of the investigation to confirm the presence or otherwise of any potential pollutant linkages.

RPS has been advised by the client that a feature adjacent to the northeast of the site comprises an unused World War 2 gun emplacement. Despite it being understood to be unused, it is recommended that an unexploded ordnance (UXO) desk based study be completed in advance of any future intrusive ground works. UXO mitigation measures may be required, dependent on findings of the desk study.

1 INTRODUCTION

1.1 Preamble

RPS Consulting Services Ltd (RPS) was commissioned by *STX – A10 Ltd* to undertake a Phase 1 Preliminary Risk Assessment for land at Maxwells Farm West, Broxbourne, Hertfordshire. The report has been commissioned to support an outline planning application for the proposed redevelopment of the site to comprise a data centre. A site location plan is provided as Figure 1.

1.2 Scope of Work

The scope of works for this assessment was as follows:

- To undertake a site inspection;
- To review the historical land uses to assess the potential for ground contamination;
- To review the environmental setting to assess the sensitivity of the surrounding area to contamination/pollution;
- Produce an outline Conceptual Site Model (CSM) detailing potential pollutant linkages associated with the redevelopment of the site; and
- Recommendations for any further assessment, where considered necessary.

1.3 Legislation and Guidance

This report has been produced in general accordance with:

- *Contaminated Land (England) Regulations 2006 (as amended);*
- *DEFRA Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance (2012);*
- DEFRA and Environment Agency (2004) Contaminated Land Report 11 (CLR 11): *Model Procedures for the Management of Land Contamination;*
- *National Planning Policy Framework (2012)*; and
- British Standard requirements for the *'Investigation of potentially contaminated sites - Code of practice' (ref. BS10175:2011+A1:2013)*.

Where appropriate, consideration has also been given to the following:

- The potential for environmental liabilities to occur under other associated regimes, for example the *Water Resources Act (1991)* and the *Environmental Damage Regulations (2009)*; and

- Key constraints on site redevelopment.

Details of the limitations of this type of assessment are described in Appendix A.

2 SITE RECONNAISSANCE AND DESK STUDY

2.1 Site Reconnaissance

This section of the report is based upon observations made during a site visit carried out on 25th June 2018. A site boundary plan is shown as Figure 2. Selected photos are shown in Appendix B.

General view of the site. For further photos see Appendix B.

2.1.1 The Site

Table 1 – Summary of Site Reconnaissance

Section	Description
Background:	The site is located approximately 900m to the southeast of Cheshunt town centre at National Grid Coordinates 535013, 201461. It is irregular in shape and occupies an area of approximately 19.0ha.
Site Layout, Activity / Operations:	At the time of the walkover, the site comprised undeveloped, former agricultural land that had gone to seed. The canalised New River flowed southwards within a raised bluff along the western boundary of the site (see Appendix A, Photo 1). A path/cycleway bisected the southern portion of the site. Secured ramped access/egress from the path/cycleway to the land either side was present adjacent to the New River in the southwest of the site. The eastern boundary of the site was delineated by a maintained hedgerow (with occasional mature trees) along the route of the A10 dual carriageway. The northeastern boundary comprised discontinuous mature conifer hedgerow with mature trees whilst the northern boundary was demarcated by mature unkempt hedgerow. Access to the southern portion of the site either side of the cycle/pathway way prevented by the presence of low wire fencing. The southern boundary of the site was generally formed of

Section	Description
	discontinuous unkempt, mature hedgerow and mature trees.
Building Structure(s):	No buildings or structures were observed on the site at the time of the walkover.
Surface Cover:	The site was predominantly unsurfaced and well vegetated with crops gone to seed, grasses and wildflowers. The path/cycleway bisecting the southern portion of the site was surfaced with tarmacadam.
Surface Water Drainage:	No evidence of any surface water drainage was observed on site at the time of the walkover. Current aerial mapping indicates that a pond feature is present in the east of the site. Due to the density of vegetation cover, this location was inaccessible at the time of the visit. It should be noted that drainage plans for the site were not made available to RPS for review as part of this assessment.
Bulk Storage / Tanks:	No evidence of above or below ground storage tanks were observed during the walkover.
Waste:	No evidence of waste storage or waste disposal was observed during the walkover
Electricity Substations /Transformers:	No electricity substations/transformers were observed during the site visit.
Visual Evidence of Contamination:	No visual evidence of contamination was observed on site during the walkover.
Other Issues:	No Japanese Knotweed or Giant Hogweed (invasive plant species) were readily identified on the site at the time of the survey. *(It should be noted that the identification of such species can be limited by the seasons and in areas of dense vegetation growth).*

2.1.2 The Surrounding Area

The site is located in an area of predominantly rural land use. At the time of the site inspection, neighbouring land consisted of the following:

Table 2 – Neighbouring Land Uses

Direction	Description
North:	Maxwells West industrial estate/business park to the northeast and sports pitches to the northwest.
East:	Great Cambridge Road with agricultural/rural land beyond.
South:	Residential dwellings to the southeast and agricultural/rural land to the southwest.
West:	Agricultural/rural land with residential dwellings to the far northwest.

Maxwells West industrial estate/business park to the northeast was observed during the site walkover to comprise 11 units. These were indicated to be occupied by Pensworth Dairy (Units 1 to 3, in use as a depot), Salvo 1968 Ltd (Units 4 to 6, in use as a depot), Loaded Imports (Unit 7), DAC Wholesale (flooring and artificial grass wholesaler in Unit 8), T.W. Parker Ltd (a timber merchant and moulding manufacturer in Unit 9), The Revival Company (fire and flood restoration company in Unit 10) and Summit Furniture (Unit 11).

Only limited access to the industrial estate/business park could be gained during the site walkover and no significant above or below ground storage of hazardous substance was observed within those areas that could be observed. Limited storage of dry building materials was observed on poor quality

concrete hardstanding at the periphery of the industrial estate, bordering the northeastern boundary of the site (see Appendix A, Photo 2). A series of well-vegetated mounds, up to 5m high in places, were observed in this area along with an approximately 3m high, un-vegetated stockpile of crushed tarmac/rubble (see Appendix A, Photo 3). It is considered likely that these mounds comprise excess material from recent redevelopment of the industrial estate (see Section 2.3.2 below).

2.2 Proposed Development

The proposed development will comprise a data centre with ancillary units, car parking and areas of landscaping. The proposed site plan is provided as Figure 3.

2.3 Site History

2.3.1 Historical Map Review

The following review is based on past editions of readily available Ordnance Survey (OS) maps. These include scales of 1:1,250, 1:2,500 and 1:10,000 dated 1873 to 2014. Extracts from selected historical maps are given as Figures 4 to 7.

Table 3 – Historical Site Uses

On-site Land Use and Features	Dates
The site comprised rural land and trees.	1873 to Present
A footpath was indicated to bisect the southern portion of the site.	1882 to c.1960
An orchard was present in the north of the site.	1912 to c.1960
A well was indicated to be present in the northeast of the site.	1923 to c.1932
Tracks were indicated to cross the north and south of the site.	1967 to c.2010
A small building of unspecified use was indicated to be present in the southeast of the site.	1967 to at least 1992
A pond was indicated to be present in the east of the site. *Then* the pond had been extended. From 1992, the site has resembled its present day layout.	1967 to c.1992 1992 to Present

Table 4 – Historical Neighbouring Site Uses

Surrounding Land Uses (250m radius)	Orientation	Distance	Dates	
			From	To
Nursery	Southeast	Adjacent	1873	c.1914
Four circular features radially centred around a track*	Northeast	Adjacent	1967	c.2010
Nursery	Southeast	20m	1873	c.1896
Tank	West	25m	1898	c.1914
Pumping station	Southeast	80m	2002	Present
Rifle range	East	100m	1967	c.2010
Fish pond *Then* potentially infilled	Southeast	100m	1873 1912	c.1912
Tank	North	115m	1967	
Tramway with associated area of cutting *Then* area indicated to comprise vacant land (potentially infilled)**	East	145m	1935 1960	c.1960
Tanks (associated with Albury Farm)	Northeast	150m	1967	Present

Surrounding Land Uses (250m radius)	Orientation	Distance	Dates	
			From	To
Gravel pit *Then* potentially infilled**	East	220m	1912 1923	c.1923
Old gravel pit *Then* potentially infilled**	East	220m	1912 1935	c.1935

* RPS has been advised that this feature comprises an unused World War 2 gun emplacement.
** These areas correspond to the location of an historical landfill, known as Theobalds Grove. This landfill is discussed further in section 2.5.1.

2.3.2 Site Planning History

No relevant or readily available planning applications for the site were listed on the Borough of Broxbourneôs planning website.

An outline planning application (ref: 07/12/0955/O, dated 11th June 2013) was granted for the construction of two units (B1 and B8 use) on the existing Maxwells West business park, located immediately to the northeast of the site. Condition 14 on the decision notice stated that due to the proximity to a disused landfill site, buildings on the site may have been constructed with a gas protection system. If such gas protection is on the existing development, the construction of this development should therefore be carried out in such a way as to continue the system to the new external walls of the property. The reason was that the site was located within 250m of a disused landfill which may pose a landfill gas migration risk to the site. Further details regarding landfills in the vicinity of the subject site are provided in section 2.5.1.

2.4 Environmental Setting

2.4.1 Geology

Based on British Geological Survey (BGS) mapping (1:50,000-scale) and the Environment Agency (EA) Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are indicated to be as follows:

Table 5 – Descriptions of Geological Strata

Strata	Description & approximate thickness	Aquifer Classification
Enfield Silt Member	Comprises clay and silt. Indicated to be present across the majority of the site, however absent in the southeast of the site. Likely to be several metres in thickness beneath the site.	Unproductive Stratum
Kempton Park Gravel Member	Comprises sand and gravel. Likely to be up to 5m in thickness beneath the site.	Secondary A Aquifer
London Clay Formation	Comprises clay, silt and sand. This stratum is likely to be of substantial thickness (up to approximately 25m) beneath the site.	Unproductive Stratum

Given that the site has not previously been developed, it is considered unlikely that a significant thickness of Made Ground will be present beneath the site. No site investigation reports have been reviewed to verify this.

2.4.2 Hydrogeology

The majority of the site is indicated to be located above an Unproductive Stratum relating to the Enfield Silt Member. These formations have a low permeability and have negligible significance for water supply or base flow. The Enfield Silt Member is indicated to be absent in the southeast of the site.

The underlying Kempton Park Gravel Member is classified as a Secondary A Aquifer. These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers.

The underlying London Clay Formation is also classified as an Unproductive Stratum.

According to EA data, the site is not indicated to be located within a groundwater Source Protection Zone (SPZ). A Zone 2 (outer protection zone) of a groundwater SPZ, is located approximately 45m to the southwest of the site. The outer zone covers pollution that takes up to 400 days to travel to the borehole, or 25% of the total catchment area, whichever area is the biggest. This travel time is the minimum amount of time that pollutants need to be diluted, reduced in strength or delayed by the time they reach the borehole. It is considered likely that the SPZ is associated with a potable groundwater abstraction point located approximately 1.16km to the south of the site.

Groundwater chemical quality beneath the site has not been classified, under the EA's local River Basin Management Plan.

Information provided by the EA indicates that there are no records of any active licensed groundwater abstractions within 1km of the site.

2.4.3 Surface Water

Under the Water Framework Directive, the EA has identified one waterbody within 1km of the site which is classified within the local River Basin Management Plan. A list of nearby watercourses and water bodies is as follows:

Table 6 – Nearby Surface Watercourses

Watercourse / body	Quality Classification	Approx. Distance and Direction from Site
Pond	Not classified	Indicated to be present in the east of the site
Theobalds Brook	Not classified	Along part of the southern boundary of the site
Land drain	Not classified	Along part of the southern boundary of the site (leading off Theobalds Brook)
New River	Chemical quality: Good Ecological quality: Moderate	Adjacent to the west

At the time of the site walkover, the water level within the canalised New River was observed to be higher than the surrounding area. Should the river be in hydraulic continuity with surrounding groundwater then any net groundwater flow is likely to be away from the feature.

Information provided by the EA indicates that there are no records of any active licensed surface water abstractions within 1km of the site.

2.4.4 Fluvial / Tidal Flood Risk

According to the Environment Agency (EA) flood map, a part of the southern boundary of the site is located within Flood Zone 3, with the annual probability of flooding classified as greater than 1 in 100 (1%). The floodplain appears to be associated with Theobalds Brook, which flows along part of the southern boundary of the site. The site does not appear to benefit from flood defences.

2.4.5 Ecologically Sensitive Sites

Natural England data indicates that there are no ecologically sensitive sites that constitute environmental receptors as defined within Table 1 of the DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012), are indicated within a 1km radius of the site.

2.4.6 Radon

According to the Indicative Atlas of Radon in England and Wales published by the Health Protection Agency and the British Geological Survey, the site is located within a low probability radon area as less than 1% of properties are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions.

2.4.7 *Coal Authority*

According to Coal Authority data, the site is not located in an area potentially affected by coal mining activities.

2.5 Authorised Processes and Pollution Incidents

2.5.1 *Landfills and Waste Sites*

Information provided by the EA, Local Authority and BGS indicates that there are four recorded licensed or known historical landfill sites within 500m of the site and one active waste treatment/transfer site recorded within 500m of the site. The details of these are provided in the table below.

Table 7 – Landfill and Waste Treatment/Transfer Sites within 500m of the Site

Licence Details	Waste Type and Details	Approx. Distance & Direction from Site
Landfill Sites		
Theobalds Grove	First recorded: 26th April 1938 Waste types included inert waste Licence holder: Lea Valley Sand and Ballast Pits Ltd	100m East
Theobalds Lane	Licence issued: 21st October 1982 Licence surrendered: 28th October 1985 Waste types included industrial waste	160m South
Park Lane, Waltham Cross	First recorded: 22nd March 1963 Last recorded: 26th August 1971 Waste types included inert, commercial, household and special wastes Licence holder: Hoveringham Gravels Ltd	285m South
Bury Green Farm	First recorded: Unknown Last recorded: Unknown Waste types included industrial waste	440m West
Waste Treatment/Transfer Site		
Cheshunt Football Club	Deposit of waste to land as a recovery operation Operator: L W Developments Ltd	335m East

2.5.2 *Environmental Permits*

EA and Local Authority data indicates that there are no active processes regulated by an Environmental Permit (under the Environmental Permitting Regulations 2010) registered within 500m of the subject site.

2.5.3 COMAH Sites

There are no records of facilities being registered under the Control of Major Accident Hazards (COMAH) Regulations 1999 within 500m of the site.

2.5.4 Pollution Incidents

EA data indicates that there are no records of any ósignificantôor ómajorôpollution incidents to water within 500m of the site.

2.6 Unexploded Ordnance (UXO)

RPS has been advised by the client that a feature adjacent to the northeast of the site comprises an unused World War 2 gun emplacement. Despite it being understood to be unused, it is recommended that a UXO desk based study is undertaken for the site to clarify the risk of encountering UXO beneath the site during intrusive works as part of future site investigation or redevelopment.

2.7 Regulatory Consultations

The Environmental Services Department at the Borough of Broxbourne was contacted regarding any known contamination issues at the site. RPS was advised as followed:

- The Council is currently in the process of assessing the region for the purposes of identifying contaminated land under the provisions of Part 2A of the Environmental Protection Act 1990. At the time of writing (July 2018), neither the subject site, nor any adjacent land has been classified as Contaminated Land under the act. No informal or formal action has been considered against the site or surrounding areas; and
- The Council does not have any specific concerns regarding ground conditions at the site, as historical records indicate that the site has previously always been in use as open farmland.

3 OUTLINE CONCEPTUAL SITE MODEL

3.1 Background

An outline conceptual site model (CSM) consists of an appraisal of the *source-pathway-receptor* 'contaminant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- ***Source*** *referring to the source of contamination.*
- ***Pathway*** *for the contaminant to move/migrate to receptor(s).*
- ***Receptor*** *that could be affected by the contaminant(s).*

Receptors include human beings, other living organisms, crops, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. Further details on the Part 2A regime are presented within Appendix C.

3.2 Potential Pollutant Linkages

Each stage of the potential pollutant linkage sequence has been assessed individually on the basis of information obtained during the site reconnaissance and desk study exercise and is discussed in the following section.

3.2.1 Potential Contaminant Sources

On Site – Historical

Historical mapping indicates that the site has historically comprised rural land. This land use is not considered to represent a potentially significant source of contaminants of concern.

On Site – Current

At the time of the walkover, the site comprised undeveloped, former agricultural land.

It is considered unlikely that a significant thickness of Made Ground will be present beneath the site.

Off-Site – Historical

Historical mapping indicates that two plant nurseries were located within 20m of the site from at least 1873 to c.1914. Given the time elapsed, these are not considered to represent potentially significant sources of contaminants of concern. A tank was located approximately 25m to the west of the site from 1898 to c.1914. Given the time elapsed and its likely use for water storage associated with agricultural actives, this feature is also not considered to represent a potentially significant source of contaminants of concern.

A number of additional historical potentially contaminative land uses have been identified, including a rifle range, potentially infilled fish pond, tanks and potentially infilled gravel pits. However, given that these were located over 100m from the site, they are not considered to represent a potential risk to the site.

Four recorded licensed or known historical inert landfill sites are indicated to be present within 500m of the site. The nearest of these is located approximately 100m to the east of the subject site. It should be noted that an outline planning application was granted for the construction of two units on the business park, located immediately to the northeast of the site. A planning condition stated that due to the proximity to a disused landfill site, buildings on the site may have been constructed with a gas protection system. If such gas protection is on the existing development, the construction of this development should therefore be carried out in such a way as to continue the system to the new external walls of the property. The reason was that the site was located within 250m of a disused landfill which may pose a landfill gas migration risk to the site.

Off-Site – Current

Current surrounding land uses include Maxwells West industrial estate/business park, located adjacent to the northeast of the site. However, no potentially significant contaminative operations were noted from the limited observations that could be made of the industrial estate, at the time of the site visit.

A series of stockpiles - likely to comprise excess material from recent redevelopment of the industrial estate - were observed during the visit, bordering the northeastern boundary of the site. Given that this material is predominantly well-vegetated, it is not considered to represent a potentially significant source for the airborne migration of contaminants of concern (if present) onto the site.

3.2.2 Potential Pathways

It is understood that the proposed surface cover at the site will comprise a mixture of building cover, hardstanding and areas of soft landscaping. In areas of the site covered by buildings or hardstanding the risks to future on site human health receptors via the pathways of dermal contact and ingestion will

be mitigated. However, in areas of soft landscaping, these pathways could still be active. In addition, there would be potential for the airborne migration of soil/dust from these areas.

There is the potential for ground gas and volatile contaminants of concern in soil and/or groundwater (if present) beneath the site to impact future site users via the inhalation pathway in indoor areas.

It should be noted that as discussed in Section 3.2.1 above, no potentially significant sources of contaminants of concern have been identified on site.

Groundwater within granular horizons of the Made Ground (if present) may constitute a potential pathway for the on or off-site migration of contaminants of concern. The Enfield Silt Member (classified as an Unproductive Stratum) may restrict the lateral and/or vertical migration of any contaminants of concern (if present) to the Kempton Park Gravel Member Secondary A Aquifer. Although it is noted that the Enfield Silt Member is indicated to be absent across southeast of the site.

Potential contaminants of concern associated with current land uses in the vicinity of the site also have the potential to migrate onto site via groundwater. However, given the likely absence of Made Ground beneath the site and the limited permeability of the Enfield Silt Member (comprising clay and silt), any lateral migration of shallow groundwater is likely to be confined to the Kempton Park Gravel Member.

Given the presence of landfill sites within the vicinity of the subject site, there is the potential for ground gases to migrate onto site and impact future site users via the inhalation pathway in indoor areas.

3.2.3 Potential Receptors

Potential human health receptors include future site users and off-site users.

Providing construction/maintenance workers adopt appropriate levels of hygiene and personal protection equipment, they are not considered to be at significant risk from potential contaminants of concern and have not been considered further.

The Enfield Silt Member (classified as an Unproductive Stratum) may afford a degree of protection to the underlying Kempton Park Gravel Member. However, the Kempton Park Gravel Member is indicated to be present from ground surface across the southeast of the site.

A pond is indicated to be present in the east of the site. Theobalds Brook and a land drain are indicated to be present along part of the southern boundary of the site. The New River runs adjacent to the west of the site. However, at the time of the site walkover the water level within the canalised

New River was observed to be higher than the surrounding area, suggesting that any groundwater beneath the site is unlikely to be in hydraulic continuity with the river.

3.3 Outline Conceptual Site Model

An outline CSM has been developed on the basis of the site reconnaissance and desk study. The CSM is used to identify potential sources, pathways and receptors (i.e. potential pollutant linkages) on site and is summarised in the table below:

Table 8 – Outline Conceptual Site Model

Potential Source	Contaminants of Concern	*Via*	Potential Pathways	Linkage Potentially Active?	Receptors
On site – historical: N/A **On site – current:** N/A	N/A	Soil	Direct contact/ingestion	×	Future site users
			Inhalation of volatiles	×	
			Airborne migration of soil or dust	×	Off-site users
			Leaching of mobile contaminants	×	Kempton Park Gravel Member Secondary A Aquifer
		Groundwater	Direct contact/ingestion	× ×	Future site users Off-site users
			Inhalation of volatiles	× ×	Future site users Off-site users
			Vertical and lateral migration in permeable strata	× × × × ×	Kempton Park Gravel Member Secondary A Aquifer Pond Theobalds Brook Land drain New River
Off-site – historical: N/A **Off-site – current:** N/A	Metals and hydrocarbons	Groundwater	Direct contact/ingestion	×	Future site users
			Inhalation of volatiles	×	Future site users
On and off-site – Off-site landfills, Made Ground / natural strata or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓ ✓	Future site users Off-site users
			Explosive risks	✓ ✓	Future site users Off-site users

4 CONCLUSIONS AND RECOMMENDATIONS

The outline CSM produced upon completion of the desk study assessment has identified a limited number of potential pollutant linkages that may be active upon the redevelopment of the site, mainly associated with the historical landfills in the vicinity of the site. The Local Authority has previously identified this as a potential issue for investigation/mitigation on an adjacent site and will therefore likely require assessment of this as part of any future redevelopment of the site.

A geotechnical investigation is likely to be required to provide information on ground conditions and data for the assessment of geotechnical properties of strata underlying the site prior to redevelopment. It would be considered prudent to include limited environmental sampling of soil, groundwater and ground gas as part of the investigation to confirm the presence or otherwise of any potential pollutant linkages.

RPS has been advised by the client that a feature adjacent to the northeast of the site comprises an unused World War 2 gun emplacement. Despite it being understood to be unused, it is recommended that a UXO desk based study is undertaken for the site to clarify the risk of encountering UXO beneath the site during intrusive works as part of future site investigation or redevelopment. UXO mitigation measures may be required, dependent on findings of the UXO desk study.

FIGURES

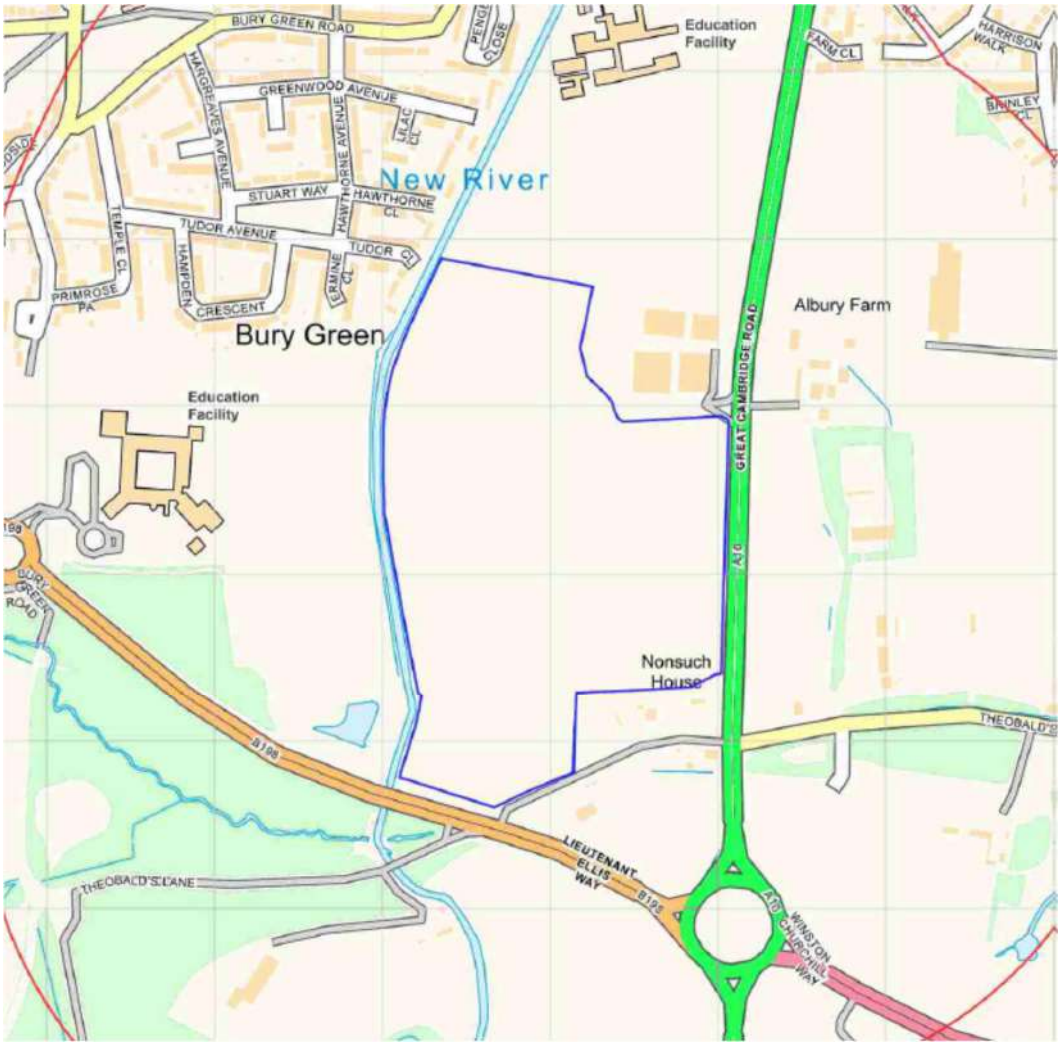

Figure 1: Site Location Plan

Map Date: Current

Scale: Not to scale

RPS
35 New Bridge Street
London
EC4V 6BW

☎ 020-7280-3240
www.rpsgroup.com

Figure 2: Site Boundary Plan

Scale: Not to scale

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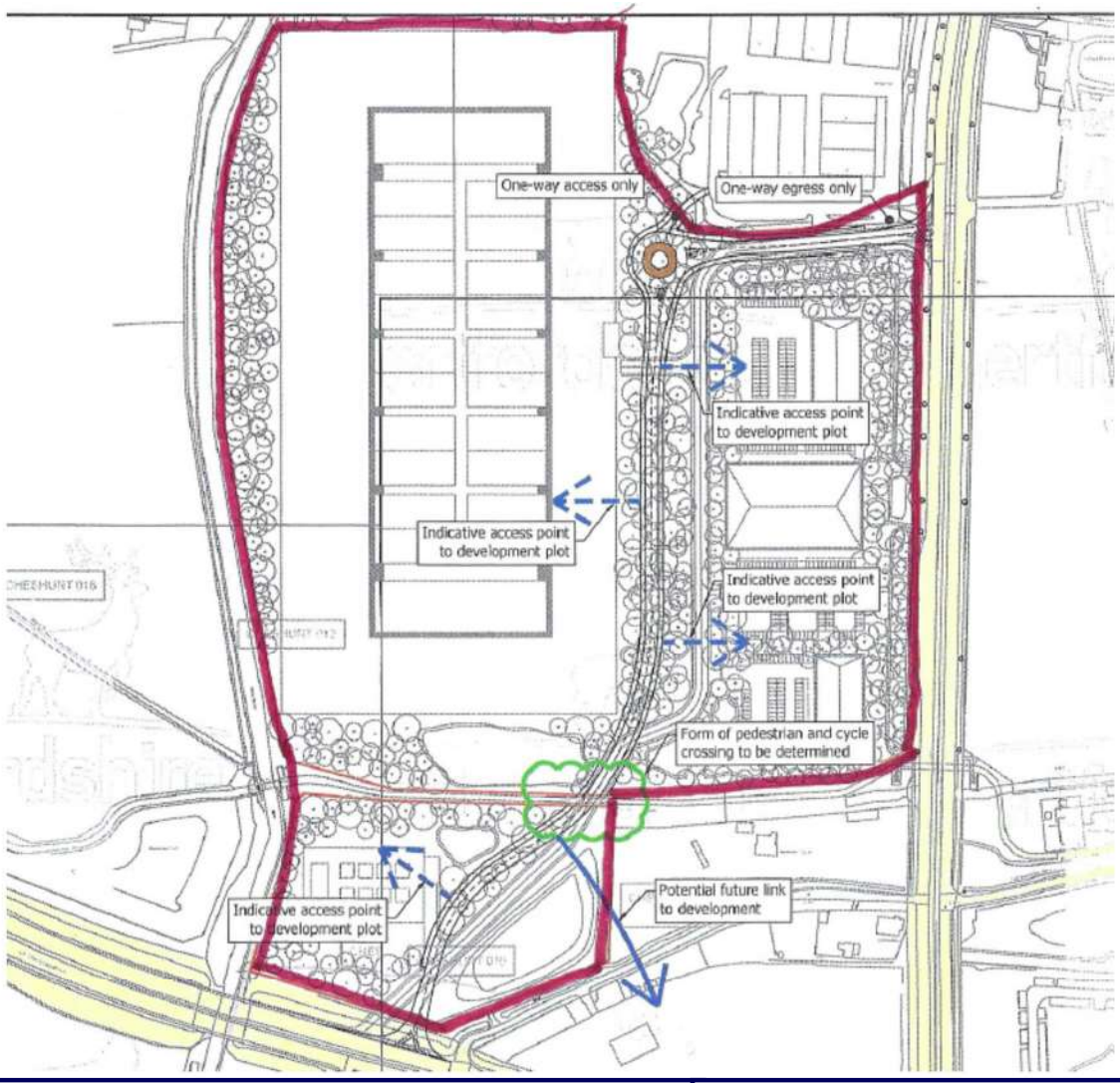

Figure 3: Proposed Development Plan

Scale: Not to scale

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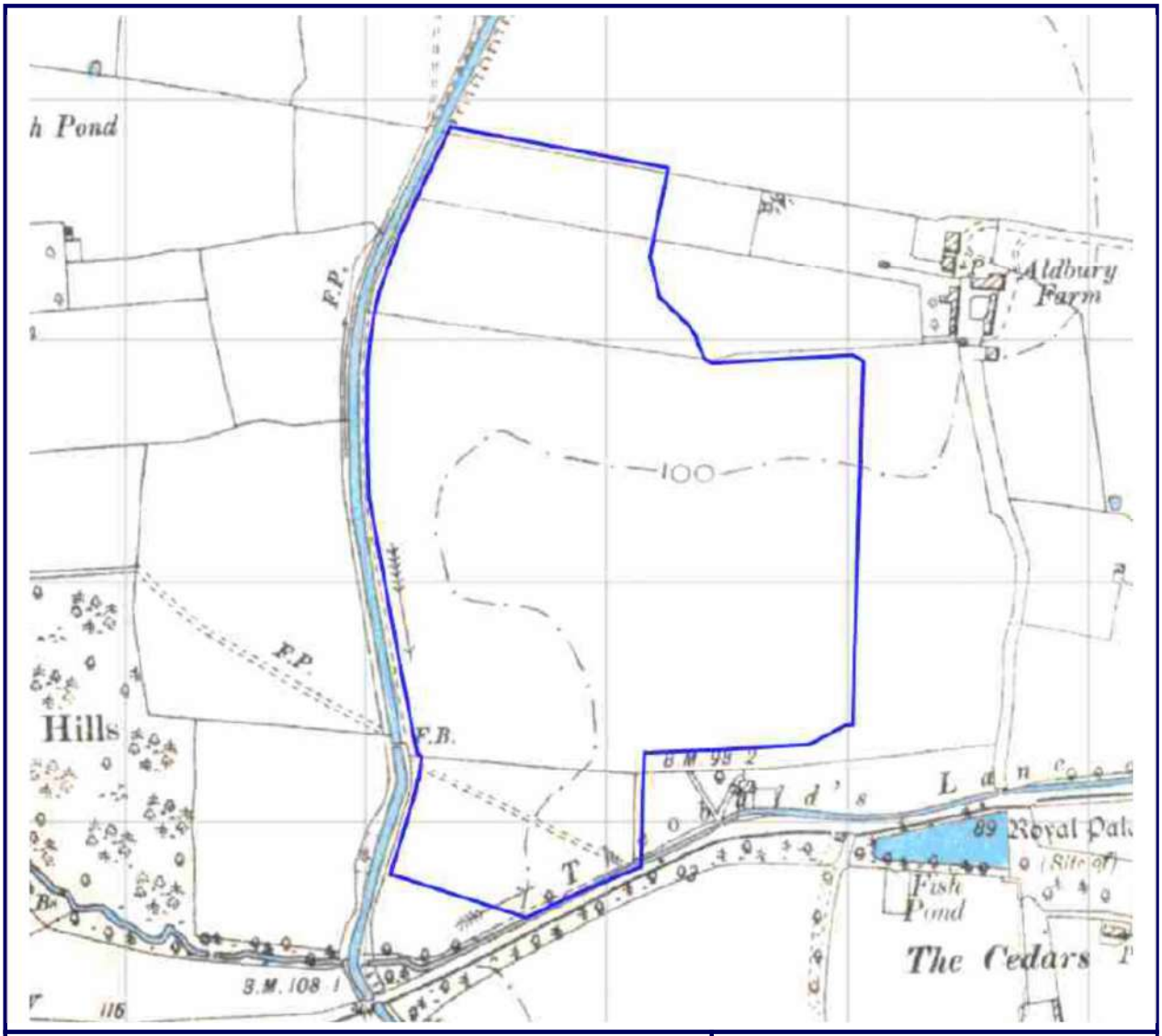

Figure 4: Historical Map Extract

Map Date: 1896

Scale: Not to scale

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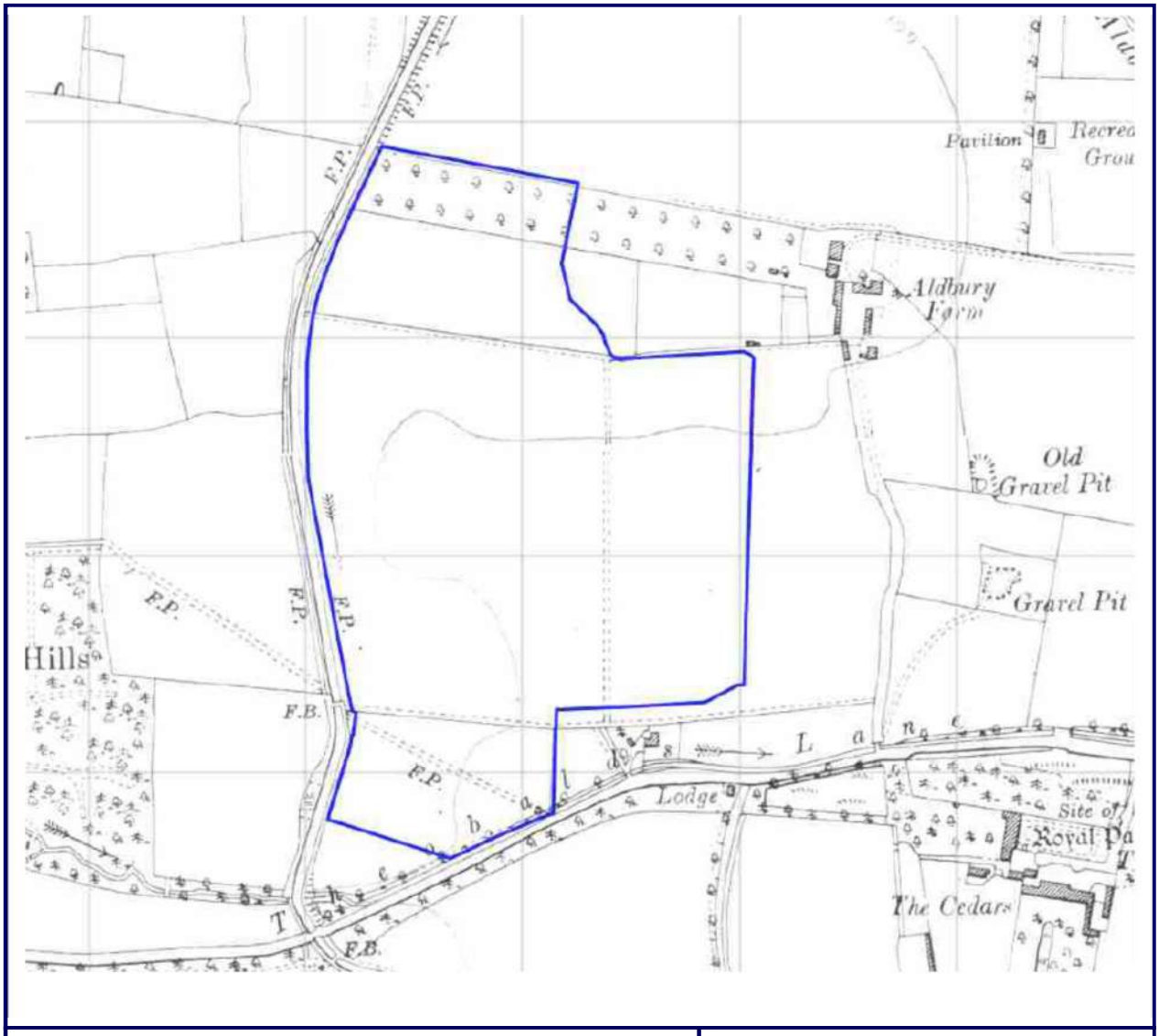

Figure 5: Historical Map Extract

Map Date: 1912

Scale: Not to scale

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35 New Bridge Street
London
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Figure 6: Historical Map Extract

Map Date: 1935-1938

Scale: Not to scale

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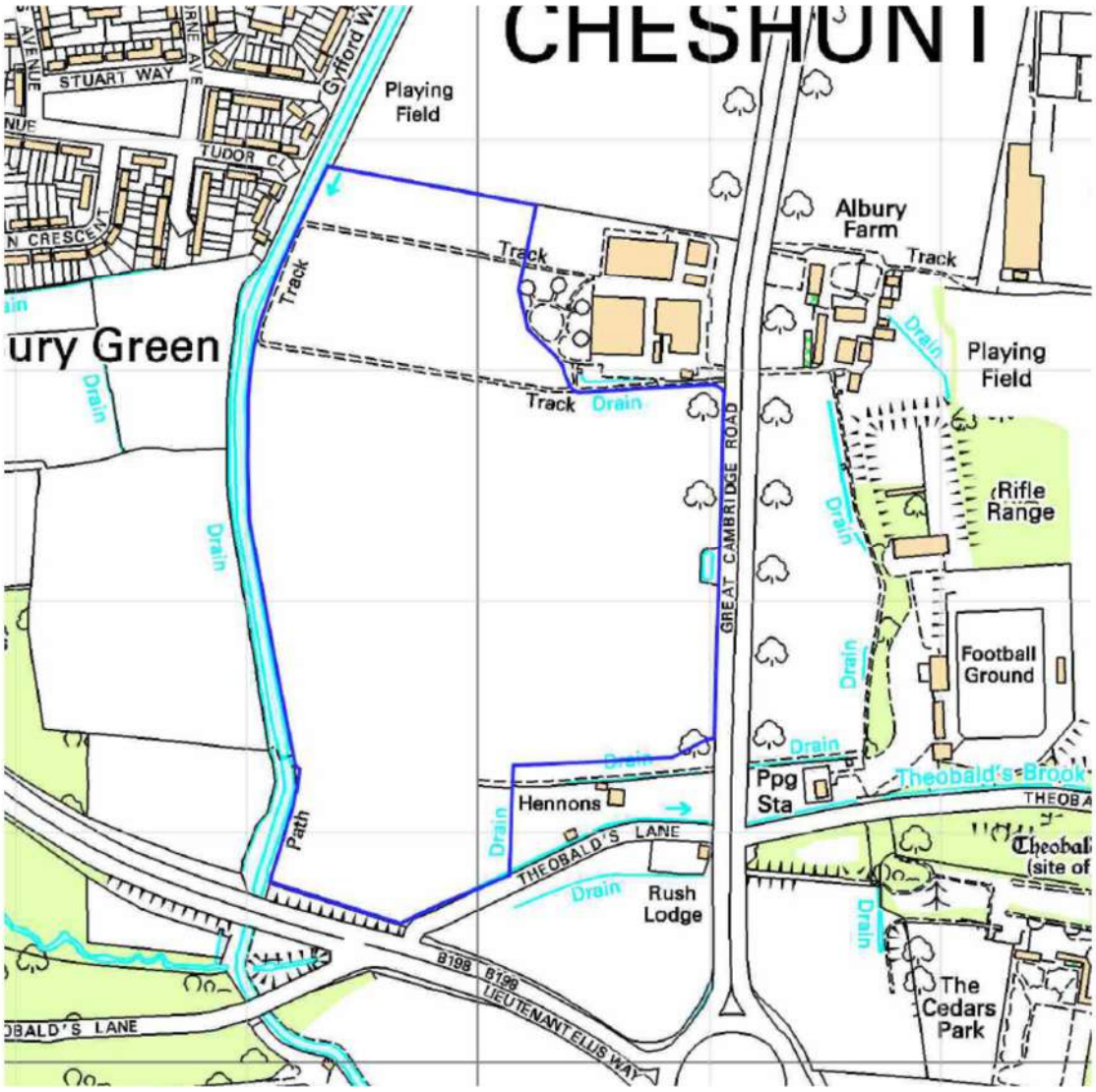

Figure 7: Historical Map Extract

Map Date: 2002

Scale: Not to scale

RPS Health, Safety & Environment
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London
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APPENDIX A

General Notes

RPS CONSULTING SERVICES LTD

Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review

General Notes

1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
5. No sampling or analysis has been undertaken in relation to this desk study.
6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
11. These terms apply in addition to the RPS "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.

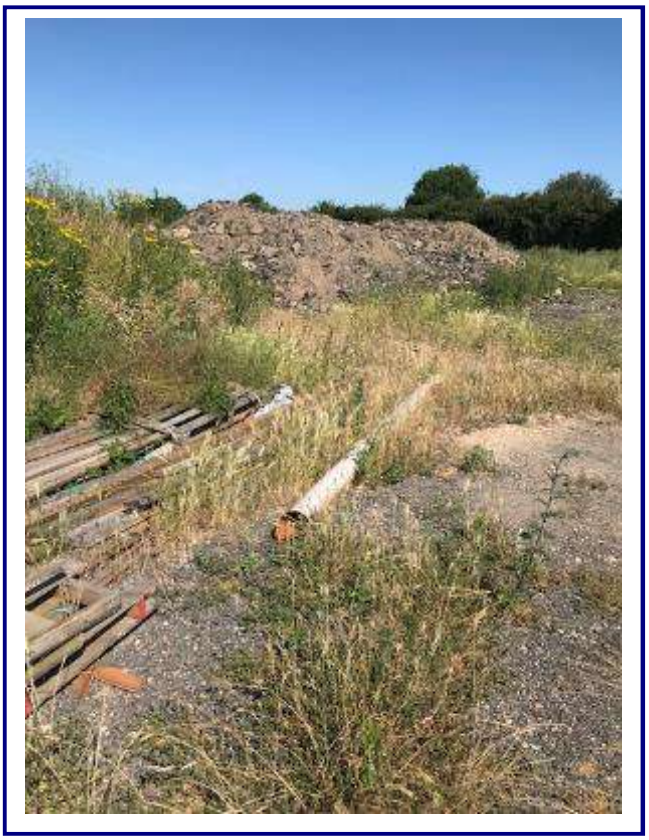
APPENDIX B

Photographs

Photo 1: Canalised New River along the western boundary of the site.

Photo 2: Limited storage of dry building materials observed at the periphery of the industrial estate, bordering the northeastern boundary of the site.

Photo 3: Approximately 3m high, un-vegetated stockpile of crushed tarmac/rubble, observed at the periphery of the industrial estate, bordering the northeastern boundary of the site.



APPENDIX C

Part 2A (The Contaminated Land Regime)

Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001[1], providing a definition of ócontaminated landôand setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as ó*any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:*

a) *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
b) *significant pollution* of controlled waters[2] is being caused or there is a significant possibility of such pollution being caused[3]ô

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term ópossibility of significant harm being causedôshould be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

i. Chronic or acute toxic effect, serious injury or death to humans
ii. Irreversible or other adverse harm to the ecological system
iii. Substantial damage to, or failure of, buildings
iv. Disease, other physical damage or death of livestock or crops
v. The pollution of controlled waters[4].

[1] In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

[2] In Scotland the term ñcontrolled waterò has been updated to ñwater environmentò under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

[3] The definition was amended in 2012 by implementation of the Water Act 2003.

[4] Groundwater in this context does not include waters within underground strata but above the saturated zone.

With regard to radioactivity, contaminated land is defined as ñany land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a *significant possibility of such harm being caused*[5]ò

The Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

The Risk Assessment

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

- The likelihood of an event (probability) - takes into account both the presence of the hazard and receptor and the integrity of the pathway.
- The severity of the potential consequence - takes into account both the potential severity of the hazard and the sensitivity of the receptor.

For further information please see the Contaminated Land section on the DEFRA website (www.defra.gov.uk)

[5] The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.