Rosedale Park North
Environmental Statement
Non-Technical Summary

For Crest Nicholson Operations Ltd, Martin John Francis, and Duncan McGregor
March 2017
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1 INTRODUCTION

Foreword

1.1 This document provides a non-technical summary of the Environmental Statement (ES), aimed to describe the technical assessments and findings of the Environmental Impact Assessment (EIA).

1.2 The ES has been prepared by RPS Planning and Development (RPS) on behalf of Crest Nicholson Operations Ltd. (Crest), Martin John Francis, and Duncan McGregor (hereafter ‘the Applicant’), to accompany the outline planning permission to Broxbourne Borough Council (BBC) for the construction and operation of a residential led, mixed use development at Rosedale Park North, off Andrews Lane, Goff’s Oak (hereafter referred to as ‘the site’). Figure 1.1 shows the red line boundary and the extent of the planning application site in its local context.

1.3 The proposed development comprises the following:

“The outline permission with all matters reserved except access for demolition of existing buildings at Garry Ross Farm and development of a mixed use scheme to include a new linear park and comprising up to 380 dwellings, 64 bed care home, local centre, primary school, improved recreational, leisure and sporting facilities and associated open space, landscaping and car parking.”

Figure 1.1: Site Location and Red Line Boundary

The Proposed Development

1.4 The proposed development site is located to the north west of Cheshunt, and to the east of Goff’s Oak, at National Grid Reference TL 33496 03601. The site covers approximately 43.77 hectares (ha) of land.

1.5 The Rosedale Park North (Rags Valley) and Rags Brook Park components which make up ‘Rosedale Park North’ were included in the Broxbourne Local Plan Consultation Document that was published in July 2016 (Ref 1). Policy CH2 within the Consultation Document identifies the site for development and describes the Council’s aspirations for its use and
design. The following is a summary of what is planned to be provided as part of the proposed development, as shown in the proposed development masterplan at Figure 1.2:

- Up to 380 residential dwellings including 20% starter/ shared ownership homes and 20% affordable rented homes;
- 64 bed care home;
- Two Form of Entry (2FE) primary school;
- A local centre comprising up to 604 sq m gross internal floor area of A1-A5 and D1/D2 uses and associated ancillary facilities;
- Improved recreational, leisure and sporting facilities and associated open space; and
- The redevelopment and landscaping of a linear park at Rags Brook.
1.6 As can be seen in Figure 1.2 there are a number of surrounding land parcels that are known to be coming forward or recently constructed:

- Grangebrook;
- Sovereign Gate; and
- Rosedale Park South (Tudor Nursery).

1.7 The ‘Grangebrook’ site includes the demolition of existing buildings and construction of 14 five bedroom dwellings with associated landscaping and car parking. This site has had planning permission approved.

1.8 The ‘Sovereign Gate’ site consisted of the demolition of concrete foundation posts of former clubhouse, removal of hardstanding, and redevelopment of the application site to provide 96 residential units together with associated car parking, highways, landscaping and other works including new access to the site from Andrew’s Lane. Construction has been completed at this development and so only the cumulative operational impacts will be assessed.

1.9 The ‘Rosedale Park South’ site is still in the early stages of advancing the masterplan and so it cannot be determined whether potential cumulative impacts will occur as it is not known when that development is proposed to be constructed. However, the cumulative operational impacts will need to be considered, especially as it has been allocated jointly with the ‘Rosedale Park North’ site within the BBC Local Plan. The development includes approximately 340 new homes, a retirement home, and a local shop.

Planning Guidance
July 2016 Draft Broxbourne Local Plan Consultation Document

1.10 The Rosedale Park site has been identified as a site for strategic development and is detailed in Policy CH2. The details of what is to be included as part of the proposed development are outlined in Chapter 3 of this Environmental Statement.

1.11 In regards to the proposed development, Policy CH2 also states:

“Section 106 agreements will accompany future planning permissions. These will finance the provision and maintenance of all on site infrastructure in full. Proportionate contributions will also be allocated to off-site priorities within the Infrastructure Delivery Plan.

Rosedale Park is to be developed in accordance with a comprehensive master plan. Incremental development of the area will be resisted.

If necessary, compulsory purchase will be pursued by the Council to assist in the timely and high quality delivery of the development.”

Structure of the Environmental Statement

1.12 The main ES (Volume I) comprises a series of separate chapters supported, where appropriate, by technical appendices (Volume II) and a Non-Technical Summary (this document).

Environmental Statement (Volume 1)

1.13 The ES is structured as follows:

- Chapters 1 and 2 are the introductory chapters of the ES: these chapters provide a description of the purpose, scope and assessment methods adopted throughout the EIA process; the content of the planning application for the proposed development;

- Chapters 3, 4 and 5 comprise a description of the scheme’s design evolution and alternatives that have been considered and a detailed description of the proposed development. They also provide a summary of the likely construction programme for the proposed
development, including a summary of the potential environmental construction effects (e.g. noise, dust and traffic), together with an outline of mitigation measures to minimise and prevent such effects, principally through the adoption of a Construction Environmental Management Plan (CEMP).

- Chapters 6 to 14 provide the main topic-based assessments included in the EIA: these describe the potential effects of development on the following aspects of the environment. The chapters set out any necessary measures to avoid, reduce or offset negative effects (collectively known as ‘mitigation measures’) and/or to enhance the positive effects of the scheme. The subsequent residual effects of the proposed development are described following implementation of such mitigation measures, and the cumulative effects of the proposed development with other application schemes in the surrounding area are also considered. These chapters comprise:
  - Chapter 6: Geology and Ground Conditions;
  - Chapter 7: Socio-economics;
  - Chapter 8: Traffic and Transportation;
  - Chapter 9: Noise and Vibration;
  - Chapter 10: Air Quality;
  - Chapter 11: Landscape and Visual Assessment;
  - Chapter 12: Ecology and Nature Conservation;
  - Chapter 13: Archaeology;
  - Chapter 14: Water Resources, Drainage and Flood Risk.

- Chapter 15: Cumulative Effects: addresses the potential for cumulative environmental effects to arise from the proposed development, in combination with other major developments in the area.

- Chapter 16: Summary of Mitigation and Residual Effects: summarises the remaining effects of the development (both positive and negative) after taking account of the proposed mitigation and enhancement measures identified in the various ES chapters.

**Environmental Statement Technical Appendices (Volume 2)**

Volume 2 of the ES provides a set of technical appendices, including plans and drawings, separate reports, surveys and data, which have informed the EIA process and support the technical chapters in Volume 1 of the ES. These comprise:

- Appendix A – EIA Scoping Report and Scoping Opinion;
- Appendix B – Project Information;
- Appendix C – Ground Conditions;
- Appendix D – Transport Assessment;
- Appendix E – Noise;
- Appendix F – Air Quality;
- Appendix G – Landscape and Visual Impacts;
- Appendix H – Ecology and Nature Conservation;
- Appendix I – Archaeology;
- Appendix J – Flood Risk Assessment;
Appendix K – Sustainability, Energy and Utilities.

Other planning application documents (not forming part of the ES)

1.15 A number of other documents accompany the application, and where relevant these are referred to in the ES. They include:

- Completed Application Forms and Certificates;
- Application Drawings/Detailed Highway Plans;
- Design and Access Statement (DAS); this provides further details on the proposals regarding siting, design, detailed landscaping, access (save for details of vehicular access to/from the site), and external appearance in accordance with the current planning requirements;
- Planning Statement;
- Statement of Community Involvement.

The EIA and Design Team

1.16 The project team that has contributed to the EIA and planning application process is detailed in Table 1.1 below.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest Nicholson Operations Limited, Martin John Francis, and Duncan McGregor</td>
<td>Applicant</td>
</tr>
<tr>
<td>Omega Partnership</td>
<td>Architect</td>
</tr>
<tr>
<td>CgMs</td>
<td>Planning Consultant</td>
</tr>
<tr>
<td></td>
<td>Author of Socio-economics ES chapter</td>
</tr>
<tr>
<td></td>
<td>Author of Archaeology ES chapter</td>
</tr>
<tr>
<td>RPS</td>
<td>EIA co-ordination and management</td>
</tr>
<tr>
<td>Vectos</td>
<td>Author of Traffic and Transport ES chapter</td>
</tr>
<tr>
<td>Peter Brett Associates (PBA)</td>
<td>Author of Noise and Vibration ES chapter</td>
</tr>
<tr>
<td></td>
<td>Author of Air Quality ES chapter</td>
</tr>
<tr>
<td></td>
<td>Author of Flooding and Water Resources ES chapter</td>
</tr>
<tr>
<td></td>
<td>Author of Ground Conditions, Hydrogeology and Contamination ES chapter</td>
</tr>
<tr>
<td>The Landscape Partnership (TLP)</td>
<td>Author of Landscape and Visual Assessment ES chapter</td>
</tr>
</tbody>
</table>
ES Availability

1.17 The NTS and ES are expected to be made available for viewing online at BBC’s website:

http://planning.broxbourne.gov.uk/Planning/lg/GFPlanningWelcome.page

1.18 Hard copies of the Non-Technical Summary are available free of charge. Additional hard copies of the ES (Volume 1) and Technical Appendices (Volume 2) can be purchased at a cost of £250 and £300 respectively (excluding postage and packaging) or on CD Rom for a cost of £5. These documents can be obtained on request to RPS at the address below:

RPS
140 London Wall
London
EC2Y 5DN

1.19 A full copy of the Rosedale Park planning application including the ES is also expected to be available for viewing by the public during normal office hours at the Planning Department of BBC.
2 EIA METHODOLOGY

Introduction

2.1 The ES submitted with the planning application has been prepared in accordance with the Environmental Impact Assessment Regulations 2011 (as amended) (hereafter the ‘EIA Regulations’), and reports the findings of a systematic assessment of the likely significant environmental effects of the proposed development. It is presented as a document for the purposes of enabling BBC to make an informed decision on the proposed development, in full knowledge of the likely environmental effects of the scheme.

Assessment Methodology

2.2 The determination and classification of the significance of environmental effects is intended to aid in identifying:
- The likely environmental effects of a development; and
- The relative weight that each identified environmental effect should be given in the decision making process.

2.3 In order to provide a consistent approach in reporting the outcomes of the various studies undertaken as part of the EIA, the terminology in Table 2.1 has generally been used within the ES to describe the relative significance of identified adverse and beneficial effects.

Table 2.1: Levels of Effect - Terminology and Explanation

<table>
<thead>
<tr>
<th>Level of Effect</th>
<th>Description</th>
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<tbody>
<tr>
<td>Major</td>
<td>These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer the most damaging impact and loss of resource integrity.</td>
</tr>
<tr>
<td>Moderate</td>
<td>These beneficial or adverse effects may be important, and may influence decision making if they effect a particular resource or receptor.</td>
</tr>
<tr>
<td>Minor</td>
<td>These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision making process, but are important in enhancing the subsequent design of the project.</td>
</tr>
<tr>
<td>Negligible</td>
<td>No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.</td>
</tr>
</tbody>
</table>

2.4 Those effects which are considered ‘significant’, and therefore material to planning decisions, are those identified as moderate or major.

Table 2.2 provides a basic matrix-based approach to the categorisation of environmental effects, which are a function of the magnitude of scale of an impact and the sensitivity or importance of the affected aspect (the receptor).

Table 2.2 Generic EIA Terminology Applied within this ES

<table>
<thead>
<tr>
<th>Receptor Sensitivity or Importance</th>
<th>Negligible</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Minor</td>
</tr>
<tr>
<td>Low</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Minor</td>
<td>Moderate</td>
</tr>
<tr>
<td>Medium</td>
<td>Negligible</td>
<td>Minor</td>
<td>Moderate</td>
<td>Major</td>
</tr>
<tr>
<td>High</td>
<td>Minor</td>
<td>Moderate</td>
<td>Major</td>
<td>Major</td>
</tr>
</tbody>
</table>
2.5 Each of the technical chapters of this ES provides specific detail on the assessment criteria used, including the sources and justifications for quantifying the different levels of effect.

2.6 Using this information, any mitigation measures considered necessary and achievable in order to avoid or reduce potentially significant adverse effects at either the construction or operational phases of the development have been proposed.

**Cumulative Effects**

2.7 Cumulative effects are considered in the ES in two ways, either as combined effects of individual residual impacts, for example, noise and dust, from one development on a particular sensitive receptor (referred to as ‘effect iterations’), or combined effects from the proposed development with other developments in the area that are planned or under construction (referred to as ‘cumulative effects’).

2.8 The developments considered within the cumulative assessment were agreed with BBC and are detailed in Table 2.3 below:

### Table 2.3: Details of Cumulative Schemes Considered

<table>
<thead>
<tr>
<th>Ref</th>
<th>Address</th>
<th>Application ref</th>
<th>Description</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grangebrook Site</td>
<td>07/15/085 6/F</td>
<td>Demolition of existing buildings and construction of 14 five bedroom dwellings with associated landscaping and car parking</td>
<td>Approved</td>
</tr>
<tr>
<td>2</td>
<td>Sovereign Gate</td>
<td>07/12/052 4/O</td>
<td>Outline planning permission for the demolition of concrete foundation posts of former clubhouse, removal of hardstanding and redevelopment of the application site to provide 96 residential units together with associated car parking, highways, landscaping and other works including new access to the site from Andrew's Lane</td>
<td>Construction complete</td>
</tr>
<tr>
<td>3</td>
<td>Former St Marys High School Site, Churchgate, Cheshunt, Hertfordshire</td>
<td>07/14/007 6/F</td>
<td>Demolition of all existing buildings and replacement with the erection of 79 residential dwellings comprising 12 apartments and 67 houses, provision of open spaces and landscaping, provision of an internal vehicular network and associated highway works and car parking, and creation of an attenuation pond</td>
<td>Approved</td>
</tr>
</tbody>
</table>

2.9 With regards to construction cumulative effects, as long as the other cumulative developments also implement ‘best practice’ mitigation measures during their construction activities there are unlikely to be significant cumulative effects. Contractors will be encouraged to liaise with each other where appropriate.

2.10 In terms of operational cumulative effects, beneficial effects from the increased provision of housing, jobs, open space, education and healthcare are likely to result from the combined effect of the proposed development and other committed schemes in the surrounding area.

2.11 There are no significant cumulative impacts considered likely with the proposed development and the other permitted schemes assessed during the operational stage.
3 SITE CONTEXT AND CONSIDERATION OF ALTERNATIVES

3.1 Following the establishment of the development brief, the EIA Regulations require that an ES should include:

‘An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects’ (Schedule 4, Part II(4)).

3.2 This section therefore sets out the key reasons for the selection of the project site and current layout, taking into account environmental effects.

Site Description and Context

3.3 The site lies within a shallow valley which is dissected by the Rags Brook. This is a tributary of the River Lea and is currently not publicly accessible as it passes through private land. The site has experienced a decline in condition from over-grazing, damage from trespassing, and fly-tipping.

3.4 The site is located within Flood Zone 1 which means it has a 1 in 1000 risk of flooding.

3.5 Andrew’s Lane crosses through the site from east to west, separating the Rags Brook Valley to the north and Rosedale Sports Club to the south. Rags Lane forms a well-defined boundary to the west of the site.

3.6 The Rosedale Sports Club hosts a number of sports clubs and contains a range of sports pitches, including rugby pitches, a bowling green, Rafles Nursery and club buildings within the southern part of the site. Construction of a new pavilion is also currently in progress.

3.7 The Broxbourne Landscape Character Assessment defines the site landscape as being enclosed by suburban housing, including the recently developed Sovereign Gate housing site to the east. The prevailing undeveloped land is identified as pasture fields, particularly used for grazing horses, and is classified as Grade 3a and 3b agricultural land, although this land is largely underused. Operational and derelict glasshouses to the south are enclosed by mature hedgerows and pockets of woodland, and hedged road corridors.

3.8 Structures on the site are limited to the buildings of Garryross Farm present on the western part of the site as well as the buildings associated with the Rosedale Sports Club to the south of Andrew’s Lane.

3.9 Overall the site contains habitats of mainly low ecological value; the key ecological features of ‘moderate value’ include Rags Brook, mature trees, hedgerows and scrub, and semi-improved grassland. There is presently no public access through the site, other than along Andrew’s Lane with poor connectivity between existing estates for pedestrians and cyclists. There are no footpath connections linking the Rosedale area and other parts of Cheshunt or to the footpath network that lies to the west of Rags Lane, limiting access to the wider countryside for the public.

3.10 A minerals resources assessment of the site has been carried out to determine whether any minerals of value were located on the site. This assessment concludes that:

“the potential sand and gravel resources on the site do not represent commercially viable mineral resources. Consequently, the proposed development of the site will not adversely affect the availability of commercially viable sand and gravel reserves in the area.”

3.11 The site is designated as Green Belt Land, and to the south of the site the ‘Meadow South of Rosedale Sports Ground’ is designated as a Local
Wildlife Site (LWS). This is an area of neutral grassland supporting a reasonably diverse sward which includes a number of indicator species, surrounded by hedgerows of native shrubs and trees. There are no listed buildings on the site, although there are a number in the wider Cheshunt area.

3.12 An Archaeological DBA has been undertaken on the site which examined and reviewed the available archaeological, historic and topographic information. It was concluded that the site has a generally ‘moderate’ to ‘low’ archaeological potential for evidence from the Palaeolithic to the Post-Medieval periods, with a heightened archaeological potential in localised areas of known activity.

The ‘No Development’ Alternative

3.13 It is considered that the proposed development will be a substantial improvement from the ‘without development’ scenario. The proposals replace an area of low value grassland with a comprehensive mixed use development, to meet an urgent need for housing and related development within the Borough. Although the construction of the proposed development will result in the loss of some grassland cover, this has a low intrinsic value. Much of the area affected will be restored as some other form of positive land use, with extensive areas of soft landscape, offering benefits of public open space and sports facilities as well as a school and care home.

Alternative Designs

3.14 Based on the Applicant’s development brief three designs were considered before the final design was chosen. The first option consisted of high density housing which would have significantly contributed to the BBC future housing requirements. However, it was decided that the proposed structure of this housing area detracted too much from the open space available at the site. It was also felt that not enough was being done to protect and enhance Rags Brook as part of this proposed development layout, and the green lung running from north to south through the site was poorly designed.

3.15 The second option had a greatly reduced density; however, it was still felt by the LPA the northern part of the site was too dense and detracted too much from the open space available at the site, as well as being in too close proximity to Rags Brook. There was still no central focal point to the site, with the school and local centre located in the eastern part of the site, and there was still a high housing density. The revised location of the Green lung running north to south was agreed in principle.

3.16 The third option, and chosen design, had much more done to enhance the natural landscape, especially on the corridor of Rags Brook, and the masterplan shows the enhanced green lung running north to south, linking the development with a more extensive cycle and footpath network which reaches across the whole site creating scenic connections routes between the 13 different housing areas. The layout of these areas was more structured to ensure each area is clustered with an area of green and open space at the centre. This made the development more aesthetically pleasing as well as reducing the density of the housing as a result.

3.17 Further modifications continued to occur following discussions with both the architects and the council; this resulted in the slight change in positioning of some of the houses and areas of vegetation.
4 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The Proposed Development

4.1 The proposed development includes 13 areas within which up to 380 dwellings are proposed to be built. Figure 1.2 shows the locations of these areas within the Masterplan in relation to other proposed parts of the development. The dwellings will largely consist of a range of detached and semi-detached houses, with both front and back gardens. Of the 380 proposed dwellings, 154 (40%) of these are projected to be affordable houses which will be split across 11 of the 13 dwelling areas.

4.2 The community hub is projected to be 232 sqm in area and will provide an area for activities and community events to take place. The commercial facilities will be flexible, providing A1-A5 uses and are proposed to be 372 sqm in area, possibly spread across four small shops.

4.3 A 64 bedroom care home for the elderly will be provided as part of the proposed development and will be located in zone 3, close to the site entrance and housing zones 1, 2, and 4. This is to ensure that the elderly people staying in the home have easy access to services, and also access to public transport facilities, due to the placement of a bus stop outside the care home.

4.4 A two form entry (2FE) primary school has been proposed as part of this development.

4.5 The proposed development will make 24ha of land available to the public as open space, and 4ha of land will be used for sports facilities as an extension to Rosedale Sports Club.

Access

4.6 The main site access will be via a new priority junction from Andrew’s Lane, whilst Andrew’s Lane itself will become the minor road, used for access only. The major route, including access for buses, will be provided within the new residential site.

4.7 There are four secondary accesses including an access from Peakes Way to the northern area of housing (north of Rags Brook) and three accesses to limited areas of housing at the western end of Andrew’s Lane. All of these accesses are simple T-junctions.

4.8 A number of non-vehicular accesses are proposed for pedestrians and cyclists to the site:

- Rags Lane to the west;
- Andrew’s Lane to the south;
- Rosedale Way to the east; and
- Peakes Way to the north.

4.9 The local road network will allow for existing bus services to divert into the site from Rosedale Way. This would provide outside access to facilities on the site, such as the school and local centre, and allow residents to have easy access to public transport with bus stops being located at the local centre. Discussions will be held with operators to try and achieve this.
5 DEVELOPMENT PROGRAMME AND CONSTRUCTION

Construction Programme

5.1 Given the scale of the proposed development, the current expectation is that the construction works will be phased and would take approximately 7.5 years, possibly commencing in November 2017 with the final phase being completed by mid-2025.

5.2 Figure 5.1 presents the phasing masterplan which includes the following phases:

- Phase 1 would provide 270 units + 64 bed care home;
- Phase 2 would provide 78 units;
- Phase 3 would provide 32 units.
5.3 Whilst all details regarding future construction have not been finalised at this stage, it is possible to provide general information about the construction activities. The expected indicative programme is presented and summarised in Figure 5.2.

**Figure 5.2: Indicative construction programme (per phase)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Phase 6</th>
<th>Phase 7</th>
<th>Phase 8</th>
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5.4 The construction phase will comprise the following sequence of works:

- Site preparation – fencing erected and trees planted around the perimeter of the phase, detailed geotechnical investigations of the phase in question;
- Substructure - foundation, piling and ground works;
- External fabric – external fitting;
- Internal fit-out, M&E and commissioning; and
- External works and completion.

5.5 For the purposes of the EIA the reasonable worst case (i.e. most active construction period and with likely occupation of Phase 1) has been taken as Q11 of the overall programme.

5.6 Construction activities, quantities of excavated and construction materials and anticipated construction related traffic and machinery are identified in Chapter 5: Development Programme and Construction.

5.7 Appointed contractors will be required to carry out works in such a way that, as far as reasonably practicable, the amount of waste and energy used is minimised and ‘best practice’ reduced disruption and impacts on amenity areas.

5.8 It is anticipated that the core working hours for demolition, construction and refurbishment will be as follows:

- 08:00 – 17:00 hours weekdays;
- 08:00 – 14:00 hours Saturday; and
- No working normally undertaken on Sundays or Bank Holidays.

5.9 It is recognised that approval from BBC is required for any works that need to be undertaken outside these permitted hours.

5.10 A key aspect of the successful management of the project will be the maintenance of good relations with site neighbours and the general public. The project team is already engaged in consultation with a broad range of stakeholders and this will continue through the various phases of the project.
6 GEOLOGY AND GROUND CONDITIONS

Introduction

6.1 Chapter 6: Geology and Ground Conditions of the ES provides the assessment of potential likely significant effects of the proposed development on land contamination and soil quality.

Land Contamination

Existing Conditions

6.2 The site is situated on the undulating land to the west of the valley of the River Lee, within the valley of the Rags Brook and a low ridge between the valleys of the Rags Brook and Theobalds Brook to the south.

6.3 The solid geology underlying the site comprises the London Clay Formation. River Terrace Deposits and Glacial Sands and Gravels are shown overlying the solid geology, respectively, in the lower part of the valley of the Rag's Brook on the eastern part of the site, and on the low ridge on the southern part of the site.

6.4 In addition, it is expected that the mapped strata are overlain by Head Deposits formed by natural geomorphological processes with limited deposits of Alluvium present in the valley of the Rag's Brook. Made Ground is locally expected to be present overlying the natural strata in areas of previous development.

6.5 The River Terrace Deposits and Glacial Sands and Gravels are classified as Secondary (A) Aquifers, whilst the London Clay Formation is classified as an Unproductive Strata. The site is not designated as part of any groundwater Source Protection Zones.

6.6 Based on the known history, current use and proposed use of the site, the potential for contamination to be present in the soils and groundwaters on the site is, in general, considered to be Very Low. With regard to the area of Garryross Farm, the potential for significant contamination to be present in these areas is considered to be Low.

Construction Phase Effects

6.7 The construction works will require the importation of fill materials including capping and sub-base to areas of pavements and hard surfacing, and bedding and surround to the drainage system. All fill materials will be tested to ensure the concentrations of potential contaminants are below the guideline values for a residential development with gardens. On this basis, the importation of materials onto the site will not adversely affect the potential risks with respect to ground contamination. Mitigation will be adopted in line with current regulations and best practice measures, as detailed in the CEMP.

6.8 Air-borne and settled dust arising from the construction works may represent a possible pathway for the inhalation, ingestion and absorption of potential contaminants by site users/neighbours, and ecology and wildlife. Measures for the mitigation of dust can be found in the CEMP, and are also addressed in Chapter 10: Air Quality.

6.9 Assessed risks from the construction phase have been assessed as very low, or low on all of the receptors identified. Residual effects were all assessed as negligible, except for site workers which was assessed as negligible/ minor adverse.

Operational Phase Effects

6.10 The potential for significant concentrations of potential contaminants to be present in the soils and groundwaters on the site owing to the occupation
of the completed development is considered to be very low. On this basis, the completed development will not adversely affect the potential for ground contamination to be present.

6.11 In the areas of built environment, the presence of buildings and hard surfaces will limit the potential for skin contact, inhalation and ingestion of any potential contaminants in the near-surface soils on the site. Similarly the buildings and hard surfaces will limit surface water infiltration and the potential for leaching of potential contaminants from the near-surface soils. In the areas of proposed gardens, community open space and soft landscaping in the area of Garryross Farm there will be a potential for significant contact, uptake or leaching of any potential contaminants in the near-surface soils by future site users.

6.12 The proposed development will increase the size and relative quality of the built environment whilst the use of the proposed development once completed will increase the length of time future site users will be on the site. On this basis, the proposed development may affect the potential risk to future site users/neighbours and the built environment with respect to ground contamination. Despite this, assessed risks during the operational phase are very low or low for all of the receptors identified. Residual effects were all determined as negligible.

Soil Quality

Existing Conditions

6.13 Based on the criteria given in the Agricultural Land Classification guidance, it is expected that the soils on the site may be classified as Grade 3a and hence comprise ‘best and most versatile’ agricultural land.

6.14 The Soils Site Report indicates the soils on the Site are typically of the Windsor soil association (slowly permeable seasonally waterlogged clayey soils mostly with brown subsoils) with soils of the Hamble soil association (deep stoneless well drained silty soils and similar soils affected by groundwater) present overlying the River Terrace Deposits in the lower part of the valley of the Rag’s Brook.

6.15 The site is currently used for agriculture comprising open arable fields and pasture with hedgerows along field boundaries. Rag’s Brook bisects the site whilst the built development on the site is limited to the buildings of Garryross Farm. The sports pitches and associated pavilion and car parking of the Rosedale Sports Ground are present on the southern part of the site.

6.16 There are no designated areas of ecological importance within the area of the site.

Construction Phase Effects

6.17 From consideration of the available information, the potential importance of the soils on the site is assessed to be Medium owing to the assessed agricultural land classification of Grade 3a – Good Quality Agricultural Land.

6.18 With regard to loss or irreversible damage to the quality of the soils on the site owing to the construction works, in line with current best practice, appropriate measures will be adopted during the construction works, and secured in a Soil Resource Plan, to mitigate potential loss and/or degradation of the soils on the site. However, because there will still be some limited loss and irreversible damage, the associated magnitude is assessed to be low.

6.19 Based on the importance of the affected soil resources and the magnitude of change associated with a loss of agricultural land and the quality of the
soils, the effect related to the construction of the proposed development is assessed to be minor adverse.

**Operational Phase Effects**

6.20 Given both the ecological habitats and biodiversity on the site and the proposed development are assessed to be of local importance, the importance of the soil resources on the site on completion of the scheme are assessed to be low.

6.21 The loss of agricultural land and loss or irreversible damage to the quality of the soils on the site will effectively be unchanged following completion of the scheme and the level of change is assessed as very low.

6.22 Therefore, based on the importance of the affected soil resources and the magnitude of change associated with a loss of agricultural land and the quality of the soils, the effect related to the proposed development once completed is assessed to be negligible.
7 SOCIO-ECONOMIC

Introduction

7.1 Chapter 7: Socio-Economics of the ES provides the assessment of potential likely significant impacts of the proposed development on the application site and the surrounding area.

Existing Conditions

7.2 There are no buildings on the site, and no permanent employment uses. The site is privately owned, and comprises of agricultural land, although this is not actively used for agricultural purposes.

7.3 The population of Broxbourne was approximately 96,000 persons in 2014, with a total working population of 67,599. The population is expected to have risen by 5,000 to 101,000 by 2021 and then by a further 8,000 persons to 109,000 by 2031.

7.4 In 2011 there were 37,658 dwellings in the administrative area of BBC of which 74.1% are privately owned and 25.1% are social or intermediate rented.

7.5 There are currently 8 primary schools within 2.1km of the site and 3 secondary schools within 2km. As of 2015 the 8 primary schools had 2,376 pupils in 2,349 places (101.1% occupancy). The 3 secondary schools had 2,729 pupils in 4,044 places (67.5% occupancy).

7.6 The average patient list size per GP within the area is 2,514. This is above the target patient list size of 1,800 patients per FTE GP recommended by the Department for Health.

7.7 There are 5 play spaces for children accessible within a 1km distance of the proposed site, and a further 5 within 1.7km. There are also 6 sites which have sports pitches within 1.25km, these mainly consist of football pitches.

Construction Phase Effects

7.8 Construction jobs for the proposed development have been estimated based on a total construction cost of approximately £73 million (2016). An average of 30% of the total cost is typically accounted for by labour costs, which equates to £21.9 million. Dividing this figure by the mean gross annual wage of skilled construction and building trades for the South East region from the Annual Survey of Hours and Earnings 2011 of £27,100, produces approximately 808 person-years of employment.

7.9 The anticipated phasing of the development is 7 years. Based on this programme an overall average of 115 Full Time Equivalent construction jobs will result in total.

7.10 It is anticipated that a significant proportion of construction workers are likely to be provided by local contractors and, therefore drawn from the local employment pool.

7.11 In the context of a large labour pool of construction workers in South East England, the direct and indirect employment and expenditure created by the temporary construction phase of the proposed development is likely to have a short/medium-term minor beneficial effect on the local economy.

Operational Phase Effects

7.12 In total it is estimated the proposed development will generate 118 FTE jobs.

7.13 Further indirect employment will be generated in the local economy through the purchase of goods and services by the residents of the
proposed development. This will have a multiplier effect on expenditure in the locality. The UK spend per head in 2005 on all retail goods was £4,334 per annum which would equate to an annual spend from residents of the proposed development on retail goods of £3,950,784. The UK spend per head in 2005 on leisure services was £1,751 per annum which would equate to an annual spend of £1,596,912.

7.14 Taking into account the net direct and indirect employment and induced employment created, the net permanent employment of the proposed development is likely to have a long-term minor/moderate beneficial effect on the local economy.

7.15 The proposed development is expected to provide up to 380 residential units. This accommodation will contribute to the policy targets for housing identified for Broxbourne Borough and contributes 69% towards the Council’s annual housing target. Based on an average for BBC of 2.4 persons per dwelling, the proposed development would have a population of 912 persons when completed.

7.16 Affordable housing within the proposed development comprises 154 affordable housing units which represents a long-term minor beneficial effect on affordable housing provision within Broxbourne Borough.

7.17 The inclusion of a 64 bedroom care home, to be developed in the first phase of the development, represents a long term minor beneficial effect on elderly housing provision.

7.18 As all three GPs are over the 1,800 HUDU benchmark, a long-term minor adverse effect will take place on healthcare due to the increased population, before mitigation measures are put in place.

7.19 The proposed development includes a 2FE primary school that will provide 420 primary pupil places. This will accommodate the primary school child yield generated by the development with a surplus of 50 pupil places based on the HCC pupil yield ratio and a surplus of 108 pupil places based on the reduced child yield ratio. The proposed development will therefore have a long-term major beneficial effect (significant) on primary education provision at the local level.

7.20 The proposed development will provide a new 16 ha public park within the application site and will therefore have a long-term major beneficial effect on open space at a local level. There will also be a long term minor beneficial impact for sports pitches due to the expansion and enhancement of Rosedale Sports Club.

7.21 The provision of shops and services and community facilities, as detailed previously will also create a long term minor beneficial effect.
8 TRAFFIC AND TRANSPORTATION

Introduction

8.1 Chapter 8: Traffic and Transportation of the ES assesses the likely impact associated with transport and travel generated by the proposed development and its construction.

Existing Conditions

8.2 The site is a single open grassed field that does not currently generate any material trips. It is strategically placed on the outskirts of Cheshunt and has good access via B roads to the A10 and M25. Andrew's Lane runs east-west through the site, and to the north of the site, Peakes Way is a single carriageway local distributor road that is a continuation of Rosedale Way.

8.3 Rags Lane to the west of the site has the character of a rural country lane with no footways on either side of the carriageway. To the south of Rags Lane, Burton Lane is a single carriageway road that provides a link between St James' Village and the B156.

8.4 To the east of the site, Rosedale Way is a local distributor road that connects to the B156 Goff's Lane in the south and to Peakes Way in the north.

8.5 To the south of the junction is the B198 Lieutenant Ellis Way which is a 2 lane dual carriageway, and connects to the A10 immediately to the north of the junction with the M25.

8.6 The closest railway station to the site is Cheshunt, located in the town centre approximately 4 km east of the site. This station is managed by National Express East Anglia and services are provided to local towns and beyond. The train services from the station operate every 10 minutes between Hertford East and Liverpool Street during peak times.

8.7 There are a number of existing bus stops located on Rosedale Way and Hammondstreet Road within a short walking distance of the site. Existing bus services that operate near to the site provide a connection to the railway station.

8.8 Most roads, except Andrew's Lane, around the site have dedicated footpaths on both sides. There are no cycle paths in the immediate vicinity of the site; however, there is a traffic free route along Goff's Lane east of the Goff's Lane (W) / Rosedale Way / Goff's Lane (E) / Lieutenant Ellis Way roundabout.

Construction Phase Effects

8.9 As a result of the construction phase of the development, there would be increased volumes of traffic on the local highway network, associated with workers travelling to and from the Site, and from the movement of material using HDVs. HGV movements would be dispersed across the working day, outside of the AM and PM peak periods. The arrival and departure of light vehicles would be concentrated during the morning and evening periods, however even assuming all take place in one AM and one PM peak hour, this still equates to less vehicle movements that will be generated by the proposed development once it is operational. In addition, traffic will be required to adhere to specific routing agreements, therefore avoiding inappropriate residential routes.

8.10 It is therefore considered that the significance of the effect would be a temporary (long term) moderate adverse effect on Andrew's Lane and a temporary (long term) minor adverse effect on road users, pedestrians and cyclists as a result of construction activity across the remainder of the network.
Operational Phase Effects

8.11 Once complete the proposed development will give rise to the following transport impacts:

- Introduction of a new residential population that would require access to public transport facilities and a safe pedestrian and cycling environment;
- Introduction of a new population that will use local facilities for which safe and convenient access to walking, cycling and public transport provision is necessary; and
- Changes to the pedestrian and cycle network through the opening of the on-site linear park and increased permeability.

8.12 These impacts could result in the following:

- Pedestrian delay caused by additional traffic flows on local roads;
- Driver delay based on the net impact of development traffic on local junctions.

8.13 In addition to the above, air quality and noise impacts associated with vehicle trips would arise. These are dealt with in Chapter 10: Air Quality and Chapter 9: Noise and Vibration.

8.14 To reiterate, the operational assessment within Chapter 8: Transport considers two sub-scenarios: without the closure of Andrew's Lane and with the closure of Andrew's Lane.

8.15 The greatest impact of the proposed development in terms of proportional increase of vehicular trips will be experienced on Andrew's Lane and Rosedale Way which are both expected to accommodate a proportional increase. The net vehicular impact on the remaining roads will be less than 10% and as such have not been considered in any further detail as per Rule 1 and Rule 2 of the guidance.

8.16 The closure of Andrew's Lane to through traffic will have a beneficial impact on Andrew's Lane where the closure occurs. This traffic will be diverted through the site however the internal spine road will be designed in accordance with the roads in Hertfordshire Design Guide and as such will be suitable for this level of traffic.
9 NOISE AND VIBRATION

Introduction

9.1 Chapter 9: Noise and Vibration of the ES provides an assessment of the potential noise and vibration effects associated with the proposed development, including consideration of effects arising from its construction and operation and the suitability of the site for noise sensitive uses.

Existing Conditions and Site Suitability

9.2 In March 2016 noise measurements were taken at locations within and around the site to establish the existing baseline noise levels.

9.3 The baseline sound level survey results are representative of the sound environment of the areas of the site which will be occupied by housing. The recorded noise measurements across the site were measured between 38dB and 42dB during the day and between 34dB and 39dB during the night.

9.4 The facades of the proposed development will provide suitable internal sound levels to the residential units within the accepted values of 35 dB and 30 dB for day and night-time, respectively.

Construction Phase Effects

9.5 The construction of the development is likely to include activities such as site levelling/clearance, ground excavation, concreting, piling, superstructure construction and external works such as road construction. The internal building construction phase is not normally a significant source of noise or vibration.

9.6 Negligible effects are those predicted construction noise levels that fall below the proposed LOAEL level for construction noise. Substantial effects are those that exceed the proposed SOAEL level.

9.7 Construction noise levels at the nearest noise sensitive receptors can be mitigated by careful phasing of the construction works as well as controlling the operation time and duration of each activity to reduce the noise impact at the receptor.

9.8 In practice, the main construction activities will tend to take place towards the central area of the Site, away from the Site boundary, which will further mitigate construction noise at the nearest noise sensitive receptors, reducing impact significantly.

9.9 It is therefore considered that whilst noise from construction has the potential to be of substantial significance, with appropriate mitigation measures the significance of effects can be reduced to between minor and moderate.

9.10 The closest existing vibration sensitive receptors are likely to be approximately 10m from construction works on the site boundary. BS 5228:2014 Part 2 provides some indicative levels of vibration associated with auger piling which indicates levels of below 0.4 mm/s peak particle velocity (PPV) at distances beyond 10 m. Therefore, vibration due to auger piling is considered to be below the proposed LOAEL of 1 mm/s PPV for human response.

9.11 Additionally, with the implementation of a carefully considered Construction Environmental Management Plan that will be secured via a planning condition, means that the risk of minor cosmetic damage to buildings from piling is considered to be low.
Operational Phase Effects

9.12 The environmental sound survey established the sound climate at the site for specific time and locations. A computer noise model has been built of the development and surrounding roads and calibrated using the results of the noise survey and the traffic data supplied. Noise contour maps have been produced to assist with the assessment.

9.13 As the proposals are in outline, the application is for development parameters and therefore the exact location of dwellings or gardens is unknown. The noise contours therefore demonstrate the spread of noise across the undeveloped site.

9.14 Sound levels in amenity areas across the majority of the site are likely to fall below the proposed LOAEL. Sound levels in amenity areas immediately adjacent to the primary road network are likely to exceed the proposed LOAEL but fall below the proposed SOAEL.

9.15 The results of the assessment indicate that noise levels within external amenity areas are likely to be above the proposed LOAEL during the daytime period at locations close to the surrounding road network. Noise levels within external amenity areas at other locations are likely to fall below the proposed LOAEL during the daytime period. External amenity areas are not expected to be used during the night-time periods.

9.16 It is therefore considered that whilst operational transportation noise has the potential to be of moderate significance at dwellings close to the surrounding road network, with appropriate mitigation measures the significance can be reduced to between minor and negligible.

9.17 Operational impacts overall are judged to be negligible to minor, once appropriate mitigation measures have been applied which deems the site suitable for residential development.

9.18 The impact of the proposed relocated Cheshunt Rugby Club clubhouse is likely to be of a minor impact with the implementation of the suggested mitigation measures.

9.19 Any increase in vibration levels would be attributable to an increase in vibration sources (e.g. due to the increase in vehicular movements). Given the relationship between the VDV, magnitude and exposure duration, it is considered that the increase on traffic levels on all roads is unlikely to result in a significant vibration impact.

9.20 Therefore, the overall vibration impact associated with the operation of the development is likely to be negligible.
10 AIR QUALITY

Introduction

10.1 Chapter 10: Air Quality of the ES provides an assessment of the potential impact of the development on local air quality and assesses the impact of construction activities on air quality in the surrounding area.

Existing Conditions and Site Suitability

10.2 Information on existing air quality has been obtained by collating the results of monitoring carried out by BBC. Background concentrations for the site have been defined using the national pollution maps published by Defra. These cover the whole country on a 1x1 km grid (Defra, (2016)).

10.3 The development site does not currently fall within an AQMA, however, one of the affected roads leads into AQMA 5, Monarchs Way.

Table 10.1: Summary of Annual Mean Pollutant Concentrations

<table>
<thead>
<tr>
<th>Year</th>
<th>NOx</th>
<th>NO2</th>
<th>PM10</th>
<th>PM2.5</th>
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</thead>
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<td>16.0</td>
<td>11.4</td>
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<td>20.4</td>
<td>17.5</td>
<td>12.6</td>
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<tr>
<td>Objectives</td>
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<td>40</td>
<td>40</td>
<td>25</td>
</tr>
</tbody>
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10.4 Annual mean nitrogen dioxide (NO2) and dust (PM10 and PM2.5) concentrations are expected to be below the national air quality objectives at all existing sensitive receptors.

Construction Phase Effects

10.5 The main potential effects during construction are dust deposition and elevated PM10 concentrations. The following activities have the potential to cause emissions of dust:

- Site preparation including delivery of construction material, erection of fences and barriers;
- Demolition of existing buildings on site;
- Earthworks including digging foundations and landscaping;
- Materials handling such as storage of material in stockpiles and spillage;
- Construction and fabrication of units; and
- Disposal of waste materials off-site.

10.6 Typically, the main cause of unmitigated dust generation on construction sites is from demolition and vehicles using unpaved haul roads, and off-site from the suspension of dust from mud deposited on local roads by construction traffic. The number of vehicles accessing the site, which may track out dust and dirt, will vary during the construction phase, but for the majority of the works there will be between 20 to 50 HDV movements per day.

10.7 Based on the IAQM guidance, the risk of dust emissions is considered to be low during demolition and trackout but large during earthworks and construction, while the study area is considered to be of high sensitivity due to the close proximity of residential receptors. Appropriate mitigation corresponding to a high risk site is therefore required during the
construction phase. With appropriate mitigation in place the construction impacts will not be significant.

**Operational Phase Effects**

10.8 Detailed atmospheric dispersion modelling has been undertaken to assess the predicted future NO$_2$, PM$_{10}$ and PM$_{2.5}$ concentrations at existing receptors.

10.9 The predicted NO$_2$, PM$_{10}$ and PM$_{2.5}$ concentrations in 2024 without and with the proposed development in place are below the relevant annual mean objectives at all existing receptor locations with the exception of receptor 20. Annual mean NO$_2$ concentrations are predicted to exceed the annual mean objective under both the with and without development scenarios.

10.10 Annual mean NO$_2$ concentrations at this receptor are predicted to be between 102% and 110% of the objective limit, therefore an imperceptible change in classed as a moderate adverse impact. The receptor is located at the junction of Churchgate and the A10 and represents part of the Cheshunt School. However there are no other receptors in this location, therefore the moderate adverse impact is limited to this single receptor.

10.11 There are no predicted exceedances of the annual mean NO$_2$, PM$_{10}$ or PM$_{2.5}$ concentrations at any of the worst case receptors within the proposed development. Furthermore, as annual mean NO$_2$ concentrations are predicted to be considerably below 60 $\mu$g/m$^3$ and annual mean PM$_{10}$ concentrations below 32 $\mu$g/m$^3$ it is unlikely that the 1-hour NO$_2$ and 24-hour PM$_{10}$ objective limits are being exceeded at the Site. Air quality will therefore be acceptable for future residents.
11 LANDSCAPE AND VISUAL

Introduction

11.1 Chapter 11: Landscape and Visual, reports the likely effects the proposed development would have on the landscape character and features of the site, the local and wider landscape character and changes to views.

Existing Conditions

11.2 At a national and regional context, the site is located within the National Character Area (NCA) 111 ‘Northern Thames Basin’. This incorporates a large and diverse landscape that comprises much of southern Hertfordshire, and is typified by a series of plateaux, which are locally well wooded, incorporating a mixture of pasture and arable farm land.

11.3 Overall the landscape character of the site areas to the south of Andrew’s Lane has become disjointed with mixed and variable land uses, including large glasshouses further to the southwest, associated with Rosedale Park South, resulting in a patchwork of mixed landscape character. This area incorporates some poor quality built features many of which are physically and visually disconnected. However, the urban edge is more defused, with the treed tall hedgerows, linear woodland belts, and copses. These are notably located along Andrew’s Lane, around Lea Mount and its approach road, Rosedale Sports Ground, and adjacent to the fishing lake and play area, which together provide important landscape features. Adjoining urban areas also demonstrate variations in character, depending on the period of development, layout, density and appearance of the built form.

11.4 The Rags Brook valley forms an important part of the local landscape and remnant rural character, including part of the site. The meandering stream and associated mature trees provide important local landscape features. However, the valley has become fragmented and segregated from the wider rural context to the west, through the presence of the surrounding settlements, and the influence of other intervening small businesses, scrap yards, glasshouses, and large farmsteads between the site and the more intact rural landscape adjacent to Cuffley.

11.5 A total of 17 viewpoints were assessed from the surrounding area.

Construction Phase Effects

11.6 The assessment of effects on landscape character and views during the construction period would be based upon the construction programme, hours of working and construction plant and ancillary elements.

11.7 The effects on landscape character would be contained to a localised context, primarily within the site. The effects would result in a major adverse, but short term change to the Local LCA A: Rags Brook Pasture. The effect on other Local LCAs would be limited by distance resulting in negligible effects. The effects on views would also similarly be contained to locations within or immediately adjacent to the site. Effects on views during the construction phase would mainly affect road users of Andrew’s Lane and Peakes Way. There would be major adverse changes for small sections of both roads, with limited effect on the broader experience of these roads. The other main adverse change would be to views from the rear and sides of residential properties that overlook the Site along the western edge of Rosedale.

Operational Phase Effects

11.8 There would be limited effect on NCA 111, with only a very small proportion of the NCA affected. The change would be consistent with the historical changes to the landscape, with the increasing human modification and development of the river valleys. The proposed
development would result in the further loss of farmland and increase in the size of settlement. However, the change would be very localised and contained to a small part of a local river valley.

11.9 The high proportion of retained grassland, copses, tree belts and hedgerows relative to built development would limit the awareness of urbanisation. The introduction of a variety of new habitats, biodiversity and age structure would help diversify the retained semi-rural parts of the local valley landscape.

11.10 The influences of landform, existing built development and tall treed hedgerows have a significant influence in visually containing the site. The ZVI shows the limited extent of visual influence of the proposed development. Consequently, the main visual effects would be within the site and on the periphery, extending no more than approximately 200m from the site boundary.

11.11 The effect of the proposed development on views would be restricted to a very contained area, largely limited to short sections of roads that border the site, Andrew’s Lane that passes through the site, residential properties that overlook the site, and recreational users of existing facilities within the site. The effect on these views from roads would be mainly adverse or neutral changes, but restricted to filtered and glimpsed views through the existing retained hedges and gaps between houses or the occasional short open view, where access is required into the site. Only one location along Andrew’s Lane in Year 1 is assessed as an adverse change, but this can be mitigated.

11.12 Recreational users would benefit from improved facilities with views having either a neutral or beneficial change. Effects on residential properties would be essentially limited to the rear and side of houses overlooking the site i.e. along Cowles, Dickson, Grandby Park Road, Great Groves, Primrose Cottage and houses near to the Rags Lane (North) and Peakes Way junction. The effect would differ depending on orientation, outlook and whether built development or open space is proposed in proximity to the house. Some properties will inevitable experience an initial major adverse change due to the close proximity of the proposed houses. However, the intention is to minimise these effects as much as possible, through orientation and offsetting of proposed houses and the planting of new boundary hedges and trees to mitigate these effects.
12 ECOLOGY AND NATURE CONSERVATION

Introduction

12.1 Chapter 12: Ecology and Nature Conservation of the ES provides the assessment of the likely effects of the proposed development and associated access routes, taking into account recommended mitigation and enhancement measures to assess habitats, ecological effects, protected species and species of ‘raised’ conservation concern.

Existing Conditions

12.2 The proposed development site largely consists of grazed and ungrazed farmland and large areas of amenity grassland with recreational facilities of low ecological value. The field boundaries are comprised of mature trees and hedgerows of varying species richness. Rags Brook traverses the northern part of the site, running from west to east.

12.3 The Phase 1 habitat survey, undertaken on the 11th May 2016, identified twelve different habitat types within the proposed development site boundary. These were dominated by improved grassland, amenity grassland and semi-improved grassland.

12.4 Reptile surveys were undertaken in 2013 and 2016 within suitable habitat on site. A single juvenile grass snake was found during the survey.

12.5 A series of breeding bird surveys were conducted between the 6th May and 23rd June 2014 in order to identify the assemblage of birds that use the site for breeding. A total of 47 different bird species were identified during the surveys, 35 of which were considered to be breeding within the site boundary. Hedgerows surrounding the individual fields on site and the brook, together with the variously-sized patches of scrub, represent the most productive habitats for breeding birds within the site and were shown to support the highest species diversity and number of territories.

12.6 Common pipistrelle, soprano pipistrelle, noctule and brown long eared bats have been recorded foraging over the site, but no bat roosts were found on site.

12.7 Overall, the site is currently of low ecological value with the linear field boundary habitats having a locally high value as relatively species rich linear habitat features traversing the site. In most cases, identified habitats are sub-optimal and species present are in low number, and the carrying capacity of the site has potential to be increased. The proposals retain these hedges/tree lines and the brook and incorporate these features into the development.

Construction Phase Effects

12.8 The majority of construction work will result in a loss of approximately 9ha of improved grassland which is of low ecological value. A significant portion of the site, 15.7ha is to be retained. The proposals provide the opportunity to enhance the retained area for the benefit of the residents and wildlife. The proposed mitigation measures will increase the mosaic and quality of the habitats present, thereby potentially increasing the future faunal biodiversity of the site. However some of the construction activities could have an impact on the habitats or species that have been recognised as valuable ecological features.

12.9 The eastern part of the site will be given over to a landscape and ecological mitigation and enhancement area. Here, extensive areas of species rich grassland and wildflower meadow will be created and maintained which would more than offset the loss of the species rich grassland within the remainder of the site. Additional tree and scrub planting, using native species of local stock wherever possible, would be
undertaken throughout the site, again offsetting the loss of trees and scrub as a result of the development. The effect of which is assessed to be minor beneficial.

12.10 Construction activities on the site have the potential to negatively impact species found on site, including reptile and bat species identified. As a result, precautionary working measures will be detailed in the CEMP to minimise any impacts.

12.11 The clearance of trees and shrubs during preparation works for construction has the potential to harm or disturb an active bird nest. Particularly considering the abundance and diversity of bird species found to be present and breeding within the site boundary. It is advised that these works are undertaken outside of the bird nesting season March – September inclusive where possible. If this is not possible, any areas needing to be cleared should be checked by a suitably qualified ecologist prior to commencement of work.

**Operational Phase Effects**

12.12 The proposed development will have a positive impact on Rags Brook as it will form part of the main public open space (POS)/natural area to be retained and enhanced. The POS will provide a natural buffer from the residential area, and will be subject to appropriate maintenance and management regimes following an Ecological Management Plan (EcMP). The design of the linear park, traversing the entire site, will retain connectivity through site as a wildlife corridor. The landscape and planting scheme will enhance the suitability of the brook and its vegetative corridor to support a wider biodiversity through enacting the EcMP, and will therefore benefit and encourage wildlife (particularly protected or notable species) from the wider district to colonise the restored stream.

12.13 Increased bat roosting opportunities will be incorporated into the proposed development scheme in the form of twenty bat boxes of varying types, including hibernation boxes, tree-mounted boxes and inbuilt boxes into the walls of the new buildings, as well as tree planting (and mature tree retention) which will increase in bat roost potential as the trees mature. This will be a minor beneficial impact of the completed development.

12.14 The completed development will have a moderate beneficial (significant) effect on reptiles through the creation of higher quality habitat and features including hibernacula and deadwood piles. The implementation of the EcMP will also enhance the quality of the retained habitats by creating and maintaining a mosaic of varying vegetation types and sward heights.

12.15 There are a number of aspects of the proposals which will have a positive impact on breeding birds. These include: the provision of forty bird boxes as part of the development which will be a selection of tree-mounted bird boxes of different styles to encourage different species.

12.16 Figure 12.1 shows the structure of the proposed landscape, including Rags Brook Park and areas of retained vegetation.
Figure 12.1 Landscape Structure Parameter Plan
13 ARCHAEOLOGY

Introduction

13.1 Chapter 13: Archaeology of the ES presents a description of archaeological baseline conditions, considers the potential effects of development on these assets and presents measures to avoid, reduce or mitigate where these are necessary.

Existing Baseline

13.2 The archaeological DBA identifies a low potential for the prehistoric periods on the site due to the sites geological and topographical location. The area around Cheshunt is considered to have been a favoured area of exploitation in the Palaeolithic period. A high number of stone tools of the period have been found mainly during gravel extraction in the surrounding area. Early prehistoric activity in the Cheshunt area appears to have occurred along the line of the earliest gravel terraces. Within the wider area, Mesolithic assemblages have been found on the terraces to the west of the Lea Valley. There are no remains within the study area attributed to the Bronze Age or the Iron Age periods. However, the absence of Iron Age finds within the wider Cheshunt area may be misleading and much Iron Age and Roman activity could have been concealed by alluvium and marsh and destroyed by erosion and gravel extraction.

13.3 There are no designated archaeological assets on or in close proximity to the study site. There are several non-designated heritage assets in the area surrounding the site and on the site itself in the form of a medieval ridge and furrow in the field south of the Rosedale Sports Ground, and a ditch located in Rosedale Sports Ground on the south of the site.

Construction Phase Effects

13.4 The site is considered to have a theoretically low potential for archaeological evidence pre-dating the Medieval period. Evidence for a linear ditch and ridge and furrow probably dating the medieval or post-medieval periods are recorded on the Hertfordshire HER in the south of the site, and are considered to be of low sensitivity. Construction groundworks and landscaping are not proposed in the area of the two HER records at the Rosedale Sports Ground and therefore the resultant effect significance is considered to be Negligible. Construction groundworks and landscaping for the residential and school development, access roads and supporting infrastructure have the potential to remove these archaeological remains from the site. The impact of the magnitude of the effect of the proposed development is considered to be medium/low negative, and the site’s potential archaeological evidence is considered to be of local importance and therefore low sensitivity. On this basis the resultant effect significance is considered to be Minor/Negligible given the low sensitivity of the potential archaeological assets.

13.5 Proposed development on the site would not affect any below ground designated archaeological assets because there are no designated heritage assets on or in close proximity to the site.

Operational Phase Effects

13.6 There would be no effect on archaeological assets during the occupation because based upon the nature of the proposed development, any potential impacts upon buried archaeological deposits are limited to the construction phase of development. As such, there will be no further impact during the occupation of the development.
14 WATER RESOURCES, DRAINAGE AND FLOOD RISK

Introduction

14.1 Chapter 14: Water Resources, Drainage and Flood Risk of the ES considers the impacts of the proposed development on hydrology, flood risk, foul drainage and water resources including; flood risk to the site and the surrounding area, surface water and groundwater quality and water resources.

Existing Baseline

14.2 The Rags Brook (a tributary of the River Lee) flows through the central part of the site in an easterly direction towards Cheshunt Reservoir (North).

14.3 The contributing catchment to the Rags Brook at the downstream extent of the site (Rosedale Way) is approximately 3.3km². The site currently drains by a series of open ditches that flow towards the Rags Brook.

14.4 The brook has experienced a decline in condition from over-grazing, damage from trespassing, and fly tipping.

14.5 The Site is underlain by the London Clay Formation. River Terrace Deposits and Glacial Sands and Gravels are shown overlying the solid geology, respectively, in the lower part of the valley of the Rag’s Brook on the eastern part of the site and on the low ridge on the southern part of the site.

14.6 The River Terrace Deposits and Glacial Sands and Gravels are classified as Secondary (A) Aquifers, whilst the London Clay Formation is classified as an Unproductive Strata.

14.7 The groundwater vulnerability map indicates that the site is underlain by a Non-Aquifer. Non-Aquifers are defined as deposits of low permeability that have negligible significance for water supply or river base flow. Also, the site is not designated as part of any groundwater EA Source Protection Zones.

14.8 The online EA Flood Map for Planning (Rivers and Sea) indicates the site lies wholly within Flood Zone 1 with a ‘Low’ probability of Flooding. Flood Zone 1 is land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

14.9 Correspondence with the EA and the PFRA and SFRA confirm there are no records of historical flooding at the site.

14.10 The Thames District RBMP confirms the groundwater quality and quantity is ‘Not Assessed’ in the vicinity of the site due to the unproductive underlying strata.

14.11 The site sits within a sub catchment of the Lower Lee referred to as ‘Small River Lee (and tributaries)’. The EA Catchment Explorer states that for the 2015 RBMP cycle, the ecological quality in water bodies within the catchment is classed as ‘Moderate’ and the chemical quality is classed as ‘Good’. The objectives for the catchment are for all criteria to be classed as ‘Good’ by 2027.

Construction Phase Effects

14.12 During construction, the impermeable area of the site will increase and surface water will be managed across the site using a temporary drainage system. This has the potential to increase surface water flooding until the permanent drainage system is in operation. The potential effect on flood risk will be minor adverse prior to the incorporation of suitable mitigation measures.
There is also the potential to affect groundwater quality beneath the site through mobilisation of contaminants and creation of new pathways during the excavation and earthworks, or through a pollution incident. The effect is considered to be temporary during construction but will affect the groundwater quality permanently and therefore the effect is considered to be moderate adverse.

The impact of the proposed development on floodplain storage capacity and conveyance will be negligible as all built development areas are located outside of the modelled floodplain extents. Therefore, no mitigation measures will be required in this respect.

During the construction phase, there is potential for the on-site generation of surface water contaminated with hydrocarbons from machinery, fuel storage or heavy vehicles parked on site. In addition, fine particles may also originate from stockpiles of construction materials, plant and wheel washing. Surface water runoff could potentially become silty during construction which would have moderate adverse effects on surface water quality.

The overall potential water quality effects resulting from the construction phase will of minor adverse significance.

Operational Phase Effects

The operation of the proposed development will result in an increase in the impermeable surfacing at the site, which could pose a risk of flooding by increasing the potential runoff and the rate at which surface water enters the receiving systems, potentially increasing downstream flood risk issues. The impact on surface water flooding would be adverse if no mitigation measures are put in place, and Figure 12.1 shows the location of a number of ponds and sustainable drainage features.

There is also the potential for the on-site generation of surface run-off contaminated with hydrocarbons from vehicles. These contaminants could potentially enter groundwater. The effect on water quality is expected to be minor adverse prior to mitigation measures.

The impact on floodplain storage capacity and conveyance as a result of the operation of the proposed development will be negligible as all built development areas are located outside of the modelled floodplain extents.

The proposed development will increase foul water discharge from the site. The increase in flood risk from foul water sewer flooding is expected to be minor adverse prior to mitigation measures.

The operation of the proposed development will result in an increased local population and have an impact on local foul water sewer networks and the receiving treatment works. It has been concluded that there is sufficient capacity available (subject to detailed proposals and discharge rates).

The Utility Service Appraisal identifies a number of water mains in the vicinity of the site which can be connected to. The appraisal states that the combined effect of all nearby developments have been confirmed as having a negligible effect on the local Darnicle Hill Water Booster Station and Service Reservoir.

The successful implementation of the incorporated mitigation measures should result in effects being reduced to negligible and therefore deemed to be not significant with respect to surface water, flood risk, water quality and water resources. Therefore no significant residual effects have been determined overall.
15 CUMULATIVE EFFECTS

15.1 Chapter 15: Cumulative Effects of the ES considers the interactions between different types of effects associated with the proposed development and the combined effects of several schemes which may, on an individual basis be insignificant, but additively, have a significant effect.

Effect Interactions of Individual Effects for the Construction Phase

15.2 The identified in-combination nuisance effects (from landscape and visual, and noise and vibration) are not untypical for a project of this nature. The ES has identified a number of best practice mitigation measures to eliminate, reduce or mitigate adverse these temporary construction effects in relation to this and these measures will be further reviewed throughout the detailed construction logistics planning, preparation of the Construction Method Statement (CMS) and throughout preparation of the Environmental Management Plan (EMP) and Construction Logistics Plan (CLP).

Effect Interactions of Individual Effects for the Operational Phase

15.3 Overall, the in-combination effects on the overall landscape character and individual views will result in benefits to this area, due to the sensitivity of the design and it consideration to provide a well thought out and appealing space.

15.4 Operation noise impacts from additional traffic and building plant are expected to be mostly negligible, and care will be taken to ensure that the building plant has a satisfactory noise rating to ensure that its effects are minimised and avoids noticeable interaction with traffic noise.

15.5 A key aspect of the proposed development is to provide a range of benefits to existing local and new residents, through the provision of good quality and affordable housing, public open and play space, a community focus, and either much needed employment or primary education facilities.
16 RESIDUAL EFFECTS AND CONCLUSIONS

Construction

16.1 Throughout the construction programme, there are several adverse and beneficial residual effects that have been reported in the ES, the majority of these will be negligible to minor and not significant.

16.2 Construction will occur in phases over approximately four years. During that time, but for short periods only, neighbouring houses immediately adjacent to noisy works may experience a moderate adverse effect. Properties further from the works would experience a lesser effect, with properties beyond the immediate boundary of the worksite exposed to no more than a minor or negligible effect. Such effects are temporary, and will be minimised through best construction practice as implemented.

16.3 The construction phase of the proposed development will have a minor beneficial effect on regional construction employment opportunities and on the regional economy.

16.4 To ensure that the measures proposed to achieve the residual effects are implemented during the works, the Applicant will develop and implement, in consultation with BBC, a Construction Method Statement (CMS) for the construction phases, which will outline how the works will comply with appropriate standards and guidance. The CMS will be a contractual document outlining the different procedures to be undertaken in order to complete the various works. Individual trade contracts will incorporate requirements for environmental control, based on good working practice, such as careful programming, resource conservation, adhering to health and safety regulations and quality procedures. In this way those involved with the construction phase, including trade contractors and site management, will be committed to adopt the agreed best practice and environmentally sound methods.

16.5 The commitments made within the CMS and ES will be incorporated into a CEMP, which will include roles and responsibilities, detail on control measures and activities to be undertaken to minimise environmental effect, and monitoring and record-keeping requirements. A commitment will be made to periodically review the CEMP and undertake regular environmental audits of its implementation during the construction phase of the proposed development.

Completed and Operational Development

16.6 Once completed and occupied the proposed development will have a number of significant benefits. For example, the design quality and provision of distinct character areas and provision of publically accessible and landscaped open space will lead to benefits on local landscape and visual amenity.

16.7 The provision of additional housing (including affordable housing) will go some way to meeting the local authority’s housing targets and the pressure on local social infrastructure has been compensated for through the provision of substantial amounts of new public open space and play space.

16.8 The proposed development will also deliver benefits through the provision of a 2 Form of Entry primary school, which will have a major contribution to improving education capacity in the area.

16.9 Overall, the proposed development has taken into account the objectives of planning policies at national and local levels, and is considered to be in accordance with the Government’s objectives for sustainable development.