ONE HORTON HEATH



Outline Planning Application Masterplan

Environmental Statement Volume 1
Main Statement

December 2020

EASTLEIGH BOROUGH COUNCIL | Investing in **our** community

Environmental Statement Volume 1

Main Statement

One Horton Heath, Eastleigh

Prepared for:

Eastleigh Borough Council

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

1.1.1 This Environmental Statement (ES) and its associated Non-Technical Summary (NTS) has been prepared by Savills (UK) Limited ("Savills") with technical input from the ES project team (see Section 1.7) on behalf of Eastleigh Borough Council ("the Applicant").

1.1.2 This ES supports two planning applications to the Local Planning Authority (LPA), Eastleigh Borough Council ("EBC"), for the development of land west of Horton Heath, known as the One Horton Heath Project. The two planning applications comprise:

- An Outline Planning Application (defined in the ES as 'the Wider OPA') for the whole One Horton Heath project; and

- A full planning application for the first phase of the One Horton Heath project (defined in the ES as 'OPA Phase 1') for 393 dwellings.

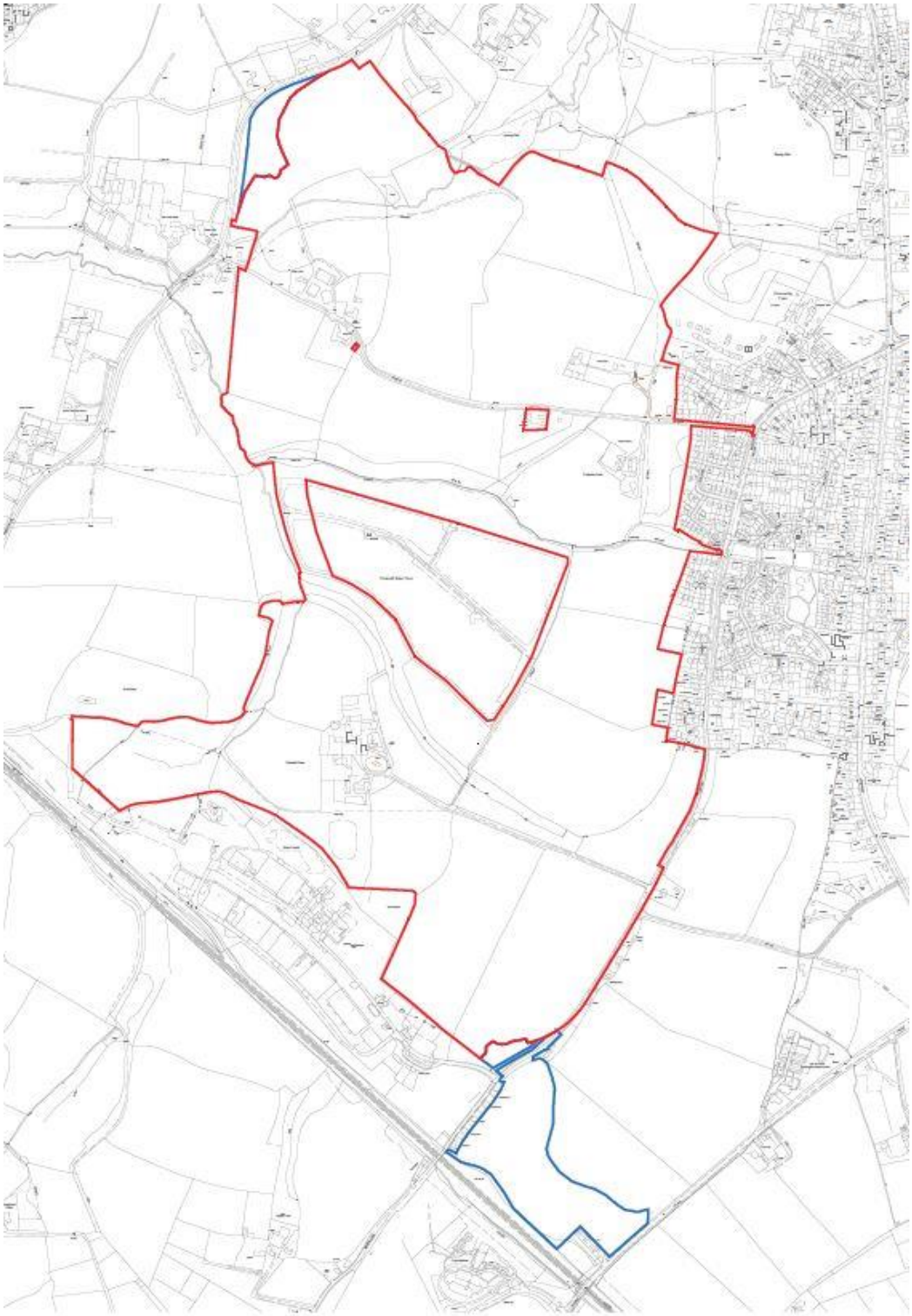
1.1.3 The outline planning application for the Wider OPA is for comprehensive development of the site, delivering up to 2,500 No. Residential Dwellings, local employment, local retail, leisure, employment and community facilities, primary school, formal and informal publicly accessible open space, including formal sports facilities, landscaping, green infrastructure and sustainable drainage systems.

1.1.4 The description of development for the Wider OPA planning application is:

Outline: phased mixed-use development comprising: up to 2,500 residential units in total; a primary Local Centre (and supporting secondary local centres) comprising mixed-use residential/retail/leisure/community/employment/day nursery/food establishment uses; office, commercial and industrial uses; a Primary School; public open space including formal sports facilities and informal provisions; relocation of solar panels; key infrastructure and utilities provision including new roads, footpaths and cyclepaths and improvements to the existing road junction at Fir Tree Lane/Burnetts Lane; and ecological, landscape, site preparation and demolition works (All Matters Reserved Except Access).

1.1.5 The Wider OPA Site is shown in Figure 1 below and supporting Figure 1.1 (Red Line Plan - Drawing reference EAST200403-RLP01-P2).

Figure 1: Wider OPA Site Red Line Boundary

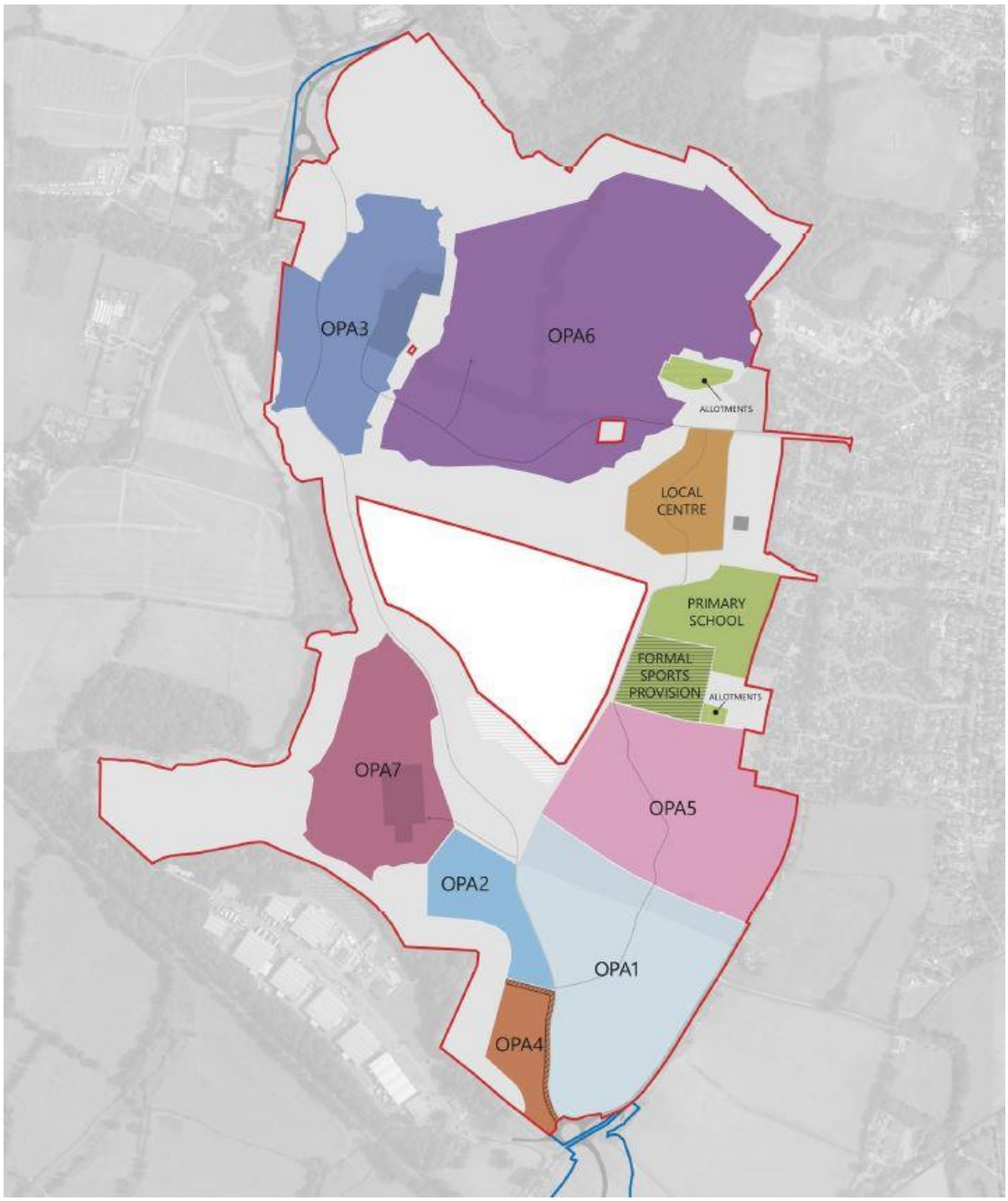


1.1.6 The description of development for the OPA Phase 1 is:

Erection of 393 residential units with public open space, hard and soft landscape works, internal roads, footway/cycleways, associated parking spaces, substation, SuDS and associated infrastructure.

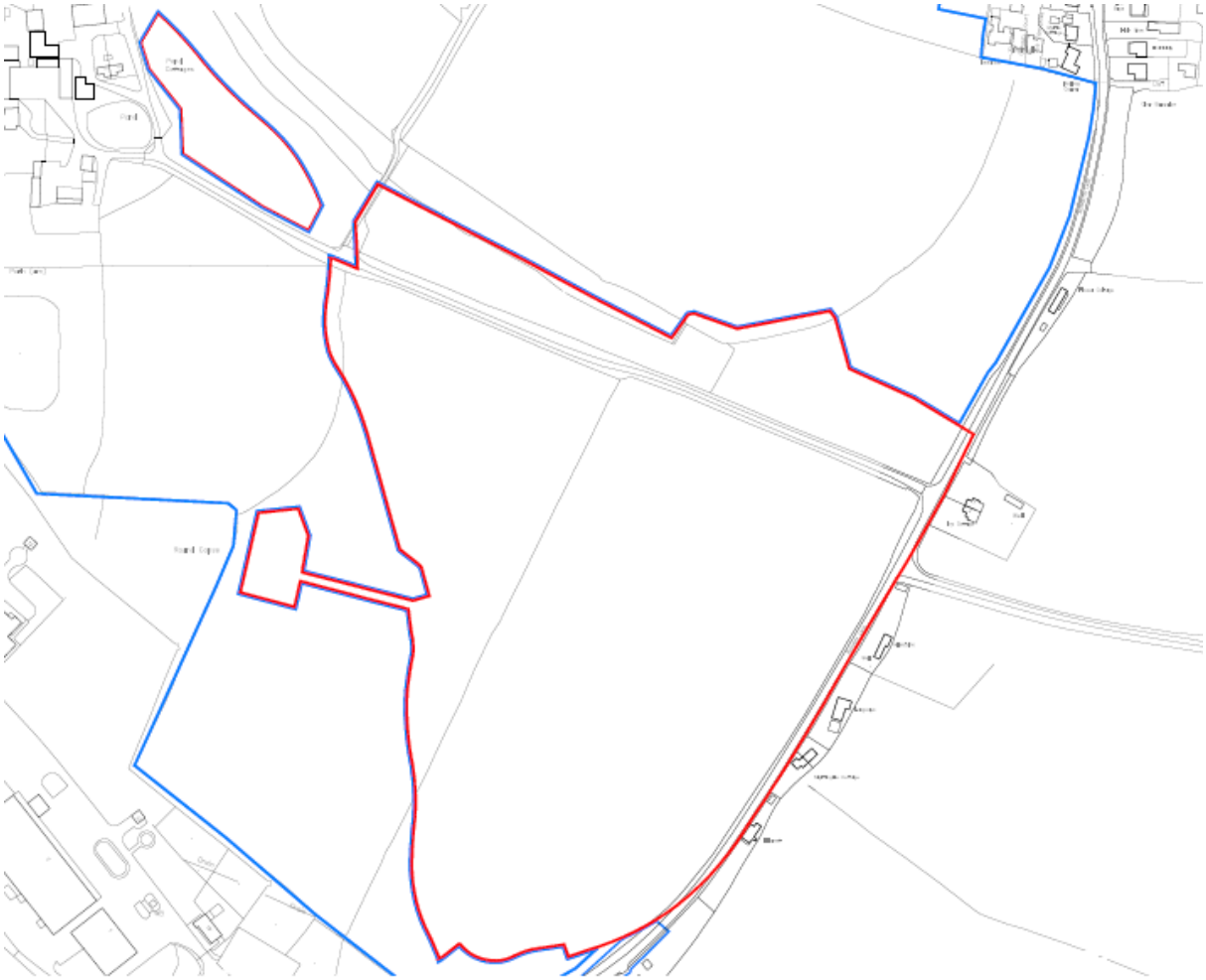
1.1.7 The location of the OPA Phase 1 Site (see OPA1) is shown in Figure 2 and supporting Figure 1.2 (Indicative Phasing Plan - Drawing reference EAST200403-PHP-01).

Figure 2: OPA Phase 1 Site Location



1.1.8 The red line plan for OPA Phase 1 is shown in Figure 3 and supporting Figure 1.3 (Red Line Plan – Drawing reference.

Figure 3: OPA Phase 1 Red Line Boundary



1.1.9 The project as a whole is referred to in the ES as 'the Proposed Development'.

Background

1.1.10 In December 2014 and October 2016, two outline planning applications were submitted for projects known as West Horton Heath (O/14/75735) and North West Horton Heath (O/16/79354). Together these applications related to the majority of the land subject to this application and sought approval for the construction of up to 1,400 homes, commercial land, education facilities, wider development infrastructure and a new Link Road from Bubb Lane through to Allington Lane.

1.1.11 EBC resolved to grant planning permission for the applications in 2015 and 2016 respectively. However, progress stalled due to protracted negotiations over the Section 106 legal agreements

accompanying each proposal. The two planning consents were finally issued in November and December 2017.

1.1.12 Recognising that delivery of development on land to the west of Horton Heath had stalled, EBC resolved to purchase the land subject to the two extant consents and commence delivery of the development. The initial acquisition completed in February 2018. Since then EBC have acquired additional areas of land to facilitate a more consistent and comprehensive development and worked to facilitate the timely delivery of development.

1.1.13 EBC, as applicant, made minor variations to the original planning consents in 2019 (X/19/86303 and X/19/86475) and commenced the construction of access infrastructure comprising roundabouts and Link Road sections at Allington Lane, Burnetts Lane and Bubb Lane. This access infrastructure, due to be completed in early 2021, will be utilised by the Wider OPA and OPA Phase 1.

1.1.14 Since the submission of the first planning application in 2014 and EBC acquiring the Wider OPA Site there have been a number of key changes that have particularly influenced the design of the Wider OPA proposals when compared with the original proposals. These include:

- Hampshire County Council, in their role as the education planning authority, decided to plan for a secondary school on their own land to the south of the Wider OPA Site at Hedge End. This has removed the need for a secondary school to be delivered at the Wider OPA Site (as was originally envisaged in the West Horton Heath application);
- Parcels of additional land outside of the two extant consents became available, and were subsequently acquired by EBC; and
- EBC embarked on the preparation of a new Local Plan covering the period 2016-2036.

1.1.15 Taking the above into account, EBC (as Landowner and Developer) adopted the non-statutory One Horton Heath Project Overview Brief (approved by Cabinet 11 July 2019) to govern the processes of planning for, delivering and subsequently maintaining the OHH development.

1.1.16 The two applications subject to this ES respond directly to this brief and seeks to deliver a development that will realise the vision of the emerging Eastleigh Borough Local Plan:

"To ensure development in Eastleigh Borough and its communities delivers a strong and sustainable economy with an adequate supply of housing and infrastructure that supports improved standards of living for residents while protecting the distinct identity of towns and villages and preventing urban sprawl; promoting thriving and healthy communities; and maintaining an attractive and sustainable environment that residents value."

1.2 ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

1.2.1 This Environmental Statement (ES) has been prepared under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the "2017 Regulations").

EIA Process

1.2.2 The 2017 Regulations require that before planning permission is granted for certain types of development an EIA must be undertaken.

1.2.3 EIA is a systematic and objective process through which the likely significant environmental effects of a project can be identified, assessed and, wherever possible, avoided or mitigated. EIA aims to improve the environmental design of a development scheme and provide decision-makers with sufficient information about the environmental impacts of a proposal.

1.2.4 This process and its outcomes are then reported in the ES to the decision maker (here the LPA), its advisors, and the public.

1.2.5 The ES sets out the environmental information about the scheme, including a description of the development, its likely environmental impacts and the measures intended to mitigate any adverse impacts. A Non-Technical Summary (NTS) is required to allow a wider public understanding of the findings of the ES.

1.2.6 EIA follows an iterative process that has the following stages:

- Screening is the first stage of the EIA process where the relevant authority (LPA or the Secretary of State) decides if EIA is required based upon the likelihood of significant environmental effects occurring as a result of the proposed development, either alone or in combination with other development proposals.

- Once it has been agreed that EIA is required for the proposed development, scoping may be undertaken to define what should be assessed and to ensure that the EIA is proportionate to the scale of the project and focussed upon the likely significant effects. This is done with input from the relevant authority and statutory consultees (including the Environment Agency, Heritage England, Natural England and the Highways England).

- With the scope of the EIA set, relevant information on the environmental baseline conditions is collected. This information is then used initially to understand the dynamics of the likely significant environmental effects and inform the design of the project to avoid and/or minimise likely significant adverse environmental effects. It is also at this stage that areas of mitigation and potential environmental enhancement are identified.

- The formal assessment stage is then undertaken on the fixed parameters that make up the development envelope (as set out in Chapter 3 of this ES) to define the likely significant environmental effects of the proposed development. Any likely significant adverse effects that are identified during the formal assessment stage are then reviewed against the design to consider whether alterations could be made to avoid or reduce the effect.

- Where likely significant adverse effects cannot be avoided or reduced through alterations to the design itself, mitigation measures are considered. Monitoring is also proposed to measure the actual significance of the effect during and after construction, and allow management of mitigation where appropriate.

1.2.7 The ES reports on the outcome of the EIA process and details the assessment that has been undertaken. Once the EIA is completed, the ES is submitted to the determining authority for consideration with the planning application.

1.3 SCREENING AND SCOPING FOR EIA

1.3.1 The 2017 Regulations set out the types of development that must always be subject to an EIA (Schedule 1 development) and other development that will only require assessment if it is likely to give rise to significant environmental effects (Schedule 2 development).

1.3.2 Schedule 3 of the EIA Regulations provides guidance and thresholds to help to decide whether EIA is required for a Schedule 2 development.

1.3.3 The Wider OPA and OPA Phase 1 both fall within Schedule 2 Section 10(b) of the 2017 Regulations as an *"Urban development project"* in which *"the development includes more than 150 dwellings"* and "*the overall area of the development exceeds 5 hectares*".

1.3.4 Given of the nature and scale of the Wider OPA and OPA Phase 1, the Applicant concluded that significant environmental effects could arise. As such it was considered that the Wider OPA and OPA Phase 1 qualify as EIA development as defined within the regulations. Therefore, a formal Screening Opinion was not requested.

1.3.5 In April 2020 an EIA Scoping Opinion was initially sought from EBC. Whilst this scope has been established in relation to the Wider OPA proposals, the Applicant considers that it remains appropriate for the assessment of OPA Phase 1, especially given the relationship between the two planning applications and proposed single Environmental Statement approach.

1.3.6 In August 2020, EBC issued its formal Scoping Opinion. The Scoping process and resultant opinion are discussed further in Chapter 5 – EIA Approach.

1.4 ENVIRONMENTAL STATEMENT STRUCTURE

1.4.1 The ES is structured as follows:

Volume 1a: ES Main Statement
Volume 1b: ES Main Statement Figures (including Parameter Plans)
Volume 2: Technical Appendices
Non-Technical Summary (NTS)

Volume 1: ES Main Report

1.4.2 This ES Main Report comprises the following chapters

Introductory Chapters

Chapter 1: Introduction
This chapter presents the legal framework and structure to the ES and an overview of the project team.

Chapter 2: Site and Designations
This chapter presents a summary overview of the OPA Phase 1 Site and the Wider OPA Site.

Chapter 3: The Proposed Development
This chapter presents the One Horton Heath Proposed Development and parameters assessed.

Chapter 4: Consultation and Alternatives
This chapter outlines the consultation and stakeholder engagement activities that have been undertaken and the alternative development options that have been considered for both OPA Phase 1 and the Wider OPA.

Chapter 5: EIA Approach
This chapter provides information on the general scope and methodology employed during the EIA process.

Technical Chapters

1.4.3 Chapters 6 – 14 describe the baseline conditions for various environmental topics and provide an assessment of likely significant environmental effects taking into account mitigation and enhancement measures to be implemented. Assessment related to the following topics has been undertaken by technical specialists.

Chapter 6: Socio-Economics

Chapter 7: Air Quality

Chapter 8: Transport and Access

Chapter 9: Built Heritage

Chapter 10: Ecology

Chapter 11: Hydrology (Including Flood Risk)

Chapter 12: Noise and Vibration

Chapter 13: Landscape & Visual Impact

Concluding Chapter

Chapter 14: Assessment, Mitigation and Implementation Summary
This chapter presents the assessment of interactive effects, sets out the proposed mitigation and enhancement measures and how they are to be controlled, implemented and verified and summarises the residual effects of the One Horton Heath Project taking into account the implementation.

1.4.4 The EIA Parameter Plans for the Wider OPA, detailed design drawings for OPA Phase 1 and supporting figures accompanying the technical chapters are included within Volume 1b.

Volume 2: Technical Appendices

1.4.5 Volume 2 contains technical appendices supporting the chapters of the ES Main Report.

Non-Technical Summary

1.4.6 This is a summary of the ES in non-technical language presenting the existing site conditions, a description of OPA Phase 1 and the Wider OPA (the One Horton Heath Project) and setting out the likely environmental effects.

1.5 THE PROJECT TEAM

1.5.1 The project team is being led by consultants Savills, with input from specialists both internal and external to the company. The project team comprises:

EIA Management and Co-ordination	Savills
Socio-Economics	Savills

Air Quality	Hydrock
Transport and Access	Paul Basham Associates
Built Heritage	Wessex Archaeology
Ecology	Johns Associates
Water Environment	PFA Consulting Ltd
Noise and Vibration	Hydrock
Landscape and Visual	Tyler Grange

1.6 STATEMENT OF RELEVANT EXPERTISE

1.6.1 The 2017 Regulations require that an ES must be prepared by competent experts. Paragraph 18 Part 5(b) of the 2017 Regulations states that *"the environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts"*. This section has been prepared to in line with this requirement.

1.6.2 In line with Regulation 18(5), it is confirmed that the project team (outlined above), constitutes a 'competent expert' for the purposes of EIA project management, and drafting of relevant technical chapters. The combined project team have relevant experience in undertaking EIA on projects of this nature and scale, and have the expertise to ensure that the ES complies with the regulatory requirements and best practice.

Savills

1.6.3 Savills is an Institute of Environmental Management and Assessment (IEMA) approved (Quality Mark) consultancy whose EIA Consultants and Expert Witnesses have many years' experience in the coordination, drafting and delivery of varied ES's.

1.6.4 As an IEMA Quality Mark consultancy, EIA's prepared by Savills are submitted to and audited by IEMA for quality and consistency. In addition, Savills is required to contribute to the ongoing development, learning and improvement of the EIA process in the UK through the provision of case studies, articles and seminars.

Socio-Economics

1.6.5 The Socio-Economic chapter of the ES has been reviewed and edited by Stefanos Zymis, Dip MSc MIED of Savills. Stefanos has five years' experience of preparing socio-economic impact assessments for a wide range of EIA projects.

1.6.6 The Socio-Economic chapter of the ES has been prepared by Georgie Sheard MSc BSc who also works in the Savills Economic Team. Georgie is experienced in the preparation socio-economic impact assessments and in contributing to EIAs.

Cotswold Archaeology

Built Heritage

1.6.7 The Built Heritage Chapter of the ES was prepared by Heather Hall of Cotswold Archaeology. With a background in architecture, Heather has extensive experience of providing built heritage advice, having previously worked as Historic Buildings Adviser to a local planning authority. During this time, she acted as expert witness at hearings, and has produced detailed written representations for a wide variety of projects.

1.6.8 Within the private sector, Heather has worked on a wide range of setting and heritage impact assessments and has been involved in proactively shaping the design of schemes in sensitive historic locations. She has prepared and submitted successful LBC applications, ensuring that all work complies with internationally accepted conservation standards, national legislation and policy and aligns with Historic England guidance.

1.6.9 Heather is Affiliate Member of the Institute of Historic Building Conservation (IHBC), and is Secretary of the IHBC South-East Branch.

Tyler Grange

Landscape and Visual

1.6.10 The Landscape and Visual ES Chapter has been prepared by Colin Pill, a Director of Tyler Grange Group Ltd with over 25 years of landscape design and planning experience. He has a Bachelor of Arts Degree and Post-Graduate Diploma in Landscape Architecture from the University of Greenwich and has been Chartered Member of the Landscape Institute (CMLI) since 1994.

1.6.11 He is a panel member of the Design Review Panel and Chair of the Landscape Institutes Apprenticeship Trailblazer as well as a judge for the Landscape Institute awards.

Hydrock

Air Quality

1.6.12 The Air Quality ES chapter has been prepared by Amy Van de Sande. Amy is a Senior Air Quality Consultant with over 5 years' experience of carrying out Air Quality Assessments for a variety of projects, including residential developments, retail and residential mixed-use developments, and large road and rail infrastructure projects. These schemes have been London, smaller towns and cities, and rural environments across the UK. She has a Masters in Air Pollution Management and Control and is a Member of the Institute of Air Quality

Management and Institute of Environmental Sciences. Areas of expertise include air dispersion modelling using ADMS Roads and ADMS Urban, data analysis for a range of datasets, undertaking construction dust assessments and providing input into technical reports, both standalone reports and ES chapters.

Noise and Vibration

1.6.13 The Noise and Vibration ES Chapter has been prepared by Eddy Goldsmith. Eddy holds a BEng (hons) Acoustics degree from the University of Salford, full membership to the Institute of Acoustics, and over 7 years of professional consultancy experience in Acoustics. His technical knowledge and understanding of key Physics concepts provide the ability to identify noise and vibration design issues during the early stages of a project, all the way through to construction and operational stages.

1.6.14 Eddy has led the acoustic engineering aspect of developments comprising a multitude of usages, within a range of sectors including residential, manufacturing, retail, energy, waste, leisure, utilities, entertainment, minerals, education and healthcare. Having worked on large scale and contentious projects, together with international design teams, he values communication as one of the crucial skills in delivering projects successfully.

Johns Associates

1.6.15 The Ecology ES Chapter has been prepared by Johns Associates.

1.6.16 Matthew Johns is a highly experienced environmental consultant and Chartered Environmentalist, specialising in Environmental Impact Assessment, biodiversity and hydrology. This includes EIA of residential development, agricultural schemes, renewable energy, water transfer schemes, waste water treatment works, afforestation, inland navigation, airport development, urban regeneration, and landfilling. A key skill is in predicting multidisciplinary environmental effects and reducing potential negative effects and project risk through good design by working with engineers, designers, architects, landscape architects and other professionals, alongside strong communication and consultation skills. He has acted as Expert Witness. Key sectors include Government Agencies, Local Authorities, Water Companies, Professionals, Aviation, Property, Estate Management and Industry. Matt also has a strong background and current experience in aquatic and terrestrial ecology, protected species licencing and mitigation, alongside the robust delivery of management and monitoring mechanisms. He is a Member of the Chartered Institute of Ecology and Environmental Management, Institute of Fisheries Management, Fellow of the Geological Society and Member of the River Restoration Centre.

1.6.17 Liz Johns is the founding Director of Johns Associates and is a qualified and experienced ecologist with 20 years' experience in both the public and private sectors. She is an experienced aquatic ecologist with a strong background in aquatic resource management and ecology, including macroinvertebrate identification and protected species surveys and she holds a range of protected species licences. Liz worked for a number of years as an ecologist for the Environment Agency across three regions before moving into environmental consultancy. Liz has extensive experience in project management, site survey, protected species survey, Ecological Impact Assessment; the production of Ecology chapters of Environmental Statements, BREEAM assessments, Appropriate Assessment, HRA and the development of detailed mitigation strategies and associated site management plans. She was a member of the Institute of Ecology & Environmental Management External Affairs Committee for a number of years.

1.6.18 Ben Mitchell is a Principal Ecologist at Johns Associates and is a qualified and experienced ecologist with over 16 years' experience in the charitable, public and private sectors. He has a significant experience of delivering ecological impact assessment for complex residential and infrastructure scale developments. He has also been responsible for the delivery of a number of nationally important conservation projects. Ben has a highly experienced ecologist specialising in survey design, interpretation of data, habitat creation/management and mitigation. He holds a range of protected species licences for both survey and mitigation. Throughout his professional career, Ben has delivered comprehensive ecological support, including complex and specialist protected species surveys, environmental impact assessment for a broad range of projects. In addition to his consultancy skills he has a wealth of practical experience of the creation, restoration and management of protected wetland sites over 10 years for the RSPB, Loch Lomond & the Trossachs National Park and North Lanarkshire Council. Ben has been instrumental in the development of project management systems for the company. He is also exploring the potential for the use of species distribution and landscape modelling techniques in commercial ecology and has recently been working with Wiltshire Council and Corsham town Council to create policies to protect important features for bats within the Wiltshire landscape.

1.6.19 Riki Therivel is director of Levett-Therivel and a visiting professor at Oxford Brookes University and University College Dublin. She specialises in environmental and social impact assessment of policies, plans and projects, and Habitats Regulations Assessment (HRA). She has co-authored key guidance documents on how to implement the European strategic environmental assessment (SEA) and Habitats Directives; has supported a wide range of authorities from the national to the sub-local level in their SA/SEAs and HRAs; and has written/edited many articles and books on these subjects. Riki studied environmental impact assessment and SEA on Oxford Brookes University's MSc courses in Environmental Assessment and Management, and

was the 2002-3 recipient of the International Association for Impact Assessment's Individual Award for her contribution to the development of SEA and excellence in teaching and research.

1.6.20 Lis Weidt has 6 years' experience working in ecological consultancy, with considerable knowledge of ecological legislation, policy and best practice. She has delivered Ecological Impact Assessments for a number of developments for local authority clients. Lis holds a range of protected species licences for both survey and mitigation purposes including advanced bat survey techniques. She has extensive experience in provision of technical support and reviewing documents and works in relation to compliance with nature conservation legislations, project management, site survey, protected species survey. She acts as named ecologist on EPS licence applications and Ecological Clerk of Works for protected species, legally protected and sensitive habitats, produces Ecological Impact Assessment and ecology chapters of Environmental Statements, and the development of detailed mitigation strategies and associated site management plans.

1.6.21 Katherine Newbert is a consultant ecologist with 4 years' experience working in ecological consultancy. She has a wide range of experience undertaking ecological field work and report writing. Katherine is a skilled botanist with experience of delivering a range of surveys including botanical field work, including phase one habitat surveys covering a range of habitats types (aquatic and terrestrial) as well as more specialist surveys e.g. NVC surveys. She also has experience in protected species surveying and has been an ecological clerk of works on projects for protected species. She has experience in writing a range of different reports including preliminary ecological appraisals, protected species and habitat inspection reports, LEMPS, CEMPS, BREEAM reports, and helping produce chapters and technical notes for environmental impact assessments.

1.6.22 Kerry White is a consultant ecologist with the ecology team at Johns Associates and has 4 years' experience working in ecological consultancy. She holds protected species licences and has experience in Ecological Clerk of Works for protected species and sensitive habitats, Phase 1 Habitat surveys, botanical surveys, survey design and implementation, data collection and data analysis. Kerry has produced and contributed a range of ecological reports including preliminary ecological appraisals, bat roost inspection and survey reports, species specific technical notes for environmental impact assessments, method statements and protected species licence applications.

PFA Consulting Ltd

1.6.23 The Hydrology Chapter of this ES has been completed by PFA Consulting Ltd's Flood Risk and Water Management Team and Infrastructure Design Team. The team is led by Steve Millard MICE IEng, with over 40 years industry experience, and includes further CIWEM accredited

personnel and individuals with relevant degree qualifications in Civil and Environmental Engineering and Environmental Science. The assessment was prepared by Ben Fox (BSc (Hons) MCIWEM C.WEM CEnv) and overseen by Mark Skivington (BSc (Hons) MSc) who have eight and seventeen years' experience respectively in preparing Flood Risk Assessments, Drainage Strategies and Environmental Assessments.

Paul Basham Associates

1.6.24 The Transport and Access Chapter of the ES has been prepared The Transport and Access chapter of the ES has been prepared by Paul Basham Associates and in particular Director; Mark Smith and Principal Transport Planner; Jessica Lloyd. Paul Basham Associates have also prepared the Transport Assessments and Travel Plans to support the two developments.

1.6.25 Mark Smith has over 13 years' experience in the transport planning field and is also a member of the Chartered Institute of Highways and Transportation and a Member of Hampshire Chamber of Commerce Planning and Transport Committee. Mark has experience of working on several Local Plan allocated sites as well as strategic planning applications, including those within Eastleigh Borough.

1.6.26 Jessica Lloyd has over 6 years' experience within Transport Planning and holds a Masters with Distinction in Transportation Planning and Engineering from the University of Southampton. Jessica has worked on a wide variety of projects on the south coast, and within Eastleigh Borough in particular, with projects of varying scales which has necessitated input into Environmental Impact Assessments.

1.7 CONSULTATION

1.7.1 Should interested parties wish to make representations on the content of this ES and the planning application made to EBC, they can be made in writing to:

Ms Dawn Errington
Eastleigh Borough Council
Eastleigh House
Upper Market Street
Eastleigh
Hampshire
SO50 9YN

1.7.2 Alternatively, representations can be made online by following instructions at:

https://www.eastleigh.gov.uk/planning-and-building/planning-applications

1.7.3 The ES is available to purchase from the Planning and EIA Consultants working on behalf of the applicant using the following address:

FAO Peter Warren
Savills
2 Charlotte Place
Southampton
SO14 0TB

1.7.4 Table 1.1 sets out the costs related to the volumes of the ES available. The ES should also be available on the LPA's website.

Table 1.1: Environmental Statement Costs

Volume		Hard Copy	CD-ROM/DVD
1	Main ES Report	£600	£5
2	Technical Appendices	Please enquire at above address	
3	Non-Technical Summary	Free of Charge	

1.7.5 Requests should be made in writing to the above address. Cheques should be made payable to 'Savills (UK) Limited'.

1.8 CROSS REFERENCING

1.8.1 Within this ES reference is made to documents submitted as part of the associated planning application. For ease of identification and location, these documents are referenced in Table 1.2. These documents can all be accessed via the LPA's website by following the instructions at:

- https://www.eastleigh.gov.uk/planning-and-building/planning-applications

Table 1.2: Application Document References

Document Title	Author
Wider OPA Planning Statement	Savills (UK) Limited
Wider OPA Design and Access Statement	Clague
OPA Phase 1 Planning Statement	Savills (UK) Limited
OPA Phase 1 Design and Access Statement	Clague
Wider OPA Transport Assessment	Paul Basham Associates
OPA Phase 1 Transport Assessment	Paul Basham Associates

Travel Plan	Paul Basham Associates
Statement of Community Involvement	Savills (UK) Limited
Retail Statement	Savills (UK) Limited
Economic Regeneration Statement	Savills (UK) Limited
One Horton Heath Design Code	Clague
Open Space Strategy	Tyler Grange
Mineral Resource Statement	Savills (UK) Limited
Phase 1 Desk Study Assessment (Ground Investigations)	Hydrock
Phase 2 Ground Investigation Report	Hydrock
Preliminary Arboricultural Report	Tyler Grange
Utilities and Foul Water Statement	Hilson Moran

1.1.1 A glossary of abbreviations used within the ES can be found in Appendix 1.1.

CHAPTER 2: SITE DESCRIPTION

2.1 INTRODUCTION

2.1.1 This chapter provides a description of the OPA Phase 1 Site and its setting and the Wider OPA Site and its setting. Further details relevant to the proposed scope of the technical assessments are provided in Chapters 6 – 14.

2.2 SITE DESCRIPTION

The Wider OPA Site

2.2.1 The Wider OPA Site, identified on Figure 1.1, is an area of land west of Horton Heath, near Eastleigh, Hampshire. The Site borders Allington Lane to the northwest, part of Burnetts Lane at the eastern boundary and Bubb Lane in the southernmost corner. Fir Tree Lane intersects the Site linking Allington Lane to Horton Heath Village, whilst Chalcroft Solar Park is situated towards the middle of the Wider OPA Site on the western side.

2.2.2 Horton Heath Village is located adjacent to the Site on the east boundary. Chalcroft Distribution Park is located immediately south beyond which an active railway line, running between Hedge End and Eastleigh stations, is situated.

2.2.3 The Site is approximately 130.9ha in size and is largely comprised of agricultural land, with a few clusters of farm buildings and residences located throughout. The topography is broadly flat with some gentle undulation. The lowest point, at the western boundary, is approximately 22m AOD rising to approximately 29m AOD in the northeast of the Wider OPA Site.

Public Rights of Way

2.2.4 Several Public Rights of Way are located within and adjacent to the Wider OPA Site, as identified through Hampshire County Councils Rights of Way map. These broadly run in an east to west direction and are connected by additional north to south footpath links.

- Footpath Route 3 runs from east to west at the southern boundary connecting Allington Lane and Burnetts Lane.
- Footpath Route 1 runs from Allington Lane through the middle of the site, along the boundary of the Chalcroft Solar Park, to Horton Heath Village.
- Footpath Route 2 joins these paths providing a north to south link.

2.2.5 In the north of the Wider OPA Site, Footpath Route 11 connects Fir Tree Lane to additional Rights of Way outside the Wider OPA Site boundary, eventually linking up with the residential properties at Pavilion Close. Footpath Route 10 is located on the eastern boundary linking routes 11 and 1.

Ground Conditions and Agricultural Land

2.2.6 The Wider OPA Site is predominately underlain by Wittering Formation (Sand, Silt and Clay) bedrock with a small area of Earnley Sand Formation (Sand, Silt and Clay) in the southeast corner of the Wider OPA Site. Alluvium (Clay, Silt, Sand and Gravel) superficial deposits are associated with the areas underlying on-site watercourses.

2.2.7 The underlying Bedrock and Superficial deposits are classified as a Secondary A aquifers which are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to riversThe Site does not lie within a groundwater source protection zone (SPZ).

2.2.8 Given the Wider OPA Site is predominantly agricultural land it is considered to have limited potential for significant ground contamination, although some localised contamination impacts may be present in the vicinity of the farms on site and adjacent to the distribution park to the south.

2.2.9 The majority of the Wider OPA Site is located on Grade 3b agricultural land and contains patches of Grade 4 around Chalcroft Distribution Park. Therefore, development of this land would not impact on the provision of best and most versatile agricultural land in the area. Two small sections of the Site, adjacent to Horton Heath Village and also at the northern boundary, are classified as Grade 3a, however, only form a small part of the Wider OPA Site.

Archaeology and Built Heritage

Archaeology

2.2.10 There are no designated Archaeological Assets within the Wider OPA Site.

2.2.11 There are no scheduled monuments within 1km of the Wider OPA Site. Extending this to a 5km radius identifies nine scheduled monuments, the nearest of which are listed below:

- Bowl barrow 200m west of Moorgreen House (Reference 1012710), located 1.9km southwest
- Park pale at Marwell, south of Fisher's Pond (Reference 1012309), located 2.7km north.

Built Heritage

2.2.12 There are no designated built heritage asset located within the Wider OPA Site boundary. However, the Site wraps around the Grade II listed Fir Tree Farm House which is located towards the north western side.

2.2.13 The surrounding area contains various designated heritage assets including four listed buildings in the neighbouring villages of Horton Heath and Fair Oak:

- Rambers Cottage, Grade II listed, located 200m east;
- Saxon Court, Grade II listed, located 280m west;
- The Bush, Grade II listed, located 320m north west; and
- The Cockpit, Grade II listed, located 679m west.

2.2.14 Other listed buildings nearby include:

- West Horton Farm Cottages, Grade II listed, located 0.7km west; and
- Moorgreen Farmhouse, Grade II listed, located 0.9km southeast.

2.2.15 Further details on heritage assets and their assessment are provided within Chapter 7 – Built Heritage.

Flood Risk and Drainage

2.2.16 The closest watercourses to the Wider OPA Site are the tributaries of the River Itchen which flow adjacent to the western and northern boundaries.

2.2.17 The Wider OPA Site is predominately at Very Low risk of flooding from watercourses and from surface water runoff or localised accumulations of surface water as a consequence of an intense rainfall event.

2.2.18 Areas of elevated watercourse and surface water flood risk (Low, Medium and High) are associated with the routes and low lying areas around the on-site watercourses.

2.2.19 Areas of Flood Zones 2 and 3 are present along the unnamed Main River which forms the Wider OPA Site's western boundary and Fair Oak Stream which bisects the northern area. The remainder of the Wider OPA Site is defined as Flood Zone 1.

2.2.20 Areas of High, Medium and Low surface water flood risk are restricted to the naturally defined channels of the on-site watercourses and a small number of isolated low lying areas within the Wider OPA Site, including the western extent of Fir Tree Lane. The remainder of the Wider OPA Site is at Very Low risk of surface water flooding.

2.2.21 The majority of the Wider OPA Site is at Low risk of flooding from groundwater with areas of elevated risk associated with the low lying areas in proximity to on-site watercourses.

2.2.22 Only one on-site watercourse, waterbody or wetland area is designated for its nature conservation value. The Fair Oak Stream which bisects the northern area of the Wider OPA Site falls within a Site of Importance for Nature Conservation (SINC) (Quobleigh Pond and Woods SINC, Fair Oak School Meadow SINC, Wyvern Technical College Meadow SINC and Ponds and Meadow adjacent to Wyvern Technical College SINC).

2.2.23 Further details on hydrology, flood risk and drainage and their assessment is provided within Chapter 11 – Hydrology (Including Flood Risk and Drainage).

Nature Conservation

2.2.24 The Wider OPA Site largely comprises a series of agricultural field compartments divided by hedgerows with trees. The north of the site is predominantly set to arable crops whilst the southern half is characterised by grass pasture. The hedgerows provide ecological connectivity through the Site, however, the intensively managed arable fields are of limited ecological value.

2.2.25 There are no Statutory Designated Sites of nature conservation interest within the Wider OPA Site, although a number are located in the surrounding area.

2.2.26 The closest Statutory Designated Site of nature conservation interest is the River Itchen Site of Special Scientific Interest (SSSI) which is located approximately 1.1km west at its nearest point. This contains the protected habitats of classic chalk stream and river, fen meadow, flood pasture and swamp. Part of the River Itchen Special Area of Conservation (SAC) is also located here. Designated as such due to its classic chalk river features supporting species such as Southern Damselfly and Bullhead.

2.2.27 The Moorgreen Meadows SSSI is located 1.2km South of the Wider OPA Site and is protected due to its neutral meadows and alder wood, flanking a small tributary of the River Hamble.

2.2.28 The Solent and Southampton Water Special Protection Area (SPA) and Ramsar site lie approximately 4km southeast at the closet point, on the River Hamble. The SPA is designated for its wintering populations of Teal, Dark-bellied Brent Geese, Black-tailed Godwit and Ringed

Plover, as well as breeding populations of Terns (Common, Sandwich, Little and Roseate) and Mediterranean Gull. The Ramsar designation results from being one of the few major sheltered channels between a substantial island and mainland European waters. It includes many wetland habitats characteristic of the bio-geographical region, as well as supporting an important assemblage of rare plants and invertebrates.

2.2.29 An area of the Solent Maritime SAC is located approximately 4km southeast of the Wider OPA Site. This SAC is designated for its estuaries, spartina swards and Atlantic salt meadows.

2.2.30 Further details on ecological sites and habitats and their assessment are provided within Chapter 10 – Ecology.

Landscape Character

2.2.31 The Wider OPA Site comprises large arable fields, generally bounded by natural features such as hedgerows, tree belts and watercourses. The South and North of the Wider OPA Site do have distinctly different landscape characters. These characters are separated by Foxwood watercourse and tree belt which crosses the site East to West.

2.2.32 At the South, the land is open and rolling, with exceptionally large fields framed by weak hedgerows. As a result, views across the South of the Wider OPA Site are long with significant intervisibility from a range of places within and without the site.

2.2.33 At the Eastern edge, the settlement of Horton Heath is visible – starting as a dispersed line of cottages along Burnetts Lane and becoming much more formal as it meets the settlement edge of the existing village.

2.2.34 To the West and North, the Southern half of the site is framed by strong, tall tree lines which largely screen the site from longer views.

2.2.35 To the North, the Wider OPA Site is very enclosed. It comprises smaller fields which are enclosed by very strong and well-established treelines. From the far North, viewed from Allington Lane, there are long distance views into the site, although these are heavily filtered by existing treelines. However, the remaining fields are almost entirely self-contained with no visibility from one field to the next, or to external spaces. The Eastern-most field actually includes the highest point on the entire site. However, it is entirely concealed from external view by the height of the tree and woodland belts which enclose it.

2.2.36 Natural England locates the Wider OPA Site within National Character Area (NCA) 128: South Hampshire Lowlands.

2.2.37 As stated in the National Character Area Profile: "*The South Hampshire Lowlands National Character Area (NCA) is a lowlying plain between the chalk hills of the Hampshire and South Downs and Southampton Water. Its highest point is an outlying chalk ridge – Portsdown Hill – but the bedrock geology is mostly open marine, estuarine and freshwater Tertiary deposits. The NCA is dominated by the city and port of Southampton and its adjoining towns and suburbs – 29 per cent of the area is urban. In the more rural areas, it is a mixture of farmland, particularly pasture, and woodland.*

Some 18 per cent of the land cover of the NCA is woodland, of which almost half is designated ancient woodland, a legacy of the Forest of Bere, a Royal Hunting Forest that once covered the area. Today the most significant blocks of woodland are West Walk near Wickham, Botley Wood at Swanwick and Ampfield Wood near Romsey.

Although a high percentage of the area is urban, the NCA has considerable biodiversity interest. Southampton Water is internationally recognised for its importance for breeding and overwintering waterfowl and waders and for its wetland habitats such as mudflats and salt marshes. Three Natura 2000 designations cover parts of the area – Solent and Southampton Water Ramsar site, Solent and Southampton Water Special Protection Area and Solent Maritime Special Area of Conservation."

2.2.38 Further details on the assessment of local landscape character are provided in Chapter 14 – Landscape and Visual.

Air Quality and Noise and Vibration

2.2.39 EBC currently has four Air Quality Management Areas (AQMA) following the recognition of poor air quality in the borough. The closest of which is the A335 Eastleigh AQMA No.1 located approximately 2.9km to the west. The full locations of these AQMAs are listed below:

- Eastleigh – Through Eastleigh along the A335 – Southampton Road and West along Leigh Road;
- Hamble Lane – In Old Netley;
- M3 – Through Eastleigh along the M3 from Dove Dave Road in the South to Boyatt Lane in the North; and
- High Street, Botley – Along the A334 through Botley.

2.2.40 EBC have not identified the Horton Heath area as being at risk of exceeding air quality objective levels, therefore no specific monitoring or modelling has been undertaken for this location by the Council.

2.2.41 The Chalcroft Distribution Centre is located to the south of the site, however a review of the Envirocheck data for the area has confirmed that there are no activities on this site which may result in the potential for elevated levels of air quality pollutants.

2.2.42 The railway line which boarders parts of the southern end of the Site may produce audible noise in nearby areas of the Proposed Development, particularly in periods of low road traffic movements. Additional noise sources in the vicinity include Chalcroft Distribution park and the network of roads in the surrounds.

2.2.43 Further details on air quality and noise and their assessments is provided within Chapter 11 – Noise and Vibration and Chapter 7 – Air Quality.

OPA Phase 1 Site

2.2.44 The OPA Phase 1 Site (as shown on Figure 1.3) is a parcel of land located south west of Horton Heath, near Eastleigh within the county of Hampshire. Eastleigh is located approximately 7km north west of the Site with the city of Southampton located approximately 8km south. Southampton Airport is located approximately 3km west of the OPA Phase 1 Site. The OPA Phase 1 Site centres Grid Reference SU489163.

2.2.45 The OPA Phase 1 Site is located to the southernmost extent of the Wider OPA Site (see Figure 1.2) and includes part of Burnetts Lane to its eastern border and an unnamed track and agricultural fields to its northern border. Chalcroft Farm is to the west of the OPA Phase 1 Site, whilst Round Copse borders the south west of the OPA Phase 1 Site beyond which lies Chalcroft Business Park. Immediately to the south of the OPA Phase1 Site lies the access infrastructure junction from Burnetts Lane which will connect the OPA Phase 1 Site to the Wider OPA.

2.2.46 The OPA Phase 1 Site is approximately 7.3ha in size and is comprised of agricultural land. Vegetation is generally restricted to field boundaries in the form of hedgerows. These run through the centre of the OPA Phase 1 Site as well as to the northern, southern and western borders.

2.2.47 Levels generally fall from the southeast towards north and west of the site, and range from approximately 29.66m Above Ordnance Datum (AOD) in the southeast to approximately 19.8m AOD in the north.

2.2.48 As such, the Site falls within the area characterised in the Eastleigh Borough Council Character Assessment as 'Horton Heath Undulating Farmland'. This describes the unifying features as '*predominantly agricultural landscape, with gentle undulation of the landform and the pattern of medium sized fields, generally bounded by good hedging with mature trees'*

2.2.49 To the immediate east of the OPA Phase 1 Site, along Burnetts Lane, lie several residential dwellings beyond which are agricultural fields. To the north east of the OPA Phase 1 Site is Horton Heath; a rural village which forms part of the civil parish of Fair Oak and Hedge End. The village comprises mostly residential properties, further east of this is the East Horton Golf Club.

2.2.50 Land beyond the western boundary is comprised of agricultural fields. Further west of this lie agricultural fields and the Seddul Bahr Industrial Estate. Beyond this is the Itchen Valley Country Park and the Southampton Airport.

2.2.51 To the north west of the OPA Phase 1 Site are also agricultural fields as well as various clusters of spaces being used for industrial and commercial purposes, which are accessed via Allington Lane. These include a garden centre, car garage and repair facilities, audio visual equipment hire service and a timber merchant.

2.2.52 North of the OPA Phase 1 Site is the Chalcroft Solar Park. North of the Solar Park is Quobleigh Woods, beyond which the large village of Fair Oak is located. This comprises residential properties along with the Fair Oak Village Hall, Wyvern College, Fair Oak Infants Schools and the Lapstone Playing Fields.

2.2.53 To the south west of the Site is Chalcroft Distribution Park, with an active railway line running south of this. Beyond this the M27 motorway can be accessed. This is adjacent to the town of Hedge End.

Public Rights of Way

2.2.54 As identified through Hampshire County Council's Rights of Way map, West End Footpath 3 runs to the northern and eastern boundaries of the OPA Phase 1 Site.

Ground Conditions and Agricultural Land

2.2.55 British Geological Survey (BGS) mapping indicated the OPA Phase 1 Site to be located on Wittering Formation, with the most westerly edge (outside of the OPA Phase 1 Site) of the land surveyed being underlain by River Terrace Deposits and Alluvium associated with a tributary of the River Itchen over Wittering Formation. Within the land associated with the OPA Phase 1

proposals, more sandy layers were encountered, and clay soils were noted to be predominately sandy clay. A small parcel in the south east of the OPA Phase 1 Site was shown to be located on Earnly Sand Formation overlying Wittering Formation. The soils underlying the OPA Phase 1 Site are classified as a Secondary 'A' Aquifer.

2.2.56 The OPA Phase 1 Site is not within a Source Protection Zone and there are no potable groundwater abstractions within 1km of the OPA Phase 1 Site.

2.2.57 No surface water features are found within the OPA Phase 1 Site.

2.2.58 Given the OPA Phase 1 Site is predominantly agricultural land it is considered to have limited potential for significant ground contamination, although some localised contamination impacts may be present in the vicinity of the farms on site and adjacent to the distribution park to the south.

2.2.59 With regards to contamination, the OPA Phase 1 Site is not located on or in close proximity to any of the identified 'farm hubs' within the Wider OPA. Therefore, the risks from current and historical agricultural activities is considered to be low.

2.2.60 The majority of the OPA Phase 1 Site is located on Grade 3b agricultural land and contains patches of Grade 4 around Chalcroft Distribution Park. Therefore, development of this land would not impact on the provision of best and most versatile agricultural land in the area. Two small sections of the OPA Phase 1 Site, adjacent to Horton Heath Village and also at the northern boundary, are classified as Grade 3a, however, only form a small part of the OPA Phase 1 Site.

Cultural Heritage (including Archaeology and Built Heritage)

Archaeology

2.2.61 The OPA Phase 1 Site is not located within an Area of Archaeological Significance (AAS). There are also no designated Archaeological Assets or Scheduled Monuments within the OPA Phase 1 Site or the immediate surrounding (within 1 km).

2.2.62 There are no scheduled monuments within 1km of the OPA Phase 1 Site. Extending this to a 5km radius identifies nine scheduled monuments, the nearest of which are listed below:

- Bowl barrow 200m west of Moorgreen House (Reference 1012710), located 1.9km southwest
- Park pale at Marwell, south of Fisher's Pond (Reference 1012309), located 2.7km north.

Built Heritage

2.2.63 There are no designated built heritage assets within the OPA Phase 1 Site and it does not fall within a conservation area.

2.2.64 The built heritage resource concerning the OPA Phase 1 Site is very limited. A number of Grade II Listed Buildings are situated within the wider surrounding landscape, with the nearest comprising Moorgreen Farmhouse and an associated granary, c. 870m to the south-west (Appendix 9.1, Figure 4). These assets are effectively screened from the OPA Phase 1 Site by the Chalcroft Business Park and railway embankments, and do not share any visual or experiential associations with the OPA Phase 1 Site.

2.2.65 Further details on heritage assets and their assessment are provided within Chapter 9 – Built Heritage.

Flood Risk and Drainage

2.2.66 The OPA Phase 1 Site is predominately at Very Low risk of flooding from watercourses (located entirely in Flood Zone 1) and from surface water runoff or localised accumulations of surface water as a consequence of an intense rainfall event.

2.2.67 Areas of elevated surface water flood risk (Low, Medium and High) are associated with the low lying areas adjacent to the existing access track, hedgerow which bisects the OPA Phase 1 Site and around the on-site watercourses.

2.2.68 A number of drainage features and watercourses are present within the OPA Phase 1 Site. An ordinary watercourse bisects the northern area of the OPA Phase 1 Site and flows from southeast (adjacent to Burnetts Lane) to west (running north of Charlcroft Farm, and south of the Solar Farm and eventually into an unnamed 'Main River' to the north west of the OPA Phase 1 Site). The OPA Phase 1 Site falls within the wider catchment of the River Itchen. No other water bodies are identified in the OPA Phase 1 Site.

2.2.69 The OPA Phase 1 Site currently comprises largely undeveloped greenfield land. In its undeveloped state the surface water runoff from the OPA Phase 1 Site drains into the on-site watercourses by overland and subsurface flow. The existing access track which connects to Chalcroft Farm drains into the adjacent drainage ditches and the ordinary watercourse described above by overland flow.

2.2.70 No public surface water sewers are identified on the OPA Phase 1 Site.

2.2.71 The OPA Phase 1 Site is predominately underlain by Wittering Formation (Sand, Silt and Clay) bedrock with a small area of Earnley Sand Formation (Sand, Silt and Clay) in the southeast corner of the Site. Alluvium (Clay, Silt, Sand and Gravel) superficial deposits are associated with the areas underlying on-site watercourses.

2.2.72 The underlying Bedrock and Superficial deposits are classified as a Secondary A aquifers which are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

2.2.73 It is considered that groundwater could be shallow on the site and shallowest in proximity to the on-site watercourses.

2.2.74 The majority of the OPA Phase 1 Site is at Low risk of flooding from groundwater with areas of elevated risk associated with the low lying areas in proximity to on-site watercourses.

2.2.75 Further details on hydrology, flood risk and drainage and their assessment is provided within Chapter 11 – Hydrology (Including Flood Risk and Drainage).

Nature Conservation

2.2.76 There are no Statutory Designated Sites of nature conservation interest within the OPA Phase 1 Site, although a number are located in the surrounding area.

2.2.77 The closest Statutory Designated Site of nature conservation interest is the River Itchen SSSI which is located approximately 2.1km west at its nearest point. This contains the protected habitats of classic chalk stream and river, fen meadow, flood pasture and swamp. Part of the River Itchen Special Area of Conservation (SAC) is also located here. Designated as such due to its classic chalk river features supporting species such as Southern Damselfly and Bullhead.

2.2.78 The Moorgreen Meadows SSSI is located 1.2km south of the OPA Phase 1 Site and is protected due to its neutral meadows and alder wood, flanking a small tributary of the River Hamble.

2.2.79 The Solent and Southampton Water Special Protection Area (SPA) and Ramsar site lie approximately 4km southeast at the closet point, on the River Hamble. The SPA is designated for its wintering populations of Teal, Dark-bellied Brent Geese, Black-tailed Godwit and Ringed Plover, as well as breeding populations of Terns (Common, Sandwich, Little and Roseate) and Mediterranean Gull. The Ramsar designation results from being one of the few major sheltered channels between a substantial island and mainland European waters. It includes many wetland habitats characteristic of the bio-geographical region, as well as supporting an important assemblage of rare plants and invertebrates.

2.2.80 An area of the Solent Maritime SAC is located approximately 4km southeast of the OPA Phase 1 Site. This SAC is designated for its estuaries, spartina swards and Atlantic salt meadows.

2.2.81 The Phase 1 OPA Site is dominated by large areas of intensively grazed, improved grassland enclosed by mature, species rich hedgerows. The areas of grassland to the north of the Chalcroft Farm access track are marginally more diverse owing to the presence of a wet ditch feature and a less intensive grazing regime.

2.2.82 The hedgerows in this area are also mature and species rich. Round Copse designated Site of Importance for Nature Conservation (SINC) lies to the south west that has been designated for its ancient woodland habitats. A patch of the vulnerable mousetail (Myosurus minimus) lies adjacent to the Chalcroft access track at the disturbed gateway into the eastern field, which is a notable record for the county.

2.2.83 Low levels of bat activity, comprise largely of common and widespread species, have been recorded across the OPA Phase 1 Site during both transect and automated detector surveys. No trees or buildings are present that would support bat roosts. A small population of great crested newt is present in Chalcroft Farm, the associated terrestrial habitat extends into OPA Phase 1. Breeding birds observed on site are all common with the exception of a family of Linnet recorded in the northern hedgerow, however this species was not confirmed as breeding on site. No badger activity was recorded on site during surveys in 2020. No dormouse activity has been recorded in the OPA Phase 1 Site

2.2.84 Further details on ecological sites and habitats and their proposed assessment are provided within Chapter 10 – Ecology.

Landscape Character

2.2.85 Natural England locates the OPA Phase 1 Site within National Character Area (NCA) 128: South Hampshire Lowlands.

2.2.86 As stated in the National Character Area Profile: "*The South Hampshire Lowlands National Character Area (NCA) is a lowlying plain between the chalk hills of the Hampshire and South Downs and Southampton Water. Its highest point is an outlying chalk ridge – Portsdown Hill – but the bedrock geology is mostly open marine, estuarine and freshwater Tertiary deposits. The NCA is dominated by the city and port of Southampton and its adjoining towns and suburbs – 29 per cent of the area is urban. In the more rural areas, it is a mixture of farmland, particularly pasture, and woodland.*

2.2.87 *Some 18 per cent of the land cover of the NCA is woodland, of which almost half is designated ancient woodland, a legacy of the Forest of Bere, a Royal Hunting Forest that once covered the area. Today the most significant blocks of woodland are West Walk near Wickham, Botley Wood at Swanwick and Ampfield Wood near Romsey.*

2.2.88 *Although a high percentage of the area is urban, the NCA has considerable biodiversity interest. Southampton Water is internationally recognised for its importance for breeding and overwintering waterfowl and waders and for its wetland habitats such as mudflats and salt marshes. Three Natura 2000 designations cover parts of the area – Solent and Southampton Water Ramsar site, Solent and Southampton Water Special Protection Area and Solent Maritime Special Area of Conservation."*

2.2.89 Further details on the assessment of local landscape character are provided in Chapter 13 – Landscape and Visual.

Air Quality and Noise

2.2.90 EBC currently has four Air Quality Management Areas (AQMA) following the recognition of poor air quality in the borough. The closest of which is the A335 Eastleigh AQMA No.1 located approximately 2.9km to the west. The full locations of these AQMAs are listed below:

- Eastleigh – Through Eastleigh along the A335 – Southampton Road and West along Leigh Road;
- Hamble Lane – In Old Netley;
- M3 – Through Eastleigh along the M3 from Dove Dave Road in the South to Boyatt Lane in the North; and
- High Street, Botley – Along the A334 through Botley.

2.2.91 EBC have not identified the Horton Heath area as being at risk of exceeding air quality objective levels, therefore no specific monitoring or modelling has been undertaken for this location by the Council.

2.2.92 The Chalcroft Distribution Centre is located to the south of the OPA Phase 1 Site, however a review of the Envirocheck data for the area has confirmed that there are no activities on this site which may result in the potential for elevated levels of air quality pollutants.

2.2.93 The railway line which borders parts of the southern end of the OPA Phase 1 Site may produce audible noise in nearby areas of the OPA Phase 1 proposals, particularly in periods of low road traffic movements. Additional noise sources in the vicinity include Chalcroft Distribution park and the network of roads in the surrounds.

2.2.94 Further details on noise and air quality and the proposed assessments are provided within Chapter 7 – Air Quality and Chapter 12 – Noise and Vibration.

2.3 SUMMARY OF SENSITIVE RECEPTORS

2.3.1 The following have been identified as the key sensitive receptors that could be affected, either directly, or indirectly by the Proposed Development:

- Occupiers of existing dwellings in proximity to the Wider OPA Site and OPA Phase 1 Site and local roads;
- The local population in respect of local services, schools, employment opportunities, etc.;
- Users of local roads, transport services and public rights of way/bridleways both on and in proximity to the Site;
- Ecological habitats and species present both on and in proximity to the Wider OPA Site and OPA Phase 1 Site;
- Surface and groundwater regimes both on and in proximity to the Wider OPA Site and OPA Phase 1 Site, including site drainage characteristics;
- The landscape character of the Wider OPA Site and OPA Phase 1 Site.
- Sensitive receptors that would be introduced to the Wider OPA Site and OPA Phase 1 Site as a result of the Proposed Development, including site workers and future residents, school children, tenants and other site users who would be present during the later phases of construction.

CHAPTER 3: THE PROPOSED DEVELOPMENT

3.1 INTRODUCTION

3.1.1 Thrive Architects are the appointed Master Planners and have designed the Wider OPA proposal with support and inputs from the wider project team.

3.1.2 Clague Architects have designed OPA Phase 1 with support and inputs from the wider project team

3.1.3 This chapter sets out the key elements of the Wider OPA and OPA Phase 1 proposals.

3.2 THE PLANNING APPLICATIONS

3.2.1 This Environmental Statement (ES) relates to two separate planning applications on 1) the Wider OPA Site and 2) the OPA Phase 1 Site.

1) The Wider OPA

3.2.2 An application for outline planning permission, with all matters reserved except access has been submitted for the Wider OPA proposals.

3.2.3 The description of development for the Wider OPA planning application is:

'Phased mixed-use development comprising: up to 2,500 residential units in total; a primary Local Centre (and supporting secondary local centres) comprising mixed-use residential/retail/leisure/community/employment/day nursery/food establishment uses; office, commercial and industrial uses; a Primary School; public open space including formal sports facilities and informal provisions; relocation of solar panels; key infrastructure and utilities provision including new roads, footpaths and cycle paths and improvements to the existing road junction at Fir Tree Lane/Burnetts Lane; and ecological, landscape, site preparation and demolition works (All Matters Reserved Except Access).

3.2.4 The Wider OPA planning application boundary is shown on Figure 1.1.

2) OPA Phase 1

3.2.5 An application for full planning permission has been submitted for the first residential parcel of the Wider OPA (defined in the EIA as 'OPA Phase 1').

3.2.6 The description of development for OPA Phase 1 is:

Erection of 393 residential units with public open space, hard and soft landscape works, internal roads, footway/cycleways, associated parking spaces, substation, SuDS and associated infrastructure (This application is subject to Environmental Impact Assessment)

3.2.7 The OPA Phase 1 planning application boundary is shown on Figure 1.3.

3.3 DEVELOPMENT DESCRIPTION

The Wider OPA

3.3.1 The proposed development for the Wider OPA comprises the comprehensive development of the site, delivering up to 2,500 No. Residential Dwellings, local employment, local retail, leisure, employment and community facilities, primary school, formal and informal publicly accessible open space, including formal sports facilities, landscaping, green infrastructure and sustainable drainage systems.

3.3.2 The Environmental Impact Assessment (EIA) for the Wider OPA has been undertaken on the basis of the Parameters Plans and design drawings set out in Table 3.3 at the end of this chapter and below. These are provided in ES Volume 1b – Main Statement Figures and Drawings.

- Access – Figure 3.1
- Land Use – Figure 3.2
- Green Infrastructure – Figure 3.3
- Building Heights – Figure 3.4
- Demolition – Figure 3.5

3.3.3 The EIA has also included any wider land outside the Wider OPA Site boundary needed for development specific infrastructure. This is specifically for off-site highway works to be carried out pursuant to a Highway Works Agreement.

3.3.4 The maximum parameters of the Proposed Development for the purposes of the EIA assessment are:

- Circa 2,500 dwellings comprising a mix of market and affordable housing (Use Classes C2 and C3);

- A Mixed Use centre of 3.1 Ha comprising residential, retail, leisure, community, employment facilities (Use Classes C2/C3, E, F.1, F.2 and Sui Generis);
- 3.3 Ha of employment land (Use Classes E(g)(i) and (iii), B2 and B8);
- A 3 FE primary school and early years education facilities (Use Class F1);
- Formal and informal publicly accessible open space, formal areas of play, youth provision and associated facilities, formal sports facilities, allotments and amenity space, including, landscaping, green infrastructure and sustainable drainage systems.
- The utilisation of existing and provision of new and/ or amended highway access points along Allington Lane, Fir Tree Lane, Burnetts Lane and Bubb Lane;
- Any wider land outside the site boundary needed for development specific infrastructure.

3.3.5 Further detail of the Wider OPA and its anticipated delivery is provided in Section 3.4 below.

3.3.6 The Illustrative Masterplan (Figure 3.6) demonstrates how the quantum of development proposed is achievable within the defined parameters.

3.3.7 The overall aim for the Wider OPA Site is to create a well-designed mixed-use development which incorporates market housing, affordable and self-build housing, employment and education provision and open space and recreational facilities. It is envisaged that the new development will become a popular residential neighbourhood and place of work, creating a network of pedestrian and cycle routes and open spaces which connect the site with the surrounding area and respond to the local context.

Residential Use and Mix

3.3.8 The aspiration for the Wider OPA Site is to provide up to 2,500 new homes (Use Class C2 and C3) that will suit all stages of home ownership from starter homes to family homes. This will also incorporate a range of market, affordable and self-build housing alongside specialist accommodation for older and vulnerable people. The Land Use Parameter Plan (Figure 3.2) shows the location of the proposed residential parcels within the Wider OPA Site.

3.3.9 The exact housing mix will be determined at the Reserved Matters Stage and will consider the housing mix requirements of both the local area and the wider borough. However, an indicative mix has been used to inform the Illustrative Masterplan (Figure 3.6) as set out in Table 3.1. In

accordance with Policy DM30 of the emerging Eastleigh Borough Local Plan the Proposed Development seeks to deliver 35% affordable housing.

Table 3.1: Indicative Housing Mix

	Percentage	Number	Open Market	Private Rented	Affordable	Retirement (Affordable)
1B2P Flat	14.87	372	100	125	77	69
2B4P Flat	24.02	601	100	125	169	206
2B4P House	23.86	597	300	125	172	-
3B6P House	31.25	782	350	250	182	-
4B8P House	6.00	150	150	-	-	-
Total		**2,500**	**1,000**	**625**	**600**	**275**
			40%	25%	35%	

Commercial Use Amount and Mix

3.3.10 The Wider OPA proposes to provide up to 3.3ha of employment land (Use Class B1, B2 and B8). The proposed location of the proposed employment areas are immediately on the most southern boundary of the Wider OPA Site and to the north west of the Wider OPA Site as shown on the Land Use Parameter Plan (Figure 3.2).

3.3.11 The exact amount and mix of uses will be determined at Reserved Matters Stage and consideration on the amenity of future residents living in properties adjacent to the proposed employment areas when determining the proposed use. However, the Illustrative Masterplan indicates that the employment areas can provide approximately 9,500sqm of Use Class E(g)(i),(ii),(iii) (previously Use Class B1) and approximately 9,300sqm of Use Classes B2/B8. The Land Use Parameter Plan also allows for ancillary retail uses (Use Class E(a) and (b) and Sui Generis) to come forward alongside the primary commercial uses in these areas, subject to detailed design.

Local Centres and Education

3.3.12 Two mixed use local centres are proposed within the Wider OPA Site (Use Class E, C2, C3, F1, F2 and Sui Generis). The principal Local Centre will be located in the north west of the Wider OPA Site, to the north of the Primary School and south of Fir Tree Lane. A secondary Local Centre will be located in the south west of the Wider OPA Site. The exact amount and mix of uses within each centre will be determined at the Reserved Matters Stage. However, to ensure flexibility, a range of proposed uses have been included within these areas. At this outline stage, it is envisaged that the principal Local Centre will include a mix of convenience / retail uses alongside small scale commercial floorspace, a community building and early years nursery. The secondary Local Centre is envisaged to provide more leisure focused facilities (e.g. a farm shop/café).

3.3.13 The Wider OPA proposals include a single 3 Form Entry Primary School located on a 2.8ha site between the Local Centre and area of formal sports provision on the eastern boundary of the Site.

3.3.14 The proposed location of the mixed use areas and primary school are shown on the Land Use Parameter Plan (Figure 3.2).

Retained Uses

3.3.15 The Grade II Listed Fir Tree Farmhouse located to the north of Fir Tree Lane in the north west of the Wider OPA Site is to be retained as part of the Proposed Development. Subject to detailed design at the Reserved Matters Stage (including any necessary Listed Building consent) Fir Tree Farmhouse will be incorporated into the north west commercial area.

3.3.16 The Wider OPA proposals result in the loss of an area of the existing Solar Farm, the remainder of which is outside of the Wider OPA Site. Decisions have not yet been made regarding whether the lost area will require replacement. However, in the event that a replacement area is required to maintain the size of the Solar Farm an area of land adjacent to the south of the Solar Farm is safeguarded for potential relocation of the removed solar panels. Until such time as this area is required for replacement solar panels it will remain as informal open space.

Design and Scale

3.3.17 The Building Heights Parameter Plan (Figure 3.4) sets upper limits to the height of proposed buildings across the Wider OPA Site. Development of predominantly up to 4 storey buildings is proposed in areas across the majority of the Wider OPA Site. However, as indicated on Figure 3.4 and explained in the supporting Design and Access Statement, it is not envisaged that these

areas will all be 4 storey. It is intended that landmark or wayfinding elements will be located in three areas of the Wider OPA Site: at the northern gateway near to Allington Lane, at the southern gateway adjacent to the Burnetts Lane roundabout and within the principal Local Centre to the south of Fir Tree Lane in the east of the Wider OPA Site. As shown on Figure 3.4, these elements could be up to 6 storeys.

3.3.18 Specific areas are restricted to lower building heights in response to characteristics of the Wider OPA Site and its surroundings. These areas include: adjacent to Burnetts Lane in the south east; around the Chalcroft Farm area in the south west; at the edge of the Wider OPA proposals in the north west; and to the south east of the Grade II Listed Fir Tree Farm house.

3.3.19 Further details of the design rationale are provided in the Design and Access Statement (DAS) and Design Code, submitted as part of the suite of planning application documents for the outline planning application.

Access Strategy

3.3.20 As shown on the Access Parameter plan (Figure 3.1), the two principal Wider OPA Site accesses are located in the north west and south east of the Wider OPA Site from Allington Lane and Burnetts Lane respectively. The access junctions benefit from extant planning consent (X/19/86303 and X/19/86475) and take the form of a 3-arm roundabout on Allington Lane and a 4-arm roundabout on Burnetts Lane. Construction of these junctions commenced in 2020 and is expected to complete in early 2021 ahead of the commencement of the Wider OPA development.

3.3.21 It is proposed that the Allington Lane and Burnetts Lane junctions will be connected via a 30mph Link Road running through the Site. The indicative alignment of the Link Road is shown on the Access Parameter Plan (Figure 3.1). The following assumptions have been made for the proposed Link Road:

- Carriageway width – Assumed 7.3m width (6.5m could be acceptable in residential areas depending on HGB traffic, total traffic volumes and swept path analysis);
- Separation margin between footway and carriageway edge – Assumed 1.0m each on both sides of the carriageway;
- Shared footway/cycleway – Assumed 3.0m on both sides of the carriageway; and
- Landscaping verge for trees – Assumed 2.0m on both sides of the carriageway.

3.3.22 It is assumed, based on consultation with the Local Highway Authority, that the entire link road will be lit with added controls on sensitive areas, such as ecological areas.

3.3.23 It is proposed that the entire link road through the Wider OPA Site would be subject to a 30mph limit and up to 40mph in specific locations, such as the access roundabouts and the link between Bubb Lane and Burnetts Lane.

3.3.24 An Internal Distributor Road will connect with the Link Road and provide access to development parcels alongside the Local Centres, Primary School and area of formal sports provision.

3.3.25 A third site access is located at the existing junction of Fir Tree Lane and Burnetts Lane. As shown on Figure 3.1 and described in detail in the Transport Assessment, this junction and Fir Tree Lane is proposed to be subject to improvement works.

3.3.26 The western end of Fir Tree Lane, which currently crosses the northern half of the Wider OPA Site between Burnetts Lane and Allington Lane, is proposed to be downgraded to a pedestrian and cycle green link (except for access) to the east of the Link Road and a pedestrian only link to the west of the Link Road. The eastern end of Fir Tree Lane would form part of the Internal Distributor Road.

3.3.27 As shown on the Access Parameter Plan, pedestrian and cycle access to the Wider OPA Site will be provided via the three vehicular access points alongside a further six pedestrian access points and three pedestrian and cycle access points.

Pedestrian and Cycle Movement

3.3.28 A key network of pedestrian links are proposed across the site which strategically link into the wider network. The downgraded Fir Tree Lane will offer safe east west access from the existing Horton Heath across to Fir tree Farmhouse whilst the upgraded Chalcroft Lane foot and cycle path will offer safe east west access across the southern part of the site. The existing PRoW that runs north-south through the site connects these two points and integrates the Local Centre, formal sports provision and Primary School. Improving footpath 7 to the east of the Local centre offers a key link between existing Horton Heath and the proposed development.

3.3.29 Wider connections are linked with no footpath simply ‘ending’. Access towards Hedge End Station is provided by footpath to the south-east with the same towards Eastleigh, via Allington Lane, to the south-west. Connections towards Fair Oak and Lapstone Playing Fields connect to the north-east.

3.3.30 Cycling is at the heart of the sustainable movement strategy and the development caters for cyclists of all abilities. Commuter of Confident cyclists can pass through the site on a dedicated cycle link alongside The Avenue. Confident recreational cyclists or those who simply value the journey over the destination can use dedicated cycle links adjacent to the secondary road network. For those true leisure cyclists, those less confident or younger cyclists can use segregated cycle links that do not run adjacent to arterial roads but pass through residential areas.

3.3.31 To support this approach key cycle links largely follow pedestrian permeability with links through the Wider OPA Site and beyond to connect key receptors such as the Local Centre, the Primary School, Hedge End Station and Fair Oak and Eastleigh.

Sustainable Access

3.3.32 Where possible, the Wider OPA proposals have been designed to promote the use of sustainable travel options and minimise single occupancy car trips. A Framework Travel Plan (FTP) has been prepared in support of the proposals which details how this will be achieved. The purpose of the FTP is to promote and encourage the uptake of sustainable modes of transport for future residents and visitors of the Wider OPA Site. This forms part of the suite of documents submitted with the Outline Planning Application.

3.3.33 The One Horton Heath development proposes a package of on and off-site infrastructure improvements to improve walking and cycling conditions for future site users as well existing residents of nearby areas. The strategy also includes the potential for a bus to route through the development with the main roads designed as such to accommodate buses. The development once constructed and on and off-site measures delivered should provide an attractive walking, cycling and public transport environment to allow site users and visitors to travel via more sustainable modes of travel.

3.3.34 The key on-site measures to promote walking and cycling include:

- New, high quality pedestrian and cycle facilities adjacent to the link road which runs through the site, connecting Allington Lane in the northwest to Burnetts Lane and then Bubb Lane in the south east.
- Pedestrian and cycle facilities provided along the two main distributor roads which run through the site north to south and east to west.

- Downgrading of Fir Tree Lane to the west of the Local Centre and removal of highway rights to accommodate an attractive green travel corridor to accommodate pedestrians and cyclists.
- Two new pedestrian/cycle access onto Burnetts Lane via FOHHF7 and WEF3, of which both will be upgraded to accommodate all year round use by pedestrians and cyclists and likely include surface improvements and some form of lighting.
- Pedestrian improvements to the eastern section of Fir Tree Lane between Burnetts Lane and the Local Centre.
- Pedestrian routes which connect with existing PROW routes.

Green and Blue Infrastructure

3.3.35 The green infrastructure strategy for the Wider OPA Site builds upon a comprehensive understanding of the existing character, fabric and ecological value of the site and its surroundings. It has regard to its heritage, edge of settlement context, and connections to the surrounding area. As shown on the Green Infrastructure Parameter Plan (Figure 3.3) the 'Green' infrastructure on the Wider OPA Site is extensive and covers numerous character areas. Of particular note there are two key wooded areas that extend east-west across the Wider OPA Site, both at Quobleigh at the north of the site and across the middle of the site. Ancient woodland extends to the north-east of the Wider OPA Site and, of particular note, to the south-west corner of the Wider OPA Site, adjacent to Chalcroft Business Park, including Round Copse.

3.3.36 Figure 3.3 includes the retention of all the existing areas of woodland in additional to the retention of almost all the tree belts and hedgerows.

3.3.37 Large areas are protected as ecological mitigation areas whilst informal open space is integrated alongside the existing green corridors.

3.3.38 Blue infrastructure has been guided by SuDS and also the need to complement the green infrastructure strategy and provide ecological benefits. The 'Blue' infrastructure across the site is principally formed of three water corridors that run east to west across the Wider OPA Site.

Retained Uses

3.3.39 The Grade II Listed Fir Tree Farmhouse located to the north of Fir Tree Lane in the north west of the Wider OPA Site is to be retained as part of the Proposed Development. Subject to detailed

design at the Reserved Matters stage, Fir Tree Farmhouse will be incorporated into the north west commercial area.

3.3.40 The Wider OPA results in the loss of an area of the existing Solar Farm, the remainder of which is outside of the Wider OPA Site. Decisions have not yet been made regarding whether the lost area will require replacement. However, in the event that a replacement area is required to maintain the size of the Solar Farm an area of land adjacent to the south of the Solar Farm is safeguarded for potential relocation of the removed solar panels.

Landscaping and Open Space Strategy

3.3.41 The Proposed Development incorporates roughly 51ha of open space in a mix of formal and informal amenity spaces, SuDs features, ecological zones, woodland copses, wildflower meadows, allotments and formal sports provision.

3.3.42 The indicative breakdown of the publicly accessible open space is detailed in the Open Space Strategy (Tyler Grange) set out in Table 3.2.

Table 3.2: Indicative Open Space Strategy

Informal Open Space	**14.5ha**
Amenity Space (comprising):	**6.64ha**
LEAPs	0.16
LAPs	0.24
Natural Play	0.07
Destination Play	0.54
Formal Sports Area	1.86
Other Amenity Space	3.77
	21.14ha

3.3.43 As described in more detail in the submitted Open Space Strategy (Tyler Grange), the approach to play provision responds to the historical context, ecology and landscape character of the Wider OPA Site. The provision of play links the northern and southern ecological hubs at Quobleigh Woods and Chalcroft with the hub of activity centred around the principal Local

Centre. As shown on the Parameter Plans, a destination play facility is to be located in the open to the east of the principal Local Centre.

3.3.44 This approach will result in a gradual change in the character and type of play across the Wider OPA Site, with higher levels of activity and more formal play provision located around the principal Local Centre and in the east of the Wider OPA Site, and play provision changing as the community travel away from the Local Centre and towards the ecological hubs and ecological networks to the north and south providing a 'Formal' to 'Informal' approach to play.

3.3.45 Supporting the 'central hub' approach, it is proposed that formal sports provision is located to the immediate south of the Primary School, which opens up the opportunity for some complementary and, potentially, shared facilities. Through discussions with EBC, the Parish Council and wider stakeholders it has been agreed that formal sports provision on the site should focus on football alongside a contribution to the provision of enhanced cricket provision at the nearby Lapstone playing fields. As shown on the Illustrative Masterplan, the parameter plans allow for the provision of two FA Size 5v5 pitches within the primary school site alongside an FA Size 11v11 3G pitch to the south. Changing and storage facilities will also be provided alongside community indoor space within the principal Local Centre.

3.3.46 A key aspiration of the Proposed Development is the promotion of walking and cycling, not only for the purposes of travel to destinations but also for recreational purposes including dog walking. To this end, as discussed in more detail in the submitted Open Space Strategy, the Proposed Development will incorporate a network of recreational foot and cycle paths that will encourage their use by residents. The quality of the open space provision will be such that residents will be able to meet these leisure needs on site rather than travelling to more distant locations such as the New Forest or Solent areas.

3.3.47 Further information is provided in the Illustrative Open Space Strategy submitted with the Wider OPA outline planning application. Detailed Green Infrastructure Management Schemes will be provided with the subsequent Reserved Matters (RM) applications in due course.

Ecological Mitigation and Management

3.3.48 The Proposed Development includes an integrated landscape and ecological design that would retain and protect ecological receptors from the built environment and create a network of new and enhanced wildlife habitats. Further details are provided in Chapter 10 – Ecology.

3.3.49 Large areas of Priority Habitats will be created, including a minimum of 4 wildlife ponds, 6 km of species rich hedgerows and 5.6 ha of broadleaved woodland and these will enhance existing

features. The retained and created habitats will be enhanced for biodiversity in accordance with a detailed Landscape & Environment Management Plan (LEMP).

3.3.50 A key component of the management of the potential impact of increased human disturbance is to provide well signed pathways and to deliver a suite of educational material to new residents that will engender a sense of value in the natural habitats in and around the development. Measures will be included to manage unrestricted access to sensitive areas of the site by people and their pets. This will be delivered by the Open Space Strategy for the development.

Arboriculture

3.3.51 The design of the Wider OPA proposals and the Landscaping and Ecological strategies have been informed by the Preliminary Arboricultural Impact Assessment (AIA) undertaken in relation to the Wider OPA Site and proposals. The AIA is provided as a supporting document as part of the outline planning application.

3.3.52 Existing trees form a key component of the Wider OPA Site's overall network of green infrastructure. They form part of the Wider OPA Site's natural landscape, comprising woodlands, tree lines, hedgerows, and standalone specimens. Key arboricultural features include mature woodlands, veteran trees, and other mature trees belts and groups.

3.3.53 The potential tree loss requirement to accommodate the Wider OPA proposals has been assessed based on the proposed development parameters. It is estimated that there would be a loss of around 83 trees, of which 79% are of low arboricultural value or have no future retention value. No high value trees will require removal.

3.3.54 The opportunities for new tree planting as part of the Wider OPA proposals is expected to provide a future net gain in tree cover despite the loss of trees predicted.

3.3.55 Further details on Arboriculture are contained within the supporting AIA.

Drainage Strategy

<u>Surface Water Strategy and Water Quality</u>

3.3.56 A sustainable water management strategy, involving the implementation of SuDS, is proposed for managing the disposal of surface water runoff on the Wider OPA Site.

3.3.57 It was agreed with the Lead Local Flood Authority and other stakeholders that the Strategic SuDS features on the Wider OPA Site should comprise above ground storage features within the green corridors that follow the onsite watercourses.

3.3.58 Additional source control measures will be utilised within the upstream development parcels. This approach provides flexibility for the detailed design of the individual phases of development whilst maximising the water quality, water quantity, amenity and biodiversity benefits of the overall SuDS strategy.

3.3.59 Runoff from all development areas on the Wider OPA Site will pass through at least one Strategic SuDS feature. The Strategic SuDS features will incorporate the following treatment processes at a minimum:

- Sediment forebays at inlets
- Extensive wetland areas
- Wetland planting
- Secondary sedimentation areas prior to outlets.

3.3.60 The proposed water management strategy would ensure the surface water arising from the Wider OPA Site would be managed in a sustainable manner to mimic the surface water flows arising from the Wider OPA Site prior to the Proposed Development, while reducing the flood risk to the Wider OPA Site itself and elsewhere (taking climate change into account).

Foul Water Drainage

3.3.61 The outline Foul Water Drainage Strategy for the Wider OPA Site is fully detailed within the Wider OPA Flood Risk Assessment (Appendix 11.1). The proposed foul drainage strategy demonstrates that the Wider OPA Site can be drained of foul water.

3.3.62 Due to the site topography, foul water flows arising from the Wider OPA proposals will be collected in foul sewers and directed to onsite foul water pumping stations. The proposed locations of the Strategic Foul Water Pumping Stations are shown in Appendix 11.1.

3.3.63 The pumping stations would pump foul water to the public sewer network via a rising main.

3.3.64 Figure 3.7 (ref: SWS-S98-000798_Sketch One HH 1.0) shows the Section 98 formal estimated route from Southern Water showing the indicative route for a proposed off-site foul water sewer. These works would all be within the public highway.

3.3.65 The strategy will be refined as the proposed levels evolve during the further stages of design, when exact numbers of units and accommodation is fixed.

Energy and Sustainability Strategy

3.3.66 An Energy and Sustainability Statement has been produced for the Proposed Development which details the energy strategy and has been submitted as part of the outline planning application.

3.3.67 OHH has a Zero Operational Carbon aspiration and a number of studies have been carried out to explore feasible options. The submitted Sustainability and Energy Statement identifies specific strategies within the outline application proposals that will enable future residents to live sustainability and sets out a sustainability framework and objectives that will guide future Reserved Matters applications.

Utilities

3.3.68 All necessary enquiries have been undertaken with statutory undertakers and utility service providers. A Utilities Assessment has been produced for the Wider OPA.

3.3.69 Asset mapping for utilities infrastructure indicates that there is an existing water main that runs from the north through the Wider OPA Site on the eastern edge of the site. Records indicate that there are existing Low-Pressure, Medium-Pressure and High-Pressure apparatus within the vicinity of the Wider OPA Site, and various electricity distribution mains within the Wider OPA Site. There is existing telecommunications infrastructure running west-east across the Wider OPA Site along Fir Tree Lane. There are no adopted surface or foul water assets within the Wider OPA Site.

3.3.70 There are no services within the Wider OPA Site boundary and therefore no diversion are required.

3.3.71 It is anticipated that the Wider OPA proposals can be serviced via new connections to existing utilities.

Waste

3.3.72 Means by which the waste arisings from the Wider OPA can be reduced and recycling rates increased have been identified. These will contribute to ensuring a continual process of improvement in waste management performance associated with the Wider OPA proposals.

Demolition Waste

3.3.73 The Wider OPA proposals includes the demolition of Victoria Farmhouse as part of the comprehensive redevelopment of the Wider OPA Site.

3.3.74 The quantum and composition of waste generated through the demolition of this building will be established as part of the design of the detailed demolition programme in the Construction Environmental Management Plan (CEMP) for the relevant construction phase (to be secured by condition). However, consideration has been given at this stage to the waste management principles that should be employed and the potential management routes for demolition waste arisings.

Waste from the Construction Phase

3.3.75 It is estimated that the Wider OPA could potentially generate approximately 36,874 tonnes of construction waste not including waste from infrastructure development, such as utilities and pavements, which will add to the total construction waste volume. Over the duration of the construction works, waste generation is likely to vary significantly according to the programme and phasing.

3.3.76 The Building Research Establishment (BRE) has developed waste arising benchmarks to aid in the calculation of construction waste arisings at the design stage of a new development. These benchmarks are derived from data provided from completed projects on the SMARTWaste Plan.

3.3.77 Table 3.3 shows the most recent benchmark data (October 2017) for tonnes of construction waste per 100m^2 of floor area for new build developments.

Table 3.3: BRE Construction Waste Benchmarks

Project Type	Tonnes / 100m^2 gross internal floor area
Residential	15.3
Commercial Retail	12.4

Commercial Offices	15.7
Healthcare	13.0
Education	14.9
Civil Engineering*	26.7

Source: BRE Waste Benchmark Data, October 2017

*Source: BRE Waste Benchmark Data, January 2010

3.3.78 These benchmarks have been used to measure construction waste generation from the Wider OPA and relate to waste generation rates where no minimisation, reuse or recycling has taken place. It is the baseline figure from which a reduction in waste arisings will be established.

3.3.79 Table 3.4 shows the estimated construction waste arisings for the residential elements of the Wider OPA proposals based upon approximate and illustrative floor areas.

Table 3.4: Residential Waste Arisings

Number of Dwellings	Estimated Residential Floorspace (m^2)	Estimated Construction Waste Arisings (tonnes)
2,500	193,063	29,539

3.3.80 Table 3.5 shows the estimated construction waste arisings for the non-residential elements of the Wider OPA based upon approximate and illustrative floor areas and the applicable BRE waste benchmarks.

Table 3.5: Non-Residential Waste Arisings

Education/ Community Floorspace (m^2)*	Retail Floorspace (m^2)**	Link Road (m^2)***	Employment (m^2)	Estimated Construction Waste Arisings (tonnes)
3,835	2,499	13,000	19,000	7,335

*Estimate based upon Department for Education Area Guidelines for Mainstream Schools (June 2014) and Illustrative Masterplan. Construction waste associated with the Community Building and Early Years Nursery has been calculated upon the Education Benchmark.

**To enable a robust assessment and allow for a variance in eventual mix of uses, construction waste associated with the Employment has been calculated upon the Commercial Offices Benchmark.

*** Estimate based on indicative length of the proposed Link Road and width of 6.5m.

3.3.81 The estimations show that, in total, approximately 29,539 tonnes of waste may arise from the construction of the residential elements and approximately 3,864 tonnes from the non-residential elements of the Wider OPA proposals.

3.3.82 This provides an estimated total of approximately 36,874 tonnes of construction waste from the Wider OPA proposals.

3.3.83 Figure 3.8 illustrates the estimated composition of construction waste arisings for the Wider OPA based upon SmartWaste benchmark data from UK residential construction projects of a similar nature.

Figure 3.8: Typical Residential Construction Waste Composition (Waste Benchmark Data October 2017))

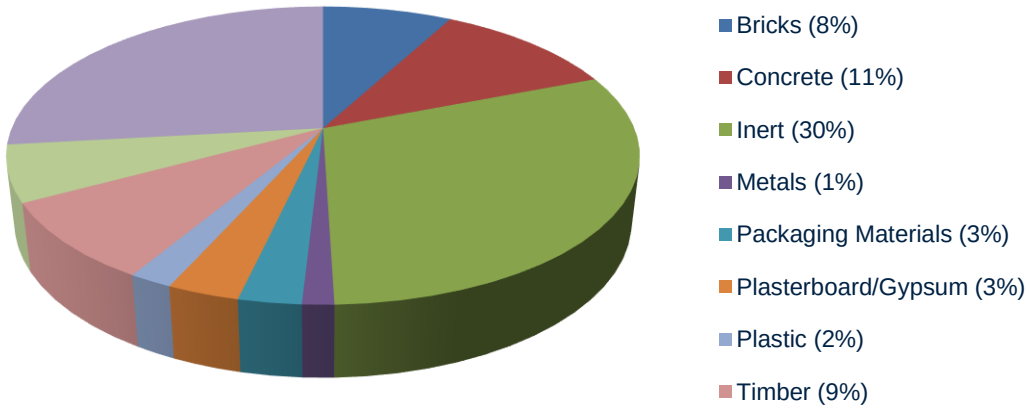


Table 3.6: Estimated Residential Construction Waste Composition

Estimated Residential Construction Waste Composition (Based on Waste Benchmark Data, October 2017
Inert (30%) – 8,861 tonnes
Mixed construction and/or demolition waste (27%) – 7,975 tonnes
Concrete (11%) – 3,249 tonnes
Timber (9%) – 2,658 tonnes
Bricks (8%) – 2,363 tonnes
Miscellaneous (6%) – 1,772 tonnes
Plasterboard/Gypsum (3%) – 886 tonnes

Packaging Materials (3%) – 886 tonnes
Plastic (2%) – 590 tonnes
Metals (1%) - 295 tonnes

3.3.84 The above figures are based upon standard construction operations in the UK. The estimated volumes identified can be lowered through good waste management practice. Opportunities to prevent and reduce the generation of construction waste are considered below.

3.3.85 A Construction Environmental Management Plan for each phase of development covering the management of anticipated waste arisings will be produced by the relevant contractor prior to any construction activities within that phase taking place.

3.3.86 For waste arising from the construction phase of the Wider OPA, materials will be separated into key waste groups. Suitable areas will be provided within the construction site(s) for the separation of materials for recycling (e.g. timber, metals, packaging, hardcore etc.).

3.3.87 However, it is acknowledged that construction sites can often be space constrained and this may limit the opportunity for segregation of the full suite of materials on-site. As such, if required, this may instead be undertaken off-site by a suitable waste contractor.

3.3.88 It will be a condition of contract for the contractors to agree target waste recovery rates. These will be discussed at the inaugural contract meeting. A monitoring report will then be generated on a regular basis which will include details of the progress made in diverting waste materials from landfill against these pre-agreed targets.

Waste from the Operational Phase

Generation of Household Waste

3.3.89 Household waste generation from the Wider OPA proposals has been estimated using gov.uk municipal waste statistics and Eastleigh Borough Council (EBC) data.

3.3.90 At this stage in the design process the figures can only be considered indicative as a variety of factors, such as the ongoing promotion of waste minimisation and recycling, consumer habits and population changes will impact on waste generation rates in future years.

3.3.91 As a baseline, Table 3.7 outlines how the average household waste generation rate per residential unit has been established.

Table 3.7: Average Household Waste Generation for Eastleigh Borough

Total household waste generated within Eastleigh Borough in 2018/19 (tonnes)[1]	41,785
Total number of households within Eastleigh Borough[2]	48,500
Estimated mean annual waste generation per household (tonnes)	0.86

3.3.92 This average household waste generation rate (0.86 tonnes per household) has been used to provide an estimate of the waste arisings from the Wider OPA.

3.3.93 It is estimated that the Wider OPA proposals would generate approximately 2,150 tonnes of household waste per annum (approximately 41 tonnes per week) should all units be constructed and occupied. Of this tonnage, a significant proportion will be separated by EBC for recycling and composting. Based upon the stated waste performance figures for EBC this would be 58.3% or 1,253 tonnes per annum (approximately 24 tonnes per week). The remaining residual waste (approximately 897 tonnes per annum) would require management through means such as landfill or energy recovery.

3.3.94 Residential units will incorporate sufficient internal waste storage container to promote the separation of recycling and compostable materials at source.

3.3.95 Externally, sufficient space will be provided to enable waste containers to be stored in accordance with EBC's refuse and recycling collection arrangements.

3.3.96 The non-residential elements will be provided with their own or shared waste storage areas for refuse and recycling with ease of access for end users and by collection vehicles.

OPA Phase 1

3.3.97 OPA Phase 1 forms Phase 1 of the wider Outline Planning Application (the Wider OPA), providing 393 of the 2,500 dwellings for which outline consent is sought. OPA Phase 1 has been submitted as a standalone planning application to enable the early delivery of homes within the One Horton Heath development. However, the proposal is entirely consistent with the outline

[1] https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables

[2] ONS: Estimated number of households by local authorities of England, 2004 to 2016

parameter plans, with detailed assessment of the Wider OPA and OPA Phase 1 having been considered in tandem to ensure consistency throughout the design process.

3.3.98 The EIA for OPA Phase 1 has been undertaken on the basis of the set of detailed design drawings set out in Appendix 3.1.

3.3.99 Further detail of OPA Phase 1 and its anticipated delivery is provided below and in Section 3.4.

Residential Use and Mix

3.3.100 A total of 393 residential units will be provided on the OPA Phase 1 Site. Based on a net developable area of 7.3ha, the density of the proposal equates to 54 dwellings per hectare.

3.3.101 The OPA Phase 1 proposals are to be comprised of the following housing mix:

Table 3.8: Proposed Housing Mix

	%	No.	Open Market	Private Rented	Affordable Rent	Shared Ownership	First Homes
Apartments							
1B2P Flat	9.92%	39	10	14	12	0	3
2B2P Maisonette	3.05%	12	3	4	4	0	1
2B4P Flat	17.8%	70	12	17	23	11	6
2B4P FOG	4.07%	16	3	4	5	3	1
House							
A1 2B4P	25.19%	99	38	20	20	16	7
B2 3B6P	8.40%	33	19	3	3	3	0
C1 3B6P	2.29%	9	0	2	2	2	0
D1 3B6P	2.80%	11	4	2	2	1	0
B3 3B6P	7.38%	29	11	5	5	4	0
F1 3B6P	10.18%	40	15	7	7	6	0
C2 4B8P	1.53%	6	6	0	0	0	0
C3 4B8P	3.05%	12	12	0	0	0	0
H1 4B8P	4.33%	17	17	0	0	0	0
Total		**393**	**150**	**94**	**84**	**46**	**19**

3.3.102 The proposed housing mix is comprised of 35% affordable homes formed of Private Rent, Affordable Rent, and Shared Ownership tenures.

Design and Scale

3.3.103 The Building Heights Parameter Plan (Figure 3.4) sets upper limits to the height of proposed buildings across the Wider OPA Site. For OPA Phase 1, the maximum building height across the majority of the OPA Phase 1 Site is 4 storeys with a 6 storey building having been assessed at the Southern Gateway. The Landscape and Visual ES Chapter, submitted DAS and LVIA report set out how these heights are appropriate to the landscape capacity of the site and other relevant matters, such as aerodrome safeguarding.

3.3.104 The proposed dwelling houses are typically 2 - 3 storey's in height, with the proposed apartment blocks ranging from 4 - 6 storey's in varying locations.

3.3.105 Further details of the design rationale are provided in the Design and Access Statement (DAS) and Design Code, submitted as part of the suite of planning application documents for the full planning application for OPA Phase 1.

Access and Movement Strategy

3.3.106 The Access Parameter Plan (Figure 3.1) of the Wider OPA identifies the indicative location of the link road and distributor road alignment within OPA Phase 1. The two extant consents (X/19/86475 and X/19/86303) have begun the early delivery of infrastructure through the development with the Bubb Lane/Link Road Roundabout, Burnetts Lane/Link Road Roundabout, the Link Road between Bubb Lane and Burnetts Lane and the Allington Lane/Link Road Roundabout. The early construction and delivery of these accesses secure access into OPA Phase 1 for the first tranche of residents via the southern gateway. The occupation of more than 100 units within OPA Phase 1 is dependent on the completion of the Link Road between Allington Lane and Burnetts Lane. This is set out in further detail in the EIA Approach chapter (ES Chapter 5).

3.3.107 The development of OPA Phase 1 is to be served via three access points, all taken from the proposed link road through the wider development site. Two pedestrian and cycle accesses are proposed to the north and south of the OPA Phase 1 Site.

3.3.108 A full Travel Plan has been completed in support of the full planning application for OPA Phase 1, which should be read alongside the Transport Statement. The Travel Plan seeks to facilitate and promote the use of sustainable transport modes, by providing a package of soft measures, supported by investment in infrastructure.

3.3.109 Offsite highways works are to include traffic calming measures along Burnetts Lane in order to prevent the road from becoming a rat run for vehicles traveling north. Full details of the proposed off-site highways works are set out in the accompanying Transport Assessment.

3.3.110 Sustainable transport improvements have been considered throughout the design process to encourage walking, cycling and public transport use. A package of measures is proposed as part of the wider OPA, with the following measures being specifically linked to the development of OPA Phase 1 as part of the cohesive design approach;

- A high quality 3m wide footway/cycleway which flanks the eastern side of the link road which connects from Bubb Lane in the south to Allington Lane in the north along with associated crossing points.
- A high quality 3m wide footway/cycleway which flanks the eastern distribution road which would eventually connect to the Primary school and local centre
- A new pedestrian/cycle access from/onto Burnetts Lane in the location of the existing Chalcroft Farm Access road and improvements to the eastern c.430m stretch of WEF3 and associated crossing point
- Allowing connections onto other local PROW routes which border the site, including the wester stretch of WEF3 and West End Footpath 2
- Proposed layout designed with considered to bus use
- Provision of a Full Travel Plan

3.3.111 Additional sustainable transport improvements which are linked to the Wider OPA, of which this proposal will benefit from, includes the provision of a bus service through the site, improved connections to local secondary schools and upgrades to the wider PROW network. Such measures will include upgrades to Fair Oak and Horton Heath Footpath 7 to improve connections into the existing Horton Heath, the downgrading of West End Footpath 3 to create an attractive pedestrian and cycle route and the potential for additional contributions to other PROW upgrades.

Open Space

3.3.112 An overarching Open Space Document provides the vision for the green infrastructure within the One Horton Heath development. For OPA Phase 1, open spaces will provide links to wider

networks of footpaths and green corridors, integrating play spaces within them by taking advantage of planting and natural materials and ensuring spaces are well overlooked with good surveillance and lighting. A detailed landscape principles document sets out the landscape design aspirations for each part of OPA Phase 1, including the provision of street trees and the use of planting to define edges and create places.

Ecology

3.3.113 Key ecological design principles have been applied to the development to avoid any likely significant effects on ecological features. The Wider OPA delivers suitable ecological buffers and these measures are design to preserve and extend the existing valuable habitats, with additional green infrastructure incorporated to absorb the impact of the presence of additional residents to protect the valuable habitats on, and adjacent to the site.

3.3.114 Where habitats are affected, detailed protection measures have been included to limit effects to those which are absolutely necessary for the development.

3.3.115 The design of OPA Phase 1 has been guided by ecological best practice since the earliest iterations of the current designed to avoid an protect the most valuable habitats on site where possible. As set out in detail in the Ecology ES Chapter, the important receptors present within the zone of influence of the OPA Phase 1 Site include Hedgerows, Ancient Woodland (Round Copse), Watercourse and a number of species including breeding birds, bats, great crested newts and common reptile species.

Drainage Strategy

3.3.116 The Flood Risk Assessment and Drainage Strategy (see Appendix 11.2), sets out that surface water runoff generation by the development would drain to permeable paving, swales and attenuation basins across the development parcel before discharging at restricted rates to the adjacent ditches to the west and northwest of the OPA Phase 1 Site. The location of the proposed drainage basins is provided in the site-wide indicative location of strategic SuDs Features drawing prepared by PFA consulting in November 2020. This plan is included within Appendix 11.2.

Energy and Sustainability Strategy

3.3.117 An Energy and Sustainability Statement has been produced for OPA Phase 1 which details the sustainability and energy strategy.

3.3.118 As detailed within the report, a series of sustainability and energy best practice measures are to adopted within the delivery of OPA Phase 1. Such measures include a Zero Operational Carbon aspiration within initiatives such as solar energy, passive design, EV charging for vehicles and the use of smart/meters and sub-metering for properties. Water conservation will be achieved through the installation of low flow rate sanitary ware and water butts will be provided on houses to allow rainwater to be used for irrigation purposes.

3.3.119 Sustainable materials will be sourced for development purposes and the design of the proposal has been led by detailed strategies for flood risk, drainage, transport, ecology, health and wellbeing (through design). The selection of materials for the proposed development will be informed by environmental performance and supply chain with a series of criteria set for the procurement process to ensure sustainable materials are sourced.

Waste

3.3.120 Means by which the waste arisings from OPA Phase 1 can be reduced and recycling rates increased have been identified. These will contribute to ensuring a continual process of improvement in waste management performance associated with the OPA Phase 1 proposals.

Demolition Waste

3.3.121 No demolition is proposed as part of the OPA Phase 1 proposals.

Waste from the Construction Phase

3.3.122 It is estimated that OPA Phase 1 could potentially generate approximately 4,644 tonnes of construction waste not including waste from infrastructure development, such as utilities and pavements, which will add to the total construction waste volume. Over the duration of the construction works, waste generation is likely to vary significantly according to the programme and phasing.

3.3.123 The Building Research Establishment (BRE) has developed waste arising benchmarks to aid in the calculation of construction waste arisings at the design stage of a new development. These benchmarks are derived from data provided from completed projects on the SMARTWaste Plan.

3.3.124 Table 3.9 shows the most recent benchmark data (October 2017) for tonnes of construction waste per 100m^2 of floor area for new build developments.

Table 3.9: BRE Construction Waste Benchmarks

Project Type	Tonnes / 100m^2 gross internal floor area
Residential	15.3
Commercial Retail	12.4
Commercial Offices	15.7
Healthcare	13.0
Education	14.9
Civil Engineering*	26.7

Source: BRE Waste Benchmark Data, October 2017

*Source: BRE Waste Benchmark Data, January 2010

3.3.125 These benchmarks have been used to measure construction waste generation from the Wider OPA and relate to waste generation rates where no minimisation, reuse or recycling has taken place. It is the baseline figure from which a reduction in waste arisings will be established.

3.3.126 Table 3.10 shows the estimated construction waste arisings for the residential elements of the Wider OPA proposals based upon approximate and illustrative floor areas.

Table 3.10: Residential Waste Arisings

Number of Dwellings	Estimated Residential Floorspace (m^2)	Estimated Construction Waste Arisings (tonnes)
393	30,350	4,644

3.3.127 The estimations show that, in total, approximately 4,644 tonnes of waste may arise from the construction of the OPA Phase 1 proposals.

3.3.128 Figure 3.9 illustrates the estimated composition of construction waste arisings for the OPA Phase 1 proposals based upon SmartWaste benchmark data from UK residential construction projects of a similar nature.

Figure 3.9: Typical Residential Construction Waste Composition (Waste Benchmark Data October 2017))

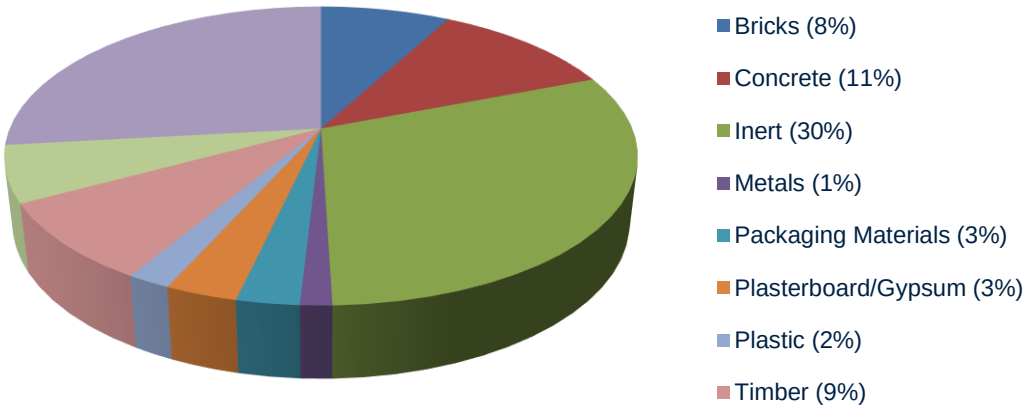


Table 3.11: Estimated Residential Construction Waste Composition

Estimated Residential Construction Waste Composition (Based on Waste Benchmark Data, October 2017
Inert (30%) – 8,861 tonnes
Mixed construction and/or demolition waste (27%) – 7,975 tonnes
Concrete (11%) – 3,249 tonnes
Timber (9%) – 2,658 tonnes
Bricks (8%) – 2,363 tonnes
Miscellaneous (6%) – 1,772 tonnes
Plasterboard/Gypsum (3%) – 886 tonnes
Packaging Materials (3%) – 886 tonnes
Plastic (2%) – 590 tonnes
Metals (1%) - 295 tonnes

3.3.129 The above figures are based upon standard construction operations in the UK. The estimated volumes identified can be lowered through good waste management practice. Opportunities to prevent and reduce the generation of construction waste are considered below.

3.3.130 A Construction Environmental Management Plan for each phase of development covering the management of anticipated waste arisings will be produced by the relevant contractor prior to any construction activities within that phase taking place.

3.3.131 For waste arising from the construction phase of OPA Phase 1, materials will be separated into key waste groups. Suitable areas will be provided within the construction site(s) for the separation of materials for recycling (e.g. timber, metals, packaging, hardcore etc.).

3.3.132 However, it is acknowledged that construction sites can often be space constrained and this may limit the opportunity for segregation of the full suite of materials on-site. As such, if required, this may instead be undertaken off-site by a suitable waste contractor.

3.3.133 It will be a condition of contract for the contractors to agree target waste recovery rates. These will be discussed at the inaugural contract meeting. A monitoring report will then be generated on a regular basis which will include details of the progress made in diverting waste materials from landfill against these pre-agreed targets.

Waste from the Operational Phase

Generation of Household Waste

3.3.134 Household waste generation from the OPA Phase 1 proposals has been estimated using gov.uk municipal waste statistics and Eastleigh Borough Council (EBC) data.

3.3.135 At this stage in the design process the figures can only be considered indicative as a variety of factors, such as the ongoing promotion of waste minimisation and recycling, consumer habits and population changes will impact on waste generation rates in future years.

3.3.136 As a baseline, Table 3.12 outlines how the average household waste generation rate per residential unit has been established.

Table 3.12: Average Household Waste Generation for Eastleigh Borough

Total household waste generated within Eastleigh Borough in 2018/19 (tonnes)[3]	41,785
Total number of households within Eastleigh Borough[4]	48,500
Estimated mean annual waste generation per household (tonnes)	0.86

[3] https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables

[4] ONS: Estimated number of households by local authorities of England, 2004 to 2016

3.3.137 This average household waste generation rate (0.86 tonnes per household) has been used to provide an estimate of the waste arisings from OPA Phase 1.

3.3.138 It is estimated that the OPA Phase 1 proposals would generate approximately 337 tonnes of household waste per annum (approximately 6.5 tonnes per week) should all units be constructed and occupied. Of this tonnage, a significant proportion will be separated by EBC for recycling and composting. Based upon the stated waste performance figures for EBC this would be 58.3% or 196 tonnes per annum (approximately 3.7 tonnes per week). The remaining residual waste (approximately 141 tonnes per annum) would require management through means such as landfill or energy recovery.

3.3.139 Residential units will incorporate sufficient internal waste storage container to promote the separation of recycling and compostable materials at source.

3.3.140 Externally, sufficient space will be provided to enable waste containers to be stored in accordance with EBC's refuse and recycling collection arrangements.

3.4 PHASING

3.4.1 It is anticipated that the construction of the Wider OPA will commence in 2021 and continue to 2035.

3.4.2 As shown on the Indicative Phasing Plan (Figure 1.2), in the first phases of the construction, necessary site-wide infrastructure, including the Link Road, Internal Distributor Road, Sustainable Drainage Systems and Strategic Green Infrastructure, will be implemented.

3.4.3 OPA Phase 1 will be first residential parcel to be delivered and there will be six additional residential phases to be delivered over 15 years. The on-site primary school, Phase 1 of the principal Local Centre, formal sports provision and the allotments are anticipated to be delivered in the first five years of construction and the second phase of the local centre, including the commercial and retail uses, is anticipated to be delivered from Year 5 through to completion of the OPA development.

3.4.4 First occupation is expected in late 2022/early 2023.

3.5 CONSTRUCTION AND IMPLEMENTATION

3.5.1 This section describes the proposed programme of site preparation and construction works and the key activities that will be undertaken prior to completion and occupation of the Wider OPA proposals.

Construction and Methods of Working

3.5.2 It is anticipated that contractor compounds will be located as secure areas within the relevant phase under construction and will be relocated as each phase nears completion onto the subsequent phase. The precise nature and location of the contractor compounds cannot be determined at this time. The location of construction compounds will be established at the Reserved Matters stage as part of detailed design.

3.5.3 The working hours are anticipated to be:

- 07:00 - 19:00 hours Monday to Friday inclusive;
- 08:00 - 13:00 hours on Saturday; and
- No work to be carried out on Sundays or Bank Holidays.

3.5.4 In order to maintain these working hours, the contractor(s) may require a period of up to half an hour before and up to one hour after normal working hours for start-up and close down of activities. This does not include operation of plant or machinery giving rise to noise with the potential to disturb nearby residents or the arrival of any HGV at site before 06:30 hours.

Construction Phasing

3.5.5 It is anticipated that development would be undertaken on a rolling programme of site preparation and construction, allowing earlier phases to be completed and occupied while subsequent phases are constructed. First occupation is expected in late 2022, early 2023.

3.5.6 All materials and plant storage will occur on the Wider OPA Site and no off-site compounds are necessary. The on-site materials storage compound will be located in a position compatible with the ongoing phases of development.

Cut and Fill Balance

3.5.7 The Proposed Development is to be delivered over a number of years and the cut/fill balance is anticipated to be neutral across the Wider OPA Site as a whole and within each phase. Proposed site levels are to be broadly similar to the existing site levels.

Plant and Equipment

3.5.8 An indication of the typical types of plant and equipment likely to be used during the Site clearance and construction works are provided in Table 3.13.

Table 3.13: Indicative Plant and Equipment

Plant/Equipment	Site Preparation Works	Ground and Foundation Works	Superstructure works	Road Works
Tracked Excavator	✓	✓	×	✓
Lorry	✓	✓	×	✓
Wheeled Loader	✓	✓	×	×
Dump Truck	✓	✓	✓	✓
Diesel generator	✓	✓	✓	×
Poker vibrator	×	✓	×	×
Concrete pump and a cement mixer truck	×	✓	×	×
Concrete truck	×	✓	×	×
Excavators	×	✓	✓	✓
Vibratory Roller	×	✓	×	×
Vibro-displacement rig	×	✓	×	×
Augered Piling Rig	×	✓	×	×
Lorry - pull up	×	×	✓	×
Compressor	×	×	✓	×
Tracked crane	×	×	✓	×
Asphalt paver + tipping lorry	×	×	×	✓
Road Lorry	×	×	×	✓

Construction Site Set-up

3.5.9 A number of facilities will be required during the construction phases of the Wider OPA. Onsite facilities will likely include:

- Office and Welfare facilities;
- Locker room;
- WCs;
- Canteen/Kitchen;
- Materials Storage and Handling areas

3.5.10 Exact details of the nature and location of these facilities is not known at the time of this assessment. Details of the construction site set up will be provided within a Construction Environmental Management Plan (CEMP) to be secured by a planning condition.

Hoarding/Fencing

3.5.11 The contractor will provide site security measures around the construction zone, through the provision of hoarding/fencing. The full details of the types of hoarding have yet to be developed. More detailed plans will be developed prior to commencement and secured by a planning condition, to ensure minimal environmental impact in providing the required control measures to mitigate anticipated security risks.

Construction Environmental Management Plan (CEMP)

3.5.12 Details of measures to protect the environment during the construction of the Proposed Development will be set out in a CEMP. Measures will address hours of working, noise, vibration, dust, light spill, wheel washing and control of runoff. It is anticipated that the implementation of the CEMP will be a condition of the planning permission and that it will be regularly monitored.

3.5.13 Once finalised and approved by EBC, the CEMP would be held on-site. All site personnel would be made aware of its existence and undertake to adhere to the guidance.

Considerate Constructors Scheme

3.5.14 In order to adhere to best construction practices, it is recommended that the Site is registered with the 'Considerate Constructors Scheme'.

3.5.15 The Considerate Constructors Scheme is a national initiative set up by the construction industry to improve the image of construction. Through a voluntary registration to the Scheme construction sites, companies and suppliers agree to abide by the Code of Considerate Practice which is designed to encourage best practice beyond statutory requirements.

3.5.16 The Scheme relates to any construction activity that may have a direct or indirect impact on the image of the construction industry as a whole. The Code of Considerate Practice comprises five parts relating to Appearance, Community, Environment, Safety and Workforce. Waste management is a key area of focus explicitly referred to as part of protecting the environment: "*Seeking sustainable solutions, and minimising waste, the carbon footprint and resources*".

3.5.17 Particular on-site considerations to ensure compliance with the Code of Considerate Practice may include:

- how waste is avoided, reduced, reused, and/or recycled;

- whether there is a Waste Management plan/Strategy and how this is monitored; and
- the type of feedback received as to how much on-site waste is diverted from landfill.

3.5.18 It is the expectation of the Considerate Constructors Scheme that registered construction sites work in an environmentally conscious and sustainable manner in order to adhere to the Code of Practice.

3.6 ASSESSMENT DRAWINGS

3.6.1 The assessment drawings for this EIA are listed in Table 3.14 below (for the Wider OPA) and in Appendix 3.1 (for OPA Phase 1).

Table 3.14: Wider OPA Assessment Drawings

Drawing Number	Drawing Title	Figure Number
EAST200403-PP-01-P22	Access Parameter Plan	3.1
EAST200403-PP-02-P26	Land Use Parameter Plan	3.2
EAST200403-PP-03-P24	Green Infrastructure Parameter Plan	3.3
EAST200403-PP-04-P23	Building Heights Parameter Plan	3.4
EAST200403-DEP-01-P2	Demolition Plan	3.5
039.0014.701	Fir Tree Lane Improvements	3.8

CHAPTER 4: CONSULTATION AND ALTERNATIVES

4.1 DESIGN CONSULTATION

4.1.1 The various pre-application discussions with statutory and non-statutory consultees and the local community all have an influence over the evolution of the design of the EIA proposals and the scope of the EIA.

Pre-Application Discussion with Eastleigh Borough Council (as Planning Authority) and Statutory and Non-Statutory Bodies

4.1.2 The Applicant and their technical consultant team have had a series of meetings with EBC officers and technical consultees. This has been a proactive process, which has enabled the Wider OPA and OPA Phase 1 planning applications to be responsive to discussions and observations made by both technical and non-technical consultees.

4.1.3 In addition to pre-application discussions with EBC officers, and as part of the preparation of the EIA, the Applicant and their project design/technical team have engaged with relevant organisations, individuals and statutory consultees during the pre-application period. The schedule at Appendix 4.1 of this Statement outlines the engagement meetings held since September 2019 between the Applicant, EBC and stakeholder organisations (including Statutory and Non-Statutory bodies) to discuss and guide the Wider OPA proposals. This has included:

- Bluestar
- Burnetts Lane Residents Association
- Environment Agency
- Fair Oak and Horton Heath Parish Council
- Hampshire County Council
- Hampshire and Isle of Wight Wildlife Trust
- Natural England
- Southampton Airport
- Southern Water
- Sport England
- Sustrans
- West Hampshire Clinical Commissioning Group
- Xelabus

4.1.4 Recognising the importance of the natural environment to the Proposed Development a particular feature of the pre-application engagement has been the Ecological Steering Group. This forum was set up to discuss and guide the approach taken to the management of onsite

ecological assets both before and after development. The Ecological Steering Group is made up of representatives from EBC (planning and ecology), Natural England, Environment Agency and the Hampshire and Isle of Wight Wildlife Trust and met ten times between October 2018 and July 2020.

4.1.5 Comments made by officers have informed the scope of the planning application and this ES and the development proposals have evolved to address comments made by officers. The evolution of the application proposals are detailed within the Wider OPA and OPA Phase 1 Design and Access Statements.

4.1.6 Further details of the pre-application consultation with EBC is contained within the Planning Statements submitted as part of the suite of planning application documents.

Public Consultation

4.1.7 Initial consultation saw the creation of a Local Development Forum in September 2019, which held meetings at EBC Offices and Fair Oak and Horton Heath Parish Council Hall. From March 2020, following the Covid-19 pandemic, these design-led forums were conducted via online platforms. A schedule of these meetings is provided in Appendix 4.2.

4.1.8 During September 2020 and November 2020, the Applicant held a total of eight online public consultations on the emerging Masterplan and first new homes. The first sessions informed the latter as additional information on design refinements, highways, walking and cycling, drainage and the layout for the first new homes was presented. A planning survey for feedback opportunities was setup via the One Horton Heath Website, resulting in additional consultation material being published.

4.1.9 Further details of the public engagement is contained within the Statements of Community Involvement which form part of the suite of documents submitted with the Wider OPA and OPA Phase 1 planning applications.

4.2 EIA CONSULTATION

4.2.1 In April 2020, an EIA Scoping Opinion was requested from EBC to establish the technical scope of the EIA.

4.2.2 EBC issued their EIA Scoping Opinion in August 2020 and an updated in March 2020 which concluded that significant effects were likely in respect of Socio-Economics, Air Quality, Transport and Access, Built Heritage, Ecology, Hydrology, Noise and Vibration, and Landscape

and Visual Impacts. These matters have all been considered in the relevant topic chapters of the ES.

4.2.3 Details of technical consultation directly related to the EIA are provided in the methodology and baseline sections of each topic chapter.

4.3 CONSIDERATION OF ALTERNATIVES

4.3.1 Schedule 18, Paragraph 3(d) of the 2017 Regulations requires an ES to include "*a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment*".

4.3.2 The 2017 Regulations do not require the full assessment of all potential alternatives, only a reasonable account of those actually considered by a developer prior to the submission of the planning application.

4.3.3 For the Wider OPA and OPA Phase 1 Sites there are two realistic types of alternative, the 'do nothing', where each existing site remains in its current state (as set out in Chapter 2), or alternative layouts to the Proposed Development submitted for planning approval. Therefore assessment of alternatives has considered options within the following two categories:

- 'Do Nothing': Under this scenario no development is implemented at either the Wider OPA Site or the OPA Phase 1 Site and baseline conditions continue in their current trends.
- A different design: Under this scenario the Proposed Development is realised with alternative scales and layouts in the context of developmental constraints present at the Wider OPA Site and the OPA Phase 1 Site.

The 'Do Nothing' scenario

4.3.4 Under the 'do nothing' scenario, the Wider OPA Site and the OPA Phase 1 Site would not be developed and would be remain underused in terms of economic and social potential. Both sites would not contribute to the local and regional housing needs of both private and affordable tenure and there would be no socio-economic benefit from the Proposed Development. This is not an alternative option that has been considered further.

A Different Design

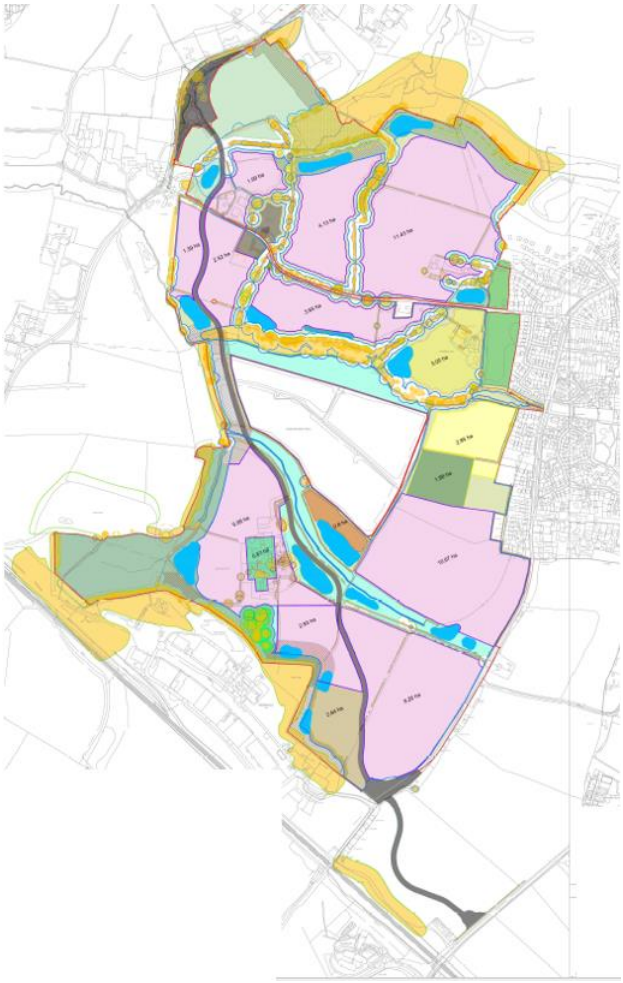
4.3.5 Through an iterative design process evolution of the illustrative masterplan and the parameters of the Proposed Development (both the Wider OPA and OPA Phase 1) were informed through

consultation with the key stakeholders. Design comments were taken on board at each stage in the consultation with these bodies.

Wider OPA Site

4.3.6 As described in detail in Section 5 of the submitted Design and Access Statement, the design of the Wider OPA site commenced with an identification of the area available for development. As part of this process the physical features and characteristics of the Site were mapped alongside their zones of influence resulting in the production of a 'land availability plan' as shown in Figure 4.1. This approach to establishing the available development land ensured that environmental considerations were engaged from the very outset of the design process.

Figure 4.1: Land Availability



4.3.7 Following analysis of the land availability, initial masterplan options were produced exploring a mix of land uses (including employment, leisure and residential led schemes) to best utilise the

Site for the benefit of the surrounding area whilst reflecting the environmental constraints and aspirations of the Site and One Horton Heath project.

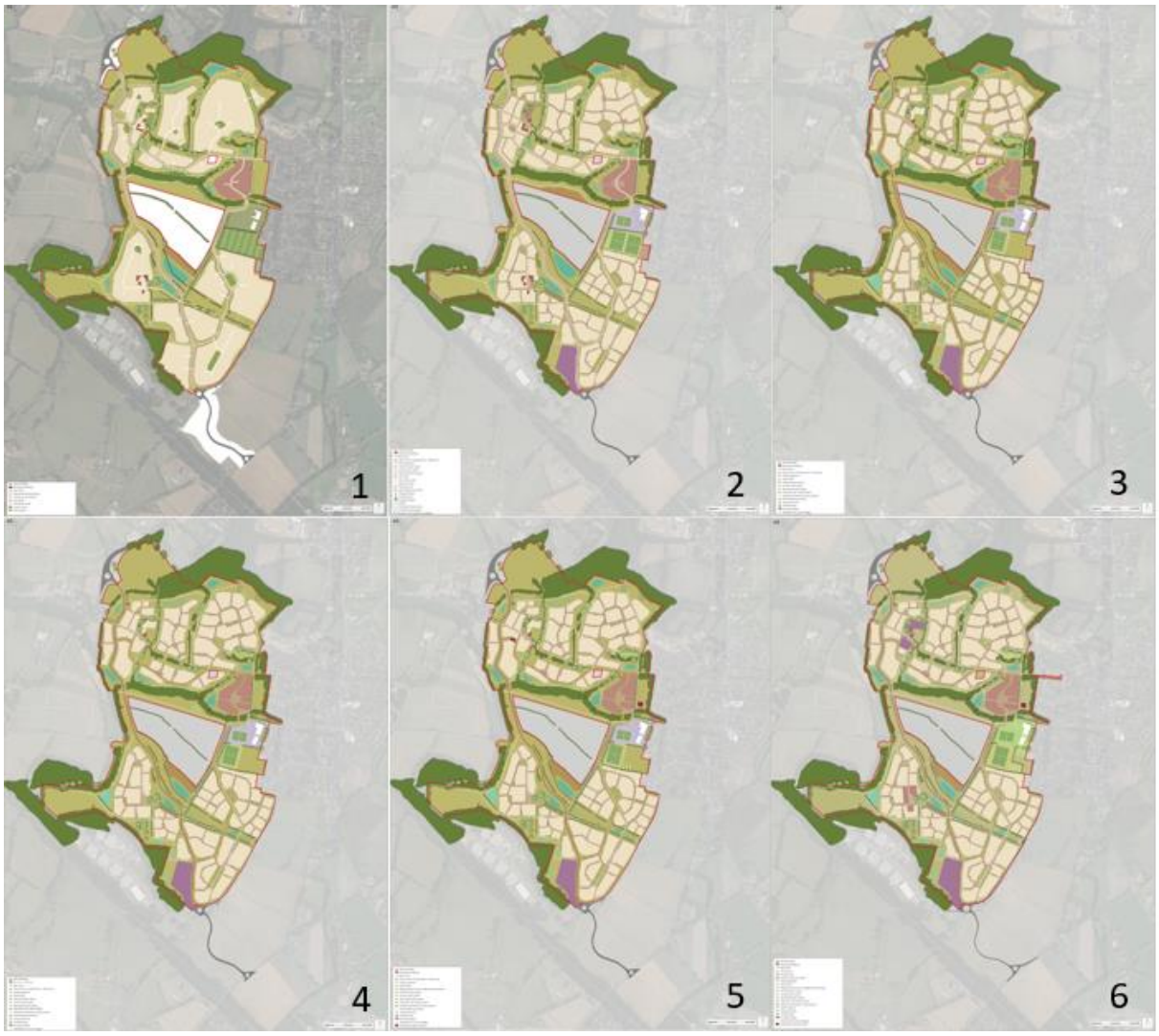
4.3.8 Further refinements, volumes of development and layouts were then analysed. The design evolution was informed by both the project objectives and as part of the iterative process, initial and early high level massing appraisals were undertaken by the technical team. With the aim of avoiding and minimising adverse effects from the outset. Both professional judgement and targeted testing informed this process.

4.3.9 Figure 4.2 shows an early draft of the illustrative masterplan whist Figure 4.3 shows the some of the alternative designs considered and changes implemented through the consultation process and consideration of environmental constraints and issues leading to the final Illustrative Masterplan.

Figure 4.2: Early Illustrative Masterplan



Figure 4.3: Design Iterations



Key Amendments
1: Additional SuDs features and sports provision on Primary School site
2: Introduction of Southern Commercial Zone
3. Introduction of Allotments to north of Local Centre, realignment of Internal Distributor road between Local Centre and Primary School
4: Amendments to development parcels in north west of site
5: Additional area of allotments to east of formal sports provision and introduction of destination play facility east of the Local Centre
6: Expansion of Primary School site to 2.8 Ha

4.3.10 Table 4.1 outlines further how environmental constraints and aspirations and consideration of potential impacts have influenced the design of the Wider OPA proposals. Changes were also made in response to comments from EBC through the design process. Further detail on this is provided in the Wider OPA Design and Access Statement.

Table 4.1: Design Changes/Influences

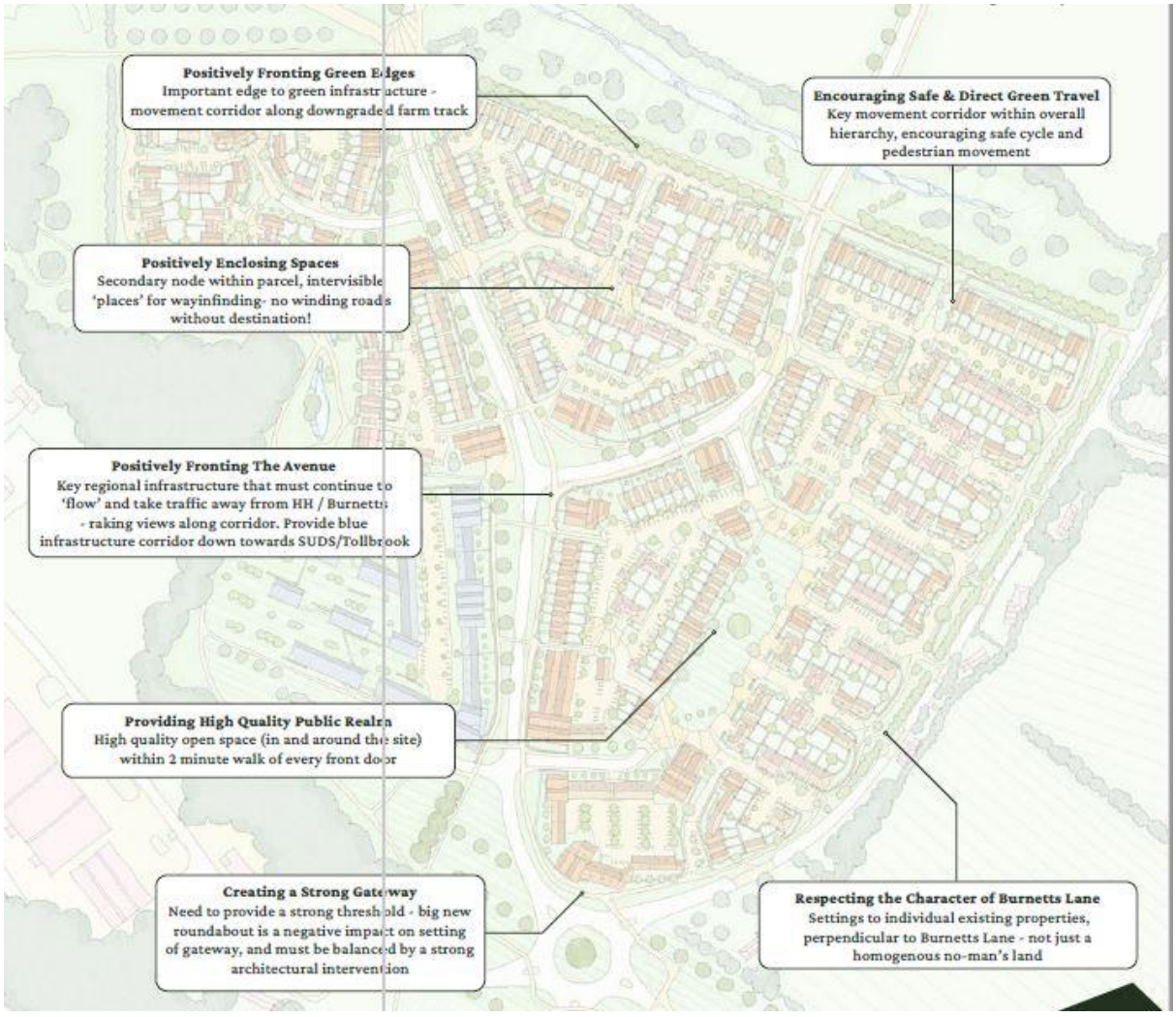
Change / Influence	Comment
Location and orientation of Primary School and Formal Sports Provision	The location and orientation of the Primary School site and Formal Sports provision has been determined through a consideration of site topography, ecological features (including hedgerows) and the location of both existing and proposed development (including the Local Centre). By locating the school site to the north of the Formal Sports provision, improved connectivity is achieved between the Local Centre and Primary School, the requirement for earthworks associated with the creation of sports fields is greatly reduced and the potential impacts associated with lighting are also reduced. In addition, the orientation of both features reduces the need for hedgerow losses to facilitate access points.
Connectivity between Local Centre and Primary School	During the design process the alignment and location of the Internal Distributor Road between the Local Centre and Primary School was revised in order to create a more efficient vehicular route between these two locations whilst allowing for the creation of a separate foot and cycle link to promote the use of sustainable transport modes between the two key facilities.
Addition/resizing of allotments provision	Early designs of the Proposed Development identified a suitable location for the provision of allotments to the north of the Local Centre. This location is well contained visually and also well related to the surrounding land uses. During the design process, including consultation with the Parish Council it was identified that there may be a requirement for additional allotment provision to cater for projected demand (should this materialise). To provide for this eventuality and in the interest of securing all possible benefits from the proposed development, a secondary allotment area was identified to the east of the Formal Sports area. To minimise potential visual amenity impacts from the allotment area and also from the formal sports provision itself, additional planting is proposed to assist with screening these elements from both existing and proposed residential properties.
Safeguarding of potential cycle link to south west	In recognition of the EBC aspiration for a Hedge End to Eastleigh strategic cycle link, the access and movement strategy of the Proposed Development was amended to explicitly safeguard a route for the potential provision of a section of the cycle link between Chalcroft Farm and the south western site boundary. The Proposed Development will also deliver an improved cycle link from Chalcroft Farm to Burnetts Lane to connect to the potential strategic cycle link in the east.
Widening of road corridor to west of solar farm (particularly done to benefit ecology and accessibility)	Early designs of the Proposed Development utilised a much narrower corridor for the Link Road to the west of the existing Solar Farm. This corridor was widened through the masterplanning process to facilitate the provision of additional open space and ecological measures along the alignment of the Link Road. By doing so, visual and ecological impacts associated with the delivery of the Link Road will be reduced whilst also allowing for greater flexibility in the eventual design and delivery of the Link Road.
Reduction in building heights to south east of Fir Tree Farmhouse	The Illustrative Masterplan and Parameter Plans have been the subject of ongoing review and input by the technical consultant team. In respect of Built Heritage this review process resulted in a reduction in building heights in the development parcels to the south east of the Listed Fir Tree Farmhouse. This reduction in building heights was

Change / Influence	Comment
	made so as to reduce the impacts of development upon the setting of the heritage asset.

OPA Phase 1

4.3.11 As described in detail in Section 5 of the submitted OPA Phase 1 Design and Access Statement, a set of core design principles for OPA Phase 1 were identified. This included creating a strong gateway into the Wider OPA development, respecting the character of Burnetts Lane and providing high quality public realm.

Figure 4.4: Core Design Principles



4.3.12 Table 4.2 outlines how environmental constraints and aspirations and consideration of potential impacts have influenced the design of the OPA Phase 1 proposals. Changes were also made in response to comments from EBC through the design process. Further detail on this is provided in the OPA Phase 1 Design and Access Statement.

Change / Influence	Comment
The introduction of The Acre	Access to high quality open space is at the core of the ethos driving the OPA Phase scheme, Through the evolution of the OPA Phase 1 layout, it was identified that an acre of primary open space at the heart of the scheme would not only create a space for recreation, but create areas to socialise and play. The Acre (see Figure 4.5) also performs the function of being a junction for several pedestrian vehicular movement streams that support the legibility of the wider site and promote sustainable forms of transport.
Character of Burnetts Lane	Burnetts Lane is a rural lane of relatively narrow width and enclosed character with strong green edges. There are also existing residents along Burnetts Lane looking to the OPA Phase 1 Site. Moving away from the southern gateway it was identified through the scheme evolution that the character of Burnetts Lane is protected from 'harm' but is also actively enhanced by the proposals. Localised carriageway narrowing to 4.1m has therefore been introduced along Burnetts Lane, with movement shifting towards that of cyclist and pedestrians. With those traffic calming measures in place it also ensures safe crossing for existing residents into the OPA Phase 1 Site. The majority of hedgerows along Burnetts Lane are retained with breaks only proposed to facilitate access into the OPA Phase 1 Site (The Roughets) for existing residents.

Figure 4.5: The Acre

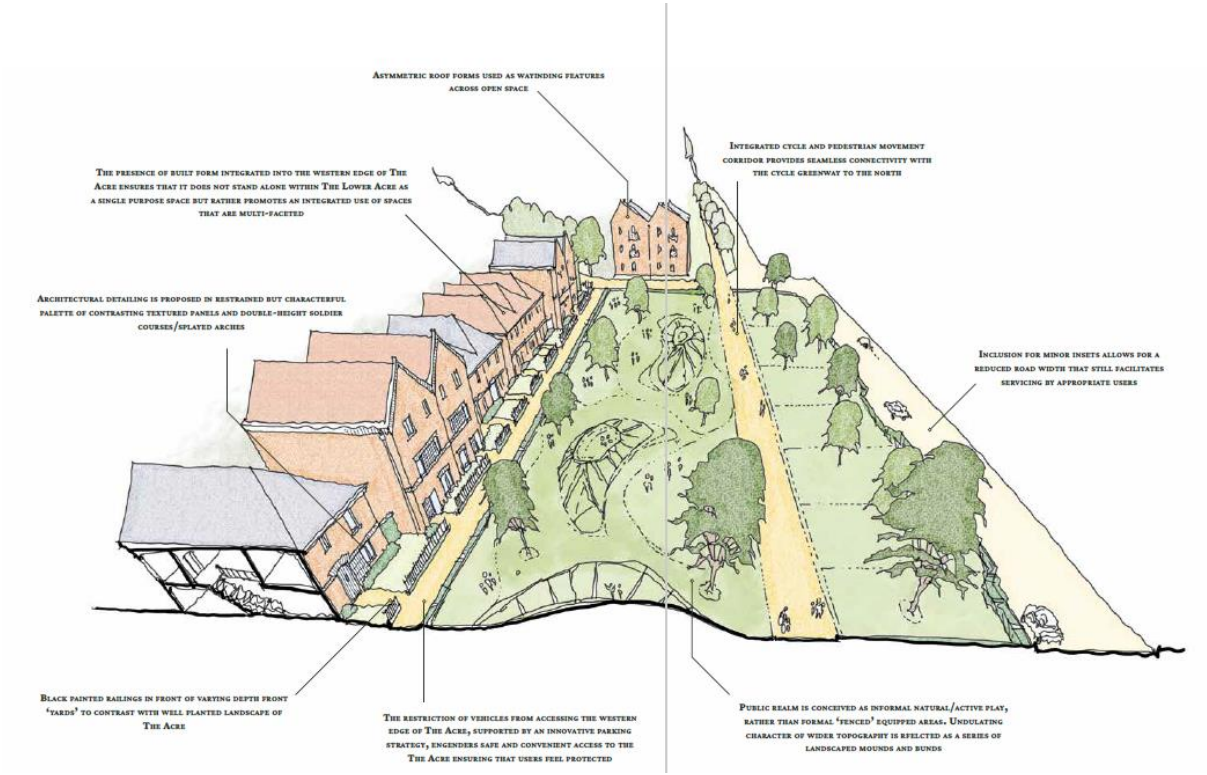


Figure 4.6: Traffic Calming along Burnetts Lane



4.3.13 It is not considered appropriate to consider alternative designs in any further detail. Details of the design evolution are set out clearly within the Design and Access Statement which forms part of the suite of submitted planning application documentation.

CHAPTER 5: EIA APPROACH

5.1 EIA PROCESS

5.1.1 As set out in Chapter 1, EIA is a process through which the likely significant environmental effects of a development proposal can be identified and, where possible, adverse effects avoided or mitigated.

5.1.2 The overall aim of this ES is to provide an objective and systematic account of the likely significant environmental effects of the One Horton Heath Project and to assess the ability of the Site and surrounding area, including receptors such as people, flora and fauna, to accept those effects.

5.1.3 This chapter describes the methodology adopted for the EIA.

5.2 EIA SCREENING

5.2.1 The Wider OPA and OPA Phase 1 both fall within Schedule 2 Section 10(b) of the 2017 Regulations as an *"Urban development project"* in which *"the development includes more than 150 dwellings"*, and "*the overall area of the development exceeds 5 hectares*".

5.2.2 Given of the nature and scale of the Wider OPA and OPA Phase 1, the Applicant concluded that significant environmental effects could arise. As such it was considered that Wider OPA and OPA Phase 1 (the One Horton Heath Project) qualify as EIA development as defined within the regulations. Therefore, a formal Screening Opinion was not sought from the Local Planning Authority (LPA).

5.3 EIA SCOPING

5.3.1 In April 2020 an EIA Scoping Opinion was requested from Eastleigh Borough Council (EBC), the LPA in relation to the Wider OPA.

5.3.2 As part of the Scoping process, statutory consultees were advised of the proposal and given the opportunity to provide comments in order to assist the LPA in the formulation of their formal Scoping Opinion.

5.3.3 In August 2020, EBC issued their formal Scoping Opinion (See Appendix 5.1). As required by the 2017 Regulations this EIA is based upon the Scoping Opinion.

5.3.4 Whilst this scope has been established in relation to the Wider OPA proposals, the Applicant considers that it remains appropriate for the assessment of OPA Phase 1, especially given the relationship between the applications and proposed single Environmental Statement approach.

5.3.5 Further details of technical consultation directly related to the EIA are provided in the methodology and baseline sections of each topic chapter.

5.3.6 In line with the Planning Practice Guidance (PPG), a proportionate approach has been taken with regards to the scope of the ES to ensure focus is given environmental factors likely to be significantly affected by the One Horton Heath Project (Paragraph: 035 Reference ID: 4-035-20170728).[1]

5.4 SCOPE OF WORK

Technical Scope

5.4.1 Alongside addressing the r**e**commendations made by EBC and associated consultees through the EIA Scoping Opinion, the following technical assessment work has been undertaken:

- Identification of the Site boundary;
- Identification of the key characteristics of the Site and the establishment of the environmental baseline through a series of desk and field studies;
- Identification of where there were gaps in the baseline and the further survey work required to address this;
- Undertaking required further survey work;
- Consideration of the potential sources and nature of environmental effects through assessment against the established environmental baseline; and
- Definition of the assessment methodologies to be used in each study area.

5.4.2 Part 1, Regulation 4(2) of the 2017 Regulations states that *'the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors—*

(a) population and human health;

[1] https://www.gov.uk/guidance/environmental-impact-assessment

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC(a) and Directive 2009/147/EC(b);

(c) land, soil, water, air and climate;

(d) material assets, cultural heritage and the landscape;

(e) the interaction between the factors referred to in sub-paragraphs (a) to (d).

5.4.3 Schedule 4, Paragraph 4 of the 2017 Regulations require an ES to provide *"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."*

Topics scoped into the EIA

5.4.4 Table 5.1 provides a list of the topics that have been considered in this EIA, in accordance with the Scoping Opinion dated 12 August 2020.

Table 5.1: Environmental Topics considered in the EIA

Topic	ES Chapter
Socio-Economics	6
Air Quality	7
Transport and Access	8
Built Heritage	9
Ecology	10
Hydrology (including Flood Risk)	11
Noise and Vibration	12
Landscape and Visual	13

5.4.5 A series of baseline studies have been undertaken to establish the baseline environment for these topic areas. The baseline and assessment work undertaken as part of preparing this ES is set out within the relevant technical chapters and their technical appendices in Volumes 1a and 2.

Topics scoped out of the EIA

5.4.6 The Scoping Opinion issued in August 2020 confirmed that the following topics are scoped out of the EIA on the basis of no likelihood of significant effects.

Soils and Agricultural Land

5.4.7 Annex 2 of the NPPF defines Best and Most Versatile (BMV) agricultural land as "*Land in Grades 1,2, and 3a of the agricultural land classification*". As described in in Chapter 2 (Site Description), the Wider OPA Site and OPA Phase 1 Site are almost entirely Grade 3b agricultural land and are therefore not classed as BMV.

5.4.8 The Wider OPA Site (including the OPA Phase 1 land) comprises land that is proposed for allocation for mixed-use development in the emerging Eastleigh Borough Local Plan and benefits from extant planning consents for development of a similar scale and nature to the Proposed Development. The principle of the redevelopment of the Wider OPA Site has therefore been demonstrated as acceptable taking into account the associated loss of agricultural land. The loss of agricultural land is a consideration in the Sustainability Appraisal undertaken in relation to the emerging Eastleigh Borough Local Plan.

5.4.9 As such, the loss of predominately non BMV land on a site where the principle of development is well established is not likely to result in significant effects agricultural land. This topic is therefore scoped out of the EIA.

Accidents, Fire and Natural Disasters

5.4.10 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[2];
- UK Government Emergency Response & Recovery Guidance[3]; and
- International Federation of Red Cross & Red Crescent Societies Disaster and Crisis Management Guidance[4].

5.4.11 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*

[2] Cabinet Office. (2017) National Risk Register of Civil Emergencies. [Online]. **https://www.gov.uk/government/publications/national-risk-register-of-civil-emergencies-2017-edition**.

[3] International Federation of Red Cross and Red Crescent Societies, "The Red Cross Red Crescent approach to disaster and crisis management: Position paper," **http://www.ifrc.org/PageFiles/91314/1209600-DM-Position-Paper-EN.pdf** 2011.

[4] International Federation of Red Cross and Red Crescent Societies, "What is a disaster?," **http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/** 2017.

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".[3] An accident can be defined as *"an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury"*[5].

5.4.12 The location of the Wider OPA Site and the OPA Phase 1 Site within the UK are such that natural disasters are not considered to represent a likely risk to the Proposed Development. 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 Wider OPA Site (and OPA Phase 1 Site) is extremely low. Furthermore, the topography of both the Wider OPA Site and OPA Phase 1 Site is not considered to be sufficiently steep such that a major mass movement disaster could arise.

5.4.13 Given the nature of the Proposed Development, the potential for either large volume storage or frequent passage / delivery of fuels and chemicals during either the construction phase or following completion, is considered to be low when compared to more industrial development proposals such as chemical works, storage depots, docks, or major highways.

5.4.14 The Proposed Development will be designed in accordance with recognised and accepted best practice in terms of highway design, specification of drainage and current building regulations.

5.4.15 It is therefore considered that whilst there is always a potential risk that an accident, fire or natural disaster could result in a significant environmental impact, this risk can be appropriately mitigated through embedded design measures and through compliance with statutory design guidelines.

Climate Change

5.4.16 As agreed through the EIA Scoping process, the ES does not include a separate chapter on climate change and greenhouse gas emissions. This assessment is primarily achieved through the Wider OPA and OPA Phase 1 Sustainability and Energy Statements (see Appendix 5.3. and Appendix 5.4). The Sustainability Statements include consideration of the impact of the Proposed Development upon carbon emissions. Each technical chapter also considers whether and how climate change could affect the findings of the assessments as set out below.

5.4.17 EIA is a key tool for ensuring that future that future development is resilient to the potential effects of climate change and that the proposals do not exacerbate climate change effects on

[5] Oxford English Dictionary. 2018. [Online]. **https://en.oxforddictionaries.com/definition/accident**.

human or natural systems. The Institute of Environmental Management and Assessment (IEMA) has published an 'EIA Guide to Climate Change Resilience and Adaptation' (2020) which provides a framework for the effective consideration of climate change resilience and adaption in the EIA process. This guidance states that the scoping of a project, taking into account climate change, should focus on general considerations rather than detailed, quantitative analysis.

5.4.18 There are significant uncertainties in the magnitude, frequency and spatial occurrence of climate change projections and information, which make it difficult to assess the impact of climate change in relation to a specific project. IEMA guidance notes that EIAs consider specific sites, whereas climate change models are prepared at a regional or national scale, thus adding uncertainty when with predictions on such a small area.

5.4.19 The EIA refers to, and relies upon, UKCP18 to conduct a high-level assessment of climate risk. In line with IEMA guidance, the impact of climate change on the Proposed Development has been assessed by way of a potential future baseline scenario and presented within an additional section of each technical chapter. Utilising climate change projections (see Appendix 5.2), the EIA qualitatively assesses how potential climate change may alter the predicted effects of the Proposed Development. It is unlikely that completely new direct impacts will arise as a result of climate change based on the current conditions, but the geographic spread or scale of potential impacts might be changed when considered against the future baseline conditions.

Health and Safety

5.4.20 The Wider OPA Site and the OPA Phase 1 Site are not located within or near any sites identified in zones for the Health and Safety Executive (HSE). Such zones are established around major hazard sites and pipelines for the purposes of consultation with the HSE upon any potential risks presented to either a proposed development or existing sites.

5.4.21 Therefore, significant effects related to Health and Safety associated with major hazard sites were not considered likely to result from the Proposed Development. Health and safety impacts arising as a result of topic specific impacts (e.g. Transport and Access) are considered as appropriate within the respective chapters.

Waste

5.4.22 It is estimated that the Wider OPA could potentially generate up to 33,403 tonnes of construction waste not including waste material associated with cut/fill operation. Based upon an indicative phasing strategy and an even distribution of waste generation this equates to approximately 2,226 tonnes of waste each year from the Wider OPA.

5.4.23 It is estimated that the OPA Phase 1 proposals could potentially generate up to 4,644 tonnes of construction waste not including waste material associated with cut/fill operation. Based upon an indicative phasing strategy and an even distribution of waste generation this equates to approximately 1,161 tonnes of waste each year from OPA Phase 1.

5.4.24 Any waste arising from the construction will be separated into key waste groups. If space is available then suitable areas will be provided within the construction site(s) for the separation of materials for recycling (e.g. timber, metals, packaging, hardcore etc.). If there is not space, this may instead be undertaken off-site by a suitable waste contractor.

5.4.25 The re-use of demolition waste on site, where possible, will further reduce traffic movements, and the air quality impacts associated with these, as a consequence of exporting and importing spoil and wastes.

5.4.26 In accordance with the EIA Scoping Opinion, a specific waste chapter is not incorporated into the ES. However, in accordance with the EIA Regulations, the Proposed Development description, upon which the EIA is based, includes estimated volumes of waste associated with construction activities (Construction, Demolition and Excavation waste) and the operational phase of the development (Municipal Solid Waste, Commercial Waste) (see ES Chapter 3).

Ground Conditions

5.4.27 Previous assessment of the Wider OPA Site (including the OPA Phase 1 Site) or part thereof, including two desk studies provided in support of the Wider OPA and OPA Phase 1 planning applications, indicate the Wider OPA Site and the OPA Phase 1 Site to be of low risk or of minor adverse effect significance.

5.4.28 Appropriate design of the Proposed Development and management of construction process will minimise risks associated with the contamination of the ground and controlled waters and the mobilisation of any contaminants that may already be present.

5.4.29 It is considered that the Proposed Development can be accommodated without adverse effect on the ground conditions. As such, significant effects in relation to ground condition are not considered to be likely and, in accordance with the EIA regulations, scoped out of the EIA.

Mineral Resources

5.4.30 The British Geological Survey (BGS) and borehole data available indicates predominantly clay bedrock at the Wider OPA Site with some surface deposits of Alluvium. River Terrace surface

deposits are shown along the west boundary of the Wider OPA Site however it appears that most if not all of these deposits are outside the Wider OPA Site and OPA Phase 1 boundaries.

5.4.31 The nature and extent of the bedrock and Alluvium are such that they have no economic use.

5.4.32 Further details are provided in the supporting Mineral Resource Assessment.

Odour

5.4.33 In line with The Institute of Air Quality Management (IAQM) guidance on the assessment of Odour for Planning, the Proposed Development, and activities associated with it, are not considered to generate significant odour emissions. During construction, standard mitigation measures set out in the CEMP will ensure any potential odorous activity is suitably controlled so ensure that no significant impacts are arise.

5.4.34 As residential developments, the Wider OPA Site and the OPA Phase 1 Site, once occupied, would be potential sensitive receptors to odours originating from sources in the surrounding area, such as sewage treatment works, intensive animal rearing, waste management sites and some industrial processes. However, the immediate surrounds are not characterised by these features, with the nearest source emitter of note being Eastleigh Sewage Treatment Works located 1.75km west at the nearest point. Given the localised nature of odour pollution exposure from external sources is not considered to be significant at the Wider OPA Site or the OPA Phase 1 Site and therefore odour is scoped out of the EIA.

Archaeology

5.4.35 Due to lack of known significant archaeological remains on the Wider OPA Site (including the OPA Phase 1 Site) which may be affected by the Proposed Development, the Wider OPA Site and the OPA Phase 1 Site are unlikely to contain any archaeological remains that would constrain or prevent development. The Proposed Development can be accommodated without significant environmental effects on the archaeological resource. As such, significant effects related to archaeology are not considered to be likely.

5.4.36 A Heritage Desk-Based Assessment is provided in Appendix 9.1. In terms of archaeology, the archaeological potential of the Wider OPA Site (including the OPA Phase 1 Site) has been established and below ground impacts associated with the Proposed Development have been discussed. The report will inform further discussions with the archaeological advisor to EBC with regard to any further work or mitigation which may be required.

Geographic Scope

5.4.37 The geographic scope of the EIA includes the physical extent of the Wider OPA Site and the OPA Phase 1 Site, as shown on the Wider OPA Site Boundary Plan (Figure 1.1) and the OPA Phase 1 Site Boundary Plan (Figure 1.3). However, for individual topic chapters the geographic scope extends beyond both the Wider OPA Site and the OPA Phase 1 Site where necessary to ensure current environmental conditions and the manner in which impacts are likely to be generated are properly considered. Where identified and relevant, such impacts have been assessed as part of the EIA. This is set out and explained as appropriate in each of the topic chapters.

5.4.38 The geographical extent of the EIA also considers the potential implications of related and un-related development activities, that could be taking place concurrently with the application, and any other land required for development specific infrastructure outside the current site boundary.

Temporal Scope

5.4.39 The timing and phasing of the Proposed Development is not currently fixed. However, it is anticipated that construction of the Wider OPA will commence in 2021 and continue to 2035 (representing a 15 year construction period). It is anticipated that development would be undertaken on a rolling programme of site preparation and construction, allowing earlier phases to be completed and occupied while subsequent phases are constructed.

5.4.40 As shown on the Indicative Phasing Plan (Figure 1.2), in the first phases of the construction, necessary site-wide infrastructure, including the Link Road, Internal Distributor Road, Sustainable Drainage Systems and Strategic Green Infrastructure, will be implemented.

5.4.41 OPA Phase 1 will be first residential parcel to be delivered as part of the Wider OPA and there will be six additional residential phases to be delivered over 15 years. The on-site primary school, Phase 1 of the principal Local Centre, formal sports provision and the allotments are anticipated to be delivered in the first five years of construction and the second phase of the local centre, including the commercial and retail uses, is anticipated to be delivered from Year 5 through to completion of the OPA development.

5.4.42 First occupation in OPA Phase 1 is expected in late 2022/early 2023.

5.4.43 The EIA will consider impacts arising from both construction and operational phases. The Proposed Development is designed as a permanent provision and therefore a demolition phase is not applicable.

5.4.44 Unless stated otherwise within a technical chapter, the EIA assesses the effects of the Proposed Development arising during the anticipated construction phase and the occupation phase and is based upon the following scenarios:

- Baseline/Future Baseline + OPA Phase 1 with the Link Road delivered concurrently and completed by occupation of 100 units of OPA Phase 1
- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered)*
- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered)* + Cumulative Development

* when assessing the Wider OPA, scenario 1 is not re-assessed. The 'baseline' when assessing the Wider OPA includes OPA Phase 1 and the Link Road.

5.4.45 The above scenarios are necessary to demonstrate the impacts, effects and necessary mitigation required to deliver the separate elements of the Proposed Development.

Cumulative Scope

5.4.46 The Planning Practice Guidance: Environmental Impact Assessment (Planning Paragraph: 024 Reference ID: 4-024-20170728: Revision date: 28/07/2017) states the following in relation to the assessment of cumulative effects:

'Each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development.'

5.4.47 Schedule 4 of the 2017 Regulations requires that the cumulative effects of the Proposed Development should be included within the ES. Usually cumulative effects are considered in three categories - incremental, accumulative and cumulative:

- Incremental effects relate to small changes over time by numerous developments potentially giving rise to significant impact. These are incorporated into the baseline and each assessment describes whether the Proposed Development would cause a significant effect or cause another incremental change.
- Accumulative effects relate to multiple effects from a single development, which may give rise to a potentially significant impact upon a receptor.

- Cumulative effects relate to multiple developments giving rise to significant effects at a receptor. For example, a number of projects in proximity to each other may give rise to significant landscape and ecological effects cumulatively.

5.4.48 The potential cumulative effects of the Proposed Development in association with other committed developments both during the construction phase and following completion are included where relevant as required by the EIA Regulations.

5.4.49 The assessment of accumulative effects aims to identify potential impacts on receptors arising from multiple effects. An analysis has been undertaken into specific receptors or receptor groups to identify any predicted residual effects across all of the assessments within this ES. Where one receptor or group of receptors are predicted to experience multiple effects, consideration has been given to the interaction of these effects and whether significant accumulative effects are likely to arise as a result. Further details are presented in Chapter 15.

5.4.50 Table 5.2 shows existing and approved schemes of a significant size (e.g. 80+ units, 1,000sqm non-residential development) in the vicinity of the Site (circa 5km) which are potentially concurrent with the Proposed Development that are considered to have the potential to give rise to significant cumulative effects. These committed schemes form the basis for the assessment of potential cumulative effects taking into account the availability of information at the time of assessment.

5.4.51 As part of the Scoping process, the list has been verified and amended in line with the LPA's and other stakeholder comments.

Table 5.2: Schedule of Committed Development

Site Address	Application Reference	Outstanding Residential Units (at March 2018) / Non-Residential Floor space	Local Authority	Approximate Distance from Site Boundary (km)	Timing Assumptions
Allington Lane, Burnetts Lane and Bubb Lane access	O/14/75735 and O/16/79354	N/A	EBC	0	Concurrent with the Proposed Development
Chalcroft Business Park,	F/18/83945	10,541m^2	EBC	0.025 (Adjacent)	Currently undecided. Planning committee date of 06/02/2019

Burnetts Lane, West End					
Land off Botley Road, West End, Southampton	O/15/76418 **F/19/85439**	100 units plus 30 units	EBC	1.5	All 100 units (Phase1) expected to be delivered by 2021/22.
Land at Hedge End North, Winchester Road, Botley, Southampton (north west Boorley Green)	O/15/75953	680 units	EBC	1.5	Predicted to deliver 463 units by 2022
Land to North and East of Boorley Green, Winchester Road, Botley, Southampton SO32 2UA	O/12/71514 F/19/86233	842 units (outstanding) plus 68 units	EBC	1.7	First occupation achieved in Feb 2017. All 1330 total net dwellings of original application expected to be completed by 2023/24.
Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh SO50 7EA	O/15/77190	242 units	EBC	1.7	Expected completion by 2023/24
Land west of Woodhouse Lane	**O/18/83634**	605 units	EBC	2	Expected commencement in 2023/24
Land South of Maddoxford Lane, Boorley Green, Botley, Southampton, SO32 2DB,	**F/19/84937**	86 units	EBC	2.4	If positively determined in 2020, allowing for discharge of conditions, expected commencement in 2021/22 and completion in 2022/23
Land to the south of Maddoxford Lane and west of Westfield, Boorley Green, Botley, SO32 2DB	**F/19/85178**	104 units	EBC	2.5	If positively determined in 2020, allowing for discharge of conditions, expected commencement in 2021/22 and completion in 2022/23
Southampton International Airport, Mitchell Way, Eastleigh,	**F/19/86707**	Runway extension	EBC	2.7	Runway extension expected to be operational by April 2021

The Mount Hospital, Church Road, Bishopstoke	O/12/71007 F/13/73226 F/14/75061 F/17/80513	53 units (outstanding)	EBC	2.8	Phase 1 has been completed with the remaining 53 of 217 total outstanding dwellings projected to be completed by 2022.
Land to the North and East of Winchester Street, Botley	**O/18/83698**	375 units	EBC	2.8	Due to commence in 2023/24 with 38 units expected to be completed by Sept 2024
Land at Woodhouse Lane and to the North and East of Botley Village, Eastleigh	CS/17/81226	Construction of a bypass for Botley, providing a connection from Station Hill (A334/A3051 junction) to Woodhouse Lane	HCC	3.3	Granted 22/11/2017. HCC are currently progressing with the detailed design of the scheme, and will be looking to start the improvements to Woodhouse Lane in 2019. Works to construct the bypass are likely to follow on in 2020/21
Land off St Johns Road, South of Foord Road, Hedge End, Southampton SO30 4DG	F/15/76804	109 units	EBC	4	Construction started. Developer has confirmed the build out rates, resulting in completion by 2021.
Serenity, Heath House Lane, Hedge End, Southampton, SO30 0LE	**F/19/86829**	107	EBC	4	If positively determined in 2020, allowing for discharge of conditions, expected commencement in 2021/22 and completion in 2022/23
Land west of Waylands Place and north of Peewit Hill Close, Hedge End, SO31 1DJ	**F/17/80651**	106 units	EBC	4.2	Expected to be delivered in full by 2024.
Land at Park Farm/North Stoneham Park Stoneham Lane, Eastleigh, SO50 9HS	F/19/86946	15,731sqm	EBC	4.3	If positively determined in 2020, allowing for discharge of conditions, expected commencement in 2021/22 and completion in 2023/24

Land south of Chestnut Avenue north Stoneham Park, Chestnut Avenue, Stoneham Lane, Eastleigh	**O/15/76023** **F/17/81167** **F/17/81165** **F/19/87086**	868 units (outstanding) plus 18 units, 39 units and 65 units	EBC	4.5	Development commenced on site with the delivery of 728 units by 2024 at a build out rate of circa 150 dwellings per annum. 18 unit scheme expected completion by 2021/22. 39 unit scheme expected completion by 2021/22.
Land South of Bursledon Road, Bursledon, Southampton	**O/15/77121** **F/18/82322**	178 (outstanding)	EBC	5	Completions began in 2019 with full delivery expected by 2021/22
Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, SO50 9DG	F/19/85332	2,686sqm	EBC	3.4	Expected commencement in 2021 upon s106 agreement and completion in 2022/23

NOTE: – the scope of committed developments for the purposes of the Transport Assessment (TA) have been established and agreed with the LPA and Highway Authority via the TA scoping process based upon a separate criteria (e.g. through the inclusion of Local Plan allocated sites and other highways commitments). The assessment of cumulative effects in the Transport, Noise and Air Quality chapters in the ES are based upon the committed schemes agreed for the TA to ensure consistency with the agreed transport modelling.

* Committed developments considered within the TA and Transport assessment beyond the criteria for the committed developments within the EIA but used for the assessment of traffic related impacts and effects.

The Baseline

5.4.52 The assessments are based on the comparison of qualitative, and where possible quantitative, predicted impacts against current or recent baseline environmental conditions. Any significant changes expected in future baselines due to environmental trends are described qualitatively, or in certain cases calculated as quantitative future baselines, to allow meaningful future year assessment. These future year baselines can take account of cumulative developments not yet built but in the planning system. Where relevant these approaches are explained in further detail in the relevant technical chapters.

Inherent Mitigation

5.4.53 Mitigation is defined as a measure that is additional to the project proposed. Measures that design out significant effects and which form an inherent part of the project proposed are known as inherent mitigation. For example, many environmental constraints, such as flood risk, must be designed out of a project for it to be viable and it would be impractical to consider the project without such measures in place.

5.4.54 Where relevant, best practice measures, such as the implementation of a CEMP, Drainage Strategy and Dust Management Plan etc., have been included as inherent mitigation. This approach ensures that standard best practice measure and industry standards are accounted for within the assessments on the assumption that construction will adhere to these standards. As such this is not considered as additional mitigation.

5.4.55 Where this approach has been taken it has been stated in the relevant chapters and carried through into the mitigation summaries to ensure that any required assumed measures are suitably conditioned.

5.4.56 Inherent mitigation is therefore included in the assessments as part of the scheme and taken into account in the assessments.

5.5 EIA PARAMETERS & METHODOLOGY

Project Parameters

5.5.1 In order for the significant environmental effects to be identified and assessed, it is necessary to clearly identify all the components of the Proposed Development.

5.5.2 As the Wider OPA planning application has been made in outline, the ES assesses the construction and operation effects of the Wider OPA proposals using the identified outline parameters which allow some flexibility for development within defined limits.

5.5.3 The parameters comprise land-use, access, building heights, green infrastructure and proposed levels. These parameters identify the maximum extent of development in order to assess the worst case development scenario. In other aspects, such as the main access routes, these are the minimum fixed points that will be delivered. This allows inherent flexibility for future applications within these parameters. This is the ‘Rochdale Envelope’.

5.5.4 An indicative development phasing plan is also included.

5.5.5 As the OPA Phase 1 planning application is being made in full with detailed designs available, these designs form the basis of the EIA parameters for OPA Phase 1.

5.5.6 The EIA parameters therefore comprise the project descriptions, including development quantums, and design parameters specified in Chapter 3 – The Proposed Development.

Impact Assessment Guidance

5.5.7 The assessments presented in the ES consider the potential for significant environmental impacts to affect the baseline conditions as a direct/ indirect result of the Proposed Development.

5.5.8 A description of the aspects of the environment likely to be significantly affected by the Proposed Development is a requirement of the EIA Regulations. The baseline conditions are defined as the existing state of the environment and how it may develop in the future in the absence of the proposals and with certain committed developments included. In order to forecast potential future effects it is necessary to make predictions. To ensure that predictions are as accurate as possible, a description of the methods used to assess the effects of the Proposed Development is also required by the EIA Regulations.

5.5.9 Unless specifically stated otherwise, the assessments have been undertaken in accordance with best practice guidelines published by the relevant professional bodies. Each technical chapter in this report provides full details of the baseline and assessment methodology employed for that topic area alongside terminology used in the context of that technical discipline.

5.5.10 Where there is no topic specific guidance available, a generic framework of assessment criteria and terminology has been developed to enable the prediction of potential effects and their subsequent presentation. The development of this framework has drawn upon the experience of Savills and project team of undertaking EIA.

Generic Assessment Framework

<u>Receptor Sensitivity & Impact Magnitude</u>

5.5.11 Significance of environmental effects is determined through considering the sensitivity of a receptor to change and the magnitude of the likely change.

5.5.12 Receptors are those aspects of the environment sensitive to changes in baseline conditions. The sensitivity of a particular receptor depends upon the extent to which it is susceptible to such changes.

5.5.13 Impact magnitude is determined by predicting the scale of any potential change on the baseline conditions. Where possible, magnitude is quantified; however where this is not possible a fully defined qualitative assessment is undertaken. The assessment of magnitude is carried out taking account of any inherent design mitigation in the proposal that forms part of the development description.

Table 5.3: Receptor Sensitivity & Impact Magnitude

Receptor		**Impact**	
Sensitivity to Change		**Magnitude of Change**	
Very High	VH	Very High	VH
High	H	High	H
Medium	M	Medium	M
Low	L	Low	L
Very Low	VL	Very Low	VL
Negligible	N	Negligible	N

Effect Significance

5.5.14 As shown in Table 5.4, the effect significance is determined by combining the predicted magnitude of impact with the assigned sensitivity of the receptor. Table 5.5 sets out the broad definitions of significance. The definition of the level of significance at which a *significant* effect arises is provided within the topic method section of each chapter of the ES. Unless stated otherwise within a technical chapter, effects of moderate significance or above are considered to be significant in EIA terms.

Table 5.4: Effect Significance

Criteria			**Receptor Sensitivity**				
			VH	H	M	L	VL
Impact Magnitude	**Positive**	VH	Substantial	Substantial	Major	Moderate	Moderate
		H	Substantial	Major	Moderate	Moderate	Minor
		M	Major	Moderate	Moderate	Minor	Minor
		L	Moderate	Moderate	Minor	Minor	Minor-Neutral
		VL	Moderate	Minor	Minor	Minor-Neutral	Minor-Neutral
	Negligible		Neutral	Neutral	Neutral	Neutral	Neutral
	Negative	VL	Moderate	Minor	Minor	Minor-Neutral	Minor-Neutral
		L	Moderate	Moderate	Minor	Minor	Minor-Neutral
		M	Major	Moderate	Moderate	Minor	Minor
		H	Substantial	Major	Moderate	Moderate	Minor
		VH	Substantial	Substantial	Major	Moderate	Moderate

Table 5.5: Definition of Significance

Significance	Definition
Substantial	These effects represent key factors in the decision-making process. They are generally, but not exclusively associated with sites and features of national importance and resources/ features which are unique and which, if lost, cannot be replaced or relocated.
Major	These effects are likely to be important considerations at a regional or district scale but, if adverse, are potential concerns to the project, and are likely to be important in the decision making process.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision making process. Nevertheless, they are likely to be relevant in the detailed design of the project.
Neutral	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

5.5.15 As required by the EIA Regulations, the likely significant effects of the Proposed Development are described as:

- Adverse or beneficial
- Direct or indirect
- Temporary or permanent
- Reversible or irreversible
- Cumulative

5.5.16 Adverse effects are generally undesirable and result from negative impacts. Beneficial effects are generally desirable and result from positive impacts.

5.5.17 Each effect will have a source originating from the development, a pathway and a receptor. Effects which operate in this direct way are regarded as direct effects. Effects on other receptors via subsequent pathways are regarded as indirect effects.

Initial & Residual Effects

5.5.18 As stated previously, the EIA process enables the likely significant effects of a proposed development to be identified so that, where possible, adverse effects predicted to arise as a result of the proposal can be avoided or mitigated through the adoption of suitable measures known as additional mitigation. Additionally, enhancement measures can be incorporated to maximise the beneficial effects of the development. The adoption of mitigation and enhancement measures results in initial and residual effects. These can be defined as:

- Initial Effects: Effects occurring as a result of the Proposed Development prior to the adoption of any additional mitigation or enhancement measures.
- Residual Effects: Effects occurring as a result of the Proposed Development taking into account the adoption of identified additional mitigation or enhancement measures.

5.5.19 Additional mitigation and enhancement is defined as a measure that is additional to the Proposed Development as initially proposed. Measures that design out significant effects that form an inherent part of the proposal, known as inherent mitigation, are considered in the initial impact. For example, many environmental constraints, such as flood risk, must be designed out of a project for it to be viable, and it would be impractical to consider the project without such measures in place.

EIA Assumptions & Limitations

5.5.20 The following key assumptions have been made in preparing the ES:

- All legislative requirements will be met. Therefore, any standard guidance which is provided to ensure minimum legal compliance is not considered to constitute mitigation in the EIA and has not been taken into account.
- The assessment of effects prior to the adoption of mitigation measures assumes that the Proposed Development will be constructed in accordance with industry standard techniques. Such techniques are not considered as mitigation.
- Where further assumptions have been made for individual topic assessments these are identified within the relevant topic chapters.
- Any limitations or uncertainties associated with impact prediction or the sensitivity of receptors due to the absence of data or other factors will give rise to uncertainty in the assessment. Any such limitations are referred to in the relevant technical chapters of the ES.

Technical Chapter Structure

5.5.21 Each technical specialist has prepared their technical chapter to comprise of:

- Methodology used including assumptions and limitations;
- Baseline analysis;
- Prediction of potential impacts;

- Mitigation and/or enhancements proposed; and
- Evaluation of residual impacts.

5.5.22 Where appropriate and necessary, detailed information or baseline studies are presented in the appendices of the ES (Volume 2) and referred to as relevant within the specific chapter.

CHAPTER 6: SOCIO-ECONOMICS

6.1 INTRODUCTION

6.1.1 This chapter of the ES has been produced by Savills to assess the potential socio-economic effects that the Proposed Development could have upon existing population groups during the construction and operation phases of OPA Phase 1 and the Wider OPA.

6.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessment

6.2.1 There are two existing planning consents for the Subject Site, O/14/75735 and O/16/79354.

O/14/75735 and O/16/79354 Planning Applications

6.2.2 Eastleigh Borough Council (EBC) resolved to grant outline planning permission in June 2015 for the West Horton Heath development (reference no O/14/75735), comprising up to 950 dwellings, a primary school and secondary school, employment uses, creation of a village centre at Chalcroft Farm (including a community building), and associated infrastructure (including public open space, landscaping, drainage, new access road, public rights of way, footpath and cycle links and utilities infrastructure). The planning permission includes the demolition and/or conversion/change of use of existing buildings at Chalcroft Farm.

6.2.3 Subsequently, an outline planning application for the North West Horton Heath (NWHH) development was submitted to EBC in 2016 (reference no O/16/79354), comprising construction of up to 450 dwellings with new road and access onto Fir Tree Lane and Allington Lane and with associated highway modifications, infrastructure, public open space, landscaping and drainage. Outline planning permission was granted in November 2017.

6.2.4 Both schemes were EIA developments and each planning application was supported by an ES, which included Socio-Economic Impact Assessments. In both cases, the socio-economic impact assessments concluded that the proposals would not likely result in significant adverse effects on existing population groups during the construction and operation phases of those developments.

Scoping Opinion

6.2.5 A Scoping Report was submitted to the Local Planning Authority (LPA) of EBC on 16 April 2020. Queries and comments were received from EBC on 12 August 2020 which have been taken into account in undertaking this assessment.

6.2.6 Given the scale of the development and potential impacts, both positive and negative, on the facilities, services and economy of the surrounding area, the LPA is in agreement with the applicant that socio-economics should be scoped into the ES.

6.2.7 The ES should include matters covered by Policies DM9 Public Utilities and Communications, DM10 Water and Waste Water, DM23 Housing, DM26 Housing Mix, DM27 Older People's Housing, and DM31 Dwellings with Higher Access Standards of the Submitted Eastleigh Borough Local Plan (2016-2036), as these combine to impact socio-economic considerations. These have been taken into consideration in undertaking this assessment.

6.2.8 For social impact and benefits, improved foul sewage connections for the local area, including the scope to remove the need for septic tanks should also be a consideration and could provide a positive impact.

6.2.9 The application should include a Health Impact Assessment which addresses the physical, health and wellbeing impacts and opportunities resulting from the development and, in the absence of any formal advice from HCC Public Health, a Rapid HIA is agreed as being appropriate for the EIA. A Rapid HIA has therefore been scoped into the ES.

6.2.10 The EBC scoping response stated that the baseline data collection is heavily biased towards social (health and education). Economic sources are therefore extended to include the work being conducted by Oxford Economics, Solent Local Enterprise Partnership (LEP), Partnership for Urban South Hampshire (PUSH), and EBC's Economic Development team.

6.2.11 The EBC scoping response also stated that more clarity is needed regarding exactly which aspects of the socio-economic judgements might be subjective. Where judgements are subjective, these are stated.

6.2.12 The scoping response also stated that national and regional economic information should be utilised as duplications just beyond the immediate geographical scope when mitigating certain effects. This has been taken into account in undertaking this assessment by comparing EBC's

economic baseline against the South East of England average, and the average for Great Britain.

6.2.13 It was also stated that it is important to consider not only the snapshot of the local economy at the time of study, but also an understanding of how it might evolve given recent events, and what changes we may see in the future as a result of both natural selection and EBC strategy. Oxford Economics has been utilised to review economic growth forecasts from 2019 to 2029.

NHS Healthcare West Hampshire Clinical Commissioning Group (CCG) Response

6.2.14 Consultation with West Hampshire Clinical Commissioning Group (CCG) confirms that a contribution will be required to fund the expansion/improvement of Stokewood Surgery.

Hampshire Country Council (HCC) Education Response

6.2.15 The following are agreed headline commitments that cover the full education outputs of the Proposed Development:

- The yield for a primary school is 0.3 per qualifying dwelling (Based on Paragraph 4.1 requirement set out in HCC Developers' Contribution towards Children's Services Facilities (May 2019));
- There is a requirement for a Primary School to be delivered on site. The size of the primary school site is to be 2.8 ha based on Paragraph 3.2 requirement set out in HCC Developers' Contributions towards Children's Services Facilities (May 2019). The capacity of the primary school is to be 3FE as secured via s106 agreement, based on 0.3 yield and indicative mix. The primary school is to be available to be operational prior to occupation of the 400th dwelling as secured via s106 agreement, based on Paragraph 3.11 requirement set out in HCC Developers' Contributions towards Children's Services Facilities (May 2019);
- The yield for secondary school is 0.21 per qualifying dwelling (Based on Paragraph 4.1 requirement set out in HCC Developers' Contributions towards Children's Services Facilities (May 2019));
- There is not a requirement for a Secondary School to be delivered on site;

- The yield for early years is 0.09 per qualifying dwelling (Based on Paragraph 4.1 requirement set out in HCC Developers' Contributions towards Children's Services Facilities (May 2019)); and
- There is requirement for early years provision to be delivered on site.

Legislative Context

6.2.16 There is no legislation specifically relevant to the socio-economic assessment.

Planning Policy and Guidance

6.2.17 There are a range of documents which are relevant to the undertaking of the socio-economic assessment at the national, regional and district level. In particular:

- National Planning Policy Framework (NPPF) (2019);
- Solent Local Enterprise Partnership (LEP) Transforming the Solent (February 2017);
- Solent LEP Transforming Solent Strategic Economic Plan (SEP) 2014-2020 (2014):
- Solent LEP Delivery Plan 2020-2021;
- Partnership for Urban South Hampshire (PUSH) Economic Development Strategy (2010);
- PUSH South Hampshire Spatial Position Statement (2016);
- Eastleigh Borough Council Local Plan Review 2001-2011 (2006);
- Eastleigh Borough Council Prosperity Delivery Plan;
- Eastleigh Borough Council Corporate Plan Strategy (2018);
- Infrastructure Delivery Plan (IDP) (2018);
- Eastleigh Borough Council Affordable Housing Supplementary Planning Document (SPD) (July 2009, Updated May 2016);
- Eastleigh Borough Council's Community Infrastructure Levy (CIL) Charging Schedule;

- Emerging Eastleigh Borough Council Local Plan 2016-2036 (2018);
- Eastleigh Borough Open Space Needs Assessment (2017);
- Eastleigh Borough's Green Infrastructure Corporate Strategy (2018);
- Hampshire County Council Eastleigh Childcare Sufficiency Update (2019);
- Hampshire County Council Developers' Contributions Towards Children's Services Facilities (2019);
- Department for Transport (DfT) Manual for Streets (2007); and
- National Travel Survey (2019)

National Planning Policy

National Planning Policy Framework (NPPF) (2019)

6.2.18 The revised National Planning Policy Framework (NPPF) (2019) sets out the Government's planning polices for England, and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced, and is underpinned by the presumption in favour of sustainable development, with a clear objective of supporting the supply of homes and economic growth. The NPPF must be taken into account in preparing development plans, and is a material consideration in the planning process.

6.2.19 The following paragraphs of the NPPF are of relevance to the assessment of socio-economic effects.

6.2.20 In terms of achieving sustainable development, the NPPF recognises the importance of coordinating economic investment with the delivery of housing. The economic objective at Paragraph 8a (p5) states:

'To help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure'.

6.2.21 In relation to delivering a sufficient supply of homes, the NPPF states at Paragraph 59:

'It is important that a sufficient amount and variety of land can come forward where it is needed, that the needs of groups with specific housing requirements are addressed and that land with permission is developed without unnecessary delay'.

6.2.22 The NPPF also states that a range of homes should be delivered which incorporate a mix of housing to meet local needs including the provision of affordable homes (Paragraph 61).

6.2.23 In relation to building a strong, competitive economy, the NPPF states at Paragraph 80:

'Planning policies and decisions should help create the conditions in which businesses can invest, expand and adapt. Significant weight should be placed on the need to support economic growth and productivity, taking into account both local business needs and wider opportunities for development'.

6.2.24 Paragraph 81 (p23) emphasises the importance of housing in securing economic development objectives. It states that planning policies should:

- *'Set out a clear economic vision and strategy which positively and proactively encourages sustainable economic growth;*
- *Seek to address potential barriers to investment, such as inadequate infrastructure, services or housing, or a poor environment; and*
- *Allow for new and flexible working practices such as live-work accommodation'.*

6.2.25 The link between delivering homes and supporting economic development is also referenced in terms of promoting healthy and safe communities at Paragraph 92 (p27):

'Planning policies and decisions should ensure an integrated approach to considering the location of housing, economic uses and community facilities and services'.

6.2.26 In relation to promoting healthy and safe communities, the NPPF states at Paragraphs 91, 92 and 94:

'Planning policies and decisions should aim to achieve healthy, inclusive and safe places which:

- *Promote social interaction, including opportunities for meetings between people who might not otherwise come into contact with each other – for example through mixed-use developments, strong neighbourhood centres, street layouts that allow for easy*

pedestrian and cycle connections within and between neighbourhoods, and active street frontages;

- *Are safe and accessible, so that crime and disorder, and fear of crime, do not undermine the quality of life or community cohesion – for example through the use of clear and legible pedestrian routes, and high quality public space, which encourages the active and continual use of public areas; and*

- *Enable and support healthy lifestyles, especially where this would address identified local health and well-being needs – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling'.*

'To provide the social, recreational and cultural facilities and services the community needs, planning policies and decisions should:

- *Plan positively for the provision and use of shared spaces, community facilities (such as local shops, meeting places, sports venues, open space, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of communities and residential environments;*

- *Take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community; and*

- *Ensure an integrated approach to considering the location of housing, economic uses and community facilities and services'.*

'It is important that a sufficient choice of school places is available to meet the needs of existing and new communities. Local planning authorities should take a proactive, positive and collaborative approach to meeting this requirement, and to development that will widen choice in education. They should:

- *Give great weight to the need to create, expand or alter schools through the preparation of plans and decisions on applications; and*

- *Work with school promoters, delivery partners and statutory bodies to identify and resolve key planning issues before applications are submitted'.*

6.2.27 In relation to open space and recreation, the NPPF states at Paragraph 96 that access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and wellbeing of communities. Robust and up-to-date assessments of open space, sport and recreation facilities should be used to determine need.

6.2.28 In terms of making effective use of land, the NPPF at Paragraph 117 (p35) and 119 (p35) states that planning policies and decisions should promote the effective use of land in meeting the needs of homes and other uses to meet development needs.

'Local planning authorities, and other plan-making bodies, should take a proactive role in identifying and helping to bring forward land that may be suitable for meeting development needs, including suitable sites on brownfield register or held in public ownership'.

Regional Planning Policy

6.2.29 The Borough is sited within the Solent Local Enterprise Partnership (LEP) area.

Solent Local Enterprise Partnership (LEP) Transforming the Solent (February 2017)

6.2.30 The borough is sited within the Solent Local Enterprise Partnership (LEP) area. The Solent Local Enterprise Partnership (Solent LEP) helps to determine local economic priorities and drive local economic growth and the creation of new jobs. The Solent LEP is driven by the business community and is supported by four university partners, the further education sector, four upper tier local authorities, eight district Councils and the voluntary and community sector, all of whom are actively working together to secure a more prosperous and sustainable future in the Solent area.

6.2.31 The Solent LEP Transforming the Solent states the following objectives to achieve economic growth and productivity within the Solent:

- Invest in economic infrastructure;
- Develop the skills that the economy needs to succeed;
- Ensure that ideas and knowledge are at the forefront of our approach, supporting our businesses to innovate, export and grow; and
- Build on our sectoral strengths and recognise our comparative advantage.

Solent LEP Transforming Solent Strategic Economic Plan (SEP) 2014-2020 (2014)

6.2.32 The vision for the Solent was set out in the initial growth strategy, 'A Strategy for Growth' in December 2012:

6.2.33 *'Our vision is to create an environment that will bring about sustainable economic growth and private sector investment in the Solent. It will assist this globally competitive area reach its full potential, enabling existing businesses to grow, become more profitable and to be greener, enabling the creation of new businesses and attracting new businesses to the region'.*

6.2.34 The following objectives from the SEP are of relevance to the assessment of economic development:

- Maximise economic impact of our economic assets in the areas and sectors with the potential for growth. Promoting the area as the UK's leading growth hub for advanced manufacturing, marine and aerospace both at home, and in the global marketplace. Developing the advanced engineering and manufacturing sector through a business-led approach and supporting the visitor economy.
- Unlock critical employment sites to enable the Solent businesses, particularly the marine, maritime and advanced manufacturing sectors of their economy, to expand.
- Provide new housing to support our growing workforce.
- Ensure people have the right skills to access employment and support our growing sectors.
- Provide effective support to our small and medium-sized enterprises (SMEs) to enable them to grow, including marine and maritime SMEs.
- Unlock innovation led growth to engage more businesses in knowledge exchange and innovation, develop links to wider Higher Education Institutions (HEIs) and demonstrate the benefits of working with knowledge-based partners.

Solent LEP Delivery Plan 2020-2021

6.2.35 The vision for the Solent economy in 2050 is to be:

'The global leader in maritime and climate change adaptation, with towns and cities that are fantastic places to live, trade and with opportunities for all our communities to flourish'.

6.2.36 The following objectives are noted for their relevance to economic development within the Solent LEP:

- Continue to support start-ups and established businesses to grow;
- Support Solent businesses to identify opportunities post the exit from the EU;
- Support Solent businesses to identify opportunities post the exit from the EU;
- Support and accelerate the delivery of housing to build sustainable communities;
- Lead regional Maritime UK cluster activity;
- Strengthen and formalise the role of Maritime UK Solent;

Partnership for Urban South Hampshire (PUSH) Economic Development Strategy (2010)

6.2.37 Eastleigh Borough sits within the South Hampshire area, which includes the cities of Southampton and Portsmouth along with neighbouring areas related to them through transport

links, their local economy or community interests. PUSH is a partnership of the unitary authorities of Portsmouth, Southampton and Hampshire County Council.

6.2.38 The Partnership for Urban South Hampshire (PUSH) is committed to:

'Delivering sustainable, economic-led growth and regeneration to create a more prosperous, attractive South Hampshire and Isle of Wight, offering a better quality of life for everyone who lives, works and spends their leisure time here'.

6.2.39 Through joint working and public consultation, PUSH has established an Economic Development Strategy for the South Hampshire area up to 2026. The strategy was revised in 2010 and suggests how much economic development will need to be accommodated in the member authorities' cities, Boroughs and districts over that time period, in order to promote a healthy local economy and meet local needs, along with the housing required to support it.

6.2.40 The revised PUSH Economic Development Strategy proposes economic development to help boost south Hampshire's economic performance, which is lagging slightly behind that of other areas in the south east of England. It suggests 1.36-1.72 million sq.ft of new employment over the period 2006 to 2026.

PUSH South Hampshire Spatial Position Statement (2016)

6.2.41 PUSH has produced a statement that apportions the identified development requirements between its constituent authorities, informed by the Economic Development Strategy and Strategy Housing Market Assessment.

6.2.42 There are a number of key spatial principles which have underpinned the development of the Position Statement and which should continue to guide and inform local plan processes in achieving sustainable development. The relevant spatial principles to economic development include:

- Sustainable Economic Growth – Locating new employment close to where people live, delivering high quality employment sites which will attract investment, and protecting high quality and waterfront employment sites from redevelopment.
- Good Places to Live and Work – Optimising potential to reduce reliance on private car, higher employment densities at locations with high public transport accessibility, and providing a good range and mix of homes, jobs, services, leisure, recreational and cultural facilities and public space.

6.2.43 For Eastleigh Borough, the South Hampshire Spatial Position Statement states that:

- Identifies the northern part of Eastleigh Borough as a strategic development location for mixed use development, subject to significant infrastructure investment;
- Identifies Eastleigh River Side as a major regeneration opportunity;
- Identifies Eastleigh town centre as a large Town Centre where there is to be modest expansion of retail, office and other town centre uses;
- Restricts out-of-centre retailing; and
- Requires the development of a net additional 40,000 sq.m of offices and 74,000 sq.m of manufacturing and distribution floorspace in the period 2011-2034.

Local Planning Policy

Current Planning Policy

Eastleigh Borough Council Local Plan Review 2001-2011 (2006)

6.2.44 The following policies from the Adopted Local Plan are noted for the relevance to this assessment:

- Paragraph 4 Urban Renaissance and the Built Environment (p38) – It is essential that we meet the reasonable needs of our communities for development and that we meet those needs in ways which make the towns and villages more rather than less attractive places to live, and protect and conserve as much countryside as possible. These objectives will only be met if new development achieves high standards of design with as much of it as possible being accommodated on previously developed land in built up areas.

- Paragraph 5.3 Housing (p59) – The Council will ensure that its housing policies help to create or maintain mixed and balanced communities, and address the needs of all sections of the community, including those in need of affordable housing. The Council will ensure that as many of the necessary dwellings as possible will be accommodated within existing built up areas or on land committed for development.

- Paragraph 7 The Economy (p97) – A balance needs to be struck between providing development to maintain economic competitiveness and low unemployment, and protecting the environment and reducing the need to travel.

- Paragraph 9.1 Public Open Space, Sport and Recreation (p180) – The key objective for open space is to ensure the adequate provision of high quality, and accessible public open space, sports and recreation facilities. When assessing development proposals the Council will consider the nature, type, extent, quality and ease of access and location of existing open space in the vicinity of the proposal.

- Policy 191. IN Community Facilities, Infrastructure and Developers' Contributions (p173) – Appropriate proposals for development will be permitted provided that the developer has made arrangements for the infrastructure necessitated by the development to be delivered.

Eastleigh Borough Council Prosperity Delivery Plan

6.2.45 Eastleigh Strategic Partnership vision is that in 20 years time, Eastleigh borough has a thriving and inclusive economy in which:

- The borough plays an important role in the South Hampshire economy;
- Support for local businesses including a variety of sites and premises to meet business needs, including small-scale starter and 'move-on units';
- Local people have a wide range of employment opportunities, with an increased proportion of high quality jobs;
- Businesses and other organisations work with local young people to enhance their qualifications and skills, so they can compete for, and keep, jobs;
- High quality retail, leisure, community and cultural facilities ensure the vitality and attractiveness of Eastleigh town centre and other district and local centres; and
- Housing needs are met, with provision for people with specific needs.

Eastleigh Borough Council Corporate Plan Strategy (2018)

6.2.46 The following objectives of the Corporate Plan are of relevance to the assessment of economic development in Eastleigh Borough Council:

- Develop an appropriately skilled workforce in the Borough and a varied mix of employment opportunities, ensuring the Borough is seen as a desirable location to set up a new business or to relocate a growing business, so as to sustain economic demand and increase job security and satisfaction;
- Secure an ongoing provision of employment land and infrastructure that can support current and future business needs, and to stimulate sufficient economic growth to sustain a rising population.

6.2.47 The four foundations for a strong regional economy, generating productivity, job growth and prosperity are:

- Increased Housing Provision
- Investment in Skills and Expertise
- Improved Infrastructure
- Vibrant Town and Local Centres

Infrastructure Delivery Plan (IDP) (October 2018)

6.2.48 The IDP was updated in October 2018, and provides an indication of the nature, scale and extent of new infrastructure required to support the new development planned in the emerging Eastleigh Borough Local Plan 2016 to 2036. Such infrastructure is required to ensure that future development is accompanied by the services and facilities needed to deliver sustainable communities.

6.2.49 The funding for new infrastructure comes from a variety of sources such as service or utility providers, government grants, other funding schemes and Section 106 agreements.

6.2.50 This IDP establishes a total cost of the infrastructure considered essential to the delivery of the EBLP of £215.38 million. However, funding is identified or anticipated at £153.78 million leaving a potential funding shortfall for infrastructure essential to the delivery of the EBLP of £61.6 million. **Table 6.1** presents the essential EBLP infrastructure identified in the IDP.

Table 6.1 Essential EBLP Infrastructure

	Cost	Funding	Shortfall
Physical Infrastructure			
Transport and Access			
Roads	£143.7m	£82.1m	£61.6m
Total Physical Infrastructure	£142.1m	£82.1m	£61.6m
Green Infrastructure			
Outdoor Sports Facilities	£7.0m	£7.0m	£0.0m
Total Green Infrastructure	£7.0m	£7.0m	£0.0m
Social and Community Infrastructure			
Primary and Secondary Schools	£62.58m	£62.58m	£0.0m
Health Infrastructure	£2.1m	£2.1m	£0.0m
Total Social and Community	£64.68m	£64.68m	£0.0m

Total Essential Infrastructure	£215.38m	£153.78m	£61.6m

Source: Eastleigh Borough Council Infrastructure Delivery Plan (IDP), 2018

Affordable Housing Supplementary Planning Document (SPD) (July 2009, updated May 2016)

6.2.51 The Affordable Housing SPD sets out the guidance on the implementation of the policies in the Eastleigh Borough Local Plan Review (2001-2011) relating to the provision of affordable housing as a proportion of the total number of new dwellings in appropriate development sites.

6.2.52 In accordance with Policy 74.H of the Local Plan, the Council will seek an element of affordable housing on all sites capable of accommodating 15 dwellings or more. Policy 74.H (ii) states that a target of 35% of new dwellings provided on eligible sites will be sought as affordable housing.

Emerging Planning Policy

Emerging Eastleigh Borough Council Local Plan 2016-2036 (2018)

6.2.53 The Emerging Eastleigh Borough Local Plan 2016-2036 (2018) is Eastleigh Borough Council's new plan for the Borough which looks ahead to 2036. This is necessary as the existing plan (Eastleigh Borough Local Plan Review 2001-2011) is now out of date.

6.2.54 EBC have derived a vision of what the Local Plan should achieve for the Borough, which states (p28):

'To ensure development in Eastleigh Borough and its communities delivers a strong and sustainable economy with an adequate supply of housing and infrastructure that supports improved standards of living for residents while protecting the distinct identity of towns and villages and preventing urban sprawl; promoting thriving and healthy communities; and maintaining an attractive and sustainable environment that residents value'.

6.2.55 New employment floor space is considered a prosperity issue to be addressed through the Local Plan. Issue P5 New Employment Floorspace (p14) states that the Borough Council's Employment Land Review shows that between 2016 and 2036, there is a need for around 144,050 sq.m of net additional employment floorspace to accommodate future economic growth.

6.2.56 Issue P7 Local Growth Sectors (p14) states that there is a need to encourage particular business sectors in the Borough that are growing or that will help to increase prosperity locally and in South Hampshire. These include high-tech, green economy and advanced engineering

and manufacturing, and digital economy and cultural industries. Because the Borough is close to Southampton and its port, there is also likely to be demand for quality office, distribution and logistics floorspace.

6.2.57 The following policies are of relevance to the assessment of socio-economic effects. Policies DM9, DM10, DM21, DM23, DM26, DM27 and DM31 are of particular note as these combine to impact socio-economic considerations:

- Policy DM1 General Criteria for New Development states that all new development should:
    - Not have an unacceptable impact on, and where possible should enhance residential amenities of both new and existing residents, the character and appearance of urban areas, the countryside and the coast, biodiversity, and heritage assets;
    - Not involve the loss of or damage to trees, woodlands, hedgerows, ponds, priority habitats or other landscape features of value to the character of the area, for appearance or biodiversity unless they can be replaced with features of equivalent or enhanced value;
    - Include a landscape scheme covering the design and layout of external space;
    - Provide fully connected green infrastructure that interlaces the development and connects into the wider network;
    - Incorporate provision for disabled people;
    - Incorporate design measures to inhibit criminal and anti-social behaviour;
    - Incorporate provision for on-site waste management; and
    - Include provision for public art associated with new large scale development in accordance with the Council's adopted Public Art Strategy.
- Policy DM3 Adaption to Climate Change states that all development should be designed to adapt to the predicted climate change impacts for the Borough.

- Policy DM8 Pollution states that development will not be permitted if it is likely to cause loss of amenity or impact on public health or other unacceptable environmental impacts.

- Policy DM9 Public Utilities and Communications states that the development of new and improvement of existing utilities infrastructure essential to meet the needs of new and existing communities will be encouraged and permitted subject to the other policies of this plan. New development will only be permitted if the essential utilities infrastructure including communications infrastructure required to serve it is available. Where off-site utilities infrastructure is not adequate to serve a development site, developers will be required to contribute to the costs of new off-site provision in consultation with the utilities providers. The Council will encourage developers to make provision for the installation and maintenance of telecommunications infrastructure within new developments.

- Policy DM10 Water and Waste Water states that where required to meet the Habitats Regulation at 'project level stage' and to meet the Water Framework Directive requirement for no deterioration of the status of water bodies, major development will be phased alongside the completion of enhancements to the water supply of waste water infrastructure.

- Policy DM13 General Development Criteria Transport states that all new development must have safe and convenient access to the highway network and make provision for access to, and by, other transport modes including public transport and cycle and pedestrian routes as appropriate.

- Policy DM15 Safeguarding Existing Employment Sites states that the major existing employment sites as identified on the policies map shall be retained predominantly in employment use classes B1, B2 and B8.

- Policy DM16 Workforce Training Requirements and New Jobs states that the provision of workforce training activities will normally be permitted on employment sites where they are related to employment uses on that site, and/or contribute to improving workforce skills for the Borough. Opportunities will be sought for the provision of workforce training opportunities and jobs for local unemployed people on major construction sites, and within the companies occupying new employment developments.

- Policy DM21 New Retail Development states that retail development will be permitted in the defined centres provided that it is compatible with the role and retail character of the centre, and it accords with policies for Eastleigh town centre set out in Chapter 6 of the Local Plan (Policies E3-E4). Retail development will only be permitted outside these centres subject to a sequential test.

- Policy DM23 Residential Development in Urban Areas states that within the urban edge as defined on the policies map, residential development through new build, conversion, sub-division or extension will normally be permitted subject to the general development criteria and transport policies of the Local Plan. New dwellings will be permitted provided that:

    - Where feasible the scheme provides a mix of dwelling types and sizes to meet local needs, including dwellings capable of adaptation to meet changing needs over time and housing for older people in accordance with policies DM26 and DM27;

    - Affordable housing is provided in accordance with policy DM30;

    - A minimum density of 40 dwellings per hectare (net) should be achieved unless site constraints or local character justify a lower density. In areas with good access to public transport and other services and amenities, higher densities will be sought.

- Policy DM26 Creating a Mix of Housing states that applicants for market residential and mixed-use schemes will be required to:

    - Demonstrate how the proposal contributes to the overall mix of housing in the Housing Market Area, informed by the current need, current demand and existing housing stock (including approved developments);

    - Where appropriate, demonstrate how the scheme contributes to the provision of properties suitable for, for example, first time buyers, downsizers, and those in need of lower cost housing; and

    - Demonstrate that where a mix of different house sizes and types is provided on-site, the development is designed to avoid excessive concentrations of the same size or type of home.

- Policy DM27 Delivering Older Peoples Housing states that new development should seek to respond to the requirements of an ageing population by increasing the supply of specialist housing and accessible housing in accordance with policy DM31. The Council will support the provision of accommodation suitable for the needs of older people. Proposals should be:
    - Located in sustainable locations within the urban edge with good access to the public transport network;
    - Close to local facilities that residents can use, ideally Extra Care housing should be in or close to local centres; and
    - Well integrated into the local community.
- Policy DM30 Delivering Affordable Housing states that the Council will seek the maximum reasonable amount of affordable housing when negotiating on individual market residential and mixed-use schemes, in line with the following:
    - 35% affordable housing will be required as part of new housing developments, where the proposal comprises sites of 0.33 ha or more, or capable of accommodating 11 dwellings or more, or a maximum combined gross floor space of more than 1,000 sq.m;
    - Provision on qualifying sites will be on-site unless it can be demonstrated that an off-site contribution would be more appropriate and more deliverable;
    - The tenure split, size and type of affordable housing will be informed by the latest Strategic Housing Market Assessment, the housing register, and the level and type of existing affordable housing in the locality;
    - Where affordable housing is provided as part of a mixed use tenure site it should be integrated into the development in terms of its design and layout;
    - The Council will also support acceptable schemes where developers choose to offer more affordable housing than is required by the policy, where this is in accordance with other policies in the Plan;

- Inclusion of an element of specialist residential accommodation and facilities for older people within the affordable housing requirement may be appropriate depending on the proposal.

- Policy DM31 Dwellings with Higher Access Standards states that the Borough Council requires that development should meet higher national access standards as set out in Part M of the building regulations for new build residential development whereby 100% of dwellings meet at least Part M4(1) standard, including 80% of dwellings on each site meet Part M4(2) standard. For major development of 40 residential units and above, this 80% should include at least 2 dwellings or 7% of all market housing, at least 1 dwelling or 8% of all affordable housing, and 100% of all specialist housing for older people should meet the Part M4(3) standard.

- Policy DM35 Provision of Recreation and Open Space Facilities with New Development states that all new residential development should contribute to the achievement of the quantitative, qualitative and accessibility standards for recreation and open space facilities in the Open Space Needs Assessment 2017. The level of provision and contribution will vary depending on the existing areas of open space located within the distance set by the accessibility standard and the size of the proposed development.

- Policy DM36 New and Enhanced Recreation and Open Space Facilities states that the provision, extension, and private recreation and open space facilities or uses will be permitted provided that they accord with the general development criteria and the biodiversity, and heritage policies of the Local Plan.

- Policy DM38 Community, Leisure and Cultural Facilities states that the development of new community, cultural and leisure facilities and extensions to existing facilities will be permitted within Eastleigh town centre, district and local centres, neighbourhood parades and in the new local centres to be provided as part of the strategic housing sites. Proposals must be of a scale appropriate to the centre.

- Policy DM40 Funding Infrastructure states that development will be permitted provided that the developer has made arrangements for the provision of, or for contributions to the improvement of, any infrastructure, services, facilities or amenities necessitated by the development proposed, by means of either a planning obligations agreement, and/or should it be introduced in the Borough in the future, the Community Infrastructure Levy (CIL) under the Planning Act 2008.

6.2.58 The Emerging Local Plan states that when considering development proposals, the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will always work proactively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area.

Eastleigh Borough Council's Community Infrastructure Levy (CIL) Charging Schedule

6.2.59 Eastleigh Borough Council consulted on a draft CIL Charging Schedule in 2013-2014. Following the Inspector's Report into the Eastleigh Borough Local Plan 2011-2029, the examination into this Charging Schedule was not progressed.

6.2.60 As part of the emerging Eastleigh Borough Council Local Plan 2016-2036, Eastleigh Borough Council are currently considering whether to introduce CIL.

Guidance/Best Practice

6.2.61 In addition to the above documents, there are a range of additional documents which are considered appropriate for this socio-economic assessment.

Eastleigh Borough Open Space Needs Assessment (2017)

6.2.62 The Eastleigh Borough Open Space Needs Assessment delivers an update of the Council's 2014 Open Space Study, and provides an evidence base of needs and deficiencies in open space, and establishes local provision standards.

6.2.63 On the whole, provision of open space in Eastleigh Borough is good, with some small pockets of deficiencies as follows:

- There are deficiencies of amenity space in Chandler's Ford and Hiltingbury;
- There are existing surpluses of amenity space in Bishopstoke, Fair Oak and Horton Heath, Eastleigh and Hedge End, West End and Botley Local Areas. These surpluses would be reduced in the event of the project population increases, particularly in Hedge End, West End and Botley.
- There are currently deficiencies of allotments in Chandler's Ford and Hiltingbury.

6.2.64 **Table 6.2** outlines the findings of the Open Space Needs Assessment with specific reference to the local areas of Fair Oak and Horton Heath, and West End North, which the Proposed Development is located within.

Table 6.2 Public Open Space Provision in Bishopstoke, Fair Oak and Horton Heath, and Hedge End, West End and Botley in Eastleigh Borough

Typology (Ha)	Bishopstoke, Fair Oak and Horton Heath	Hedge End, West End and Botley
Amenity Space	161.8	63.8
Country Park	N/A	196.9
Green Routes	24.2	36.5
Allotments	3.7	7.8

Source: Eastleigh Borough Open Space Needs Assessment, 2017

6.2.65 In terms of the proposed quantity standard for amenity space of 1.2 hectares per 1,000 population, West End has moderate levels of provision, and Fair Oak and Horton Heath have a considerable surplus of amenity space provision per 1,000 population. However, when the existing quantity standards for amenity space are applied, this indicates that when the population density of LACs is considered, West End is an area which does not meet the quantity standards. In terms of the accessibility of provision, Natural England's Accessible Natural Greenspace Standard recommends that everyone should be able to access greenspace within a 5 minute walk or 300 metres. West End and Fair Oak and Horton Heath are not considered as areas of deficiency.

6.2.66 At present, Eastleigh Borough has a good provision of Country Parks against the national standard. At a strategic level, the application of the accessibility standards (both 100 ha area of accessible natural green space within 5km, and a 500 ha area of accessible natural green space within 10km) for the provision of country parks are applied, it indicates that all communities in the borough have good provision of country parks, and that adequate provision of country parks exists in Eastleigh Borough. However, application of the 20 ha natural green space accessibility standard indicates that Fair Oak and Horton Heath are deficient in Country Parks.

6.2.67 In terms of the quantity of the current provision of allotments, West End North and Fair Oak and Horton Heath meet the proposed quantity standard for allotments of 0.125 hectares per 1,000 population. However, based on the allotment accessibility standard of 900m, West End and the southern part of Horton Heath do not meet these standards of accessibility, and are therefore considered as areas of deficiency.

6.2.68 It is not possible to provide a robust conclusion on the quantity of provision of children's play space and space for young people, due to the lack of mapped data on the exact location and extent of space dedicated to this purpose within Eastleigh Borough. However, there is information available on the open spaces which incorporate some sort of play space for children and young people, and therefore the accessibility standard is employed as the primary indicator of any gaps in provision.

6.2.69 The accessibility standard for play space for children is amended to a 300m straight line. Horton Heath is an area which does not currently meet the 300 metre standard, and is therefore considered a residential area which has poor access to local children's play space.

6.2.70 In terms of play space for young people, the Eastleigh Open Space Study (2017) states that young people should have access to play space within a 15 minute walk of home. The West End North ward, and Fair Oak and Horton Heath meet the provision standards for young people.

6.2.71 **Table 6.3** presents the proposed open space standards for the open space typologies within Eastleigh Borough.

Table 6.3 Eastleigh Borough Proposed Open Space Standards

Open Space Typology	Proposed Quantity Standard	Proposed Accessibility Standard
Children's Play Areas	0.052 hectares per 1,000 population	300 metres
Amenity Open Space	1.2 hectares per 1,000 population	300 metres
Play Space for Young People	0.022 hectares per 1,000 population	900 metres
Allotments	0.125 hectares per 1,000 population	900 metres

Source: Eastleigh Borough Open Space Needs Assessment, 2017

6.2.72 The Council should require that high quality open space is provided along with new housing development, particularly in areas with an existing deficiency, or which are likely to have a deficiency following an increase in population. It is recommended that Eastleigh Council use the proposed quantity and accessibility standards in discussion with developers and partners to establish the amount and typology of open space that should be delivered, and the features and facilities included within open spaces.

6.2.73 The Open Space Study should be used in conjunction with the Borough's Green Infrastructure Strategy to help define the appropriate locations for new open spaces, which should be

incorporated within the wider green infrastructure network, and also contribute to a range of ecosystem services.

Eastleigh Borough's Green Infrastructure Corporate Strategy (2018)

6.2.74 The Green Infrastructure Strategy has been prepared to help the Council develop action plans, agree priorities and make decisions, in order to meet its longer term objectives relating to a Green Borough.

6.2.75 The vision for green infrastructure is to increase residents' and visitors' access, usage and connection with natural space, to maximise benefits such as physical and mental wellbeing, and to enhance biodiversity.

6.2.76 This will be achieved by ensuring that future development contributes to the Borough's sustainability and resilience through effective low carbon planning and design, incorporating access to and between local facilities, joined up open space, and the safeguarding and enhancement of wildlife and natural resources.

Hampshire County Council Eastleigh Childcare Sufficiency Update (2019)

6.2.77 For the reporting period 1 April 2019 to 31 August 2019, the Childcare Sufficiency Update shows a gain in childminding settings which has created additional places. The wards of West End North and Fair Oak and Horton Heath have some of the highest numbers of early years education places across providers in Eastleigh Borough.

6.2.78 During the reporting period, the local development team have not been aware of any parents who have not been able to secure or access childcare and early years services to meet their needs.

Hampshire County Council Developers' Contributions Towards Children's Services Facilities (2019)

6.2.79 Hampshire County Council is the education authority for the Borough and is responsible for planning the provision of primary and secondary schools places, and securing an appropriate balance between supply and demand.

6.2.80 District and Borough Planning Departments are expected to consult Hampshire Children's Services Department on any planning proposals relating to a development of 10 dwellings or more. It is the County Council's policy that new primary schools are to be provided within major new housing areas, where justified by the number of children likely to be living there when the

development is complete. Where the additional demand is not enough for a new school, in the interest of integrating new development into existing communities and to promote sustainability principles in relation to travel to school, it is expected that a new development will be served by its nearest schools.

6.2.81 **Table 6.4** presents the minimum usable areas for new schools.

Table 6.4 Hampshire Schools Land Areas for New Schools

	School Size	Total Site Area (ha)
Primary	1FE (210 places)	1.2
	2FE (420 places)	2.0
	3FE (630 places)	2.8
Secondary	5FE (750 places)	5.83
	6FE (900 places)	6.77
	7FE (1,050 places)	7.72
	8FE (1,200 places)	8.66
	9FE (1,250 places)	9.61

Source: Hampshire County Council Developers' Contributions Towards Children's Services Facilities, 2019

6.2.82 **Table 6.5** presents the number of school places required per dwelling. These factors apply to all dwellings with two or more bedrooms, excluding those specifically for elderly persons.

Table 6.5 Number of School Places Required per Dwelling

Age Group	Yield/Dwelling
0-3 (Pre-school)	0.09
4-11 (Primary)	0.30
11-16 (Secondary)	0.21
Post-16	0.06

Source: Hampshire County Council Developers' Contributions Towards Children's Services Facilities, 2019

Department for Transport (DfT) Manual for Streets (2007)

6.2.83 The Walkable Impact Area is the walkable catchment in and around the Site. The guidance states that journeys up to 2km could be considered suitable for walking. The Walkable Impact Area for OPA Phase 1 is shown in **Figure 6.1.** The Walkable Impact Area for the Wider OPA is shown in **Figure 6.2.**

National Travel Survey (2019)

6.2.84 The National Travel Survey states that the average distance travelled to secondary schools in the South East of England is 6.4km. This informs the Secondary Impact Area. The Secondary Impact Area for OPA Phase 1 is shown in **Figure 6.3.** The Secondary Impact Area for the Wider OPA is shown in **Figure 6.4.**

Baseline Data Collection

6.2.85 The baseline conditions of the Study Area are established and compared to the wider regional and national conditions for context when applicable. This considers recent and future trends for socio-economic indicators including the demographic profile, employment structure, housing delivery, economic performance and utilisation of social infrastructure.

6.2.86 Baseline data on the socio-economic conditions has been collated from the planning policy and guidance documents stated in the above Section, and a variety of publicly available sources including:

- National Census (2001) and (2011) and other ONS-produced sources;
- NOMIS Labour Market Statistics;
- Ministry of Housing, Communities, and Local Government (2019);
- Oxford Economics;
- Indices of Multiple Deprivation;
- Eastleigh Borough Council;
- Hampshire County Council;
- West Hampshire Clinical Commissioning Group;
- NHS Choices (2020);
- Get Information About Schools (2020);
- Ofsted Inspection Reports.

Assessment Methodology

6.2.87 This section presents the approach to the assessment of socio-economic impacts of the Proposed Development, consistent with the Scoping Opinion and the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

6.2.88 The stages of the assessment include:

- Review of legislation, policy and guidance – Review relevant legislation, policy and guidance to establish the baseline of community expectations for the Proposed Development;
- Define socio-economic baseline conditions – Including a review of the existing demographic and economic profile of the local population, local housing need, and identify relevant social infrastructure (education, health, and open and play space) and any spare capacity.
- Impact assessment – Consider the nature, scale and performance of the potential impacts and effects on the relevant impact areas during both the construction and operational phase of the Proposed Development, and also consider proposed mitigation measures where there are any likely significant adverse effects;
- Cumulative impacts and effects and residual impacts and effects; and
- Summary of impacts and effects.

6.2.89 The following sections provide further detail regarding the assessment of socio-economic impact assessments.

Significance Criteria

6.2.90 To arrive at a judgement on the significance of effect on population, the assessment considers the sensitivity of different population groups. **Table 6.6** identifies these receptors and their sensitivity for OPA 1 and the Wider OPA. The assessment of the receptors' sensitivity is based on the baseline research section below (Section 6.4).

Table 6.6 OPA Phase 1 and Wider OPA Receptor Sensitivity

Receptor	OPA Phase 1 Receptor Sensitivity	Wider OPA Receptor Sensitivity	Commentary

Residents in the housing market area looking for new housing in Eastleigh Borough.	Medium	Medium	The baseline research shows that Eastleigh Borough Council has exceeded its housing need. According to the Housing Delivery Test 2019 Measurement, EBC delivered 145% of its housing need between 2016 and 2019. The number of homes required between 2016-2019 was 1,775, and the number of homes delivered between 2016-2019 was 2,572. The population of EBC is projected to increase by 8% from 2016 to 2031.
Residents in Eastleigh Borough that could work on the construction project.	Low	Low	The baseline research shows that the construction unemployment rate in EBC is lower than the South East of England region, and the national average.
Residents in Eastleigh Borough that could benefit from employment opportunities associated with the Proposed Development and new household expenditure.	Low	Low	The baseline research shows that the construction unemployment rate in the South East of England is lower than national average.
Residents in the Walkable Impact Area using or planning to use pre-school education.	Low	Low	The baseline research shows that there is spare pre-school capacity, therefore existing users of these facilities would have low sensitivity to new users.
Residents in the Walkable Impact Area using or planning to use primary education.	High	High	The baseline research shows that there is limited spare primary school capacity, therefore existing users of these facilities would be highly sensitive to new users.
Residents in the Secondary Impact Area using or planning to use secondary education.	Low	Low	The baseline research shows that there is spare secondary school capacity, therefore existing users of these facilities would have low sensitivity to new users.
Residents in the Walkable Impact area using or planning to use GP services.	High	High	*OPA Phase 1* The baseline research shows that there are no GP practices located within the impact area, and the closest GP practice has no spare capacity, and therefore existing users of these facilities would have high sensitivity to new users. *Wider OPA* The baseline research shows that there is no spare capacity in the impact area, therefore existing users of these facilities would have high sensitivity to new users.
Residents in the Walkable Impact Area using or seeking open space.	Medium	Medium	The baseline showed that deficiencies in open space exist. Therefore existing users of these facilities would have medium sensitivity to new users.
Residents in the Impact Areas Related to Child Play Space using Child Play Space.	Low	Medium	*OPA Phase 1* Accessibility standards are employed as the primary indicator of any gaps in provision. The accessibility standard for

			play space for children is 300m straight line. The West End North ward meets these accessibility standards. Young people should have access to play space within 900m straight line distance of home. West End North meets the Eastleigh Open Space Study (2017) accessibility standards for play space for children and young people and therefore existing users of these facilities would have a low sensitivity to new users. *The Wider OPA* Horton Heath does not currently meet the 300 metre standard, and is therefore identified as an area with deficiency. Bishopstoke, Fair Oak and Horton Heath, and West End North meet the provision standards for young people. The gaps in children's play space provision mean that existing users of these facilities would have medium sensitivity to new users.

Source: Savills, 2020

6.2.91 The magnitude of an impact has been described as Negligible, Low, Medium and High. Impacts are either positive or negative in nature. Such terms are relative to the receptor affected by the impact. The scale of effect is determined with reference to planning policy, best practice guidance and relevant contextual factors. For example, employment generation of 100 new jobs could be considered a major beneficial effect in a settlement of 1,000 residents, but it would be a less significant effect in a larger settlement of 100,000 residents. Impacts that are medium or larger in scale are considered to be significant in EIA terms.

6.2.92 As there are no standard criteria for assessing sensitivity, magnitude and significance for socio-economic resources, the level of significance applied to an effect has been determined using professional judgement. The assessment has aimed to be objective and to quantify effects, where possible. Where quantification has not been possible, qualitative assessments have been made and justified. The relative significance of an effect is largely a product of the value and sensitivity of the identified receptor and the magnitude and duration of the impact. **Table 6.7** shows how the receptors' sensitivity and the impacts' magnitude are used to estimate the significance of an effect.

Table 6.7 Matrix of Significance

		Receptor Sensitivity		
		Low	**Medium**	**High**
Impact Magnitude	Negligible	Neutral	Neutral	Neutral

	Low	Minor	Minor/Moderate	Minor/Moderate
	Medium	Minor/Moderate	Moderate	Moderate/Major
	High	Moderate	Moderate/Major	Major

Source: Savills, 2020

6.2.93 In terms of describing the duration of effect, short to medium-term effects are considered to be those associated with the site preparation and construction phase, and long-term impacts are those associated with the completed development and its operation.

6.2.94 Effects are defined as either:

- Beneficial – An advantageous effect on the impact area;
- Negligible – An imperceptible effect on the impact area; and
- Adverse – Detrimental effect on the impact area.

6.2.95 Major effects are considered to be significant in EIA terms, with other types of effects considered not significant.

Geographical Scope

Impact Areas

6.2.96 The concept of a primary area of influence or study area is standard in socio-economic assessment practice, however there is no standard measure. For socio-economic impact assessments, this is further complicated by the mobility and network of potential receptors.

6.2.97 Socio-economic impacts have been considered across a number of geographic scales, which are explained below in detail:

- Walkable Impact Area
- Secondary Impact Area
- Eastleigh Borough Council

Walkable Impact Area

6.2.98 The Walkable Impact Area comprises the walkable catchment from the Site's proposed access points. The Manual for Streets Guidance (DfT, 2007) states that journeys up to 2km could be

considered suitable for walking. The Walkable Impact Area for OPA Phase 1 is shown in **Figure 6.1.** The Walkable Impact Area for the Wider OPA is shown in **Figure 6.2.**

6.2.99 The following social infrastructure is assessed against the Walkable Impact Area:

- Early years and primary schools
- GP surgeries; and
- Small typologies of open space including child play space.

Secondary Impact Area

6.2.100 People typically travel further for secondary school education. The average distance travelled to secondary schools in the South East of England was 4 miles (6.4km) according to the National Travel Survey (2018/2019; Table NTS9908). This forms the Secondary Impact Area. The Secondary Impact Area for OPA Phase 1 is shown in **Figure 6.3.** The Secondary Impact Area for the Wider OPA is shown in **Figure 6.4.**

Eastleigh Borough

6.2.101 Housing impacts are considered across Eastleigh Borough Council, with housing targets from the relevant Local Plan derived from housing market areas. Eastleigh Borough Council is within the area identified as the Southampton Housing Market Area (HMA).

6.2.102 Employment impacts of the Proposed Development are assessed against Eastleigh Borough Council.

Temporal Scope

6.2.103 The temporal scope for the assessment has considered the length of the construction phase, at 15 years, and the operational phase. This is used to consider the temporary and permanent impacts and effects of the Proposed Development. The temporal scope includes:

- Short term – Generally identified as temporary impacts lasting 0-5 years;
- Medium term – 5-10 years; and
- Long term – Permanent impacts during the operational phase of the Proposed Development.

Assumptions & Limitations

6.2.104 By the nature of the methodology, estimates of change in the socio-economic elements such as economic and employment impacts are subject to uncertainty. The estimates in this chapter are based on good practice, but there is a degree of uncertainty around estimates.

6.2.105 The current Coronavirus crisis will have a major impact on values in the short to medium term. The analysis and conclusions should be considered as potentially relevant to the situation once the UK economy has recovered from the most significant impacts of Coronavirus.

6.2.106 Actual impacts are likely to be in a range of +/- 20% of figures given to account for this uncertainty, as is standard practice with such matters.

6.2.107 The assessment of spare capacity in social infrastructure is relatively high level, which is a reflection of the availability of data.

6.3 CONSULTATION

6.3.1 The scope of this assessment was submitted to EBC in the EIA Scoping Report. Comments from EBC and other stakeholders were received through their Scoping Opinion, and these have been taken into account in the undertaking of this assessment, see Section 6.2.2.

6.4 BASELINE ENVIRONMENT

6.4.1 This section provides details on the existing conditions in EBC, and the relevant impact areas. Where information is available and it is relevant, conditions are framed in the regional and national context.

6.4.2 The baseline is structured around the following subjects. These provide the context for the impact assessment:

- Population demographics
- Economic profile
- Deprivation
- Housing need

- Social infrastructure (early years, primary and secondary schools, GPs, open and play space).

Population Demographics

Population

6.4.3 Eastleigh Borough Council had a population of 133,600 people in 2019[1], with an average household size of 2.36 in 2018[2]. The working age population (persons aged 16-64) was 81,600 in 2019[3], which represents 61% of the total population.

6.4.4 The population of EBC is projected to increase from 129,500 in 2016, to 139,900 in 2031, an increase of 10,400 (8% increase). This compares to a population growth of 9% from 2016-2031 in the South East region. The population of England is forecasted to grow by 4,521,700 (8%) from 2016 to 2031. The projected population increase from 2016-2031 in EBC is therefore 1% lower than the South East of England region, but consistent with the England average[4]. **Figure 6.5** shows the population projections for EBC over the time period of 2016-2031.

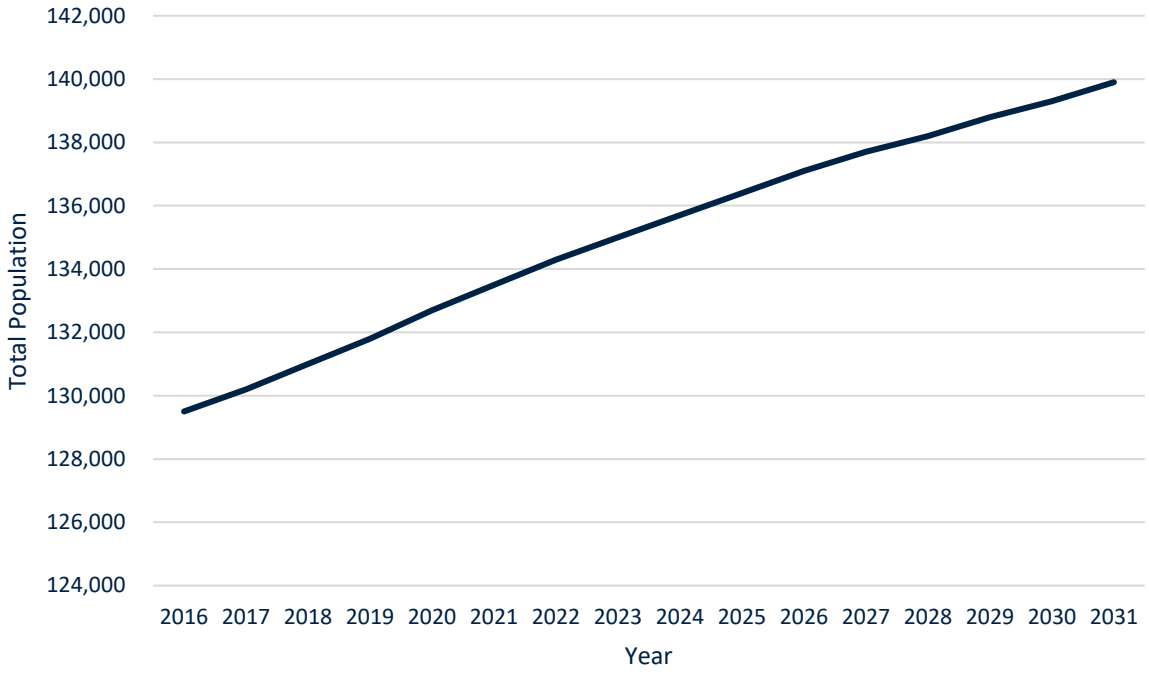
[1] ONS Population Estimates

[2] ONS 2018-based household projections for local authorities and higher administrative areas within England

[3] ONS Population Estimates

[4] ONS 2016-based subnational population projections

Figure 6.5 EBC Population Projections 2016-2031

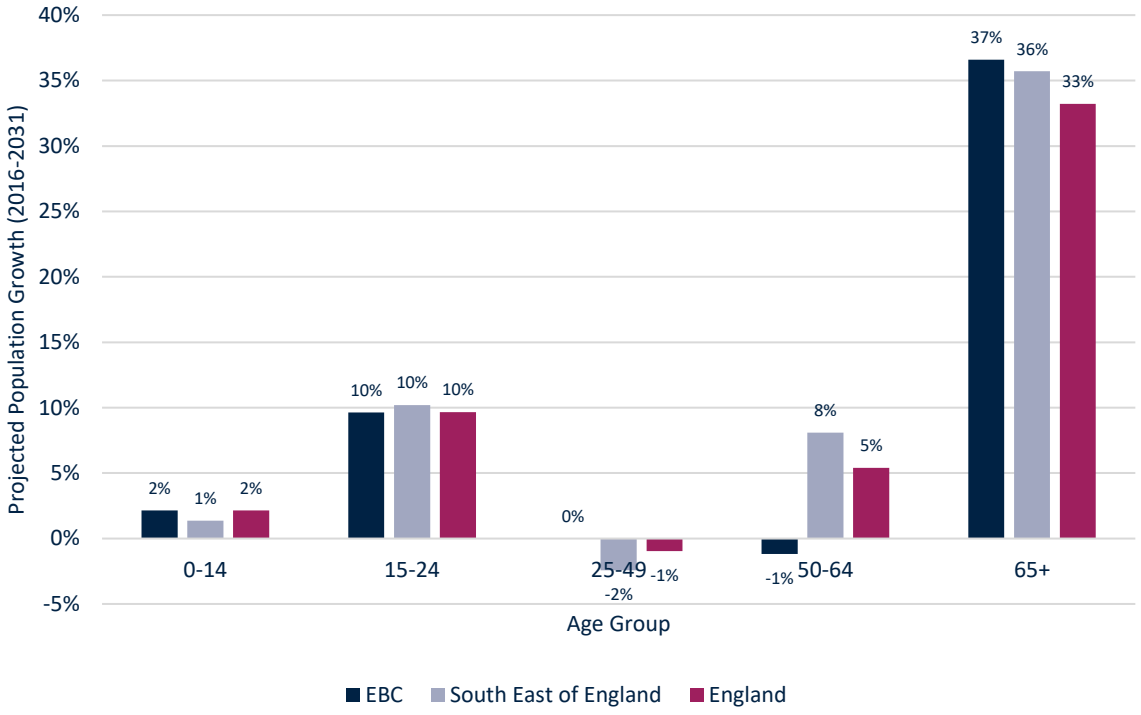


Source: ONS Population Projections, 2016

Changing Age Structure

6.4.5 **Figure 6.6** shows the changing demographic profile of EBC between 2016-2031 in the context of the South East of England region and England. Consistent with population trends in the South East of England and England, the age bracket in EBC with the largest population growth from 2016-2031 is 65+, with a 37% increase over the 15 year period. Also consistent with regional and national trends, in EBC the 0-14 and 25-49 age brackets have the lowest growth in population at 2% and 0% change respectively from 2016-2031. The population growth of 15-24 year olds in EBC is consistent with the South East of England average and England average, at 10% increase from 2016-2031, however the population growth of 50-64 year olds in EBC is negative (-1%), compared to a positive population growth in the South East of England (8%) and England (5%).

Figure 6.6 Projected Population Growth by Age Group in EBC, South East of England and England (2016-2031)



Source: ONS Population Projections, 2016

Economic Profile

Employment

6.4.6 The employment rate in EBC in the year to December 2019 stood at 77.2%, which is lower than the South East average at 79.5%, but higher than the average for Great Britain (75.8%)[5].

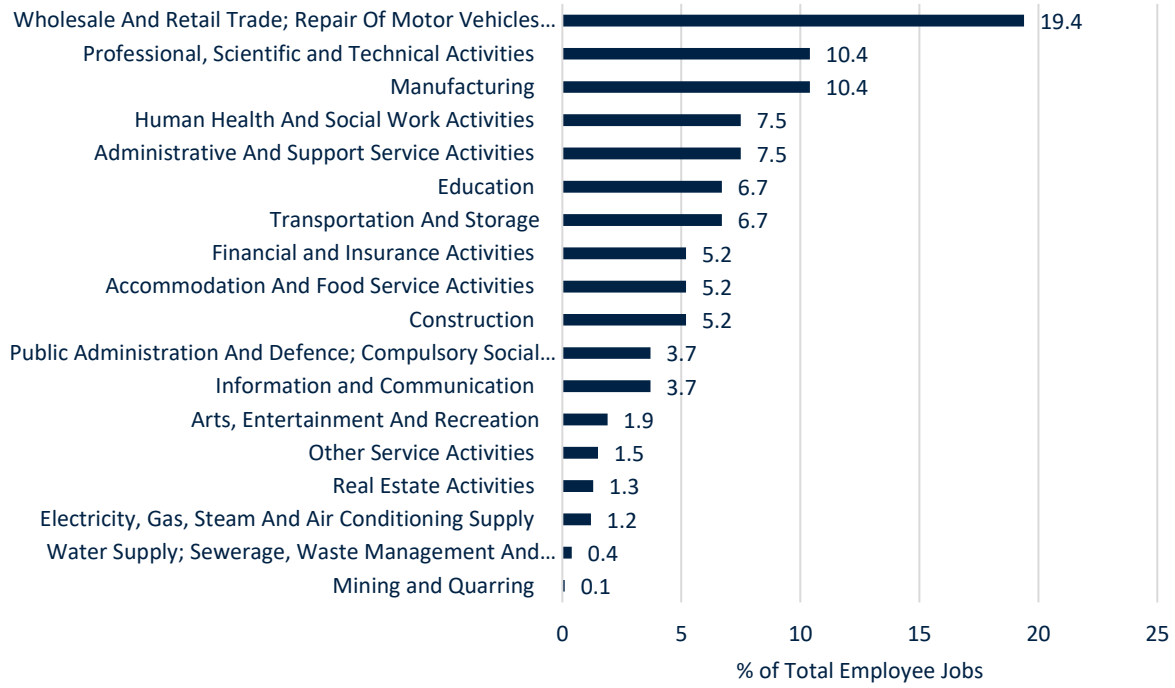
6.4.7 The unemployment rate within EBC for the working age population (16-64) in the year to December 2019 stood at 2.8%, which is lower than the South East of England average (3.0%), and average for Great Britain (3.9%)[6].

[5] ONS Labour Market Profile, 2019

[6] ONS Labour Market Profile, 2019

6.4.8 **Figure 6.7** shows employment by industry sector in EBC. The total employee jobs in Eastleigh is 67,000. The Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles is the largest employer in the Borough, employing 19.4% of total employees (13,000 people). Professional, Scientific and Technical Activities, and the Manufacturing sector are the second largest employers, both with 7,000 employees, representing 10.4% of the total workforce. The smallest employer in Eastleigh Borough is the Mining and Quarrying sector, with only 100 employees (0.1%)[7].

Figure 6.7 Employment by Sector in EBC



Source: ONS Business Register and Employment Survey, 2018

Economic Growth

6.4.9 Oxford Economics produces the UK Local Authority Forecasts. This offers detailed data, forecasts and analysis on 19 industries for all local authorities from 2019 to 2029. Oxford Economics predicts that total employment in EBC will increase by 3,423 additional jobs from

[7] Business Register and Employment Survey, 2018

2019 to 2029, equivalent to a growth of 0.5% per annum. This is consistent with the regional employment growth of 0.5% per annum from 2019-2029 in the South East of England[8].

6.4.10 The employment sector which is forecasted to have the highest growth in EBC is the Information and Communication sector, estimated to increase by 20% between 2019 and 2029. This is followed by the Arts, Entertainment and Recreation sector (18%), and Human Health and Social Work sector (15%). In the South East of England region, the Arts, Entertainment and Recreation sector is also forecasted to experience the largest growth, also increasing by 18% between 2019 and 2029, followed by the Administrative and Support sector, and Human Health and Social Work sector both increasing by 12% over the 10 year period[9].

Existing Employment

6.4.11 The existing Site is largely comprised of agricultural land, Fir Tree Farmhouse, Victoria Farmhouse and Chalcroft Farm. Fir Tree Farmhouse and Victoria Farmhouse are currently vacant. Chalcroft Farm is excluded from the baseline assessment as EBC are expected to grant consent in January 2021 for the demolition of all buildings, dwellings and structures as part of EBC's ongoing estate management activities. With the demolition works due to be undertaken in early 2021, this area of the Site will therefore be vacant prior to the commencement of the Proposed Development. There is therefore no employment activity associated with the Site in its current use.

Deprivation

6.4.12 The Ministry of Housing, Communities and Local Government (MHCLG) publish the English Indices of Deprivation to measure relative deprivation in communities across the country. The last indices were released in 2019, and provide a measure for every local authority and Lower Super Output Area (LSOA) in England. Local authorities and LSOAs are ranked accordingly to how deprived they are relative to each other.

6.4.13 These indices of multiple deprivation (IMD) consider a range of indicators, and a household is considered deprived if they meet one or more of the following conditions:

[8] Oxford Economics, 2020

[9] Oxford Economics, 2020

- Employment – Any member of a household, not a full-time student, is either unemployed or long-term sick;
- Education – No person in the household has at least level 2 education, and no person aged 16-18 is a full time student;
- Health and disability – Any person in the household has general health 'bad or very bad' or has a long term health problem; and
- Housing – Household's accommodation is either overcrowded, with an occupancy rating -1 or less, or is in shared dwellings, or has no central heating.

6.4.14 In respect to the IMD at the local authority level, EBC ranks 288 out of 317 local authorities, with 1 representing the most deprived local authority.

6.4.15 In respect to LSOAs, the Site is located within Eastleigh 008F and Eastleigh 009A. These are ranked 29,686 and 21,414 respectively out of 32,844 LSOAs in England (where one is the most deprived LSOA), which indicates that it is not a deprived area. Eastleigh 008F is part of the 10th IMD decile, and Eastleigh 009A is part of the 7th IMD decile, where one is the most deprived 10% of LSOAs. This indicates that Eastleigh 009A is more deprived than Eastleigh 008F, which is amongst the least deprived areas in the UK[10]. **Figure 6.8** presents a map of deprivation.

Housing Need

6.4.16 The Borough of Eastleigh is within the area identified as the Southampton Housing Market Area (HMA) which comprises Southampton, Eastleigh, Southern Test Valley, Eastern New Forest and the western wards of Winchester and Fareham.

6.4.17 The Draft Eastleigh Borough Local Plan 2011-2029 contains proposals to accommodate 10,140 new homes in the Borough over the plan period (563 dwellings per annum). The Draft Eastleigh Local Plan 2011-2029 was submitted for formal examination in 2014. The Government's Planning Inspector concluded that the Plan was not sound because it did not provide sufficient housing, and recommended that the Council produces a new Local Plan.

[10] Ministry of Housing, Communities and Local Government English Indices of Deprivation, 2019

6.4.18 The Strategic Housing Market Assessment (SHMA) concludes that the provision of 2,045 homes per annum in the Southampton HMA would represent a robust basis for forward planning on the demographic evidence and market signals.

6.4.19 The Eastleigh Borough Council Five-Year Housing Land Supply (2020) states that the total five-year housing land supply requirement for Eastleigh is 3,605 dwellings (721 dwellings per annum). This is based on the calculation of local housing need, determined in accordance with the standard method as set out in the PPG. The Objectively Assessed Housing Need is therefore 721 dwellings per annum from 2019-2029. Results published in February 2019 showed that Eastleigh had delivered 1,866 dwellings over the three years between 1st April 2015 and 21st March 2018 against a target of 1,617 dwellings in the same period. This meant that Eastleigh Borough passed the Housing Delivery Test and is not subject to a 20% buffer.

6.4.20 The most recent 2017-2018 Annual Monitoring Report states that a total of 893 new dwellings were completed in 2017/2018[11].

6.4.21 According to the Housing Delivery Test (2019), the total number of homes required from 2016-2019 was 1,775, and the number of homes delivered was 2,572. Eastleigh Borough Council has therefore delivered 145% of its housing target[12].

Social Infrastructure

OPA Phase 1

Education

6.4.22 The Education Authority for Eastleigh Borough is Hampshire County Council.

Pre-Schools

[11] Eastleigh Borough Council Monitoring Report 2017-2018

[12] Ministry of Housing, Communities and Local Government (MHCG) Housing Delivery Test: 2019 Measurement, 2020

6.4.23 The Hampshire County Council Childcare Sufficiency Update for Quarter 1 provides an overview of the supply and demand for childcare in the county, and outlines the priorities for 2019/2020[13].

6.4.24 In the period of 1 April to 31 August, there has been a small gain in childminder settings which has created additional places. During the reporting period, the local development team have not been aware of any parents who have not been able to secure or access childcare and early years to meet their needs.

Primary Education

6.4.25 **Figure 6.9** shows that Fair Oak Infant School (ages 5 to 7), Fair Oak Junior School (ages 7 to 11), and Saint James' Church of England Primary School (ages 5 to 11) are located within the Walkable Impact Area of OPA Phase 1. **Table 6.8** shows that the only primary school with spare capacity is Saint James' Church of England Primary School, which has a total of 20 places after a 7.5% buffer is applied[14]. The 7.5% buffer is taken into account to allow flexibility in responding to parents' preferences, and to account for unexpected changes in pupil numbers.

Table 6.8 Primary Education Capacity

Primary School	Map Reference	Ages Catered For	Capacity (2019)	No. On Roll (2019)	Spare Capacity (After 7.5% Surplus)
Fair Oak Infant School	A	5 to 7	360	403	0
Fair Oak Junior School	B	7 to 11	598	568	0
Saint James' Church of England Primary School	C	5 to 11	620	554	20
Total					**20**

Source: Get Information About Schools, 2020

Secondary Education

[13] Hampshire County Council Childcare Sufficiency Update for Quarter 1 (April-August 2019)

[14] National Audit Office Department for Education Capital Funding For New School Places, 2013

6.4.26 **Figure 6.10** shows that there are 3 secondary schools located within 6.4km of the OPA Phase 1 Site. There are no post-16 facilities within the Secondary Impact Area of the OPA Phase 1 Site. **Table 6.9** shows that the existing spare capacity of the secondary schools after a 7.5% buffer is applied is a total of 410 places at Woodlands Community College.

Table 6.9 Secondary Education Capacity

Secondary School	Map Reference	Capacity (2019)	No. On Roll (2019)	Spare Capacity (After 7.5% Surplus)
Secondary School				
Woodlands Community College	A	1,144	648	410
Wildern School	B	1,900	1,913	0
Wyvern College	C	1,350	1,303	0
Total				**410**

Source: Get Information About Schools, 2020

Primary Healthcare

6.4.27 Primary Healthcare facilities assessed include General Practitioner (GP) surgeries. There are no GP surgeries located within the Walkable Impact Area of OPA Phase 1.

Public Open Space and Play Space

Public Open Space

6.4.28 Eastleigh Borough Council Open Space Needs Assessment (2017) delivers an update of the Council's 2014 Open Space Study, and provides an evidence base of need and deficiencies in open space, and establishes local provision standards. **Table 6.10** shows the results of the open space audits detailing the provision in the local area of Hedge End, West End and Botley, where the OPA Phase 1 development is located in Eastleigh Borough.

Table 6.10 Current Public Open Space Provision in Hedge End, West End and Botley

PPG17 Typology	Hedge End, West End and Botley
Amenity Space	63.8
Country Park	196.9
Green Routes	36.5
Allotments	7.8

Source: Eastleigh Open Space Needs Assessment, 2017

6.4.29 **Table 6.11** presents a summary of the recommended quantity and accessibility standards for Eastleigh Borough.

Table 6.11 Proposed Quantity and Accessibility Standards for Eastleigh Borough

Open Space Typology	Proposed Quantity Standard	Proposed Accessibility Standard
Amenity Open Space	1.2 hectares per 1,000 population	300 metres
Children's Play Areas	0.052 hectares per 1,000 population	300 metres
Play Space for Young People	0.022 hectares per 1,000 population	900 metres
Allotments	0.125 hectares per 1,000 population	900 metres

Source: Eastleigh Borough Open Space Study, 2017

6.4.30 **Table 6.12** below shows that current provision of open space in Eastleigh Borough generally meets or exceeds national standards. The review of the existing Eastleigh standards against those of neighbouring local authorities and relevant national bodies indicates that the current standards are adequate because they are generally in accordance with the neighbouring and national standards.

Table 6.12 Benchmarking Open Space Quantity Standards in Eastleigh

Open Space Typology	Eastleigh Current Provision	Eastleigh Standard	Comparable Neighbouring Standards	National Standard
Amenity Space	3.2 ha/1,000 population (Exceeds standard)	1.2 ha/1,000 population	1.5 ha/1,000 population (Fareham) 1.2 ha/1,000 population (Southampton) 0.8 ha/1,000 population (Test Valley)	0.6 ha Amenity Space 0.8 ha Parks and Gardens 1.4 ha total
Country Parks	3.1 ha/1,000 population (Exceeds national standard)	None	None	1.8 ha/1,000 population 1 ha of Local Nature Reserve/1,000 population
Allotments	0.2 ha/1,000 population (Exceed national standards)	None	0.2 ha/1,000 population (Southampton and Test Valley)	0.125 ha/1,000 population

Play Space for Children	0.4 sites/1,000 population	0.052 ha/1,000 population (LEAP)	0.3 ha/1,000 population (0.6 ha per 1,000 population for children and young people) (Test Valley)	1.35 ha per 1,000 children
Space for Young People	0.3 sites/1,000 population	0.022 ha/1,000 population (NEAP)	0.3 ha/1,000 population (0.6 ha/1,000 population for children and young people) (Test Valley)	0.25 ha equipped play areas for all ages combined

Source: Eastleigh Borough Council Open Space Study, 2017

6.4.31 Most Local Areas have good access to a range of open space typologies. The majority of residents are within 300m of an amenity open space of fair or good quality, and the subject ward of West End North, is considered to have moderate levels of provision, and is therefore not considered an area of deficiency. However, when the existing quantity standards for amenity space are applied, this highlights different areas of deficiency, and indicates that when the population density of LACs is considered, the subject ward of West End, does not meet the quantity standards.

6.4.32 There is good provision of country parks, which are well dispersed to serve the whole population of Eastleigh. At a strategic level, the application of the accessibility standards (both 100 ha area of accessible natural green space within 5km, and a 500 ha area of accessible natural green space within 10km) for the provision of country parks are applied, which indicates that all communities in the borough have good provision of country parks, and that adequate provision of country parks exist in Eastleigh Borough. In light of the borough meeting the accessibility provision standards, and good provision in proximity to the Borough boundary by neighbouring authorities, it is not recommended that the creation of new country parks is viewed as a priority. Instead, it might be more appropriate for future residential development to support the maintenance of this important strategic open space resource by contributing to their maintenance via Community Infrastructure Levy payments (CIL).

6.4.33 The proposed quantity standard for allotments is 0.125 hectares per 1,100 population. There is generally good quantitative provision of allotments, with the borough as a whole meeting the national quantity standards for allotments as promoted by the National Association Allotment and Leisure Gardeners. The subject ward of West End North, meets these standards. However, accessibility to allotments is more varied with notable differences between settlements. West

End is stated as an area which does not meet the standards of accessibility, based on an accessibility standard of 900m.

Play Space

6.4.34 It is not possible to provide a robust conclusion on the quantity of provision of children's play space and space for young people, due to the lack of mapped data on the exact location and extent of space dedicated to this purpose within Eastleigh Borough. However, there is information available on the open spaces which incorporate some sort of play space for children and young people, and we suggest that therefore the accessibility standards should be employed as the primary indicator of any gaps in provision. The proposed quantity standard for play space for children is 0.052 hectares per 1,000 population. The proposed quantity standard for play space for young people is 0.022 hectares per 1,000 population.

6.4.35 Using accessibility standards as a primary indicator of any gaps in the provision of play space, in line with the Eastleigh Play Strategy, the Eastleigh Open Space Study (2017) recommends that the accessibility standard for play space for children is 300m straight line (approximately 400m walking distance, i.e. a 5 minute walk). The Ward that OPA Phase 1 is located within, West End North Ward technically meets these accessibility standards.

6.4.36 In terms of play space for young people, the Eastleigh Open Space Study (2017) states that young people should have access to play space within a 15-minute walk (1,000 metres approximate walking distance, 900m straight line distance) of home. This is in line with the recommendation of the Eastleigh Play Strategy. The West End North Ward meets the provision standards for young people.

The Wider OPA

Education

6.4.37 The Education Authority for Eastleigh Borough is Hampshire County Council.

Pre-Schools

6.4.38 The Hampshire County Council Childcare Sufficiency Update for Quarter 1 provides an overview of the supply and demand for childcare in the county, and outlines the priorities for 2019/2020[15].

6.4.39 In the period of 1 April to 31 August, there has been a small gain in childminder settings which has created additional places. During the reporting period, the local development team have not been aware of any parents who have not been able to secure or access childcare and early years services to meet their needs.

Primary Education

6.4.40 **Figure 6.11** shows that there are two infant schools, Stoke Park Infant School and Fair Oak Infant School, serving students from age 5 to 7 located within the Walkable Impact Area. Two junior schools, Fair Oak Junior School (ages 7 to 11) and Stoke Park Junior School (ages 7 to 11) also fall within the Walkable Impact Area, along with Saint James' Church of England Primary School (ages 5 to 11). **Table 6.13** shows that Saint James' Church of England Primary School is the only primary school within the Walkable Impact Area with spare capacity, with a total spare capacity of 20 places including a 7.5% buffer[16]. The 7.5% buffer is taken into account to allow flexibility in responding to parents' preferences, and to account for unexpected changes in pupil numbers.

Table 6.13 Primary Education Capacity

Primary School	Map Reference	Ages Catered For	Capacity (2019)	No. On Roll (2019)	Spare Capacity (After 7.5% Surplus)
Stoke Park Infant School	A	5 to 7	270	268	0
Stoke Park Junior School	B	7 to 11	360	359	0
Fair Oak Infant School	C	5 to 7	360	403	0
Fair Oak Junior School	D	7 to 11	598	568	0
Saint James' Church of	E	5 to 11	620	554	20

[15] Hampshire County Council Childcare Sufficiency Update for Quarter 1 (April-August 2019)

[16] National Audit Office Department for Education Capital Funding For New School Places, 2013

England Primary School					
Total					**20**

Source: Get Information About Schools, 2020

Secondary Education

6.4.41 **Figure 6.12** shows that there are four secondary schools and two post-16 facilities within 6.4km of the Wider OPA Site. **Table 6.14** shows that the existing spare capacity of the secondary schools after a 7.5% buffer is applied is a total of 643 places. Data was not available to estimate the capacity of the post-16 facilities.

Table 6.14 Secondary Education Capacity and Post-16 Facilities

Secondary School and Post-16 Facility	Map Reference	Capacity (2019)	No. On Roll (2019)	Spare Capacity (After 7.5% Surplus)
Secondary School				
Crestwood Community School	A	1,500	1,155	233
Woodlands Community College	B	1,144	648	410
Wildern School	C	1,900	1,913	0
Wyvern College	D	1,350	1,303	0
Total				**643**
Post-16 Facilities				
Eastleigh College	E			
Barton Peveril Sixth Form College	F			

Source: Get Information About Schools, 2020

Primary Healthcare

6.4.42 Primary healthcare facilities assessed include General Practice (GP) surgeries. **Figure 6.13** shows that there is one GP surgery within the Walkable Impact Area, Stokewood Surgery. Old Anchor Surgery is a branch of Stokewood Surgery, and the two GP practices operate as a combined surgery[17].

[17] Data could not be collected for the split of the number of GPs (FTE) and registered patients between Stokewood Surgery and Old Anchor Surgery. The two GP practices operate as a combined surgery as confirmed with a phone call with Stokewood Surgery in July 2020.

6.4.43 **Table 6.15** shows the number of registered patients per GP for Stokewood Surgery and Old Anchor Surgery in 2020, and the estimated capacity, using a ratio of 2,000 patients per 1 GP[18]. Data could not be collected for the split of the number of GPs (FTE) and registered patients between Stokewood Surgery and Old Anchor Surgery. The two GP practices operate as a combined surgery as confirmed with a phone call with Stokewood Surgery in July 2020. This indicates that Stokewood Surgery and Old Anchor Surgery have no spare capacity.

Table 6.15 Number of Registered Patients per GP in GP Surgeries within the Walkable Impact Area

GP Surgery	Registered Patients	Number of GPs	Number of Registered Patients per GP	Spare Capacity
Stokewood Surgery and Old Anchor Surgery	18,106	4.133	4,381	0
Total	**18,106**	**4.133**	**4,381**	**0**

Source: NHS Digital General Practice Workforce, 2020

Public Open Space and Play Space

Public Open Space

6.4.44 As stated above, Eastleigh Borough Council Open Space Needs Assessment (2017) delivers an update of the Council's 2014 Open Space Study, and provides an evidence base of need and deficiencies in open space, and establishes local provision standards. **Table 6.16** shows the results of the open space audits detailing the provision in the local areas of Bishopstoke, Fair Oak and Horton Heath, and Hedge End, West End and Botley, where the Wider OPA is located within in Eastleigh Borough.

Table 6.16 Current Public Open Space Provision in Bishopstoke, Fair Oak and Horton Heath, and Hedge End, West End and Botley

PPG17 Typology	Bishopstoke, Fair Oak and Horton Heath	Hedge End, West End and Botley
Amenity Space	161.8	63.8
Country Park	N/A	196.9
Green Routes	24.2	36.5

[18] NHS England Premises Principles of Best Practice Part 1 Procurement and Development.

Allotments	3.7	7.8

Source: Eastleigh Open Space Needs Assessment, 2017

6.4.45 The Wider OPA transgresses the West End North ward, and Fair Oak and Horton Heath ward. In terms of the proposed quantity standard for amenity space of 1.2 hectares per 1,000 population, West End has moderate levels of provision, and Fair Oak and Horton Heath have a considerable surplus of amenity space provision per 1,000 population. However, when the existing quantity standards for amenity space are applied, this indicates that when the population density of LACs is considered, West End is an area which does not meet the quantity standards. In terms of the accessibility of provision, Natural England's Accessible Natural Greenspace Standard recommends that everyone should be able to access greenspace within a 5 minute walk or 300 metres. West End and Fair Oak and Horton Heath are not considered as areas of deficiency.

6.4.46 At present, Eastleigh Borough has a good provision of Country Parks against the national standard. At a strategic level, the application of the accessibility standards (both 100 ha area of accessible natural green space within 5km, and a 500 ha area of accessible natural green space within 10km) for the provision of country parks are applied, it indicates that all communities in the borough have good provision of country parks, and that adequate provision of country parks exists in Eastleigh Borough. However, application of the 20 ha natural green space accessibility standard indicates that Fair Oak and Horton Heath are deficient in Country Parks.

6.4.47 In terms of the quantity of the current provision of allotments, West End North and Fair Oak and Horton Heath meet the proposed quantity standard for allotments of 0.125 hectares per 1,000 population. However, based on the allotment accessibility standard of 900m, West End and the southern part of Horton Heath do not meet these standards of accessibility, and are therefore considered as areas of deficiency.

Play Space

6.4.48 As stated above, it is not possible to provide a robust conclusion on the quantity of provision of children's play space and space for young people, due to the lack of mapped data on the exact location and extent of space dedicated to this purpose within Eastleigh Borough. However, there is information available on the open spaces which incorporate some sort of play space for children and young people, and therefore the accessibility standards should be employed as the primary indicator of any gaps in provision.

6.4.49 In line with the Eastleigh Play Strategy, the Eastleigh Borough Open Space Study (2017) recommends that the accessibility standard for play space for children is amended to 300m straight line (approximately 400m walking distance, i.e. a 5 minute walk). Horton Heath is an area which does not currently meet the 300 metre standard, and is therefore considered a residential area which has poor access to local children's play space.

6.4.50 In terms of play space for young people, the Eastleigh Open Space Study (2017) states that young people should have access to play space within a 15 minute walk (1,000 metres approximate walking distance, 900m straight line distance) of home. The West End North ward, and Fair Oak and Horton Heath meet the provision standards for young people.

6.5 INHERENT DESIGN MITIGATION

6.5.1 The overall strategy is to ensure that OPA Phase 1 and the Wider OPA respond to the surrounding area and produce a high quality, sustainable development.

OPA Phase 1

No inherent design mitigation is proposed as part of OPA Phase 1.

Wider OPA

6.5.2 As part of the Wider OPA, an early years nursery totalling 465 sq.m is proposed to be delivered.

6.5.3 A 3 Form Entry (FE) primary school is also proposed to be delivered as part of the Wider OPA, which will provide a total of 630 primary school places.

6.5.4 For the purposes of this socio-economic impact assessment, the associated access, and supporting amenity space, landscaping and green infrastructure are also considered as inherent design mitigation. The Wider OPA is proposing to deliver 20.16 ha of total open space, comprising 14.50 ha of informal open space, and 6.64 ha of overall amenity space. The amenity space is broken down to comprise 0.16 ha of LEAPs, 0.24 ha of LAPs, 0.07 ha of natural play, 0.54 ha of destination play, 1.86 ha of formal sports area, and 3.77 of other amenity space (including 0.82 ha of allotments).

6.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

6.6.1 This section provides a description of the potential socio-economic effects that are anticipated to arise from the construction (temporary) and operation (permanent) phases of OPA Phase 1 and the Wider OPA. The potential impacts and the significance of the effects are characterised

in the absence of mitigation measures, beyond those identified and described as inherent design mitigation. The significance of residual effects, post-mitigation, are also identified.

6.6.2 Impacts may be direct or indirect. The effects during construction are anticipated to be short to medium term duration (temporary), while effects during operation are anticipated to be of long term duration (permanent), unless otherwise stated.

OPA Phase 1

Construction Impacts and Effects

6.6.3 In terms of construction impacts, the most significant effects are likely to be on employment, as the population is not expected to increase significantly during construction as workers are unlikely to relocate to the local area. Therefore, population, housing, and social infrastructure have been scoped out of the assessment of construction effects.

6.6.4 In general, it is considered that disruption during construction would be controlled and managed through implementation of the Construction Environmental Management Plan (CEMP).

Employment

6.6.5 The construction of OPA Phase 1 would help support construction firms operating in the region, and provide jobs in the industry. This would lead to the creation of new direct and indirect jobs, through supply chain benefits and new expenditure introduced to the local economy.

Direct Employment

6.6.6 To estimate the number of jobs required for the construction of OPA Phase 1, the average output per construction worker for the South East of England[19] is used in combination with the estimated construction cost of OPA Phase 1. **Table 6.17** sets out the steps involved in estimating the construction employment for OPA Phase 1. The construction of OPA Phase 1 is expected to support 155 on-site jobs per annum during the construction period of 4 years.

Table 6.17 OPA Phase 1 Construction Jobs

	Step Involved	

[19] Business Population Estimates for the UK and Regions (2019) Department for Business, Energy and Industrial Strategy

A	Estimated Construction Cost (£)	£115,000,000
B	Average revenue per construction employee in the South East of England (2020)	184,771
C	Estimate of number of worker years required for the construction of the Proposed Development (jobs) (A/B)	619
D	Duration of Construction Phase (years)	4 years
E	Average Construction On-Site Jobs per annum (C/D)	155

Source: Savills 2020

6.6.7 Given that construction is made up of many discrete elements of work undertaken by specialists, additional construction workers may be employed on the OPA Phase 1 Site for shorter periods.

6.6.8 Due to the nature of the construction industry and the different stages involved with the construction of OPA Phase 1, not all trades would be required on the OPA Phase 1 Site permanently and some would be on the Site for less time than others. The construction process would include a range of occupational levels, including unskilled or labouring jobs to more senior positions, as well as across a range of professional disciplines. The construction of OPA Phase 1 could facilitate the growth of the local construction industry, thus enabling firms to expand and potentially take on employees.

6.6.9 Occupation and skill demand in the construction sector revolves around specialist skills, i.e. electricians, plumbers, bricklayers, carpenters, and plant operation trades. These skills tend to be contract labour offered by construction/building firms locally. In addition, low skilled manual labour would be expected to be in demand. In this case, employment tends to be contracted via Job Centres and Employment Agencies on a needs basis.

Indirect and Induced Employment

6.6.10 In addition, businesses in the local, and regional economy would benefit from the trade linkages that would be established to construct the development, meaning that further indirect jobs would be supported locally in suppliers of construction materials and equipment. Local businesses would generally also benefit to some extent from temporary increases in expenditure as a result of the direct and indirect employment effects of the construction phase, for example, as construction workers spend some of their wages in local shops, accommodation and other facilities.

6.6.11 The development of OPA Phase 1 would set off a chain reaction of increases in expenditure, such as through the sale of building materials, design services, legal services and insurance.

This in turn can result in jobs close to the Site, generating an increase in demand for goods and services, and generate growth in the local economy. The above form the multiplier effects.

Additional Employment

6.6.12 There are further steps involved in estimating the 'additionality' of development. The first is leakage, which refers to the proportion of output that benefit those outside of the intervention's target area or group. Taking into account the Proposed Development's specific characteristics and the guidance in the Housing and Communities Agency's (HCA) Additionality Guide (2014), leakage of workers from outside Eastleigh Borough is assumed to be 22%[20].

6.6.13 The second step is estimating displacement. Displacement is where the proposed activity could displace another activity in the target area; thereby reducing its additionality. In this case, the amount of employment on-site per annum is a small proportion of the existing construction workforce in Eastleigh Borough (4,000[21]), therefore it is likely to have a negligible impact. To be conservative, 25% has been applied as per the Additionality Guide[22].

6.6.14 The third step is estimating the indirect benefits of the construction activity, the benefits to companies in the supply chain, and to the local economy by the new expenditure introduced to the area from the construction workers. The construction multiplier is 2.1[23].

6.6.15 **Table 6.18** sets out the steps involved in estimating the additionality of the construction employment associated with OPA Phase 1.

Table 6.18 OPA Phase 1 Construction Jobs – Additionality

	Step Involved	Jobs Per Annum
A	Construction workers on-site (gross, direct, per annum)	155
B	Leakage to workers from outside Eastleigh Borough (22%) (A*(0-22%))	-34

[20] Based on NOMIS Distance Travelled to Work by Industry (Workplace Population) 2011

[21] ONS Business Register and Employment Survey (2019)

[22] Homes and Communities Agency (2014) Additionality Guide

[23] ONS Input Output Tables, 2015

C	On-site jobs (direct, for residents from the impact area) (A-B)	121
D	Displacement of other activities (25%) (C*(0-25%))	-30
E	Multiplier effects (2.1)	100
F	Employment off-site induced by construction employment (net, indirect) (D+E)	69
G	Net additional employment from construction of Proposed Development (C+F)	190

Source: Savills 2020, HCA Additionality Guide 2015. Note figures are rounded.

6.6.16 **Table 6.18** shows that the construction of OPA Phase 1 will generate a total of approximately 155 on-site construction jobs. Once the effects of leakage, displacement, and multiplier effects have been considered, this equates to 190 net additional construction jobs. OPA Phase 1 is estimated to have a low positive impact on the low sensitivity construction workers (total 4,000 employees[24]) in Eastleigh Borough, resulting in a **minor beneficial** effect over the short term.

Occupation Impacts and Effects

6.6.17 This section identifies the likely significant socio-economic effects from the completion and operation phases of OPA Phase 1.

6.6.18 There are a number of operational effects that will result from OPA Phase 1. These include the delivery of new homes, and opportunities for home working. An increase in the local population will bring an associated increase in expenditure in local shops, businesses and services. The new population would also require school places, access to GP services, open space and recreational facilities. The following effects have been considered:

- Employment – Impacts on the labour market;
- Housing – The supply of new homes; and
- Social infrastructure – Impacts on schools, primary health services, and open space.

Employment

[24] ONS Business Register and Employment Survey, 2019

6.6.19 Operational phase jobs would be generated once the construction has been completed and the Proposed Development is occupied. The assessment also considers displacement of jobs elsewhere, and indirect multiplier effects as a result of the new jobs on the Site.

6.6.20 The employment study area considered for operational employment is Eastleigh Borough (**Figure 6.14**).

Direct Employment

6.6.21 Once operational, OPA Phase 1 could generate up to 61 on-site Full Time Equivalent (FTE) jobs upon completion, via the homeworkers[25].

6.6.22 **Table 6.19** presents the indicated employment (FTE) derived from the most relevant and recent sources available[26].

Table 6.19 OPA Phase 1 Operational Jobs (Direct)

Use Class	Assumed Employment Density	Illustrative Floorspace (GEA sq.m)	Indicated Employment (FTE)
Homeworkers[27]		393 units	61
Total FTE jobs generated			**61**

Source: HCA Employment Density Guide 2015

Indirect and Induced Employment

6.6.23 The Proposed Development of OPA Phase 1 is likely to have indirect/off-site economic benefits. These are considered as indirect multiplier effects which include:

[25] Assumed average household size of 2.31, 61.1% of people in the 16-64 age group, 80.9% of 16-64 age group economically active. 16.4% of the economically active population work from home in the South East of England (NOMIS Local Authority Profile (2018), Characteristics of Home Workers, ONS (2014)). 83% FTE.

[26] Homes and Communities Agency Employment Density Guide, 3rd Edition, November 2015

[27] Assumed average household size of 2.31, 61.1% of people in the 16-64 age group, 80.9% of 16-64 age group economically active. 16.4% of the economically active population work from home in the South East of England (NOMIS Local Authority Profile (2018), Characteristics of Home Workers, ONS, (2014)). 83% FTE.

- Supply linkage multiplier: Such effects occur due to purchases made as a result of the Proposed Development, and further purchases associated with linked firms along the supply chain.

- Income/induced multiplier effects: Such effects are associated with local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the Proposed Development.

Additional Employment

6.6.24 **Table 6.20** sets out the steps and assumptions taken in estimating the net additionality of OPA Phase 1, in accordance with the Additionality Guide[28]. There is no leakage due to the nature of homeworking. Displacement is assumed to be 0 due to the increasing local population and associated demand for new housing.

Table 6.20 OPA Phase 1 Operational Jobs – Additionality

	Step Involved	Jobs Per Annum
A	Operational workers on-site (gross, direct, occupied)	61
B	Leakage to workers from outside of study area (A*(0-0%))	0
C	On-site jobs (direct, for residents within the study area) (A-B)	61
D	Displacement (C*(0-0%))	0
E	Multiplier effects ((C+D)*Multiplier 1.4)	33
F	Total off-site jobs (D+E)	33
G	Net additional employment from Proposed Development (C+F)	94

Source: Savills 2020, HCA Additionality Guide 2014. Note figures are rounded.

6.6.25 **Table 6.20** shows that the Proposed Development would support approximately 61 operational on-site jobs via homeworking. Once the effects of leakage, displacement and multiplier effects have been considered, this equates to 94 new FTE jobs.

[28] Homes and Community Agency (HCA) (2014)

6.6.26 The magnitude of employment in the Proposed Development is considered to be low positive. The sensitivity of employees is low. Therefore the effect of operational jobs from the proposed development of OPA Phase 1 is predicted to be **minor beneficial** over the long-term.

Gross Value Added

6.6.27 The additional operational jobs are associated with an increase in the productivity of the regional economy (GVA). Each job type is associated with a different GVA per annum. The GVA rates per homeworker per annum is £71,685[29].

6.6.28 The GVA that OPA Phase 1 is expected to generate is £4.4 million per annum.

Residential Expenditure

6.6.29 Utilising the average household size of Eastleigh Borough of 2.31 persons in 2033[30], the incoming resident population from the Proposed Development would be approximately 908 people.

6.6.30 Of the economically active population in EBC (61.1%), 80.9% of the 16-64 age group are in employment, according to recent estimates[31]. The delivery of 393 new homes in EBC would therefore have the potential to accommodate 449 additional working age, economically active and employed residents once complete.

6.6.31 New residents would introduce new expenditure to the local economy. The Annual Survey of Hours and Earnings from ONS provides income data by local authority. The median earnings for full-time workers living in Eastleigh is £34,336[32].

[29] Sectors used to estimate homeworkers' GVA are; Information and Communication, Financial and Insurance Activities, Professional, Scientific and Technical Activities, Administrative and Support Services, and Public Administration and Defence. ONS Labour Productivity 2018 Output per Job (Current Price) South East Region

[30] ONS 2018-based household projections for local authority and higher administrative areas in England. Average household size in EBC in 2033

[31] ONS Annual Population Survey, 2019

[32] ONS (2020) Annual Survey of Hours and Earnings

6.6.32 The income would be used to meet housing and other fixed costs. However, a considerable proportion of this income would be available for discretionary expenditure by households in the local economy.

6.6.33 The additional household expenditure that the scheme is capable of generating is likely to have a beneficial impact on the economy of EBC and the demand for products and services of a number of interlinked business sectors. We estimate that the expenditure that would be retained in the local authority area to be approximately £1.4 million per annum.

6.6.34 Expenditure from new residents living at the Proposed Development would contribute to local shops and businesses in EBC, which in turn are an important source of local employment. It is estimated that the additional expenditure associated with residents of the Proposed Development would support 2 additional retail and 7 food and beverage jobs.

Housing

6.6.35 According to the Eastleigh Borough Council Five-Year Housing Land Supply (2020), the Objectively Assessed Housing Need is 721 dwellings per annum from 2019-2029. The Proposed Development would assist in EBC's housing delivery, providing 393 dwellings comprising a mix of market and affordable housing. The proportion of affordable housing provision will be agreed with the local planning authority subject to viability.

6.6.36 The delivery of 393 dwellings would therefore be a significant addition to Eastleigh Borough Council's housing pipeline. The magnitude of additional home provision is considered to be a low positive. The sensitivity of people looking for new housing is Eastleigh Borough is medium, and the impact magnitude of OPA Phase 1 is expected to be low positive. Therefore the effect of the Proposed Development on housing is predicted to be **minor beneficial** over the long term.

Pre-Schools

6.6.37 The baseline assessment indicates that there is spare capacity for childcare within the Walkable Impact Area. The Proposed Development is estimated to have a negligible impact on the low sensitivity users of pre-school facilities within the Walkable Impact Area, resulting in a **neutral** effect over the long-term.

Primary Education

6.6.38 The baseline assessment indicates that Fair Oak Infant School (ages 5 to 7), Fair Oak Junior School (ages 7 to 11) and Saint James' Church of England Primary School (ages 5 to 11) are located within the Walkable Impact Area, with a total spare capacity at Saint James' Church of England Primary School of 20 places once a buffer of 7.5% is considered. The need from the Proposed Development is 102 places, calculated by using the Hampshire County Council's Developers' Contributions Towards Children's Services Facilities (2019)[33]. The Proposed Development is estimated to have a medium negative impact on the highly sensitive primary school pupils in the Walkable Impact Area resulting in a **moderate adverse** effect over the long term.

6.6.39 However as part of the Wider OPA, a 3FE primary school is proposed, providing 630 primary school places. The Wider OPA would generate a need for 556 primary school places. The moderate adverse effect of Phase 1 OPA on primary school provision will be mitigated through the provision of the 3FE primary school. This will alleviate the pressure of the incoming population resulting in a **neutral** effect over the long term.

Secondary Education

6.6.40 The baseline assessment reports 3 secondary schools within the Secondary Impact Area of the OPA Phase 1 Site. There are no post-16 facilities located within the Secondary Impact Area of the OPA Phase 1 Site. The only secondary school with spare capacity once a 7.5% buffer has been considered is Woodlands Community College, with a total of 410 places. The need from the Proposed Development is 71 places, calculated using the pupil yields published in Hampshire County Council's Developers' Contributions Towards Children's Services Facilities[34]. The Proposed Development is estimated to have a negligible impact on the low sensitivity users of secondary schools in the Secondary Impact Area, resulting in a **neutral** effect over the long-term.

[33] In 2019 HCC published a study focusing on pupil yields from new developments. This study suggests a primary pupil yield of 0.3 children per dwelling.

[34] In 2019 HCC published a study focusing on pupil yields from new developments. For secondary education this is 0.21 children per dwelling. This excludes a Post-16 element.

GPs

6.6.41 There are no GP surgeries located within the Walkable Impact Area of the OPA Phase 1 Site. Utilising the average household size for Eastleigh Borough of 2.31 persons in 2033[35], the incoming resident population from the Proposed Development of 393 units would be 908 people. The Proposed Development is estimated to have a medium negative impact on the high sensitivity users of GPs in the Walkable Impact Area resulting in a **major adverse** effect over the long-term.

Public Open Space and Play Space

6.6.42 In terms of the quantity of current provision, the subject ward of West End North is considered to have moderate levels of amenity open space provision. However when the existing quantity standards for amenity space are applied, this highlights different areas of deficiency, and indicates that when population density of LACs are considered, West End North does not meet the quantity standard. There is good provision of country parks, which are well dispersed to serve the whole population of Eastleigh. At a strategic level, the application of the accessibility standards (both 100 ha area of accessible natural green space within 5km, and a 500 ha area of accessible natural green space within 10km) indicates that all communities within the borough have good provision of country parks. The subject ward of West End North meets the proposed quantity standard for allotments of 0.125 hectares per 1,100 population. However in terms of accessibility, West End North is stated as an area which does not meet the standards of accessibility, based on an accessibility standard of 900m.

6.6.43 The Proposed Development of OPA Phase 1 is expected to have a low negative impact on the medium sensitivity users of open space, resulting in a **minor adverse** effect over the long term.

6.6.44 Using accessibility standards as a primary indicator of any gaps in provision of play space, the Eastleigh Open Space Study (2017) recommends that the accessibility standard for play space for children is 300m straight line. The Ward that OPA Phase 1 is located within, West End North ward, technically meets these accessibility standards. In terms of play space for young people, the Eastleigh Open Space Study (2017) states that young people should have access to play space within a 15 minute walk of home. The West End North Ward meets the provision standards for young people.

[35] ONS 2018-based household projections for local authorities and higher administrative areas in England.

6.6.45 The Proposed Development of OPA Phase 1 is therefore expected to have a negligible impact on the low sensitivity users of play space, resulting in a **neutral** effect over the long term.

6.6.46 However, as part of the Wider OPA, 20.16 ha of total open space is proposed, comprising 14.50 ha of informal open space, and 6.64 ha of overall amenity space. If this is delivered, this would result in a medium positive impact on the medium sensitive users of open space, resulting in a **moderate beneficial** effect over the long term. In respect to play space, the green infrastructure associated with the Wider OPA would have a medium positive impact on the low sensitivity users of play space, resulting in a **minor beneficial** effect over the long term.

The Wider OPA

Construction Impact and Effects

Employment

6.6.47 The construction of the Wider OPA would help support construction firms operating in the region, and provide jobs in the industry. This would lead to the creation of new direct and indirect jobs, through supply chain benefits and new expenditure introduced to the local economy.

Direct Employment

6.6.48 To estimate the number of jobs required for the construction of the Wider OPA, the same approach is used as stated above for OPA Phase 1. **Table 6.21** sets out the steps involved in estimating the construction employment for the Wider OPA. The construction of the Wider OPA is expected to support 220 on-site jobs per annum during the construction period of 15 years.

Table 6.21 The Wider OPA Construction Jobs

	Step Involved	
A	Estimated Construction Cost (£)	£600,000,000
B	Average revenue per construction employee in the South East of England (2020)	£184,771
C	Estimate of number of worker years required for the construction of the Proposed Development (jobs) (A/B)	3,247
D	Duration of Construction Phase (years)	15
E	Average Construction On-Site Jobs per annum (C/D)	216

Source: Savills 2020

6.6.49 As stated above, given that construction is made up of many discrete elements of work undertaken by specialists, additional construction workers may be employed on the Site for

shorter periods. The construction of the Wider OPA could facilitate the growth of the local construction industry, thus enabling firms to expand and potentially take on employees.

Indirect and Induced Employment

6.6.50 As discussed above with OPA Phase 1, businesses in the local and regional economy would benefit from the trade linkages that would be established to construct the Wider OPA, meaning that further indirect jobs would be supported locally in suppliers of construction materials and equipment. The development of the Wider OPA would set off a chain reaction of increases in expenditure which in turn can result in jobs close to the Wider OPA Site, generating an increase in demand for goods and services, and generate growth in the local economy. The above form the multiplier effect.

Additional Employment

6.6.51 To calculate the additional employment associated with the construction of the Wider OPA, the same methodology stated above for the OPA Phase 1 is utilised.

6.6.52 **Table 6.22** sets out the steps involved in estimating the additionality of the construction employment associated with the Wider OPA.

Table 6.22 The Wider OPA Construction Jobs – Additionality

	Step Involved	Jobs Per Annum
A	Construction workers on-site (gross, direct, per annum)	216
B	Leakage to workers from outside Eastleigh Borough (22%) (A*(0-22%))	-48
C	On-site jobs (direct, for residents from Eastleigh Borough) (A-B)	169
D	Displacement of other activities (25%) (C*(0-25%))	-42
E	Multiplier effects (2.1)	139
F	Employment off-site induced by construction employment (net, indirect) (D+E)	97
G	Net additional employment from construction of Proposed Development (C+F)	266

Source: Savills 2020, HCA Additionality Guide 2015. Note figures are rounded.

6.6.53 **Table 6.22** shows that the construction of the Wider OPA will generate a total of approximately 220 on-site construction jobs. Once the effects of leakage, displacement, and multiplier effects have been considered, this equates to 270 net additional construction jobs. The Wider OPA is

estimated to have a medium positive impact on the low sensitivity construction workers (total 4,000 employees[36]) in Eastleigh Borough, resulting in a minor beneficial effect over the short term.

Occupation Impacts and Effects

6.6.54 This section identifies the likely significant socio-economic effects from the completion and operation phases of the Wider OPA.

6.6.55 There are a number of operational effects that will result from the Wider OPA. These include the delivery of new homes, and opportunities for home working, along with the employment associated with the proposed employment uses. An increase in the local population will bring an associated increase in expenditure in local shops, businesses and services. The new population would also require school places, access to GP services, open space and recreational facilities. The following effects have been considered:

- Employment – Impacts on the labour market;
- Housing – The supply of new homes; and
- Social Infrastructure – Impacts on schools, primary health services, and open space.

Employment

6.6.56 Operational phase jobs would be generated once the construction has been completed and the Proposed Development is occupied. The assessment also considers displacement of jobs elsewhere, and indirect multiplier effects as a result of the new jobs on the Site.

6.6.57 The employment study area considered for operational employment is Eastleigh Borough (**Figure 6.14**).

Direct Employment

[36] ONS Business Register and Employment Survey, 2019

6.6.58 Once operational, the Wider OPA could generate up to 1,540 on-site FTE jobs upon completion, based on the employment densities for each use class within the Proposed Development, including 390 homeworkers[37].

6.6.59 Employment densities for each use class are set out in **Table 6.23**, derived from the most relevant and recent sources available[38].

Table 6.23 The Wider OPA Operational Jobs (Direct)

Use Class	Assumed Employment Density	Indicated Employment (FTE)
Office	9.6 NIA sq.m per FTE	752
Industrial	36 GIA sq.m per FTE	125
Storage and Distribution	70-95 GEA sq.m per FTE	58
Retail	15-20 NIA sq.m per FTE	122
Community	112 GIA sq.m per FTE	4
Nursery	15 GIA sq.m per FTE	33
Primary Education	11 pupils per adult FTE	57
Homeworkers		389
Total FTE jobs generated		**1,541**

Source: British Council for Offices Office Occupancy: Density and Utilisation 2018, HCA Employment Density Guide 205, School Workforce in England, Department for Education 2018. Assuming 50% split between B2 and B8 uses

Indirect and Induced Employment

6.6.60 The development of the Wider OPA is likely to have indirect/off-site economic benefits. These are considered as indirect multiplier effects which include:

- Supply linkage multiplier: Such effects occur due to purchases made as a result of the Proposed Development, and further purchases associated with linked firms along the supply chain.

[37] Assumed average household size of 2.31, 61.1% of people in the 16-64 age group, 80.9% of 16-64 age group economically active. 16.4% of the economically active population work from home in the South East of England (NOMIS Local Authority Profile (2018), Characteristics of Home Workers, ONS (2014)). 83% FTE.

[38] British Council for Offices, Office Occupancy: Density and Utilisation 2018, Homes and Communities Agency Employment Density Guide, 3rd Edition, November 2015, School Workforce in England, Department for Education 2018.

- Income/induced multiplier effects: Such effects are associated with local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the Proposed Development.

Additional Employment

6.6.61 **Table 6.24** sets out the steps and assumptions taken in estimating the net additionality of the Wider OPA, in accordance with the Additionality Guide[39].

Table 6.24 The Wider OPA Operational Jobs – Additionality

	Step Involved	Jobs Per Annum
A	Operational workers on-site (gross, direct, occupied)	1,541
B	Leakage to workers from outside of Eastleigh	-301
C	On-site jobs (direct, for residents within Eastleigh)	1,240
D	Displacement	-85
E	Multiplier effects	438
F	Total off-site jobs	353
G	Net additional employment from Proposed Development	1,593

Source: Savills 2020, HCA Additionality Guide 2014. Note Figures are rounded.

6.6.62 **Table 6.24** shows that the Wider OPA would support approximately 1,540 operational on-site jobs. Once the effects of leakage, displacement and multiplier effects have been considered this equates to 1,600 new FTE jobs, which accounts for the range of land uses across the Wider OPA.

6.6.63 The magnitude of employment in the Wider OPA is considered to be medium positive. The Wider OPA is anticipated to support 1,540 operational on-site jobs which comprises 2% of the total number of employees in Eastleigh (67,000[40]). The sensitivity of employees is low. Therefore the effect of operational jobs from the Wider OPA is predicted to be **minor beneficial** over the long-term.

Gross Value Added

[39] Homes and Communities Agency (HCA) (2014)

[40] ONS Business Register and Employment Survey Employee Jobs (2019)

6.6.64 The GVA associated with the Wider OPA is £99 million per annum.

Residential Expenditure

6.6.65 Utilising the average household size of Eastleigh Borough of 2.31 persons in 2033[41], the incoming resident population from the Proposed Development would be approximately 5,775 people.

6.6.66 Of the economically active population in EBC (61.1%), 80.9% of the 16-64 age group are in employment, according to recent estimates[42]. The delivery of 2,500 new homes in EBC would therefore have the potential to accommodate 2,855 additional working age, economically active and employed residents once complete.

6.6.67 New residents would introduce new expenditure to the local economy. The Annual Survey of Hours and Earnings from ONS provides income data by local authority. The median earnings for full-time workers living in Eastleigh is £34,336[43].

6.6.68 The income would be used to meet housing and other fixed household costs. However, a considerable proportion of this income would be available for discretionary expenditure by households in the local economy.

6.6.69 The additional household expenditure that the scheme is capable of generating is likely to have a beneficial impact on the economy of EBC and the demand for products and services of a number of interlinked business sectors. We estimate that the expenditure that would be retained in the local authority area to be approximately £8.7 million per annum.

6.6.70 Expenditure from new residents living at the Proposed Development would contribute to local shops and businesses in EBC, which in turn are an important source of local employment. It is estimated that the additional expenditure associated with residents of the Proposed Development would support 13 additional retail and 42 food and beverage jobs.

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[41] ONS 2018-based household projections for local authorities and higher administrative areas in England. Average household size in EBC in 2033

[42] ONS Annual Population Survey, 2019

[43] ONS (2020) Annual Survey of Hours and Earnings

Housing

6.6.71 According to the Eastleigh Borough Council Five-Year Housing Land Supply (2020), the Objectively Assessed Housing Need is 721 dwellings per annum from 2019-2029. The Proposed Development would assist in EBC's housing delivery, providing up to 2,500 dwellings comprising a mix of market and affordable housing. The proportion of affordable housing provision will be agreed with the local planning authority subject to viability.

6.6.72 The delivery of up to 2,500 residential dwellings would therefore be a significant addition to Eastleigh Borough Council's housing pipeline. The impact magnitude of additional home provision is considered to be medium positive. The sensitivity of people looking for new housing is Eastleigh Borough is considered to be medium, and the impact magnitude of the Proposed Development is anticipated to be medium positive. Therefore the effect of the Proposed Development on housing is predicted to be **moderate beneficial** over the long term.

Pre-Schools

6.6.73 The baseline assessment indicates that there is spare capacity for childcare within the Walkable Impact Area. The Wider OPA is also proposing to deliver an early years nursery totalling 465 sq.m. The Proposed Development is estimated to have a negligible impact on the low sensitivity users of pre-school facilities within the Walkable Impact Area, resulting in a **neutral** effect over the long-term.

Primary Education

6.6.74 The baseline assessment for the Wider OPA indicates that there are two infant schools (ages 5 to 7), two junior schools (ages 7 to 11) and one primary school (ages 5 to 11) within the Walkable Impact Area. Saint James' Church of England Primary School is the only school with spare capacity, with 20 places once a buffer of 7.5% is considered. The need from the Proposed Development is 556 places, calculated by using the Hampshire County Council's Developers' Contributions Towards Children's Services Facilities (2019)[44]. The Wider OPA is proposing to deliver a 3FE primary school which will provide 630 primary school places, and will help to alleviate the pressure of the incoming population. The Proposed Development is therefore

[44] In 2019 HCC published a study focusing on pupil yields from new developments. This study suggests a primary pupil yield of 0.3 children per dwelling.

estimated to have a low positive impact on the highly sensitive primary school pupils in the Walkable Impact Area resulting in a **minor beneficial** effect over the long term.

Secondary Education

6.6.75 The baseline assessment for the Wider OPA reports four secondary schools and two post-16 facilities within the Secondary Impact Area. The four secondary schools have a combined spare capacity of 643 places. The need from the Proposed Development is 389 places, calculated using the pupil yields published in Hampshire County Council's Developers' Contributions Towards Children's Services Facilities (2019)[45]. The Wider OPA is estimated to have a negligible impact on the low sensitivity users of secondary schools in the Secondary Impact Area, resulting in a **neutral** effect over the long-term.

GPs

6.6.76 There is one GP surgery within the Walkable Impact Area, Stokewood Surgery. Utilising the average household size for Eastleigh Borough of 2.31 persons in 2033[46], the incoming resident population from the Wider OPA is 5,775 people. The national average of 2,000 patients per GP[47] has shown there is no spare capacity across Stokewood Surgery and Old Anchor Surgery, and therefore the need of the incoming population would not be met by the existing GP practices. The Wider OPA is estimated to have a high negative impact on the high sensitivity users of GPs in the Walkable Impact Area resulting in a **major adverse** effect over the long-term.

Public Open Space and Play Space

6.6.77 The Wider OPA transgresses the West End North ward, and Fair Oak and Horton Heath ward. In terms of the proposed quantity standard for amenity space of 1.2 hectares per 1,000 population, West End has moderate levels of provision, and Fair Oak and Horton Heath have a considerable surplus of amenity space provision per 1,000 population. However, when the existing quantity standards for amenity space are applied, this indicates that when the

[45] In 2019 HCC published a study focusing on pupil yields from new developments. For secondary education this is 0.21 children per dwelling. This excludes a Post-16 element.

[46] ONS 2018-based household projections for local authorities and higher administrative areas in England.

[47] NHS England Premises Principles of Best Practice Part 1 Procurement and Development

population density of LACs is considered, West End is an area which does not meet the quantity standards. In terms of the accessibility of provision, Natural England's Accessible Natural Greenspace Standard recommends that everyone should be able to access greenspace within a 5 minute walk or 300 metres. West End and Fair Oak and Horton Heath are not considered as areas of deficiency. At present, Eastleigh Borough has a good provision of country parks against the national standard. At a strategic level, the application of accessibility standards indicates that all communities in the borough have good provision of country parks. However, application of the 20 ha natural green space accessibility standard indicates that Fair Oak and Horton Heath are deficient in country parks. In terms of the quantity of the current provision of allotments, West End North and Fair Oak and Horton Heath meet the proposed quantity standard for allotments of 0.125 hectares per 1,000 population. However, based on the allotment accessibility standard of 900m, West End and the southern part of Horton Heath do not meet these standards of accessibility, and are therefore considered as areas of deficiency.

6.6.78 The Proposed Development of the Wider OPA will incorporate an indicative total of 21.14 ha of open space, comprising 14.50 ha of informal open space, and 6.64 ha of overall amenity space. The amenity space indicatively is broken down into 0.16 ha of LEAPs, 0.24 ha of LAPs, 0.07 ha of natural play, 0.54 ha of destination play, 1.86 ha of formal sports area, and 3.77 ha of other amenity space (including 0.82 ha of allotments). The proposed amenity space therefore meets or exceeds the minimum required quantity standards set out by Eastleigh Borough Council.

6.6.79 The Wider OPA is therefore expected to have a medium positive impact on the medium sensitivity users of open space, resulting in a **moderate beneficial** effect over the long term. The Proposed Development is anticipated to have a medium positive impact on the medium sensitivity users of play space, resulting in a **moderate beneficial** effect over the long term.

6.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

6.7.1 This section provides a description of any additional enhancement and mitigation measures proposed to minimise the potential adverse effects identified by the assessment of OPA Phase 1 and the Wider OPA as set out previously. The mitigation measures will reduce the severity of impacts, and their significance.

6.7.2 The Proposed Development could be liable for Community Infrastructure Levy (CIL) payments, however EBC do not currently enforce CIL payments. As part of the emerging Eastleigh Borough Local Plan 2016-2036, EBC are currently considering whether to introduce CIL.

6.7.3 A financial contribution towards primary education will be required for OPA Phase 1 if the 3FE primary school associated with the Wider OPA is not delivered, resulting in a **neutral** effect over the long term.

6.7.4 The major adverse effect of OPA Phase 1 and the Wider OPA on GP provision will be mitigated by a suitable financial contribution to be agreed with Eastleigh Borough Council. This will alleviate the pressure of the incoming population, resulting in a **neutral** effect over the long term.

6.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

OPA Phase 1

6.8.1 With the implementation of mitigation measures identified in Section 6.7, the residual effects of OPA Phase 1 during the construction and the operational phases are assessed to be:

- Construction Employment: Not Significant
- Operational Employment: Not Significant
- Housing: Not Significant
- Early Years Education: Not Significant
- Primary Education: Not Significant
- Secondary Education: Not Significant
- Primary Heath – GPs: Not Significant
- Open Space: Not Significant

6.8.2 The above assessment is based on assessment of the residual effects with the significance criteria set out in Section 6.2.

The Wider OPA

6.8.3 With the implementation of mitigation measures identified in Section 6.7, the residual effects of the Wider OPA during the construction and the operational phases are assessed to be:

- Construction Employment: Not Significant

- Operational Employment: Not Significant
- Housing: Not Significant
- Early Years Education: Not Significant
- Primary Education: Not Significant
- Secondary Education: Not Significant
- Primary Health – GPs: Not Significant
- Open Space: Not Significant

6.8.4 The above assessment is based on assessment of the residual effects with the significance criteria set out in Section 6.2.

6.9 CUMULATIVE EFFECTS

6.9.1 The potential for likely significant effects on the environment resulting from committed developments in the area coming forward at the same time as the Proposed Development have been considered.

6.9.2 A committed development on Site is the One Horton Heath Utilities Enabling Works which comprises underground cabling. A further committed development is the Allington Lane, Burnetts Lane and Bubb Lane access. There is also a runway extension proposed at Southampton International Airport, Mitchell Way, Eastleigh, located 2.7km from the Subject Site.

6.9.3 A further committed development is the construction of a bypass for Botley, providing a connection from Station Hill (A334/A3051 junction) to Woodhouse Lane, located 3.3km from the Subject Site.

6.9.4 The Site at Chalcroft Business Park, Burnetts Lane, West End, proposes the development of 10,541 sq.m of non-residential floorspace adjacent to the Subject Site. 2,686 sq.m of non-residential floorspace is also proposed at Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, located 3.4km from the Site. A further 15,731 sq.m of non-residential floorspace is proposed at Land at Park Farm/North Stoneham Park, Stoneham Lane, located 4.3km from the Subject Site. In combination with OPA Phase 1 and the Wider OPA, the Proposed Developments totalling

28,958 sq.m of non-residential floorspace is estimated to have a low positive impact on the low sensitivity employees resulting in a **minor beneficial** effect over the long-term.

6.9.5 The following residential schemes have also been considered:

- Land off Botley Road, West End, Southampton comprising 100 units plus 30 units located 1.5km from Site boundary;
- 680 units at Land at Hedge End North, Winchester Road, Botley, Southampton (Land north west of Boorley Green) located 1.5km from Site boundary;
- Land to North and East of Boorley Green, Winchester Road, Botley, Southampton, SO32 2UA, comprising 704 units at 1.7km from the Site boundary;
- 242 units at Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh, SO50 7EA, located 1.7km from the Site Boundary;
- 605 units at Land west of Woodhouse Lane, located 2km from the Site boundary;
- Land South of Maddoxford Lane, Boorley Green, Botley, Southampton, SO32 2DB, comprising 86 units, located 2.4km from the Site boundary;
- 104 units at Land to the south of Maddoxford Lane and west of Westfield, Boorley Green, Botley, SO32 2DB, located 2.5km from Site boundary;
- 53 units at the Mount Hospital, Church Road, Bishopstoke, comprising 53 units located 2.8km from the Site boundary;
- 375 units at Land to the North and East of Winchester Street, Botley, located 2.8km from the Site boundary;
- 109 units at Land off St Johns Road, South of Foord Road, Hedge End, Southampton, SO30 4DG, located 4km from Site boundary;
- 107 units at Serenity, Heath House Lane, Hedge End, Southampton, SO30 0LE, located 4km from Site boundary;
- Land west of Waylands Place and north of Peewit Hill Close, Hedge End, SO31 1DJ comprising 106 units, located within 4.2km of Site boundary;

- 868 units (outstanding) plus 18 units, 39 units and 65 units at Land south of Chestnut Avenue north Stoneham Park, Chestnut Avenue, Stoneham Lane, Eastleigh, within 4.5km of Site; and

- 178 (outstanding) units at Land South of Bursledon Road, Bursledon, Southampton within 5km of Site.

6.9.6 Overall, 4,469 residential units are to be delivered within 5km of the Site. These are anticipated to generate additional pressures on the local social infrastructure, but are anticipated to be addressed by financial contributions to allow the Local Authorities to put in place the necessary mitigation. The residual effects of the Proposed Development alongside the expected effects of the identified committed schemes are combined to assess the overall cumulative effect.

6.9.7 In combination with the residential developments listed above, the Proposed Development is estimated to have a negligible impact on the low sensitivity pre-school users, resulting in a **neutral** effect over the long-term.

6.9.8 In combination with the 14 other committed residential developments in the area, in respect to primary school provision, the Proposed Development is estimated to have a **neutral** effect over the long-term owing to the mitigation measures proposed (Section 6.7).

6.9.9 With consideration to the other 14 residential developments within 5km of the Site, in respect to secondary school provision, the Proposed Development is estimated to have a **neutral** effect over the long-term.

6.9.10 In combination with the other 14 residential units to be delivered within 5km of the Subject Site, the Proposed Development is estimated to have a negligible impact on the high sensitivity users of GP surgeries, resulting in a **neutral** effect over the long-term.

6.9.11 With consideration to the other 14 committed residential developments in the area, the Proposed Development of the Wider OPA is estimated to have a medium positive impact on the medium sensitivity users of open and play space, resulting in a **moderate beneficial** effect on the provision of open and play space over the long-term.

6.9.12 The Proposed Development is assessed to have a **neutral** cumulative socio-economic effect over the long-term. This is due to the financial contributions from each cumulative development which are anticipated to mitigate the adverse effects.

6.10 IMPACT OF CLIMATE CHANGE

6.10.1 A future climate change scenario has been developed using UK Climate Projections 18 (UKCP18) published by the Met Office. UKCP18 projections are based on the latest developments in climate science and translate global climate change statistics into changing seasonal weather characteristics for the UK. This is used to facilitate consideration as to how the environmental and socio-economic effects of a Proposed Development may change under a future climate scenario.

6.10.2 The projection with central UK mean has been used in this analysis. The timeframe considered most relevant for urban regeneration projects covers 2070-2099. Several environmental factors are likely to vary in the future due to climate change. These include warmer air temperatures with warming being greater in the summer, a significant increase in winter precipitation, and decrease of summer rainfall and sea level rise.

6.10.3 When considering climate change effects, it is necessary to firstly consider the vulnerability of specific receptors to climate change. High vulnerability receptors are those where the receptor is directly dependent on the existing or prevailing climate. Moderate vulnerability receptors are those where the receptors are dependent on some climatic factors, but able to tolerate a range of conditions. A receptor that is of low vulnerability is one where climate has little influence on the receptor.

6.10.4 In the context of socio-economics, it is considered that climate factors have little influence on most receptors. Receptors which may experience some climate influence are:

- Residential using or seeking GP services;
- Residents using open space; and
- Residents using child play space.

6.10.5 Under a future climate, the possible socio-economic considerations of relevance to the Proposed Development primarily relate to health risks, and are thought to be as follows:

- An increased risk of over overheating due to a forecast increase in mean average air temperatures;
- A reduction in cold-weather related illness in winter, particularly in vulnerable groups such as the elderly, due to forecast increases in mean average air temperatures;

- An increased risk of surface water flooding, and associated water-borne disease resulting from an increase in average annual precipitation and sea level rise.

6.10.6 All of the above (in addition to an aging population) have the potential to place an extra burden on primary health care services, specifically the demand for GP services. As such, residents using or seeking GP services are considered to be of moderate vulnerability to climate change.

6.10.7 The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use local open spaces and children's play space. It is plausible therefore that there could be a more consistent demand for outdoor amenity and play space. The need for well-designed/presented and equipped areas is becoming increasingly important. As such, residents using open space and children's play space are considered to be of moderate vulnerability to climate change.

6.10.8 It is considered that whilst the impact of climate change could magnify the adverse impacts of the Proposed Development on the demand for GP services, open space and play space, the magnification, although uncertain, is assessed as being relatively low. This is on the basis that the demand arising because of the Proposed Development is being accounted for through onsite provision.

6.10.9 As such, under a future climate, the effects of the Proposed Development on residents using or seeking GP services and residents using open space and children's play space are anticipated to remain as presented for the Proposed Development under the current climate conditions.

6.11 ASSESSMENT SUMMARY

6.11.1 The baseline research found that the population in EBC is forecasted to grow by 8% over the period of 2016-2031, lower than the population growth of the South East of England but consistent with the England average over the same time period.

6.11.2 In 2016 the average household size in EBC was 2.37, and this is projected to decrease to 2.31 by 2033.

6.11.3 Consistent with population trends in the South East of England and England, the projected demographic profile of EBC shows an ageing population, with a 37% increase in the population of those aged 65 or over during the time period of 2016-2031. Also consistent with regional and national trends, in EBC the 0-14 and 25-49 age brackets have the lowest growth in population at 2% and 0% change respectively from 2016-2031.

6.11.4 The unemployment rate within EBC for the working age population (16-64) in the year to December 2019 stood at 2.8% which is lower than the South East of England average (3.0%) and the average for Great Britain (3.9%).

OPA Phase 1

6.11.5 The baseline assessment indicates that Fair Oak Infant School (ages 5 to 7), Fair Oak Junior School (ages 7 to 11) and Saint James' Church of England Primary School (ages 5 to 11) are located within the Walkable Impact Area, with a total capacity of 20 places at Saint James' Church of England Primary School once a buffer of 7.5% is considered.

6.11.6 There are no GP surgeries located within the Walkable Impact Area of OPA Phase 1, the closest GP surgery of Stokewood Surgery has no spare capacity.

6.11.7 There are 3 secondary schools located within the Secondary Impact Area (6.4km from the OPA Phase 1 Site). The Woodlands Community College is the only secondary school with existing spare capacity after a 7.5% buffer is applied, with a total of 410 places. There are no post-16 facilities located within the Secondary Impact Area of OPA Phase 1.

6.11.8 The construction of the Proposed Development is expected to generate 190 net additional construction jobs on and off-site per annum. The Proposed Development is estimated to have a low positive impact on the low sensitivity construction workers in Eastleigh Borough resulting in a **minor beneficial** effect over the short term.

6.11.9 Once operational, the Proposed Development could support a total of 60 homeworkers within the Proposed Development. The magnitude of employment in the Proposed Development is considered to be low positive. The sensitivity of the employees in Eastleigh Borough is low. Therefore operational jobs in the Proposed Development is predicted to be **minor beneficial** over the long term.

6.11.10 The delivery of 393 dwellings provided by the Proposed Development would be a significant addition to the housing pipeline of Eastleigh Borough Council. Including the impact of the affordable housing, the Proposed Development is estimated to have a low positive impact on the medium sensitive users looking for new housing in the borough resulting in a **minor beneficial** effect over the long term.

6.11.11 The baseline assessment indicates that Fair Oak Infant School (ages 5 to 7), Fair Oak Junior School (ages 7 to 11) and Saint James' Church of England Primary School (ages 5 to 11) are

located within the Walkable Impact Area, with a spare capacity of 20 places once a 7.5% buffer is considered. The need from the Proposed Development is 102 places, calculated using the guidance stated in HCC's Developers' Contributions Towards Children's Services Facilities (2019). The Proposed Development is estimated to have a medium negative impact on the highly sensitive primary school pupils in the Walkable Impact Area resulting in a **moderate adverse** effect over the long term. However as part of the Wider OPA, a 3FE primary school is proposed, which would provide 630 primary school places. This will help to alleviate the pressure of the incoming population, resulting in a **neutral** effect over the long term. If the 3FE primary school associated with the Wider OPA does not come forward, a financial contribution toward primary school places will be required, resulting in a **neutral** effect over the long term.

6.11.12 The baseline assessment reports 3 secondary schools located within the Secondary Impact Area of the OPA Phase 1 Site. There are no post-16 facilities located within the Secondary Impact Area. Woodlands Community College is the only secondary school with spare capacity once a buffer of 7.5% is considered, with a spare capacity of 410 places. The need from the Proposed Development is 71 places, calculated using the pupil yields published in the HCC's guidance on developers' contributions. The Proposed Development is estimated to have a negligible impact on the low sensitivity secondary school pupils in the Secondary Impact Area resulting in a **neutral** effect over the long term.

6.11.13 The baseline assessment reports that there are no GP surgeries that fall within the Walkable Impact Area. The Proposed Development is estimated to have a medium negative impact on the highly sensitive GP users in the Walkable Impact Area resulting in a **major adverse** effect over the long term. This will be mitigated by a suitable financial contribution to allow the local planning authority to increase GP capacity, resulting in a **neutral** effect over the long term.

6.11.14 The baseline assessment reports the subject ward of West End North is an area where deficiencies in access to open space exist. The Proposed Development of OPA Phase 1 is expected to have a low negative impact on the medium sensitivity users of open space, resulting in a **minor adverse** effect over the long term.

6.11.15 In respect to play space, the subject ward of West End North meets the Eastleigh Open Space Study (2017) accessibility standards for play space for children and for young people, and therefore the Proposed Development is estimated to have a negligible impact on the low sensitivity users of play space resulting in a **neutral** effect over the long-term.

6.11.16 However, as part of the Wider OPA, 20.16 ha of open space is proposed, comprising 14.50 ha of informal open space, and 6.64 ha of overall amenity space. If this is delivered, this would result in a medium positive impact on the medium sensitivity users of open space, resulting in a **moderate beneficial** effect over the long term. In respect to play space, the green infrastructure associated with the Wider OPA would have a medium positive impact on the low sensitivity users of play space, resulting in a **minor beneficial** effect over the long term.

Wider OPA

6.11.17 The baseline assessment indicates that there are two infant schools (ages 5 to 7), two junior schools (ages 7 to 11) and one primary school (ages 5 to 11) within the Walkable Impact Area. Saint James' Church of England Primary School is the only school with spare capacity, with 20 places once a buffer of 7.5% is considered.

6.11.18 There is one GP surgery, Stokewood Surgery, located within the Walkable Impact Area. Old Anchor Surgery is a branch of Stokewood Surgery, and the two GP practices operate as a combined surgery. Stokewood Surgery and Old Anchor Surgery have no spare capacity.

6.11.19 There are four secondary schools and two post-16 facilities within the Secondary Impact Area (6.4km from the Site). The existing spare capacity of the secondary schools after a 7.5% buffer is applied is a total of 643 places.

6.11.20 The construction of the Wider OPA is expected to generate 270 net additional construction jobs on and off-site per annum. The Wider OPA is estimated to have a medium positive impact on the low sensitivity construction workers in Eastleigh Borough resulting in a **minor beneficial** effect over the short term.

6.11.21 Once operational, the Wider OPA could generate a total of 1,540 on-site jobs, including 390 homeworkers and across the range of employment uses. The magnitude of employment in the Proposed Development is considered to be medium positive. The sensitivity of the employees in Eastleigh Borough is low. Therefore operational jobs in the Wider OPA is predicted to be **minor beneficial** over the long term.

6.11.22 The delivery of up to 2,500 dwellings would be a significant addition to the housing pipeline of Eastleigh Borough Council. Including the impact of the affordable housing, the Wider OPA is estimated to have a medium positive impact on the medium sensitive users looking for new housing in the borough resulting in a **moderate beneficial** effect over the long term.

6.11.23 The baseline assessment undertaken for the Wider OPA indicates that there is only one primary school with spare capacity within the Walkable Impact Area, totalling 20 places once a 7.5% buffer is considered. The need from the Wider OPA is 556 places, calculated using the guidance stated in HCC's Developers' Contributions Towards Children's Services Facilities (2019). The Wider OPA is proposing to deliver a 3FE primary school, which will provide 630 primary school places. This will help to alleviate the pressure of the incoming population. The Proposed Development is estimated to have a low positive impact on the highly sensitive primary school pupils in the Walkable Impact Area resulting in a **minor beneficial** effect over the long term.

6.11.24 The baseline assessment reports four secondary schools and two post-16 facilities within the Secondary Impact Area. The combined spare capacity of the four secondary schools is 643 places. The need from the Proposed Development is 389 places, calculated using the pupil yields published in the HCC' guidance on developers' contributions. The Wider OPA is estimated to have a negligible impact on the low sensitivity secondary school pupils in the Secondary Impact Area resulting in a **neutral** effect over the long term.

6.11.25 The baseline assessment reports that there is one GP surgery that falls within the Walkable Impact Area, which has no spare capacity. The Proposed Development is estimated to have a high negative impact on the highly sensitive GP users in the Walkable Impact Area resulting in a **major adverse** effect over the long term. This will be mitigated by a suitable financial contribution to allow the local planning authority to increase GP capacity, resulting in a **neutral** effect over the long term.

6.11.26 The baseline assessment reports the subject wards of West End North, Fair Oak and Horton Heath are areas where deficiencies in open space exist. In respect to play space, Horton Heath does not currently meet the 300m accessibility standard for child's play space, and is therefore identified as an area with deficiency. The Wider OPA is proposing to deliver a total of 20.16 ha of open space, comprising 14.50 ha of informal open space, and 6.64 ha of overall amenity space. The amenity space is broken down into 0.16 ha of LEAPS, 0.24 ha of LAPs, 0.07 ha of natural play, 0.54 ha of destination play, 1.86 ha of formal sports area, and 3.77 ha of other amenity space (including 0.82 ha of allotments). The proposed amenity space therefore meets or exceeds the minimum required quantity standards set out by Eastleigh Borough Council. The Proposed Development is estimated to have a medium positive impact on the medium sensitivity users of open and play space resulting in a **moderate beneficial** effect over the long-term.

6.11.27 **Table 6.25** summarises the potential socio-economic effects and relevant mitigation measures for OPA Phase 1.

6.11.28 **Table 6.26** summarises the potential socio-economic effects and relevant mitigation measures for the Wider OPA.

6.11.29 **Table 6.27** summarises the mitigation implementation for OPA Phase 1.

6.11.30 **Table 6.28** summarises the mitigation implementation for the Wider OPA.

Table 6.25: OPA Phase 1 Socio-Economics Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
Employment	Low	Positive	Low	Not significant	None Required	Low	Not Significant
Operation Effects							
Housing Provision	Medium	Positive	Low	Not significant	None Required	Low	Not Significant
Employment	Low	Positive	Low	Not significant	None Required	Low	Not Significant
Pre-School	Low	Negligible	Negligible	Not significant	None Required	Negligible	Not Significant
Primary	High	Negative	Medium	Not significant	Wider OPA 3FE Primary School/Financial Contribution	Negligible	Not Significant
Secondary	Low	Negligible	Negligible	Not significant	None Required	Negligible	Not Significant
GP Practices	High	Negative	Medium	Significant	Financial Contribution	Negligible	Not Significant
Open Space	Medium	Negative	Low	Not significant	None Required	Low	Not Significant
Play Space	Low	Negligible	Negligible	Not significant	None Required	Low	Not Significant
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
Housing Provision	The Proposed Development is anticipated to generate additional pressure on the local social infrastructure, such as primary school places and primary healthcare facilities.				Financial Contribution		Not Significant
Impact of Climate Change							

Effect	Description	Mitigation	Significance
Residents using or seeking GP services	An increased risk of over overheating due to a forecast increase in mean average air temperature. An increased risk of surface water flooding, and associated water borne diseases resulting from an increase in average annual precipitation and sea level rise. Both of these have the potential to place an extra burden on primary healthcare services, specifically the demand for GP services.	None required	Not significant
Residents using open space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use local open spaces. It is plausible therefore that there would be a more consistent demand for outdoor amenity space.	None required	Not significant
Residents using child play space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use child play space. It is plausible therefore that there could be a more consistent demand for play space.	None required	Not significant

Table 6.26: The Wider OPA Socio-Economics Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
Employment	Low	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Operation Effects							
Housing Provision	Medium	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Employment	Low	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Pre-School	Low	Negligible	Negligible	Not Significant	None Required	Negligible	Not Significant
Primary	High	Positive	Low	Not Significant	None Required	Low	Not Significant
Secondary	Low	Negligible	Negligible	Not Significant	None Required	Negligible	Not Significant
GP Practices	High	Negative	High	Significant	Financial Contribution	Negligible	Not Significant
Open Space	Medium	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Play Space	Medium	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
Housing Provision	The Proposed Development is anticipated to generate additional pressures on the local social infrastructure, such as primary healthcare facilities.				Financial Contribution		Not Significant
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**

Residents using or seeking GP services	An increased risk of over overheating due to a forecast increase in mean average air temperature. An increased risk of surface water flooding, and associated water borne diseases resulting from an increase in average annual precipitation and sea level rise. Both of these have the potential to place an extra burden on primary healthcare services, specifically the demand for GP services.	None required	Not significant
Residents using open space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use local open spaces. It is plausible therefore that there would be a more consistent demand for outdoor amenity space.	None required	Not significant
Residents using child play space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use child play space. It is plausible therefore that there could be a more consistent demand for play space.	None required	Not significant

Table 6.27: OPA Phase 1 Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Financial Contribution	District Council	Planning Obligation/CIL	GP Places	Upon phased occupation of the Proposed Development
Financial Contribution	District Council	Planning Obligation/CIL	Primary School Places	If the Wider OPA 3FE Primary School is not delivered.

Table 6.28: The Wider OPA Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Financial Contribution	District Council	Planning Obligation/CIL	GP Places	Upon phased occupation of the Proposed Development

CHAPTER 7: AIR QUALITY

7.1 INTRODUCTION

7.1.1 This chapter of the ES has been produced by Hydrock to assess both the OPA Phase 1 and the Wider OPA in relation to the effects it would have upon Air Quality.

7.1.2 Potential effects can arise from dust impacts associated with the construction of both of the proposed developments, as well as traffic impacts from both the construction and operation. This chapter presents the results and conclusions of the potential effects and discusses mitigation measures where necessary.

7.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessment

7.2.1 Two previous air quality assessments have been undertaken for the Site. One for West of Horton Heath (WHH) application in December 2014 which was for 950 dwellings, and one for the North West Horton Heath (NWHH) site which assessed the parameters based on the masterplan for the 950 dwellings included in the WHH application, and the additional 450 dwellings included in the new application for NWHH proposals to deliver an overall comprehensive development of 1,400 units, with an addendum produced in 2016.

7.2.2 All assessments undertaken concluded that inclusion of good practice measures in the Construction Environmental Management Plan would ensure no significant effects during the construction phase of the proposals. Assessment of traffic data concluded that whilst there were some adverse impacts these were only negligible and so not significant. All levels of NO_2, PM_{10} and $PM_{2.5}$ were predicted to be within the objectives for human health.

Scoping Opinion

7.2.1 A Scoping Report was submitted to Eastleigh Borough Council on 20 April 2020. A Scoping Opinion was received from the Council on 12 August 2020. Comments in relation to air quality include

- The assessment of construction activities should be included;
- The increase in pollutants needs to be assessed to look at the impacts of increasing the health risks to people, even if they remain below the legal limits;

- Consideration of potential production of canyon effects within the Proposed Development should be included;
- The benefits of new cycle network provisions should be accounted for in the assessment.

Legislative Context

EU

7.2.2 The overriding policy document which governs air regulation is the EU Council Directive on ambient air quality and cleaner air for Europe (2008/50/EC) [1], which came into force in 2008, and provides statutory guidance on air quality. This presents statutory requirements for the protection of human health and ecosystems through long and short-term limit values for: oxides of nitrogen (NOx), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter with a diameter of less than 10 microns (PM_{10}), particulate matter with a diameter of less than 2.5 microns ($PM_{2.5}$) carbon monoxide (CO), lead, benzene and ozone (O_3). The above legislation replaces the EU's previous three daughter directives.

7.2.3 The 4th Daughter Directive 2004/107/EC[2] sets target values, where exposure is to be reduced to as low as reasonable possible, for arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons (PaH) within ambient air.

7.2.4 In addition, the Committee on the Medical Effects of Air Pollution (COMEAP)[3], the World Health Organisation (WHO)[4] and the United Nations Economic Commission for Europe (UNECE)[5] provide medical and scientific evidence of the health risks to the general public and recommended concentration limits.

[1] EC, 'Directive 2008/50/EC of the European Parliament and of the Council', 21 May 2008, 50.

[2] EC, "Directive 2004/107/EC of the European Parliament and of the Council," December 15, 2004, 107.

[3] COMEAP, 'The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom' (London: Committee on the Medical Effects of Air Pollutants (COMEAP), November 2010).
[4] WHO, 'WHO | Air Pollution', WHO, 2016, http://www.who.int/topics/air_pollution/en/.
[5] UNECE, 'Air Pollution - Air Pollution - Environmental Policy - UNECE', 2016, http://www.unece.org/env/lrtap/welcome.html.

UK

7.2.5 The above EU limit/target values within the EU Directives 2008/50/EC and 2004/107/EC were transposed into UK Law as part of the Air Quality Standards Regulations[6] which came into force in 2010.

7.2.6 These set out how the government has interpreted these directives and sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. One of the main additions to these was the addition of regulatory framework on $PM_{2.5}$.

7.2.7 The Air Quality Strategy 2007 Volume 1[7] outlines the National Air Quality Objectives that should be achieved. Whilst central government is ultimately responsible for meeting these objectives, part of the Environment Act 1995[8] dictates that a local authority is required to assess and periodically review their compliance with the non-binding objectives and any areas that repeatedly exceed the allowed limits should be designated Air Quality Management Areas (AQMAs). The limits are shown in Table 7.1.

Table 7.1: National Air Quality Objectives

Pollutant	National Air Quality Objectives (NAQO)	
NO_2	Annual mean	40 µg/m^3
	1 hour mean (18 times per year)	200 µg/m^3
PM_{10}	Annual mean	40 µg/m^3
	24 hour mean (35 times per year)	50 µg/m^3
$PM_{2.5}$	Annual mean	25 µg/m^3
NOx	Annual Mean for ecological receptors	30 µg/m^3

[6] Air Quality Standards Regulations 2010.
[7] Defra, 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - Volume 1' (Department for Food, Environment and Rural Affairs (Defra), July 2007), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf.
[8] Environment Agency, 'Environment Act 1995' (The Environment Agency, 2002), http://www.legislation.gov.uk/ukpga/1995/25/contents.

Planning Policy and Guidance

National Planning Policy

7.2.8 The National Planning Policy Framework[9] requires that planning decisions for any new development should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. Furthermore, planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.

Local Planning Policy

Current Planning Policy

7.2.9 EBC adopted the Local Plan (2001-2011) on 25 May 2006. Relevant policies in relation to air quality are:

32. ES *"Proposals for uses which may generate air, land or water pollution, will only be permitted if the Borough Council is satisfied that they have been designed to control their impact to an acceptable level".*

33. ES *"Where new development appears likely to have a significant impact on air quality in the locality, or future occupiers of the development may be subject to unacceptable air quality, the Council will require a suitable air quality assessment to be carried out prior to consideration of the application".*

Emerging Planning Policy

7.2.10 The emerging local plan (2016-2036) is currently under examination. Relevant policies in relation to air quality include:

Policy DM8, Pollution "*Development will not be permitted if it is likely to cause loss of amenity or impact on public health or other unacceptable environmental impacts through; i) air pollution (including odours or particulate emissions) … Development susceptible to particular forms of*

[9] Department for Communities and Local Government, "National Planning Policy Framework," February 2019, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf.

pollution will not be permitted; a. where it will be affected by such pollution, unless measures can be taken that adequately mitigate the polluting effects…"

Guidance/ Best Practice

7.2.11 In order to determine if an air quality assessment is required, Defra Local Air Quality management (LAQM) Technical Guidance 2016[10], and the IAQM Land-use Planning & Development Control: Planning for Air Quality[11] and the Highways Agency Design Manual for Roads and Bridges[12] is used as guidance.

Baseline Data Collection

7.2.12 Existing air quality for the area have been obtained from the following data for the assessment. No surveys were undertaken by Hydrock as part of the assessment

- Defra background maps[13];
- Monitoring data from EBC local monitoring network;
- Traffic data was provided by the transport consultants for the Project (Paul Basham Associates);
- Multi-Agency Graphic Information for the Countryside (MAGIC) and the DEFRA GIS Portal for details on relevant ecological sites to be included within the assessment.

Assessment Methodology

Construction Dust

7.2.13 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed on accordance with the methodology outlined within the

[10] Defra, 'LAQM Technical Guidance LAQM.TG16' (Department for Food, Environment and Rural Affairs (Defra), February 2018), 16, https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf.

[11] IAQM, 'Land-Use Planning & Development Control: Planning for Air Quality' (Institute for Air Quality Management (IAQM), January 2017), http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf.

[12] DfT, *Design Manual for Roads and Bridges*, vol. 12.2.1: Traffic Appraisal of Road Schemes. Section 2: Advice (London: Highways Agency, 1996).

[13] Food and Rural Affairs (Defra) webmaster@defra gsi gov uk Department for Environment, 'Background Mapping Data for Local Authorities- Defra, UK', accessed 17 December 2018, https://uk-air.defra.gov.uk/data/laqm-background-home.

IAQMs 'Guidance on the Assessment of Dust from Demolition and Construction'[14]. The assessment approach classifies the risk posed by demolition and construction activities on a development site on the basis of the scale and nature of the activities, and the sensitivity and proximity of dust-sensitive receptors.

7.2.14 Activities on construction sites with the potential to generate dust and emissions can be categorised into four types of activities:

- Demolition – any activities associated with the removal of existing structures on site;
- Earthworks – includes the processes of soil-stripping, ground-levelling, excavation and landscaping;
- Construction – any activities relating to the provision of new structures on site; and
- Trackout – the transport of dust and dirt from the construction site onto the public road network where it may be deposited and re-suspended by traffic using the network.

7.2.15 The assessment follows a step approach which is outlined below.

Step 1

7.2.16 This involves screening for a more detailed assessment. An assessment of dust impacts should be undertaken if there are:

- Sensitive human receptors within 350m of the Site boundary and/or up to 500m from site entrances are identified.

- Sensitive ecological receptors within 50m of the site boundary and/or upto 500m from site entrances.

Step 2a

7.2.17 The potential dust emission magnitude for each of the four activities outlined above is determined on the scale and magnitude of the works and are classified as small, medium or large depending on the criteria outlined in Table 7.2 below.

Table 7.2: Potential Dust Emission Magnitude Criteria

Activity	Dust Emission Magnitude

[14] IAQM, 'Guidance on the Assessment of Dust from Demolition and Construction - Version 1.1' (Institute for Air Quality Management (IAQM), February 2014), http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf.

	Small	Medium	Large
Demolition	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10 m above ground, demolition during wetter months.	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level;
Earthworks	Total site area <2 ,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds	Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes; and	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes;
Construction	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and	Total building volume >100, 000 m^3, on site concrete batching, sandblasting;
Trackout	<10HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length	10-50 HDV (>3.5t) outward movements16 in any one day17, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m; and	>50 HDV (>3.5t) outward movements16 in any one day17, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;

Step 2b

7.2.18 The sensitivity of the area is then defined on the specific sensitives of the receptors in the area, the proximity ad number of those receptors and local background concentrations of PM10 in relation to human health impacts. The sensitivity of the area is defined for separately dust soiling impacts as shown in Table 7.3, human health impacts as shown in Table 7.4 and ecological impacts as shown in Table 7.5 below.

Table 7.3: Sensitivity of the area to dust soiling impacts

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	<1	Medium	Low	Low	Low
Low	<1	Low	Low	Low	Low

Table 7.4: Sensitivity of the area to human health impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 7.5: Sensitivity of the area to ecological impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2c

7.2.19 Once the dust emission magnitudes for each activity have been determined in Step 2a and the sensitivity of the areas in relation to dust soiling and human health/ecological impacts have been determined in Step 2b, the risk of impacts is defined in Step 2c. The risk of impacts is determined for each of the four activities using the matrixes in Tables 7.6 to 7.9 below.

Table 7.6: Risk of dust impacts – Demolition

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 7.7: Risk of dust impacts – Earthworks

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 7.8: Risk of dust impacts – Construction

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 7.9: Risk of dust impacts – Trackout

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

7.2.20 The risk of dust impacts can be summarised to provide a completed risk table, as shown as an example in Table 7.10, taken from the IAQM guidance. High and Medium risks of impacts are defined are Significant Effects whereas Negligible and Low Risk impacts are defined as Not Significant Effects.

Table 7.10: Example summary of dust risk

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High Risk	High Risk	Low Risk	Medium Risk
Human Health	High Risk	Medium Risk	Negligible	Low Risk
Ecological	Low Risk	Low Risk	Low risk	Negligible

7.2.21 The overall risk of impacts from the proposed development are the highest risk category for each of the activities and potential impacts. For the example shown in Table 7.10, the overall risk of impacts would be High risk.

Step 3

7.2.22 Based on the potential risks identified in Step 2, appropriate mitigation measures and best practice methods are recommended. The suggested measures and methods are based on IAQM guidance.

Step 4

7.2.23 Having taken account of the level of risk of impacts (Step 2) and the implementation of appropriate mitigation (Step 3) the significance of the potential residual dust effects is determined. Guidance states that following the implementation of risk specific mitigation, impacts can be reduced to negligible, and therefore a not significant effect.

Operational

7.2.24 EPUK and IAQM provide criteria for when a development has the potential to cause air quality impacts. These are:

- An increase of more than 100 AADT LGVs and/or 25 HGVs in or adjacent to an AQMA; or
- An increase of more than 500 AADT LGVs and/or 100 HGVS outside of an AQMA.

7.2.25 If the above criteria are met than a detailed dispersion modelling assessment should be undertaken. Roads which exceed the above criteria have been modelled using a detailed dispersion model to determine the impacts at sensitive human and receptor locations and the overall effect of traffic.

7.2.26 The following assessment scenarios have been considered in this assessment:

- Baseline/Verification 2019.

Assessment of OPA Phase 1

- 2023 Do Minimum (DM) - Baseline 2023 + Committed Development; and
- 2023 Do Something (DS) - Baseline 2023 + Committed Development + OPA Phase 1.

Assessment of Wider OPA

- 2030 DM - Baseline 2030 + Committed Development; and
- 2030 DS - Baseline 2030 + Committed Development + Wider OPA.

7.2.27 The difference in the DS and DM scenarios are calculated for the assessment year and is equated to the percentage change in relation to the NAQO. This is used along with the long-term concentration at the receptor location in the DS scenario to determine the impact at each receptor location, following the matrix in Table 7.11.

Table 7.11: Assessment of Impacts and Significance at Receptor Locations

Long term average concentrations at receptor in assessment year	% change in concentration relative to National Air Quality Objective (NAQO)			
	1	2-5	6-10	>10
75% or less of NAQO	Negligible	Negligible	Slight	Moderate
76-94% of NAQO	Negligible	Slight	Moderate	Moderate
95-102% of NAQO	Slight	Moderate	Moderate	Substantial
103-109% of NAQO	Moderate	Moderate	Substantial	Substantial
110% or more of NAQO	Moderate	Substantial	Substantial	Substantial

7.2.28 Negligible and Slight impacts are described as Not Significant effects and Moderate and Substantial impacts are described as Significant effects.

Dispersion Model

7.2.29 ADMS-Urban 5.0.0.1 is used in such types of assessments to establish the current and future air quality situation in the area. The software is commercially available, has been validated for this type of assessment and is used extensively for air quality assessments.

7.2.30 ADMS-Urban is able to provide an estimate of air quality both before and after development, considering important input data such as background pollutant concentrations, variable emissions, meteorological data, and traffic flows.

Traffic Data

7.2.31 Traffic flows were provided by Paul Basham Associates based on existing data submitted as part of the Wider OPA Site's extant planning permission (planning application references X/19/86475 and X/19/86303) for the Baseline 2020 + Committed Development data. Additional committed development traffic has then been added to this. TEMPro Growth Factors have been used to uplift 2020 flows to 2023 and 2030. The transport consultant has confirmed that the 2020 flows are suitable and representative for the 2019 baseline assessment. Traffic Flows are shown in Appendix 7.1.

Human Receptors

7.2.32 For this assessment the NAQOs for NO_2, PM_{10} and $PM_{2.5}$ are given in Table 7.1.

7.2.33 The most sensitive receptors are those where the annual objective applies. These receptors have been the primary focus of the assessment and are shown in Table 7.12 and Figure 7.1.

Table 7.12: Sensitive Human Receptor Locations

Receptor Number	Receptor Location	Receptor Location
R01	Swaythling Road	445786,115220
R02	Botley Road/Burnetts Lane	449601,117448
R03	Knowle Lane/Botley Road	449643,117422
R04	Botley Road	449646,117529
R05	Botley Road	449618,117665
R06	Botley Road	449646,117529
R07	Sandy Lane/Winchester Road	449117,119389
R08	Winchester Road	449102,119479
R09	Fair Oak Road	446856,119001
R10	Fir Tree Lane	448354,117592
R11	Burnetts Lane/Fir Tree Lane	449386,117257
R12	Fire Tree Lane	449347,117274
R13	Burnetts Lane	448969,116052
R14	Allington Lane	448390,117942
R15	Botley Road/Stubbington Way	449479,118519
R16	Botley Road/Eastleigh Road	449466,118448
R17	Botley Road	449610,118051
R18	Tollbar Way	448977,115473
R19	Sandy Lane	449101,119385
R20	Sandy Lane	449092,119412
R21	Sandy Lane/Winchester Road	449141,119427
R22	Burnetts Lane/Botley Road	449614,117392
R23	Botley Road	449584,116450
R24	Botley Road	449585,116613
R25	Tollbar Way	448983,115480
R26	Moorgreen Road	448301,115244
R27	Botley Road	449629,116402
R28	Bishopstoke Road	446050,119175
R29	Swaythling Road	445924,115160
R30	Fair Oak Road	448596,118643
R31	Winchester Road	449426,118616
R32	Sandy Lane	448837,118577
R33	Sandy Lane/Fair Oak Road	448822,118547
R34	Twyford Road/Romsey Road	445665,119284
R35	Southampton Road	445650,118661
R36	Grange Road	449243,113832
R37	Grange Road	449163,113928
R38	Grange Road	449246,113831
R39	Grange Road	449099,113891
R40	Turnpike Way	448668,113610
R41	Townhill Way	445796,115133

R42	Wildern Lane	449047,113780
R43	Wildern Lane	449036,113733
R44	Bishopstoke Road	446556,119138
R45	Fair Oak Road/Allington Lane	448937,118424
R46	Fair Oak Road/Allington Lane	448929,118414
R47	Allington Lane	446946,115786
R48	Allington Lane	446343,115719
R49	Moorgreen Road	447341,114496
R50	Townhill Way	445792,115159
R51	Swaythling Road/Allington Lane	445812,115233
R52	Moorgreen Road/Botley Road	447352,114450
R53	Charles Watts Way/Turnpike Way	448657,113641
R54	Tollbar Way	448821,115248
R55	Charles Watts Way/Turnpike Way	448608,113580
R56	Charles Watts Way/Turnpike Way	448607,113580
R57	Charles Watts Way/Turnpike Way	448621,113590
R58	Townhill Way	445794,115148
R59	Bubb Lane	449420,115944
R60	Botley Road/Stubbington Way	449504,118471
R61	Allington Lane	448284,117566
R62	Botley Road/Eastleigh Road	449450,118480
R63	Allington Lane	448301,117627
R64	Fair Oak Road	449162,118452
R65	Bubb Lane	449013,115509
R66	Moorgreen Road/Botley Road	447366,114441
R67	Botley Road	447443,114428

Ecological Receptors

7.2.34 The area surrounding the Wider OPA Site was assessed for the designations listed below, using data from the Office for National Statistics open data portal.

- Special Protection Areas (SPAs)
- Special Areas of Conservation (SACs)
- Ramsar sites (protected wetlands)
- Sites of Special Scientific Interest (SSSIs)
- Local nature sites (ancient woods, local wildlife sites (SINCs) and national and local nature reserves)

7.2.35 For ecological sites, the effect is considered to be not significant if the total predicted NOx concentrations are below the NAQO of 30µg/m^3 or if the predicted change in NOx

concentrations is less than 0.4 µg/m^3 if the NAQO is exceeded. If these conditions are not met then an assessment of nitrogen deposition has been undertaken.

7.2.36 The closest ecological receptors are shown in Figure 7.1 and detailed in Table 7.13 below.

Table 7.13: Sensitive Ecological Receptor Locations

Receptor Number	Receptor Name	Receptor Location
E01	Moorgreen Meadows SSSI	448618,114465
E02	River Itchen SAC/SSSI	446587,119142
E03	Round Copse, West End SINC	448708,116372
E04	Stoke Park Wood SINC	448100,118885
E05	Hall Lands Copse SINC	449388,118815
E06	Scoreys Copse SINC	449715,116409

7.2.37 EBC requested that air quality impacts were also considered on the New Forest SSSI/SPA/SAC, however, further assessment of this receptor has been scoped out due to the distance of the receptor from the site. The transport model did not extend to this location and as such, the development vehicle flows at this location will not exceed the threshold criteria for assessment as discussed in section 7.2.23. It can, therefore, be concluded that any impacts on the New Forest SSSI/SPA/SAC will be negligible and there will be Not Significant effects.

Background Data

7.2.38 In addition to local authority monitoring background monitoring, Defra provide an indication of local background concentrations across 1x 1 km grid squares, from a baseline year of 2018, up to 2030. Background concentration data was considered from the Defra 1km 2019 grid for the verification assessment. Estimated future concentrations for 2023 and 2030 by Defra were used for the future year projections.

Model Verification

7.2.39 A verification study has been undertaken using EBC's air quality monitoring data from 2019. Full details of this study are included in Appendix 7.2. The model was found to be under-predicting concentrations of NOx and NO_2.

7.2.40 The model was found to be overpredicting apart from the majority of the study area, apart from the section of Bishopstoke Road between Sayers Road and Station Hill where the model was underpredicting. Therefore, an adjustment factor of 1.8 was applied to the modelled results in this section of road. An adjustment factor of 0.62 was applied across the rest of the study area.

Meteorological Data

7.2.41 Wind direction, wind speed, temperature, humidity and cloud cover data for the period 01/01/2019 – 31/12/2019 taken from Southampton weather station using the Worldmet R package[15].

7.2.42 Surface roughness, Albedo and Minimum Monin-Obukhov Length derived by Air Pollution Services (APS) for the meteorological stations and the site area[16].

Geographical Scope

7.2.43 IAQM guidance outlines the study area for a construction dust assessment, which consists of human receptors within 350m of the site boundary and 50m from roads, 500m from site access locations and ecological receptors within 50m of the site boundary. This study area is applied to both the Wider OPA and OPA Phase 1.

7.2.44 The road traffic assessment study area for both the Wider OPA and OPA Phase 1 has been determined by the changes in traffic flows along roads which may impact sensitive human and ecological receptors.

Temporal Scope

7.2.45 Construction activities are only considered to be temporary in nature. In relation to operational activities, the impacts from the Proposed Development (the Wider OPA and OPA Phase 1) is expected to be permanent.

Assumptions & Limitations

7.2.46 It is not possible to remove all error from the modelling process due to the nature of data processed. Traffic data utilised in the model, especially projected data will have some uncertainty in it and where this data may change, results of the modelling process may change.

7.2.47 Another source of data utilised in the modelling process are predicted background concentrations, which in themselves have some uncertainty associated with them and the

[15] David Carslaw, *Worldmet: Import Surface Meteorological Data from NOAA Integrated Surface Database (ISD)*, version 0.9.2, 2020, https://CRAN.R-project.org/package=worldmet.

[16] APS, 'Surface Characteristics at Meteorological Stations', Air Pollution Services, 19 November 2019, http://www.airpollutionservices.co.uk/surface-characteristics-at-meteorological-sites/.

monitoring data they are based on which is not 100% accurate in terms of published concentrations due to the nature of the method of monitoring used.

7.2.48 Data, and therefore, model uncertainty has been reduced to as small as possible through model verification. Further information on modelling assumptions and model verification is shown in Appendix 7.2.

7.3 CONSULTATION

7.3.1 An email outlining the proposed methodology was sent to Eastleigh Borough Council in August 2020, however a response is yet to be received. It is considered that the Scoping Opinion provides details on the main points to consider in relation to the air quality assessment.

7.4 BASELINE ENVIRONMENT

AQMAs

7.4.1 EBC have declared four AQMAs for the exceedances of the NO_2 annual mean objective. The Eastleigh AQMA No. 1 was declared in 2005, amended in 2015, and lies approximately 2.5 km from the Wider OPA Site. The location of the AQMA is shown in Figure 7.2.

Local Authority Monitoring

7.4.2 EBC has investigated air quality within the area as part of its responsibilities under the LAQM guidance. As part of this they have used automatic monitoring stations and diffusion tubes within the local area to monitor concentrations of NO_2 and PM_{10}.

7.4.3 One automatic station, ES1 (Location 445495,118237) is located approximately 2.8 km from the Wider OPA Site and is a roadside site which measures concentration of both NO_2 and PM_{10}. The results of the monitoring at ES1 are shown in Table 7.14 below and the location is shown in Figure 7.2.

7.4.4 17 diffusion tube monitoring locations are within approximately 3km of the Wider OPA Site. All of these tubes are roadside locations. Site details and concentrations up to 2019 are shown in Table 7.15, and the locations of these sites are shown in Figure 7.2.

Table 7.14: EBC Automatic Monitoring Data from ES1

	Objective	2016	2017	2018	2019
NO_2	Annual Mean (NAQO 40µg/m^3)	**40.8**	37.4	37.8	34.1
	Number of hours the 1-hour mean >200µg/m^3 (18 exceedances of the 1-hour mean)	4	0	0	0
PM_{10}	Annual Mean (NAQO 40µg/m^3)	22.2	20.9	22.5	21.1
	Number of hours the 24-hour mean >50µg/m^3 (35 exceedances of the 24-hour mean)	7	7	0	4

Table 7.15: EBC Diffusion Tube Monitoring Data

Site ID	Site Location (X,Y)	In AQMA?	Annual mean NO_2 concentration (µg/m^3)			
			2016	2017	2018	2019
JW	447690,114912	No	27.9	24.8	24.7	21.3
SWA	446170,114603	No	31.7	29.5	27.7	28.6
AL	445908,115544	No	28	25.2	25.1	23.5
BOT	449634,117382	No	36.5	34.4	32.5	31.9
WHL	450422,113751	No	-	19.1	20.3	17.5
FOR	447427,118780	No	23.5	22.9	21.9	20.1
BR	446604,119149	No	34.5	33	33.4	33.8
BR2	446051,119171	No	33	39.5	31.7	31.3
TW	445739,119856	No	28.3	26.5	27.5	24.7
MS	445707,119619	No	31.2	28.9	32.1	26.4
SRAN (17)	445495,118237	Yes	-	**43.4**	38.3	36.8
SR1	445450,118144	Yes	**47.3**	**44.7**	**45.7**	**43.6**
SR2	445651,118634	Yes	-	-	**42.7**	37.6

CA(15)	445339,118111	No	28.6	24.5	25.8	23.9
WYV	449577,118165	No	32.2	25	29.5	24.1
FORSL	448788,118553	No	33.2	30.2	28	28
MS	445707,119619	No	31.2	28.9	32.1	26.4

7.4.5 Table 7.14 and Table 7.15 show that, overall, nearby monitoring indicates concentrations were below the NAQOs in 2019, except at SR1 which measured 43.6 µg/m^3 and is located within the AQMA. No exceedances of the short term NO_2 or PM_{10} objectives were observed at ES1 in 2019.

Background Concentrations

7.4.6 Table 7.16 presents the Defra background concentrations for the grid squares which the Proposed Development resides in for the verification year of 2019 and the future assessment year of 2023 and 2030.

Table 7.16: Defra background concentrations

Defra grid square	2019			2023			2030		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
448500,117500	13.1	14.1	9.5	11.5	13.3	9.5	9.8	13.0	8.7
449500,117500	12.6	13.6	9.5	11.1	12.9	9.5	9.4	12.6	8.7
448500,116500	13.9	13.5	9.4	12.1	12.8	9.4	10.2	12.5	8.6
449500,116500	13.5	13.6	9.4	11.8	12.8	9.4	10.0	12.5	8.6
448500,115500	15.5	14.3	9.9	13.4	13.6	9.9	11.2	13.3	9.1
449500,115500	14.4	13.9	9.7	12.6	13.2	9.7	10.6	12.8	8.9

7.4.7 The Defra background concentrations are predicted to be well below all the NAQOs in both 2019, 2023 and 2030.

7.4.8 EBC have one background monitoring location (HG) within 3.5 km of the Wider OPA Site. It is expected that this provides more accurate background NO_2 concentrations for the Wider OPA Site and surrounding modelled receptors than the Defra Background concentrations. The 2019

monitored concentration at HG has been used in the model and has also been used along with Defra background concentrations to predict future NO_2 concentrations for the 2030 assessment year.

7.4.9 Table 7.17 below shows the monitored concentrations and predicted monitored concentrations of NO_2 used in the model.

Table 7.17: NO_2 concentrations used in the model

Year	Monitored NO_2 at HG3	Defra Background NO_2	Ratio of monitored NO2 to Defra background NO2
2019	17.1 µg/m^3	15.9 µg/m^3	1.08
Year	Defra Background NO_2	Ratio applied to Defra background	Predicted Monitored NO_2 at HG3 used in the model
2023	13.6 µg/m^3	1.08	14.7 µg/m^3
2030	11.2 µg/m^3	1.08	12.0 µg/m^3

7.4.10 Table 7.17 shows that the model utilised a background NO_2 concentration of 17.1 µg/m^3 in 2019, 14.7 µg/m^3 in 2023 and 12.0 µg/m^3 in 2030. Background PM_{10} and $PM_{2.5}$ concentrations utilised in the model were the Defra background concentrations shown in Table 7.16.

7.5 INHERENT DESIGN MITIGATION

1.5.1.1 A construction environmental management plan (CEMP) will be produced and implemented for both the OPA Phase 1 and Wider OPA which will aid in reducing any dust impacts during the construction phases. However, guidance states that a dust assessment in the absence of measures should be undertaken to determine specific measures. Therefore, a construction dust assessment and relevant mitigation is still presented.

7.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

OPA Phase 1

Construction Impacts and Effects

7.6.1 The construction phase of the proposed development will involve a number of activities that will produce polluting emissions to air. Predominantly, these will be emissions of dust.

7.6.2 The IAQM's guidance states that, from experience of assessing exhaust emissions from site traffic, it is unlikely that any significant adverse impacts on local air quality would be caused and

in the vast majority of cases, quantitative assessment is not needed. As such, short term effects of construction traffic emissions have not been assessed.

Demolition

7.6.3 There is no demolition associated with the OPA Phase 1, therefore, the impact of demolition activities is Not Applicable.

Earthworks

7.6.4 The total area of the site is above the IAQM's 'Large' threshold of 10,000m^2. There are likely to be more than 10 heavy moving vehicles active at any one time.

Construction

7.6.5 The total volume of buildings to be erected is estimated to fall above the IAQM's 'Large' threshold of 100,000m^3.

Trackout

7.6.6 The unpaved road network is likely to be greater than less than 50m in length. In addition, the number of site vehicles is unlikely to exceed the IAQM's 'Medium' threshold of 10-50 HDV (>3.5t) outward movements. Accordingly, the potential dust emission magnitude during Trackout is considered to be 'Medium'.

Sensitivity of Area

7.6.7 The prevailing wind direction for the closest regionally representative meteorological measurement station to the application site, at Southampton Airport is shown in Appendix 7.3. The wind rose shows that the prevailing winds are from the south-west. As such, receptors downwind (i.e. north, east/north-east) of the site are more sensitive to dust impacts than those located upwind.

7.6.8 The main areas of human sensitivity are to the south east. Based on the IAQM guidance residential dwellings are considered as high sensitivity receptors in relation to both dust soiling and health effects of PM_{10}. Indicative examples of medium sensitivity receptors include places of work, such as offices.

7.6.9 There are more than 10 high-sensitivity receptors within 20m of the site boundary. According to IAQM guidance, where there are more than 10 high sensitivity receptors within 20m, the overall sensitivity of the surrounding area to nuisance dust soiling effects during Demolition, Earthworks and Construction is defined as 'High'.

7.6.10 With regard to Trackout, the sensitivity is assessed where receptors are located within 50m from Trackout routes up to 500m from the site. As there are more than 10 high-sensitivity receptors within 50m of the Trackout route, the sensitivity to dust soiling impacts from Trackout is defined as 'High'.

7.6.11 UK-AIR predictions show that annual mean concentrations of PM_{10} are well below 32 µg/m^3 in the vicinity of the site (the concentration at which exceedance of the 24-hour NAQO is likely), and are not likely to exceed 24 µg/m^3. According to IAQM guidance, where PM_{10} concentrations are <24 µg/m^3 and there are fewer than 100 high sensitivity receptors within 20m of the site boundary, the overall sensitivity of the surrounding area to human health impacts is defined as 'Low' for all stages.

Risk of Impacts

7.6.12 Using the methodology prescribed in the IAQM guidance, the overall risk of impacts can be defined by combining the sensitivity of the area with the potential dust emission magnitude of each stage of the construction phase as described above.

7.6.13 Table 2.18 provides a summary of the construction dust risk assessment. Overall, the development is considered to be High Risk for nuisance dust soiling effects, Low Risk for PM_{10} health effects and to be Low Risk for ecological impacts, in the absence of mitigation.

Table 1.18: Risk of adverse impacts during construction phase

Construction Activity	Risk of Impacts		
	Nuisance Dust Soiling	Human Health	Ecological
Demolition	Not Applicable	Not Applicable	Not Applicable
Earthworks	High	Low	Low
Construction	High	Low	Low
Trackout	Medium	Low	Low

Occupation Impacts and Effects

Human Receptors

7.6.14 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been modelled both without and with the OPA Phase 1 in the 2023 assessment year. The results are shown in Tables 7.19, 7.20 and 7.21

below. The tables also report the impact in line with IAQM guidance. Impacts of Slight Adverse or below are not considered significant.

Table 7.19: 2023 NO_2 Assessment Results

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change	EPUK Impact
R01	20.3	20.4	0.1	Negligible
R02	20.9	20.9	0.0	Negligible
R03	31.5	31.6	0.1	Negligible
R04	21.1	21.1	0.0	Negligible
R05	18.7	18.7	0.0	Negligible
R06	21.1	21.1	0.0	Negligible
R07	18.3	18.3	0.1	Negligible
R08	17.4	17.4	0.0	Negligible
R09	27.7	27.8	0.1	Negligible
R10	16.8	16.9	0.1	Negligible
R11	16.5	16.5	0.0	Negligible
R12	16.4	16.4	0.0	Negligible
R13	16.4	16.4	0.1	Negligible
R14	16.5	16.6	0.1	Negligible
R15	26.7	26.7	0.1	Negligible
R16	23.0	23.1	0.0	Negligible
R17	19.9	19.9	0.0	Negligible
R18	19.6	19.7	0.1	Negligible
R19	18.1	18.2	0.1	Negligible
R20	18.0	18.1	0.1	Negligible
R21	18.5	18.5	0.1	Negligible
R22	23.7	23.7	0.0	Negligible
R23	17.4	17.4	0.0	Negligible
R24	20.1	20.2	0.0	Negligible
R25	19.6	19.6	0.1	Negligible
R26	16.7	16.8	0.1	Negligible
R27	18.7	18.7	0.0	Negligible
R28	28.0	28.2	0.1	Negligible
R29	26.5	26.6	0.1	Negligible
R30	19.0	19.1	0.1	Negligible
R31	19.4	19.4	0.0	Negligible
R32	19.0	19.0	0.1	Negligible
R33	19.9	19.9	0.1	Negligible
R34	20.0	20.0	0.1	Negligible
R35	17.7	17.7	0.0	Negligible

R36	19.5	19.5	0.0	Negligible
R37	20.4	20.4	0.0	Negligible
R38	19.7	19.7	0.0	Negligible
R39	18.9	19.0	0.0	Negligible
R40	18.5	18.6	0.0	Negligible
R41	20.4	20.4	0.0	Negligible
R42	18.3	18.3	0.0	Negligible
R43	18.9	18.9	0.0	Negligible
R44	25.0	25.1	0.1	Negligible
R45	21.2	21.3	0.2	Negligible
R46	21.7	21.9	0.2	Negligible
R47	16.9	16.9	0.1	Negligible
R48	16.9	17.0	0.1	Negligible
R49	20.6	20.6	0.1	Negligible
R50	20.0	20.0	0.0	Negligible
R51	20.0	20.1	0.1	Negligible
R52	24.4	24.5	0.1	Negligible
R53	19.0	19.1	0.0	Negligible
R54	25.0	25.2	0.1	Negligible
R55	19.4	19.5	0.1	Negligible
R56	19.4	19.5	0.1	Negligible
R57	19.3	19.3	0.0	Negligible
R58	20.1	20.1	0.0	Negligible
R59	19.6	19.7	0.1	Negligible
R60	24.1	24.2	0.1	Negligible
R61	17.2	17.3	0.1	Negligible
R62	27.4	27.4	0.0	Negligible
R63	16.9	17.0	0.1	Negligible
R64	17.6	17.6	0.0	Negligible
R65	18.8	18.9	0.1	Negligible
R66	25.9	26.0	0.0	Negligible
R67	20.3	20.4	0.0	Negligible

7.6.15 The results indicate that annual mean NO_2 concentrations at all modelled receptor locations are below the NAQO. The predicted EPUK impact is Negligible at all modelled receptor locations. As such, no significant effects are predicted.

Table 7.20: 2023 PM_{10} Assessment Results

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change	EPUK Impact
R01	18.0	18.0	0.0	Negligible

R02	13.9	13.9	0.0	Negligible
R03	15.2	15.2	0.0	Negligible
R04	14.8	14.8	0.0	Negligible
R05	14.2	14.2	0.0	Negligible
R06	14.8	14.8	0.0	Negligible
R07	13.7	13.7	0.0	Negligible
R08	13.4	13.4	0.0	Negligible
R09	15.7	15.7	0.0	Negligible
R10	14.1	14.1	0.0	Negligible
R11	13.5	13.5	0.0	Negligible
R12	13.5	13.5	0.0	Negligible
R13	13.5	13.5	0.0	Negligible
R14	14.1	14.1	0.0	Negligible
R15	14.9	15.0	0.0	Negligible
R16	14.2	14.2	0.0	Negligible
R17	15.3	15.4	0.0	Negligible
R18	15.5	15.5	0.0	Negligible
R19	13.7	13.7	0.0	Negligible
R20	13.8	13.8	0.0	Negligible
R21	14.1	14.1	0.0	Negligible
R22	14.2	14.2	0.0	Negligible
R23	13.7	13.7	0.0	Negligible
R24	15.1	15.1	0.0	Negligible
R25	15.5	15.5	0.0	Negligible
R26	14.4	14.4	0.0	Negligible
R27	14.2	14.2	0.0	Negligible
R28	15.1	15.1	0.0	Negligible
R29	17.4	17.5	0.0	Negligible
R30	15.4	15.5	0.0	Negligible
R31	14.5	14.5	0.0	Negligible
R32	15.2	15.2	0.0	Negligible
R33	15.6	15.7	0.0	Negligible
R34	16.6	16.7	0.0	Negligible
R35	15.3	15.3	0.0	Negligible
R36	15.5	15.5	0.0	Negligible
R37	16.9	16.9	0.0	Negligible
R38	15.6	15.6	0.0	Negligible
R39	15.5	15.5	0.0	Negligible
R40	17.4	17.5	0.0	Negligible
R41	17.3	17.3	0.0	Negligible
R42	15.5	15.5	0.0	Negligible
R43	15.7	15.7	0.0	Negligible

R44	14.6	14.6	0.0	Negligible
R45	14.8	14.9	0.0	Negligible
R46	14.8	14.8	0.0	Negligible
R47	16.0	16.1	0.0	Negligible
R48	16.3	16.4	0.0	Negligible
R49	16.3	16.4	0.0	Negligible
R50	17.1	17.1	0.0	Negligible
R51	17.6	17.6	0.0	Negligible
R52	16.7	16.7	0.0	Negligible
R53	17.7	17.7	0.0	Negligible
R54	15.4	15.4	0.0	Negligible
R55	17.7	17.7	0.0	Negligible
R56	17.7	17.7	0.0	Negligible
R57	17.6	17.6	0.0	Negligible
R58	17.2	17.2	0.0	Negligible
R59	15.6	15.7	0.1	Negligible
R60	14.8	14.8	0.0	Negligible
R61	14.2	14.3	0.0	Negligible
R62	14.9	14.9	0.0	Negligible
R63	14.2	14.3	0.0	Negligible
R64	14.1	14.1	0.0	Negligible
R65	14.7	14.8	0.0	Negligible
R66	16.8	16.8	0.0	Negligible
R67	17.1	17.1	0.0	Negligible

7.6.16 The results indicate that annual mean PM_{10} concentrations at all modelled receptor locations are below the NAQO. The predicted EPUK impact is Negligible at all modelled receptor locations. As such, no significant effects are predicted.

Table 7.21: 2023 $PM_{2.5}$ Assessment Results

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change	EPUK Impact
R01	12.7	12.7	0.0	Negligible
R02	10.2	10.2	0.0	Negligible
R03	11.0	11.0	0.0	Negligible
R04	10.6	10.7	0.0	Negligible
R05	10.4	10.5	0.0	Negligible
R06	10.6	10.7	0.0	Negligible
R07	10.1	10.1	0.0	Negligible
R08	9.8	9.8	0.0	Negligible
R09	11.5	11.5	0.0	Negligible

R10	10.0	10.0	0.0	Negligible
R11	9.9	9.9	0.0	Negligible
R12	9.9	9.9	0.0	Negligible
R13	9.8	9.9	0.0	Negligible
R14	10.0	10.0	0.0	Negligible
R15	10.9	10.9	0.0	Negligible
R16	10.7	10.7	0.0	Negligible
R17	11.2	11.2	0.0	Negligible
R18	11.3	11.3	0.0	Negligible
R19	10.0	10.0	0.0	Negligible
R20	10.0	10.0	0.0	Negligible
R21	10.1	10.1	0.0	Negligible
R22	10.5	10.5	0.0	Negligible
R23	10.2	10.2	0.0	Negligible
R24	10.9	10.9	0.0	Negligible
R25	11.3	11.3	0.0	Negligible
R26	10.4	10.4	0.0	Negligible
R27	10.5	10.5	0.0	Negligible
R28	11.5	11.5	0.0	Negligible
R29	12.4	12.4	0.0	Negligible
R30	11.2	11.2	0.0	Negligible
R31	10.8	10.8	0.0	Negligible
R32	11.1	11.1	0.0	Negligible
R33	11.4	11.4	0.0	Negligible
R34	12.2	12.2	0.0	Negligible
R35	11.5	11.5	0.0	Negligible
R36	11.8	11.8	0.0	Negligible
R37	12.1	12.1	0.0	Negligible
R38	11.9	11.9	0.0	Negligible
R39	11.7	11.7	0.0	Negligible
R40	12.5	12.5	0.0	Negligible
R41	12.5	12.5	0.0	Negligible
R42	11.5	11.5	0.0	Negligible
R43	11.6	11.6	0.0	Negligible
R44	11.2	11.2	0.0	Negligible
R45	11.1	11.1	0.0	Negligible
R46	11.0	11.0	0.0	Negligible
R47	11.5	11.5	0.0	Negligible
R48	11.5	11.5	0.0	Negligible
R49	11.7	11.7	0.0	Negligible
R50	12.4	12.4	0.0	Negligible
R51	12.4	12.5	0.0	Negligible

R52	11.9	12.0	0.0	Negligible
R53	12.6	12.6	0.0	Negligible
R54	11.2	11.2	0.0	Negligible
R55	12.7	12.8	0.0	Negligible
R56	12.7	12.8	0.0	Negligible
R57	12.7	12.7	0.0	Negligible
R58	12.4	12.4	0.0	Negligible
R59	11.2	11.3	0.0	Negligible
R60	10.8	10.8	0.0	Negligible
R61	10.2	10.2	0.0	Negligible
R62	11.0	11.0	0.0	Negligible
R63	10.1	10.1	0.0	Negligible
R64	10.5	10.5	0.0	Negligible
R65	10.9	10.9	0.0	Negligible
R66	12.0	12.0	0.0	Negligible
R67	12.1	12.1	0.0	Negligible

7.6.17 The results indicate that annual mean $PM_{2.5}$ concentrations at all modelled receptor locations are below the NAQO. The predicted EPUK impact is Negligible at all modelled receptor locations. As such, no significant effects are predicted.

Ecological Receptors

7.6.18 Concentrations of NOx have been modelled both without and with the OPA Phase 1 in the 2023 assessment year. The results are shown in Table 7.22 below. Where the NOx NAQO of 30 µg/m^3 is exceeded then further investigation of impacts is required.

Table 7.22: 2023 NOx Assessment Results at Ecological Receptors

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change (ug/m^3)	NOx NAQO 30 µg/m^3 Exceeded	Change greater than 0.4 ug/m^3	Effect
E01	25.5	25.8	0.3	No	No	Not Significant
E02	**43.0**	**43.3**	0.3	**Yes**	No	Not Significant
E03	10.6	10.7	0.1	No	No	Not Significant
E04	17.8	17.9	0.1	No	No	Not Significant
E05	18.8	18.8	0.1	No	No	Not Significant
E06	14.0	14.1	0.1	No	No	Not Significant

7.6.19 Table 7.22 shows that the predicted NOx concentration at all modelled ecological receptor locations are below 30 µg/m^3, except E02 where the both the with and without development scenarios predict NOx concentrations above the NAQO. The change, however, is less than the

criteria of 0.4 µg/m^3, therefore the impact is not significant. No further assessment is therefore required and predicted effects are Not Significant.

The Wider OPA

Construction Impacts and Effects

7.6.20 The construction phase of the proposed development will involve a number of activities that will produce polluting emissions to air. Predominantly, these will be emissions of dust.

7.6.21 The IAQM's guidance states that, from experience of assessing exhaust emissions from site traffic, it is unlikely that any significant adverse effects on local air quality would be caused and in the vast majority of cases, quantitative assessment is not needed. As such, short term effects of construction traffic emissions have not been assessed.

Demolition

7.6.22 Victoria Farmhouse is to be demolished as part of the Wider OPA. The total volume of these buildings has been estimated to be within the IAQM's threshold range of less than 20,000m^3, indicating a potential dust emission magnitude of 'Small'.

Earthworks

7.6.23 The total area of the site is above the IAQM's 'Large' threshold of 10,000m^2. There are likely to be more than 10 heavy moving vehicles active at any one time.

Construction

7.6.24 The total volume of buildings to be erected is estimated to fall above the IAQM's 'Large' threshold of 100,000m^3.

Trackout

7.6.25 Due to the size of the site, the unpaved road network is likely to be greater than 100m in length. In addition, the number of site vehicles is unlikely to exceed the IAQM's 'Medium' threshold of 10-50 HDV (>3.5t) outward movements. Accordingly, the potential dust emission magnitude during Trackout is considered to be 'Medium'.

Sensitivity of Area

7.6.26 The prevailing wind direction for the closest regionally representative meteorological measurement station to the application site, at Southampton Airport is shown in Appendix 7.3. The wind rose shows that the prevailing winds are from the south-west. As such, receptors

downwind (i.e. north, east/north-east) of the site are more sensitive to dust impacts than those located upwind.

7.6.27 The main areas of human sensitivity are to the north west, north, north-east and east (downwind). Based on the IAQM guidance residential dwellings are considered as high sensitivity receptors in relation to both dust soiling and health effects of PM_{10}. Indicative examples of medium sensitivity receptors include places of work, such as offices.

7.6.28 There are over 10 high-sensitivity receptors within 20m of the site boundary. According to IAQM guidance, where there are more than 10 high sensitivity receptors within 20m, the overall sensitivity of the surrounding area to nuisance dust soiling effects during Demolition, Earthworks and Construction is defined as 'High'.

7.6.29 With regard to Trackout, the sensitivity is assessed where receptors are located within 50m from Trackout routes up to 500m from the site. As there are more than 10 high-sensitivity receptors within 50m of the Trackout route, the sensitivity to dust soiling impacts from Trackout is defined as ‘High’.

7.6.30 UK-AIR predictions show that annual mean concentrations of PM_{10} are well below 32 µg/m^3 in the vicinity of the site (the concentration at which exceedance of the 24-hour NAQO is likely), and are not likely to exceed 24 µg/m^3. According to IAQM guidance, where PM_{10} concentrations are <24 µg/m^3 and there are fewer than 100 high sensitivity receptors within 20m of the site boundary, the overall sensitivity of the surrounding area to human health impacts is defined as ‘Low’ for all stages.

Risk of Impacts

7.6.31 Using the methodology prescribed in the IAQM guidance, the overall risk of impacts can be defined by combining the sensitivity of the area with the potential dust emission magnitude of each stage of the construction phase as described above.

7.6.32 Table 2.23 provides a summary of the construction dust risk assessment. Overall, the development is considered to be High Risk for nuisance dust soiling effects, Low Risk for PM_{10} health effects and to be Low Risk for ecological impacts, in the absence of mitigation.

Table 2.23: Risk of adverse impacts during construction phase

Construction Activity	Risk of Impacts		
	Nuisance Dust Soiling	Human Health	Ecological
Demolition	Negligible	Negligible	Negligible
Earthworks	High	Low	Low
Construction	High	Low	Low
Trackout	Medium	Low	Low

Occupation Impacts and Effects

Human Receptors

7.6.33 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been modelled both without and with the Wider OPA in the 2030 assessment year. The results are shown in Tables 7.24, 7.25 and 7.26 below. The tables also report the impact in line with IAQM guidance. Impacts of Slight Adverse or below are not considered significant.

Table 7.24: 2030 NO_2 Assessment Results

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change	EPUK Impact
R01	15.3	15.5	0.2	Negligible
R02	16.4	16.7	0.4	Negligible
R03	25.9	26.8	0.9	Negligible
R04	16.0	16.3	0.3	Negligible
R05	14.2	14.3	0.1	Negligible
R06	16.0	16.3	0.3	Negligible
R07	13.9	14.0	0.2	Negligible
R08	13.4	13.5	0.1	Negligible
R09	18.8	19.2	0.4	Negligible
R10	13.1	13.6	0.5	Negligible
R11	12.9	13.1	0.2	Negligible
R12	12.9	13.1	0.3	Negligible
R13	12.8	13.0	0.2	Negligible
R14	12.9	13.1	0.2	Negligible
R15	21.2	21.5	0.3	Negligible
R16	18.2	18.4	0.2	Negligible

R17	14.7	14.9	0.1	Negligible
R18	14.3	14.7	0.4	Negligible
R19	13.8	14.0	0.2	Negligible
R20	13.7	13.9	0.2	Negligible
R21	14.0	14.1	0.1	Negligible
R22	18.3	18.9	0.6	Negligible
R23	13.3	13.4	0.1	Negligible
R24	14.6	14.8	0.2	Negligible
R25	14.3	14.7	0.4	Negligible
R26	13.0	13.2	0.2	Negligible
R27	13.9	14.0	0.1	Negligible
R28	19.0	19.4	0.4	Negligible
R29	21.1	21.3	0.2	Negligible
R30	14.2	14.4	0.2	Negligible
R31	14.8	15.0	0.1	Negligible
R32	14.3	14.5	0.3	Negligible
R33	14.7	15.0	0.3	Negligible
R34	14.7	14.9	0.1	Negligible
R35	13.5	13.5	0.0	Negligible
R36	14.5	14.5	0.1	Negligible
R37	14.9	15.0	0.1	Negligible
R38	14.6	14.6	0.1	Negligible
R39	14.2	14.2	0.1	Negligible
R40	13.9	14.0	0.1	Negligible
R41	15.5	15.6	0.1	Negligible
R42	13.8	13.8	0.0	Negligible
R43	14.1	14.1	0.0	Negligible
R44	17.4	17.7	0.3	Negligible
R45	16.3	17.0	0.7	Negligible
R46	16.9	17.7	0.9	Negligible
R47	13.1	13.3	0.2	Negligible
R48	13.2	13.4	0.2	Negligible
R49	15.9	16.3	0.4	Negligible
R50	15.3	15.4	0.1	Negligible
R51	15.3	15.5	0.2	Negligible
R52	18.9	19.3	0.4	Negligible
R53	14.1	14.2	0.1	Negligible
R54	18.8	19.9	1.1	Negligible
R55	14.3	14.5	0.2	Negligible
R56	14.3	14.5	0.2	Negligible
R57	14.3	14.4	0.1	Negligible
R58	15.3	15.4	0.1	Negligible

R59	14.2	14.6	0.5	Negligible
R60	19.1	19.3	0.3	Negligible
R61	13.3	13.6	0.3	Negligible
R62	21.7	21.9	0.2	Negligible
R63	13.2	13.5	0.3	Negligible
R64	13.6	13.6	0.1	Negligible
R65	13.9	14.3	0.4	Negligible
R66	20.0	20.2	0.2	Negligible
R67	15.1	15.2	0.1	Negligible

7.6.34 The results indicate that annual mean NO_2 concentrations at all modelled receptor locations are below the NAQO. The predicted EPUK impact is Negligible at all modelled receptor locations. As such, no significant effects are predicted.

Table 7.25: 2030 PM_{10} Assessment Results

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change	EPUK Impact
R01	17.8	17.9	0.2	Negligible
R02	13.6	13.7	0.1	Negligible
R03	15.1	15.3	0.2	Negligible
R04	14.5	14.7	0.1	Negligible
R05	13.9	14.0	0.1	Negligible
R06	14.5	14.7	0.1	Negligible
R07	13.5	13.6	0.1	Negligible
R08	13.2	13.3	0.1	Negligible
R09	15.5	15.6	0.1	Negligible
R10	13.8	14.1	0.3	Negligible
R11	13.2	13.3	0.1	Negligible
R12	13.2	13.5	0.2	Negligible
R13	13.2	13.4	0.2	Negligible
R14	13.8	14.0	0.2	Negligible
R15	14.7	14.8	0.1	Negligible
R16	13.9	14.0	0.1	Negligible
R17	15.2	15.3	0.1	Negligible
R18	15.1	15.4	0.3	Negligible
R19	13.5	13.6	0.1	Negligible
R20	13.6	13.7	0.2	Negligible
R21	13.9	14.0	0.1	Negligible
R22	13.9	14.0	0.1	Negligible
R23	13.4	13.5	0.1	Negligible
R24	14.7	14.9	0.2	Negligible

R25	15.0	15.4	0.3	Negligible
R26	14.1	14.2	0.1	Negligible
R27	13.8	13.9	0.1	Negligible
R28	14.9	15.0	0.1	Negligible
R29	17.2	17.2	0.0	Negligible
R30	15.2	15.4	0.1	Negligible
R31	14.2	14.3	0.1	Negligible
R32	15.0	15.2	0.2	Negligible
R33	15.4	15.6	0.2	Negligible
R34	16.4	16.6	0.1	Negligible
R35	15.0	15.0	0.0	Negligible
R36	15.3	15.3	0.0	Negligible
R37	16.7	16.8	0.1	Negligible
R38	15.4	15.4	0.0	Negligible
R39	15.2	15.3	0.0	Negligible
R40	17.2	17.3	0.1	Negligible
R41	17.1	17.1	0.0	Negligible
R42	15.2	15.3	0.0	Negligible
R43	15.5	15.5	0.0	Negligible
R44	14.4	14.5	0.1	Negligible
R45	14.6	14.8	0.2	Negligible
R46	14.5	14.7	0.2	Negligible
R47	15.7	15.9	0.1	Negligible
R48	16.1	16.2	0.2	Negligible
R49	16.0	16.2	0.2	Negligible
R50	16.9	16.9	0.0	Negligible
R51	17.4	17.5	0.1	Negligible
R52	16.4	16.5	0.1	Negligible
R53	17.4	17.5	0.1	Negligible
R54	15.0	15.3	0.3	Negligible
R55	17.4	17.5	0.1	Negligible
R56	17.4	17.5	0.1	Negligible
R57	17.3	17.4	0.1	Negligible
R58	16.9	17.0	0.0	Negligible
R59	15.2	15.7	0.5	Negligible
R60	14.5	14.6	0.1	Negligible
R61	14.0	14.2	0.2	Negligible
R62	14.6	14.7	0.1	Negligible
R63	14.0	14.2	0.2	Negligible
R64	13.8	13.8	0.0	Negligible
R65	14.3	14.6	0.3	Negligible
R66	16.5	16.6	0.1	Negligible

R67	16.8	16.8	0.0	Negligible

7.6.35 The results indicate that annual mean PM_{10} concentrations at all modelled receptor locations are below the NAQO. The predicted EPUK impact is Negligible at all modelled receptor locations. As such, no significant effects are predicted.

Table 7.26: 2030 $PM_{2.5}$ Assessment Results

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change	EPUK Impact
R01	11.8	11.9	0.1	Negligible
R02	9.4	9.5	0.1	Negligible
R03	10.3	10.4	0.1	Negligible
R04	9.9	9.9	0.1	Negligible
R05	9.7	9.7	0.1	Negligible
R06	9.9	9.9	0.1	Negligible
R07	9.3	9.4	0.1	Negligible
R08	9.1	9.1	0.1	Negligible
R09	10.7	10.8	0.1	Negligible
R10	9.2	9.4	0.2	Negligible
R11	9.1	9.2	0.1	Negligible
R12	9.1	9.2	0.1	Negligible
R13	9.0	9.1	0.1	Negligible
R14	9.2	9.3	0.1	Negligible
R15	10.1	10.2	0.1	Negligible
R16	9.9	9.9	0.0	Negligible
R17	10.4	10.5	0.1	Negligible
R18	10.4	10.6	0.2	Negligible
R19	9.3	9.4	0.1	Negligible
R20	9.2	9.3	0.1	Negligible
R21	9.4	9.4	0.1	Negligible
R22	9.7	9.8	0.1	Negligible
R23	9.3	9.4	0.1	Negligible
R24	10.1	10.2	0.1	Negligible
R25	10.4	10.6	0.2	Negligible
R26	9.6	9.7	0.1	Negligible
R27	9.7	9.8	0.1	Negligible
R28	10.7	10.8	0.1	Negligible
R29	11.5	11.5	0.0	Negligible
R30	10.4	10.5	0.1	Negligible
R31	10.0	10.1	0.1	Negligible
R32	10.3	10.5	0.1	Negligible

R33	10.6	10.7	0.1	Negligible
R34	11.4	11.5	0.1	Negligible
R35	10.7	10.7	0.0	Negligible
R36	11.0	11.1	0.0	Negligible
R37	11.3	11.3	0.0	Negligible
R38	11.1	11.1	0.0	Negligible
R39	10.9	10.9	0.0	Negligible
R40	11.6	11.6	0.1	Negligible
R41	11.7	11.7	0.0	Negligible
R42	10.7	10.7	0.0	Negligible
R43	10.8	10.9	0.0	Negligible
R44	10.4	10.5	0.1	Negligible
R45	10.3	10.4	0.1	Negligible
R46	10.2	10.3	0.1	Negligible
R47	10.6	10.8	0.1	Negligible
R48	10.6	10.7	0.1	Negligible
R49	10.9	11.0	0.1	Negligible
R50	11.6	11.6	0.1	Negligible
R51	11.6	11.7	0.1	Negligible
R52	11.1	11.2	0.1	Negligible
R53	11.8	11.8	0.1	Negligible
R54	10.3	10.5	0.2	Negligible
R55	11.9	12.0	0.1	Negligible
R56	11.9	12.0	0.1	Negligible
R57	11.8	11.9	0.1	Negligible
R58	11.6	11.6	0.0	Negligible
R59	10.3	10.6	0.3	Negligible
R60	10.0	10.1	0.1	Negligible
R61	9.4	9.6	0.2	Negligible
R62	10.2	10.2	0.0	Negligible
R63	9.3	9.4	0.2	Negligible
R64	9.7	9.8	0.0	Negligible
R65	10.0	10.2	0.2	Negligible
R66	11.1	11.2	0.0	Negligible
R67	11.3	11.3	0.0	Negligible

7.6.36 The results indicate that annual mean $PM_{2.5}$ concentrations at all modelled receptor locations are below the NAQO. The predicted EPUK impact is Negligible at all modelled receptor locations. As such, no significant effects are predicted.

Ecological Receptors

7.6.37 Concentrations of NOx have been modelled both without and with the Wider OPA in the 2030 and assessment year. The results are shown in Table 7.27 below. Where the NOx NAQO of 30 µg/m^3 is exceeded then further investigation of impacts is required.

Table 7.27: 2030 NOx Assessment Results at Ecological Receptors

Receptor Number	Without development concentration (ug/m^3)	With development concentration (ug/m^3)	Change (ug/m^3)	NOx NAQO 30 µg/m^3 Exceeded	Change greater than 0.4 ug/m^3	Effect
E01	16.7	17.7	1.0	No	No	Not Significant
E02	26.4	27.4	1.0	No	No	Not Significant
E03	9.2	9.5	0.3	No	No	Not Significant
E04	13.2	13.5	0.2	No	No	Not Significant
E05	13.8	14.1	0.3	No	No	Not Significant
E06	10.8	11.0	0.2	No	No	Not Significant

7.6.38 Table 7.27 shows that the predicted NOx concentration at all modelled ecological receptor locations are below 30 µg/m^3. No further assessment is therefore required and predicted effects are Not Significant.

7.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

OPA Phase1

Construction

7.7.1 The qualitative construction dust risk assessment shows that the site is High Risk for adverse impacts during construction, as a worst-case, in the absence of mitigation.

7.7.2 To effectively reduce the risk of impacts to negligible, appropriate mitigation measures should be adopted. The Greater London Authority provides guidance for mitigation measures which is considered to be best-practice for the UK. Appropriate measures that could be included in the construction of the proposed development include:

- ideally cutting, grinding and sawing should not be conducted on-site and pre-fabricated material and modules should be brought in where possible;
- where such work must take place, water suppression should be used to reduce the amount of dust generated;
- skips, chutes and conveyors should be completely covered and, if necessary, enclosed to ensure that dust does not escape;

- any excess material should be reused or recycled on-site;
- developers should produce a waste or recycling plan;
- following earthworks, exposed areas and soil stockpiles should be re-vegetated to stabilise surfaces, or otherwise covered with hessian or mulches;
- stockpiles should be stored in enclosed or bunded containers or silos and kept damp where necessary;
- hard surfaces should be used for haul routes where possible;
- haul routes should be swept/washed regularly;
- vehicle wheels should be washed on leaving the site;
- all vehicles carrying dusty materials should be securely covered; and
- delivery areas, stockpiles and particularly dusty items of construction plant should be kept as far away from neighbouring properties as possible.

7.7.3 In addition to the above, the IAQM's highly recommended mitigation measures for Medium risk sites is provided at Appendix 7.4.

Occupation

7.7.4 The assessment concluded that the operation of the Proposed Development will not result in any significant effects as the overall impacts will be Negligible, therefore no additional mitigation is required.

Wider OPA

Construction

7.7.5 The qualitative construction dust risk assessment shows that the site is High Risk for adverse impacts during construction, as a worst-case, in the absence of mitigation.

7.7.6 To effectively reduce the risk of impacts to negligible, appropriate mitigation measures should be adopted. The Greater London Authority provides guidance for mitigation measures which is considered to be best-practice for the UK. Appropriate measures that could be included in the construction of the proposed development include:

- ideally cutting, grinding and sawing should not be conducted on-site and pre-fabricated material and modules should be brought in where possible;
- where such work must take place, water suppression should be used to reduce the amount of dust generated;
- skips, chutes and conveyors should be completely covered and, if necessary, enclosed to ensure that dust does not escape;

- any excess material should be reused or recycled on-site;
- developers should produce a waste or recycling plan;
- following earthworks, exposed areas and soil stockpiles should be re-vegetated to stabilise surfaces, or otherwise covered with hessian or mulches;
- stockpiles should be stored in enclosed or bunded containers or silos and kept damp where necessary;
- hard surfaces should be used for haul routes where possible;
- haul routes should be swept/washed regularly;
- vehicle wheels should be washed on leaving the site;
- all vehicles carrying dusty materials should be securely covered; and
- delivery areas, stockpiles and particularly dusty items of construction plant should be kept as far away from neighbouring properties as possible.

7.7.7 In addition to the above, the IAQM's highly recommended mitigation measures for Medium risk sites is provided at Appendix 7.4.

Occupation

7.7.8 The assessment concluded that the operation of the Proposed Development will not result in any significant effects as the overall impacts will be Negligible, therefore no additional mitigation is required.

7.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

Construction

7.8.1 Implementation of the recommended mitigation measures during the construction phase will reduce any medium impacts to negligible and the residual effects will be Not Significant.

Occupation

7.8.2 The overall impact is predicted to be negligible and Not Significant, therefore, the residual effects continue to be Not Significant.

7.9 CUMULATIVE EFFECTS

7.9.1 The traffic data utilised in the assessment has included committed developments and therefore has been considered in the air quality assessment. The traffic data has used existing data submitted as part of the sites extant planning permission for the Baseline 2020 + Committed Development data. Additional committed development traffic includes Pembers Hill Farm

(O/15/77190), Land North West of Boorley Green (P/15/75953), Land West of Woodhouse Lane (O/18/83634) and Land North of Winchester Street (O/18/83698).

7.10 IMPACT OF CLIMATE CHANGE

7.10.1 The UK CP18 Climate Change projections indicate that during the summer season, mean air temperatures will increase, average precipitation rates will decrease and average wind speeds with decrease, resulting in dryer and warmer summers. Such changes are likely to result in higher dust levels during construction due to dryer and warmer weather thus producing more dust. This could indicate that construction dust risk impacts could be higher than outlined in the assessment.

7.10.2 The climate projections indicate that during the winter season, the mean air temperature will increase, the average precipitation rate will increase and average wind speeds are likely to stay roughly the same, resulting in warmer and wetter winters. This could result in higher dust levels due to warmer weather, however, an increased precipitation rate will also result in higher suppression of suspended dust.

7.10.3 It is not anticipated that any additional mitigation is required as a result of climate change for either OPA Phase 1 or the Wider OPA. The construction phases take place during the shorter-term climate changes and the highest level of mitigation has been recommended in line with IAQM guidance. Any unlikely increased impacts as a result of climate change will be adequately mitigated.

7.10.4 Impacts from the climate change projections during the operational phase are more difficult to determine. Warmer and dryer summers could result in reduced vehicle use; however, warmer and wetter winters could result in an increased use in vehicle use.

7.10.5 It is not anticipated that any mitigation is required as a result of climate change. The modelled concentrations for both the OPA Phase 1 and the Wider OPA predict negligible impacts well below the relevant NAQOs, and it is unlikely that any climate change impacts would result in a change to these impacts.

7.11 ASSESSMENT SUMMARY

7.11.1 Table 7.28 and Table 7.29 summarises the construction effects and occupational effects both before and after mitigation to give the residual impact of the OPA Phase 1 and the Wider OPA respectively.

OPA Phase 1

Table 7.28: Air Quality Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
Demolition Activities	High	Temporary	Negligible	Not Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Earthworks Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Construction Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Track out Activities	High	Temporary	Low	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Operation Effects							
Additional Road Traffic	High	Permanent	Negligible	Not Significant	None	Negligible	Not Significant
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
Construction Effects	There is the potential for dust impacts from other nearby construction sites during overlapping construction phases.				Mitigation included within the CEMP will reduce dust impacts from the site and thus the cumulative impacts		Not Significant.
Operational Effects	The impact of road traffic effects from committed development within the area. This is included within the modelled traffic data and presented in the results.				Not required		Not Significant
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**
Construction	Potential for increased dust impacts due to dryer and warmer weather				Not required		Not Significant
Operational Impacts	Climate change unlikely to change impacts of additional vehicle emissions				Not required		Not Significant

Wider OPA

Table 7.29: Air Quality Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
Demolition Activities	High	Temporary	Negligible	Not Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Earthworks Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Construction Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Track out Activities	High	Temporary	Low	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Operation Effects							
Additional Road Traffic	High	Permanent	Negligible	Not Significant	None	Negligible	Not Significant
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
Construction Effects	There is the potential for dust impacts from other nearby construction sites during overlapping construction phases.				Mitigation included within the CEMP will reduce dust impacts from the site and thus the cumulative impacts		Not Significant.
Operational Effects	The impact of road traffic effects from committed development within the area. This is included within the modelled traffic data and presented in the results.				Not required		Not Significant
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**
Construction	Potential for increased dust impacts due to dryer and warmer weather				Not required		Not Significant
Operational Impacts	Climate change unlikely to change impacts of additional vehicle emissions				Not required		Not Significant

Table 7.30: Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Construction Measures in CEMP	Contractor	Planning Condition		Construction Phase

CHAPTER 8: TRANSPORT AND ACCESS

8.1 INTRODUCTION

8.1.1 This chapter of the ES has been produced by Paul Basham Associates on behalf of One Horton Heath and assesses the impact of the likely changes in traffic patterns arising from the proposed development both during construction and operation.

8.1.2 To confirm, this chapter reviews both the wider OPA and OPA Phase 1.

8.1.3 The chapter describes the assessment method; the baseline conditions at the Application Site and surroundings, the future baseline with committed development the likely significant environmental effects; the mitigation measures required to prevent, reduce or off-set any significant adverse effects; and the likely residual effects after these measures have been implemented.

8.1.4 Transport Assessments (TA) have been produced as separate documents for the wider OPA and OPA Phase 1. The scope and structure of each TA has been informed by discussions with officers at the Local Highway Authority, Hampshire County Council (HCC), and the Local Planning Authority, EBC. The TAs have also been prepared in accordance with national, regional and local planning policy including the National Planning Policy Framework (NPPF), HCC's Local Transport Plan 3 and EBC's Adopted and Emerging Local Plans.

8.1.5 The TAs have been used as source material which primarily identify the two proposed developments' compliance with national, regional and local transport planning policy regarding accessibility by non-car modes and the destinations and purpose of journeys. The TA also identifies measures proposed to mitigate the two developments impact and a strategy to improve accessibility for all transport modes, particularly for alternatives to the car such as walking, cycling and public transport. In addition, a Framework Travel Plan (FTP) has been prepared to support the Wider OPA and a Travel Plan has been produced to support the OPA Phase 1. Both the FTP and TP set out measures that would be introduced to encourage sustainable travel patterns and reduce the reliance on single occupancy vehicle trips.

8.1.6 The TAs do not fully assess the environmental impacts of the road traffic generated by the proposed development. This requires assessment against different criteria and traffic data has been provided to the relevant consultants; particularly noise quality and air quality specialists to determine such impacts.

8.1.7 It is important to note that the Application Site subject to both the Wider OPA and OPA Phase 1 planning applications have extant consents which included considerations with regards to traffic impacts and accessibility, some of which (e.g. accessibility) would not change as a result of the revised proposals.

8.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessment

8.2.1 The Application Site has been subject to four previous planning applications, two of which required Environmental Statement. This includes 'Chalcroft Farm and Land West of Horton Heath' which secured extant consent under application reference X/19/86475. The second application at 'Fir Tree Farm and Victoria Farm House' secured extant consent under application reference X/19/86303.

8.2.2 This Environmental Statement chapter has therefore followed that submitted previously and found acceptable.

Scoping Opinion

8.2.1 The extent of the study area has been scope with HCC Highways and EBC. A formal Scoping Opinion was issued in August 2020 and this ES chapter therefore reflects the necessary transport and traffic comments.

8.2.2 The majority of the study area reflects that agreed with HCC Highways through the pre-application scoping exercise and thus reflects the study area included within the associated Transport Assessments.

8.2.3 At the time of writing, the additional areas of assessment associated with this ES that are not included with the associated TAs include the impact of the M27 Junctions 5 and 8 and impact on Hedge End Railway Station and Eastleigh Railway Station.

8.2.4 The key routes included in the study area are summarised below:

- West Horton Heath to Eastleigh Corridor
- West Horton to Fair Oak/Colden Common Corridor
- West Horton Heath towards Hedge End Corridor
- Southampton, Hedge End and West Corridor

8.2.5 To support the OPA Phase 1 planning application, the TA reflects a smaller study area based on the smaller scale of development and location of proposed access points. This is detailed within the associated Transport Assessment.

Legislative Context

8.2.6 The process of Environmental Impact Assessment is governed by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1]. These regulations apply the WU directive 'On the assessment of the effects of certain public and private projects on the Environment' (usually referred to as the Environmental Impact Assessment Directive) required to be considered within the Town Planning System in England. In terms of transport and highways impacts there are no specific pieces of legislation.

Planning Policy and Guidance

8.2.7 This section of the report considered the transport related national and local policy under which the site will be assessed.

National Planning Policy

8.2.8 The revised National Planning Policy Framework (NPPF) [2] (adopted February 2019) acts as the central guidance for development planning, replacing all national planning policy guidance. The following NPPF paragraphs are relevant to Transport and Access.

8.2.9 Paragraph 102 states that "transport issues should be considered from the earliest stages of plan-making and development proposals", so that:

a) The potential impacts of development on transport networks can be addressed;

b) Opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised;

c) Opportunities to promote walking, cycling and public transport use are identified and pursued;

[1] Town and Country Planning (Environmental Impact Assessment) regulations 2017 as amended

[2] National Planning Policy Framework, Ministry of Housing, Communities and Local Government, 2019

d) The environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account- including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and

e) Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.

8.2.10 Paragraph 103 identifies that "Significant development should be focused on locations which are or can be made sustainable, through limiting the needs to travel and offering a genuine choice of transport modes. This can help reduce congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."

8.2.11 Paragraph 108 sets out the three transport 'tests' which need to be addressed when considering sites that may be allocated for development in plans. It should be ensured that:

a) Appropriate opportunities to promote sustainable transport modes can be- or have been- taken up, given the type of development and its location;

b) Safe and suitable access to the site can be achieved for all users; and

c) Any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

8.2.12 Paragraph 109 identifies that "Development should only be prevented or refused on highways grounds if there was an unacceptable impact on highway safety, or residual cumulative impacts on the road network would be severe".

8.2.13 Paragraph 111 states "All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impact of the proposal can be assessed".

8.2.14 Therefore, development should provide opportunities for sustainable travel; achieve safe access; and should only be prevented where highway safety or residual cumulative impacts on the road network are considered severe.

Local Planning Policy

Current Planning Policy

Hampshire County Council's Local Transport Plan (2011-2031) [3]

8.2.15 LTP3 sets out HCC's transport strategy and identifies a range of policy objectives based on the three guiding principles of "developing and supporting stronger communities, maximising wellbeing and enhancing quality of place". The most relevant policy objectives to this TA are summarised as:

- Continue to work and improve road safety through targeted measures that deliver a reduction in casualties and reduce the impact of traffic on community life and promote considerate driver behaviour;
- Work with district authorities to agree coherent policy approaches to parking; and
- Invest in sustainable transport measures, including walking and cycling infrastructure.

Eastleigh Borough Council Local Plan 2001-2011[4].

8.2.16 The current Local Plan was adopted in May 2006 with Chapter 6 focussing on Transport and Accessibility. The adopted Local Plan identifies the following objectives, relevant to transport and highways which are in partnership with HCC:

- To reduce the need to travel, especially by car
- To reduce the number of accidents on our roads, particularly those involving vulnerable road users
- To encourage further provision and use of public transport, including the improvement of existing services and facilities
- To ensure the location of new development is in places which are or can become widely accessible by means of transport other than the car

[3] Hampshire Local Transport Plan 2011-2031, 2013

[4] Eastleigh Borough Local Plan Review (2001-2011), 2006

- To improve provision for cycling and walking
- To give priority to provision for the needs of pedestrians, cyclists and public transport users
- To meet the targets of the Road Traffic Reduction Act 1997
- To encourage where appropriate the transfer of freight from road to rail

8.2.17 Policy 100.T states 'Development which accords with other relevant policies of this Plan will be permitted provided it meets all the following criteria:

i. It is, or could be well served by public transport, cycling and walking

ii. It includes measures that minimise its impacts on the existing transport network

iii. That where a large number of journeys are likely to be generated, the development is located to minimize travel demand and provide a choice of transport mode, and

iv. That where appropriate, a Transport Assessment in accordance with the thresholds set out in Table B of the Hampshire Parking Strategy and Standards is included with the proposals.'

8.2.18 Policy 102.T states 'Development requiring new or improved access will be permitted provided it does not:

i. Interfere with the safety, function and standard of service of the road network, or

ii. Have adverse environmental implications and is to the adopted standard of the highway authority

Emerging Planning Policy

Eastleigh Borough Council Emerging Local Plan 2016-2036[5]

[5] Eastleigh Borough Council Emerging Local Plan 2016-3026, 2018

8.2.19 EBC's Draft Local Plan (2011-2029) was submitted for formal examination in July 2014, however, following hearings, the Planning Inspector concluded that the plan was not sound because it did not provide sufficient housing. A revised Local Plan (2016-2036) was submitted to the Secretary of State in October 2018 with Hearings undertaken in January 2020 and the Inspector's Post Hearings advice made publicly available in April 2020. This advice outlined the need for some main modifications. At present (November 2020) the EBC Emerging Local Plan (2016-2036) remains unadopted. However, as this is emerging policy this still carries some weight and therefore has been considered in the completion of this Transport Assessment.

8.2.20 EBC's Emerging Local Plan identifies several objectives which relate to highways and transport which include:

- Tackling congestion – Tackle local traffic congestion and associated pollution by reducing car usage and improving transport infrastructure;
- Developing green infrastructure – Provide green links to and between local facilities and open space and a linked habitat network to safeguard wildlife and natural resources;
- Encouraging a sustainable community – Ensure future development contributes to the Borough's sustainability and resilience through effective low carbon and water efficient planning and design

8.2.21 Several strategic policies reference the proposed development site, including Strategic policy S3, Location of new housing which identified 'West of Horton Heath' for 950 dwellings and 'Land at Fir Tree Farm, Fair Oak' for 450 dwellings. Strategic policy S4, Employment provision also identifies land associated with this planning application under 'further employment development adjoining Chalcroft Business Park, subject to the provision of a new link road between the distribution park and Bubb Lane'. Strategic policy SA12, Transport infrastructure references 'a new link road linking Burnetts Lane and Bubb Lane serving the Chalcroft Business Park and new development west of Horton Heath'. Policy DM24, Housing sites, and Mixed-Use sites including housing with Planning Permission also makes reference to the extant permissions at Land West of Horton Heath and Land at Fir Tree Farm.

8.2.22 Policy DM13, General development criteria – transport confirms that 'all new development must have safe and convenient access to the highway network and make provision for access to, and by, other transport modes including public transport and cycle and pedestrian routes as appropriate'. The policy also confirms that 'all new development will be assessed to

establish whether it should contribute to off-site improvements to transport infrastructure in accordance with Hampshire County Council's Transport Contributions Policy, to the extent that these are necessitated by the development and proportionate to the scale of development. Development proposed that will generate vehicle movements likely to have an adverse impact on traffic conditions beyond the immediate vicinity of the site must be subject to Transport Assessment'.

8.2.23 Policy S13 of the Emerging Local Plan 'Strategic footpath, cycleway and bridleway link's references a number of new and strategic footpath/cycleway and bridleway routes which EBC are looking to secure. Those which would operate close to the site includes iv. 'Eastleigh to Botley via Bishopstoke, Horton Heath and Hedge End' and v 'Eastleigh to Hedge End parallel to the railway line. The policy states that the routes would accord with the appropriate design and construction standards to enable adoption by the highway authority. The policy also states that 'new developments should integrate with existing routes and wherever possible maintain, protect and enhance their function'. The masterplan has thus been designed to add not sever, obstruct or have a detrimental impact on the existing or proposed network.

8.2.24 The Emerging Local Plan also identifies numerous site allocations which cover the land associated with this planning application. Policy FO6 Foxholes Farm 'is allocated for development to include approximately 45 dwellings' with the following specific requirements:

ii. The provision of vehicular access from Fir Tree Lane

iii. The provision of contributions to, or delivery of, off-site highway improvements considered necessary to serve the development

iv. The provision of pedestrian and cycle links both within the site and to connect the site with the surrounding area and development permitted in adjacent sites, including the provision of access to the adjacent public open space adjacent to the east of the site

8.2.25 Paragraph 6.1.46 of the Emerging Local Plan states 'The West Horton Heath/Fir Tree Lane development sites have committed to deliver the following capacity upgrades at this location:

- Signalisation of the Allington Lane junction;
- Provision of an additional lane on Allington Lane on the northbound approach to the junction (giving dedicated left hand and right hand turn lanes)
- Widening between Allington Lane and Sandy Lane to two lanes in each direction (constituting of an ahead lane and a right turn filter lane)

- A right hand turn filter lane on Sandy Lane southbound arm; and
- Addition of two lanes on Fair Oak Road eastbound to enable dedicated lanes for each traffic movement (left and right turns and ahead).'

8.2.26 Paragraph 6.1.49 also states 'there is a commitment by the West of Horton Heath development to improve capacity at [Botley Road/Eastleigh Road Junction] by widening the northern (Winchester Road) arm to provide two southbound lanes.

8.2.27 Policy WE1 'Chalcroft Business Park' is identified as 'proposals for the alteration, extension, change of use or redevelopment of existing land and buildings within the Chalcroft Business Park for class B1b, B1c, B2 and B8 uses' and will be permitted if all the following criteria are met:

- 'A new road is built as shown on the policies map to serve the Chalcroft Business Park and the new development west of Horton Heath'

8.2.28 Policy WE2 'Land adjoining Chalcroft Business Park' is identified as 'a site of approximately 1.6 hectares between the Chalcroft Business Park and Burnetts Lane' and is allocated for employment development in use classes B1(b), B1(c) and B8 provided that:

- A new road is built as shown on the policies map to serve the Chalcroft Business Park and the new development west of Horton Heath'
- The site is served by a shared access within the rest of the Chalcroft Business Park

8.2.29 Paragraph 6.5.56 references the proposed link road through the site and states 'as part of the West of Horton Heath development, there is a commitment by developers to deliver a new road linking Burnetts Lane and Bubb Lane, serving the Chalcroft Business Park and new development west of Horton Heath'

8.2.30 More specific to transport policy are Policy 91.T Transport Schemes, Policy 100.T Transport and New Development and Policy 102.T New accesses which replicate the policies in the current adopted Local Plan.

Eastleigh Borough Transport Assessment

8.2.31 The Eastleigh Borough Transport Assessment provide the transport strategy for the Borough with a package of sustainable measures to improve accessibility and modal choice.

Guidance/ Best Practice

Manual for Streets

8.2.32 Manual for Streets[6] was adopted in March 2007 by the Department for Transport and replaced Design Bulletin 32 and Places for Streets and Movement. Manual for Streets has a focus on residential, lightly trafficked streets, but many of the key principles can be applicable to other types of streets and it is the responsibility of the user to ensure its application is appropriate. The manual provides guidance about the design, construction, adoption and maintenance of new and existing residential streets.

Manual for Streets 2

8.2.33 'Manual for Streets 2 – wider application of the principles' (September 2010)[7] acts as a companion guide to 'Manual for Streets' and extends its practices beyond just residential streets to cover urban and rural situations increasing its applicability. Manual for Streets 2 provides more background and scenarios which are applicable to transport planning and fill the gap in some design guidance, in particular the gap between Manual for Streets and Design Manual for Roads and Bridges (DMRB).

Baseline Data Collection

8.2.34 The following information and data have been collected to assist with the transport assessment and review traffic patterns associated with the Proposed Development:

- Census statistics relating to journey to work, mode and car ownership;
- Traffic flow distribution diagrams from the two previous outline planning consents;
- Trip rates approved from the previous outline planning consents;
- Additional trip rates from the national TRICS database
- TEMPro Growth Factors from TEMPro Version 7.2 software

[6] Manual for Streets, Department for Transport, 2007

[7] Manual for Streets 2 – Wider application of the principles, Department for Transport, 2010

- New traffic count surveys of the surrounding road network;
- Personal Injury Accident (PIA) statistics for the local road network; and
- Eastleigh Borough Council's 'Eastleigh Strategic Transport Study'.

8.2.35 The DfT's Transport Analysis Guidance (TAG) on Data Sources and Surveys (January 2014) advice states that 'surveys should be carried out during a 'neutral' or representative, month, avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods. National experience is that the following Monday to Thursdays can be neutral: late March and April (excluding the weeks before and after Easter); May (excluding the Thursday before and all of the week of each Bank Holiday); June; September (excluding school holidays or return to school weeks); all of October, and all of November (provided adequate lighting is available).

8.2.36 To identify the existing baseline traffic flows on the local road network, 3 Automated Traffic Counters (ATCs) and 7 Manual Classified Counts (MCCs) were undertaken in November 2018. This covered the following roads and junctions

- Burnetts Lane
- Allington Lane
- Bishopstoke Road
- Maunsell Way/Tollbar Way Roundabout
- Fair Oak Road/Sandy Lane/Blackberry Drive Junction
- Botley Road/Burnetts Lane/Knowle Lane Junction
- Winchester Road/Portsmouth Road Junction
- Tollbar Way/Charles Watts Way/Turnpike Way Junction
- Telegraph Road/Botley Road/Moorgreen Road Junction
- Allington Lane/Swaythling Road/Townhill Way Junction

8.2.37 These surveys have been conducted so that a growth factor can be calculated to factor up the 2016 baseline figures utilised in the North-West Horton Heath application (planning application reference: O/16/79354). This is an approach which has been agreed in advance with

Hampshire County Council Highways as set out in an email dated 11th October 2018, including the number and location of these surveys to identify sufficient samples to generate an accurate growth factor.

8.2.38 Through the pre-application process, HCC Highways determined 7 additional junctions required a highways capacity assessment beyond those assessed as part of the extant consents. Therefore, no data existed for these junctions and therefore Manual Classified Turning Counts were completed on Tuesday 15th September 2020 at the following junctions:

- Tollbar Way/Pets at Home/M&S Roundabout
- Romsey Road (A335)/Upper Market Street Signal Junction
- Romsey Road/Leigh Road/Leigh Road Signal Junction
- Main Road (B3354)/Spring Lane/Dunsford Ride Signal Junction
- Main Road (B3354)/Highbridge Road Priority Junction
- High Street (B3335)/Hazeley Road/Finch's Lane Signal Junction
- B3335/M3 Junction 11 Signal Junction

8.2.39 The date/time of the surveys were agreed with HCC Highways before completion due to the current COVID-19 pandemic. A review of the data has also been completed to assess whether the recorded flows are comparable to the nearby links for existing data. This review confirms the data was comparable and thus suitable for the purpose of this assessment.

8.2.40 Railway station usage data has been obtained from the Office of Road and Rail's data portal for the most recent assessment year of 2018-2019. Data on the total number of entries and exits annually at both Hedge End Railway Station and Eastleigh Railway Station have been used to consider the impact of the proposed development on rail use.

Assessment Methodology

8.2.41 The assessment methodology has been informed by guidelines issued by the Institute of Environmental Management and Assessment (IEMA). These guidelines suggest that the following rules should be applied when considering the scope and extent of the environmental assessment:

- Highway links where traffic flows are predicted to increase by at least 30% should be included within the assessment (or where the number of HGVs is predicted to increase by 30%); and

- Areas that are considered to be especially sensitive to increases in traffic volumes should be included where traffic flows are predicted to increase by at least 10%.

8.2.42 These guidelines are formed on the basis that, in environmental terms, a 30% increase in traffic flow on a standard highway link is considered to be a 'significant' impact. An increase in traffic flow of less than 10% however would not be discernible to road users as background traffic flows can fluctuate by this amount on a daily basis.

8.2.43 The exception to this is where a transport link can be considered to be within a sensitive area, such as adjacent to a school, hospital, nursing home or where residential properties front onto the link and pedestrian activity is high.

8.2.44 The IEMA guidelines refer to the assessment of the Site's impact on link flows by establishing the overall 'without Site' and 'with Site' two-way flows for the links preceding the junctions' arms subject to a material increase.

8.2.45 The 'Guidelines for the Environmental Assessment of Road Traffic' suggested that assessment should be carried out for the 'scope in' areas regarding the following effects:

- Severance: Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. In general terms according to the IEA Guidelines a 30% change in traffic flow is likely to produce a 'slight' change in severance, with 'moderate' and 'substantial' changes occurring at 60% and 90% respectively.

- Driver Delay: the delay to drivers generally occurs at junctions where opposing vehicle manoeuvres are undertaken with vehicles having to give or receive priority depending upon the type of junction arrangement.

- Pedestrian Delay: The delay incurred by pedestrians is generally a direct consequence of their ability to cross roads.

- Pedestrian Amenity: The term pedestrian amenity is broadly defined as the relative pleasantness of a journey.

- Accidents and Safety: This establishes the effect on the road safety record of the adjoining road network.

8.2.46 The receptors of impact include all local road network users with sensitivity being classed as low to very high.

8.2.47 The above would be assessed through percentage impact assessments of increases in traffic flow as a result of the Proposed Development in the assessment area and through junction modelling assessments undertaken as part of the TA.

Air Quality and Noise

8.2.48 The air quality and noise effects of traffic generated by the proposed development are dealt within in separate chapters of the ES and these deal with where sensitive receptors are in terms of air quality and noise. Traffic forecasts for the noise and air quality assessments has been produced using the methods set out in the TA's.

Significance Criteria Terminology

8.2.49 The assessment of effect significance (beneficial or adverse) is based on the following definitions:

- Substantial – a large change compared to the natural variations in background level;
- Moderate – change which is noticeable and may be a breach of limits and standards;
- Slight – change which when compared to background levels is only just noticeable. Limits and standards will not be breached;
- Negligible – minor change to baseline environment that is not perceptible; and
- No impact – no change to baseline environment.

8.2.50 The assessment of significance is based on the criteria set out in the EIA guidelines and/or the judgement and expertise of the assessor.

<u>Geographical Scope</u>

8.2.51 The scope of the assessment involves the key highway junctions and links within approximately a 5km radius of the Application Site, although it should be noted that the scope is based on route assignment and trip generation rather than purely on proximity and will include sensitive areas where the increase in traffic volumes is at least 10%. In particular, the

following junctions (as included within the previous Transport Assessments) are assessed as part of the Wider OPA:

- Fir Tree Lane/Allington Lane junction
- Allington Lane/Fair Oak Road/Eastleigh Road junction
- Sandy Lane/Blackberry Drive/Fair Oak Road
- Bishopstoke Road/Chicken Hall Lane mini-roundabout
- Bishopstoke Road/Twyford Road roundabout
- Fir Tree Lane/Burnetts Lane junction
- Burnetts Lane/Botley Road/Knowle Lane signalised junction
- Botley Road/Eastleigh Road/Stubbington Way signalised junction
- Botley Road/Winchester Road/Mortimers Lane signalised junction
- Winchester Road/Sandy Lane priority junction
- Winchester Road/Portsmouth Road (Fishers Pond)
- Winchester Road/Church Lane/Wessex Way junction
- Botley Road/Snakemoor Lane/Winchester Road/Bubb Lane roundabout
- Bubb Lane/Tollbar Way junction
- Tollbar Way/Maunsell Way roundabout
- Allington Lane/Swaythling Road/Townhill Way roundabout
- Allington Lane/Upmill Close/Oak Vale roundabout
- Moorgreen Road/High Street/Telegraph Way double mini-roundabouts
- Botley Road/Tollbar Way roundabout
- Charles Watts Way/Tollbar Way/Turnpike Way roundabout
- M27 Junction 7

8.2.52 Since the ES Scoping Report, 7 additional junctions have been included to the scope of assessment which includes:

- Tollbar Way/Pets at Home/M&S Roundabout

- Romsey Road (A335)/Upper Market Street Signal Junction
- Romsey Road/Leigh Road/Leigh Road Signal Junction
- Main Road (B3354)/Spring Lane/Dunsford Ride Signal Junction
- Main Road (B3354)/Highbridge Road Priority Junction
- High Street (B3335)/Hazeley Road/Finch's Lane Signal Junction
- B3335/M3 Junction 11 Signal Junction

8.2.53 In addition, the three proposed site access roundabouts are included within the scope of assessment.

8.2.54 The geographical scope of assessment is reduced as part of the OPA Phase 1 TA as agreed with HCC and thus covers:

- Allington Lane/Fair Oak Road Priority Junction
- Fair Oak Road/Sandy Lane/Blackberry Drive Signal Junction
- Bubb Lane/Bubb Lane/Tollbar Way Priority Junction
- Tollbar Way/Maunsell Way Roundabout
- Botley Road/Tollbar Way/Bradbeers Roundabout
- Winchester Road/Sandy Lane Priority Junction
- Winchester Road/Portsmouth Road (Fishers Pond) Signal Junction
- Winchester Road/Church Lane/Wessex Way Roundabout

8.2.55 In addition, the three proposed site access roundabouts are included within the scope of assessment for the OPA Phase 1.

8.2.56 At the time of writing this ES, no comments have been provided by Highways England with respect to additional junctions and links requiring assessment above those identified below. It is considered that the impact of the Wider OPA and OPA Phase 1 on Junction 5 on the M27 in particular would be low, with vehicles wishing to access Southampton or Eastleigh using other routes already such as Allington Lane, Moorgreen Road, Charles Watts Way for Southampton and Allington Lane and the B3037 to access Eastleigh. It is proposed 52 AM (0800-0900) trips would travel towards Junction 5 and 76 from Junction 5. In the PM (1700-1800) peak it is proposed 83 vehicle trips would travel towards Junction 5 and 50 from Junction 5. Of the

movements travelling towards Junction 5, it is considered a moderate number may exit at Junction 5, but most would continue on the M27 past Junction 5.

8.2.57 For movements travelling east, it is currently envisaged 175 AM trips enter the M27 at Junction 7 and 125 exit and in the PM 153 vehicle trips enter and 167 exit the M27 east. Similar to Junction 5, there are a variety of other routes accessing the locations which Junction 8 serves including Bursledon, Hamble and Swanwick. Whilst some vehicles wishing to travel eastbound may utilise Junctions 8, this is considered to be a small number and instead all have been attributed to the M27 Junction 7 and therefore covers a robust assessment. There are also a variety of likely destinations to the east of the Proposed Development including Whiteley, Fareham and Portsmouth and therefore it is not considered significant volumes of traffic would travel onto the M27 Junction 8.

Temporal Scope

8.2.58 The assessment work considers the year of application (2020) a future year of 2030 (10 years post submission) and 2036 (end of Local Plan period) to support the Wider OPA and 2020 and 2030 only to support the OPA Phase 1 given the smaller scale of development and likely construction/occupation timeframes.

Assumptions & Limitations

8.2.59 It is acknowledged that there may be slight changes in the design of the proposed masterplans and/or off-site mitigation measures identified after permission is granted. However, it should be noted that this ES presents the results of the environmental assessment of the proposed designs and measures at the time of writing. If there are any fundamental changes it may be necessary to revisit the assessment presented by this ES and to submit a revised planning application – although no significant changes are envisaged.

8.2.60 The environmental effects that are reported in this ES, and the level of mitigation described effectively set the minimum standard which should be achieved by the final masterplans and the off-site mitigation identified.

8.3 CONSULTATION

8.3.1 The scope and structure of the ES, TAs, FTP and TP have been discussed and agreed with HCC and EBC. In addition, transport and highway matters have been raised and discussed in various additional forums including;

- Various meetings/consultations with HCC EBC, HCC Countryside Services, Stagecoach, Xelabus and Sustrans

- Public Consultations held in September 2020 and November 2020, with a total of 8 1-hour sessions

- Meetings with the Burnetts Lane Neighbourhood Focus Group

8.4 BASELINE ENVIRONMENT

8.4.1 The Wider OPA Site is located to the west of Horton Heath, northwest of Hedge End and south of Fair Oak. All three local settlements provide Horton Heath with a range of local amenities with pedestrian and cycle networks present on some connections towards these locations to encourage the use of sustainable transport and help create a sustainable development. A summary of the existing local facilities in the vicinity of the Wider OPA Site which may form key desire lines to/from the site are identified in Table 6.1, with the approximate distance to such facilities identified and measured from the centre of the site (using existing walking routes). Distances will therefore vary depending on where the user's origin/destination is on the site.

Table 8.1: Summary of Local Facilities (Wider OPA)

Local Facilities	Approximate Distances
Primary School (Fair Oak Infants and Fair Oak Junior Schools)	1.5km
Secondary School (Wyvern Technology College)	1.5km
Pharmacy (Fair Oak Village Pharmacy)	2.1km
Dentist Surgery (Thurlow Dental)	0.8km
Doctors Surgery (Stokewood Surgery)	2.3km
Convenience Store (Horton Heath Service Station)	0.96km
Horton Heath Community Centre	1.3km
Public House (Brigadier Gerard)	1.6km
Lapstone Playing Fields	1.6km
Fair Oak Village Centre	2km
Convenience Store (Tesco Esso Express)	2km
Hedge End Train Station	4.3km
Hedge End Retail Park	5.3km
Eastleigh Town Centre	5.6km
Itchen Valley Country Park	4.6km

8.4.2 It is important to note that the Wider OPA scheme proposes a mixed-use development and therefore several key amenities would be provided on site to benefit proposed site users and also existing residents of nearby settlements.

8.4.3 The OPA Phase 1 is located in the south eastern section of the Wider OPA Site and therefore the distances referenced above may differ slightly which is fully detailed in the associated TA however for ease of reference the distances associated with the OPA Phase 1 scheme are provided in Table 8.2

Table 8.2: Summary of Local Facilities (OPA Phase 1)

Local Facilities	Approximate Distances
Primary School (Fair Oak Infants and Fair Oak Junior Schools)	2.4km**
Secondary School (Wyvern Technology College)	2.5km**
Pharmacy (Fair Oak Village Pharmacy)	3.2km**
Dentist Surgery (Thurlow Dental)	1.8km**
Doctors Surgery (Stokewood Surgery)	3.0km***
Convenience Store (Horton Heath Service Station)	2.3km*
Horton Heath Community Centre	2.0km*
Public House (Brigadier Gerard)	1.8km*
Lapstone Playing Fields	2.3km**
Fair Oak Village Centre	3.0km**
Convenience Store (Tesco Esso Express)	3.0km**
Hedge End Train Station	2.8km*
Hedge End Retail Park	2.8km*
Eastleigh Town Centre	6.2km***

*Via Link Road and Bubb Lane

**Via Local Footpaths and Burnetts Lane

***Via Link Road and Fair Oak Road

Public Transport

8.4.4 The local area is currently served by Bluestar and Xelabus bus routes with bus stops located on Burnetts Lane and Botley Road to the east and on Fair Oak Road (B3037) to the north. A summary of the bus services in the local area surrounding the development site are summarised in Table 8.3.

Table 8.3: Summary of Local Bus Services

Service	Bus Stop Location	Operator	Route	Approximate Frequency		
				M-F	Sat	Sun
X10*	Burnetts Lane	Xelabus	Bishops Waltham-West End-Southampton	Hourly	Every 2 Hours	No Service
2 Bluestar	Botley Road	Bluestar	Southampton-Eastleigh-Fair Oak	Every 15 mins	Every 15 mins	Every 20 mins
3 Bluestar	Botley Road	Bluestar	Southampton-Hedge End-Eastleigh	Hourly	Hourly	Hourly
X9/X9A	Botley Road	Bluestar	Bishops Waltham-Hedge End-Eastleigh	Hourly	Every 2 Hours	No Service
X15	Botley Road	Xelabus	Hamble-Netley-Hedge End-Eastleigh	2 a day	No Service	No Service
X17	Fair Oak Road	Xelabus	Eastleigh-Bishops Waltham-Petersfield	4 a day Tues & Thurs	No Service	No Service

8.4.5 Table 8.3 highlights the array of local bus services surrounding the Wider OPA Site and the OPA Phase 1 Site and the opportunities for sustainable travel to key destinations including Eastleigh Town Centre and Southampton City Centre.

8.4.6 In addition to bus travel, the Wider OPA Site and OPA Phase 1 Site are well located to support rail travel with Hedge End Railway Station located circa 4.3km to the south east of the Wider OPA Site and Eastleigh Railway Station located 5.2km to the northwest of the Wier OPA site. To access Hedge End Railway Station the existing route via Bubb Lane, Tollbar Way and Maunsell Way may be used or alternatively an improved route via a local footpath which runs to the south of the railway may be used (discussed in Chapter 10 of the OPA TA). In addition, it is possible to the use the Bluestar 2 and Bluestar 3 bus routes to access Eastleigh Railway Station or the XelaBus X9 to access Hedge End Railway Station.

8.4.7 Hedge End Railway Station is supported by 54 secure and sheltered cycle spaces as well as 96 car parking spaces, CCTV, customer help points and a payphone. Destinations from Hedge End Railway Station include Portsmouth Harbour (43-minute journey) and London Waterloo (94-minute journey) with intermediate stops including Fareham (12-minute journey), Winchester (18-minute journey), Basingstoke (37-minute journey) and Woking (1-hour journey). Currently there is one service an hour towards London Waterloo and one an hour towards Portsmouth Harbour).

8.4.8 Eastleigh Railway Station is equipped with 130 secured and sheltered bicycle parking spaces, a 133 space car park, a manned ticket office Monday-Sunday, customer help points, toilets, payphones, step free access coverage and ramp for train access. Eastleigh Railway Station is supported by more services than Hedge End Railway Station and therefore provides access to more destinations including London Waterloo (90-minute journey), Romsey (13-minute journey), Salisbury (55-minute journey), Portsmouth Harbour (50-minute journey).

8.4.9 The Transport Assessment associated with the Wider OPA details a Sustainable Transport Strategy, which includes Public Transport and the measures proposed to encourage users of the development to travel by rail and bus. Such measures include designing the link road and distributor roads to accommodate buses, securing a bus service through the site and improving the walking/cycling route towards Hedge End Railway Station.

Local Highway Network

8.4.10 A full review of the surrounding local highway network is provided within the associated TAs this includes an assessment of the vehicular, pedestrian and cycle amenities. A summary is provided below.

8.4.11 Burnetts Lane runs north to south through the western side of Horton Heath and culminates at the Burnetts Lane/Botley Road/Knowle Lane Signal Junction in the north and at the Burnetts Lane/Bubb Lane/Moorgreen Road Priority Junction to the south. The northern section of Burnetts Lane is subject to a 30mph speed limit and is more urban in nature, which increases to 40mph circa 75m south of the Burnetts Lane/Barley Fields Priority Junction. Controlled crossing facilities are provided at the Burnetts Lane/Botley Road/Knowle Lane Signal Junction on all arms of the junction, also supported by dropped kerbs and tactile paving.

8.4.12 Burnetts Lane changes character along its path with the northern section between the Burnetts Lane/Botley Road/Knowle Lane Signal Junction to its junction with Chapel Drove facilitated by pedestrian footways on both sides of the carriageway which both measure circa 1.8m in width. The Burnetts Lane carriageway in this section measures circa 6.5m in width. At the Chapel Drove junction the footway on the north/western side of Burnetts Lane continues behind a hedge line and exits onto Fir Tree Lane. A dropped kerb crossing point is provided across Burnetts Lane to connect two local footpath routes which would run from the proposed development into the existing Horton Heath Settlement.

8.4.13 To the south of Fir Tree Lane, a footway continues alongside the carriageway on the western side of Burnetts Lane, whilst the footway on the eastern side travels behind a substantial area of vegetation for some 75m. The footways both maintain the circa 1.8m width with the

carriageway also remaining near 6.5m. Once past the area of vegetation footways are again present on both sides of the carriageway although the eastern footway is segregated from the main carriageway by a grass verge.

8.4.14 The nature of Burnetts Lane begins to change at its junction with Meadowsweet Way where both footways divert behind vegetation and are less visible from the main carriageway. The footways cease some 30m to the north of the Burnetts Lane/Crispin Close priority junction and the carriageway width reduces to circa 5.2m.

8.4.15 To the south of Barley Fields, where Burnetts Lane becomes 40mph, Burnetts Lane is more rural in nature and is flanked by vegetation and hedgerow on both sides with no pedestrian infrastructure. The width of Burnetts Lane also decreases to some 4.5-5m. A small number of residential properties are directly accessed from this section of Burnetts Lane.

8.4.16 Allington Lane runs north to south from the Allington Lane/Fair Oak Road Priority Junction in the north to the Allington Lane/Swaythling Road (A27)/Townhill Way Roundabout in the south. Allington Lane is subject to a 40mph speed limit for the majority (except the northern 450m section which is subject to a 30mph speed limit upon approach to the urban/residential area) as well as a 6'- 6'' width restriction (except for access). Allington Lane may be used for those wishing to access Southampton to the south, Eastleigh to the north west and Fair Oak to the north east.

8.4.17 Allington Lane also has limited pedestrian infrastructure with footway/cycleways present at the northern and southern extents only. A circa 1.8-2.0m wide footway currently exists on the eastern side of Allington Lane which extends from the Allington Lane/Fair Oak Road Priority Junction to the access of the Linden Homes development 'Limewood Grange'. Following recent planning consents the footway is extending south to support the Bargate Homes development 'Archers Wood' with proposals for this to extend further south again to connect with the roundabout access onto Allington Lane as part of the One Horton Heath development. An uncontrolled crossing point is provided on Allington Lane circa 30m south of Dean Road which is supported by dropped kerbs, tactile paving, build outs and bollards to connect with Bishopstoke Footpath 744 to the west. A pedestrian refuge island equipped with dropped kerbs and tactile paving is also provided at the Allington Lane/Fair Oak Priority Junction.

8.4.18 Fir Tree Lane is a narrow primarily rural lane which runs through the development site east to west. At the eastern end Fir Tree culminates at the Fir Tree Lane/Burnetts Lane Priority Junction and to the west ceases at the Fir Tree Lane/Allington Lane Priority Junction.

8.4.19 For the first 90m in the eastern section Fir Tree Lane adopts a Manual for Streets nature with 1.8m wide footways along both sides of the main carriageway which measures circa 4.1m wide which serves access to the two residential areas of Fir Tree Close and Angelica Gardens. This section of Fir Tree Lane is subject to a 30mph speed limit. To the west of Angelica Gardens/Fir Tree Close there are no pedestrian facilities present on Fir Tree Lane and the carriageway width narrows to varying widths.

8.4.20 To the west of Angelica Gardens, Fir Tree Lane does not operate with easy two-way working and instead informal passing places are present along the route in the form of overrun areas. The road width varies between 3.0m-5.5m and is signposted as 'Single track road with passing places' and is also subject to a 6'-6'' width restriction (except for access). The western section of Fir Tree Lane is also subject to the national speed limit.

8.4.21 The B3354 is a long distance road which begins in Botley to the south and ends at the Main Road (B3354)/Highbridge Road Priority Junction in the north. Botley Road, Winchester Road and Main Road are all sections of the B3354 which run in close proximity of the site are likely to be used by development traffic travelling south towards Hedge End, Botley or Whiteley or north towards Fair Oak, Colden Common, Twyford or the M3.

8.4.22 The B3354 Botley Road runs through the centre of the existing Horton Heath settlement. This section is largely supported by footways on at least one side of the carriageway with a speed limit between 30-40mph. Where Botley Road passes through more developed and urbanised areas footways are present on both sides of the footway and is subject to a 30mph limit. A signalised pedestrian crossing is provided circa 20m to the north of Wyvern College and all arms of the Botley Road/Eastleigh Road/Stubbington Way Signal Junction are provided with controlled crossing points.

8.4.23 The north, the B3354 continues as Winchester Road through Fair Oak up to the Winchester Road/Portsmouth Road (Fishers Pond) Signal Junction. Through Fair Oak Winchester Road is supported by footways on both sides of the carriageway which decreases to one side at the junction with Mortimers Lane. The majority of Winchester Road is subject to a 30mph limit which increases to 40m, 770m south of the junction with Portsmouth Road (Fishers pond).

8.4.24 To the north of Fishers Pond the B3354 continues north as Main Road through Colden Common and up to the Main Road (B3354)/Highbridge Road Priority Junction where the B3354 ends. Main Road is supported by a footway on at least one side of the carriageway for its entirety. The speed limit of Main Road varies from 30mph through Colden Common and up to 50mph at the northern extent.

8.4.25 The B3335 begins at the Main Road (B3354)/Highbridge Road Priority Junction and travels north towards the M3. The southern section is subject to a 50mph speed limit, with a footway on at least one side of the carriageway. Upon the approach into Twyford the speed limit reduces to 30mph and footways become present on both sides of the carriageway (although some areas do have constrained widths). Upon exiting Twyford where the B3335 becomes Cox's Hill the speed limit increases to 40mph and a footway remains present on at least one side of the carriageway. Some 100m to the north of New Barn Farm the speed limit increases to national which continues up to the junction with the M3 motorway junction.

8.4.26 The B3037 runs east to west from the Botley Road/Eastleigh Road/Stubbington Way Signal Junction to the Bishopstoke Road/Romsey Road (A335)/Twyford Road roundabout and connects Fair Oak and Eastleigh. The B3037 is therefore likely to be used by vehicles wishing to travel towards Eastleigh or Fair Oak.

8.4.27 To the east of Allington Lane, Eastleigh Road is supported by footways on both side of the carriageway and a wide carriageway width of circa 7.2m. To the north of Fratton Way, the footway along the southern side of Eastleigh Road becomes a footway/cycleway. Eastleigh Road is subject to a 30mph speed limit and serves a residential area.

8.4.28 To the west of Allington Lane, Fair Oak Road continues with the footway/cycleway present on the southern side which then moves over to the north side at Stokewood Close. The width of Fair Oak Road remains similar to other areas of the B3037 at around 7m with a 30mph speed limit. The footway/cycleway continues along the northern side of Alan Drayton Way again with similar, relatively wide, road widths, although Alan Drayton Way is subject to a 40mph speed limit.

8.4.29 An on-road cycle lane on the southern side of the B3037 begins at the Co-Op and begins on the northern side at the junction with Manor Farm Close and both cease circa 50m west of the B3037/Riverside Priority Junction. A footway/cycleway is again provided at the Eastleigh Rugby and Football Club on the southern side of the carriageway which continues on the southern side of the carriageway and into Eastleigh.

8.4.30 Sections of the pedestrian and cycle infrastructure along the B3037 are separated from the main carriageway by a grass verge and there are a number of dropped kerb tactile paving and signalised crossing points to facilitate movements north to south.

8.4.31 The A335 also runs east to west from the Bishopstoke Road/Romsey Road (A335)/Twyford Road roundabout to the Leigh Road (A335)/Bournemouth Road (B3043) Signal Junction. In close proximity of the site, the A335 is likely to be used to access Eastleigh Town Centre and

Junction 13 of the M3. The A335 is urban in nature with footways present on at least one side of the carriageway whilst the carriageway widths remain relatively wide circa 8m to accommodate the various junctions along the route including at signal junctions where two lanes are required.

8.4.32 Bubb Lane runs northeast to south west and connects with infrastructure which leads into West End in the east, Hedge End in the south and Horton Heath to the north. The majority of Bubb Lane is subject to a 50mph speed limit with a circa 3m wide footway/cycleway along the eastern side of the carriageway with a main carriageway width around 7m.

8.4.33 At the Bubb Lane/Bubb Lane/Tollbar Way Priority Junction Bubb Lane continues west past Wessex Vale Crematorium and ends at the Burnetts Lane/Bubb Lane/Moorgreen Road Priority Junction. This section of Bubb Lane is more rural in nature with no footways present and instead the carriageway is flanked by vegetation. National speed limit restrictions are also in place for this section of Bubb Lane and the carriageway reduces in width to some 5.8m.

8.4.34 Tollbar Way connects to Bubb Lane in the north, travels through the centre of the Hedge End Retail Park area at ends at the Charles Watts Way/Tollbar Way/Turnpike Way Roundabout. Between the Bubb/Bubb Lane/Tollbar Way Priority Junction and Botley Road/Tollbar Way/Bradbeers Roundabout Tollbar Way is single lane with large carriageway widths and a footway/cycleway on the eastern side of the carriageway. To the south of the Bradbeers roundabout Tollbar Way has two lanes in both directions to accommodate the flow of traffic and therefore becomes more strategic in nature. Tollbar Way is subject to a 40mph speed limit for its entirety.

8.4.35 Charles Watts Way acts as a strategic link across the M27 (and Junction 7) connecting Hedge End in the east with Southampton to the west. To the east of the M27 Junction 7 Charles Watts Way has two lanes of traffic in each direction and an additional flare lane into part of the Hedge End Retail Park. This section of Charles Watts Way which is subject to a 40mph speed limit.

8.4.36 To the east of the M27 Junction 7 Charles Watts Way has a single lane of traffic for each direction and again does not have any pedestrian or cycle facilities which reflects the strategic nature of this route. This section of Charles Watts Way is subject to the national speed limit and has a carriageway width around 8m.

8.4.37 In addition to the local roads, the proposed development is also well located to access the SRN with the M27 motorway located to the south of the development and the M3 motorway located to the north west. The M27 runs between Cadnam in the west and Portsmouth in the

east with primary destinations along the route including Southampton, Fareham, Whiteley and Portsmouth. To access the M27, most site users would utilise Junction 7 at Hedge End, although a small proportion who travel east may connect onto the M27 at Junction 8 (Bursledon) by travelling through the south east of Hedge End.

8.4.38 The M3 motorway runs north east to south west from Sunbury-on-Thames in Surrey to Eastleigh in Hampshire with key destinations along the route including Basingstoke, Winchester and Aldershot. For those wishing to access the M3, vehicles could join via Junction 13 at Eastleigh or via Junction 11 in Twyford at the Hockley Link.

Public Rights of Way

8.4.39 In addition to the on-road pedestrian network, the Wider OPA Site is also well located to use local Public Rights of Way (PROW) routes which run through the Wider OPA Site and connects the Wider OPA Site with off-site pedestrian infrastructure. A map demonstrating the PROW routes which run through the Wider OPA site and connect with the site is demonstrated within Figure 8.1.

8.4.40 As shown in Figure 8.1, West End Footpath 3 runs east to west in the northern edge of the OPA Phase 1 Site connecting the OPA Phase 1 Site with off-site pedestrian infrastructure and the wider connection of PROW routes running through the Wider OPA Site.

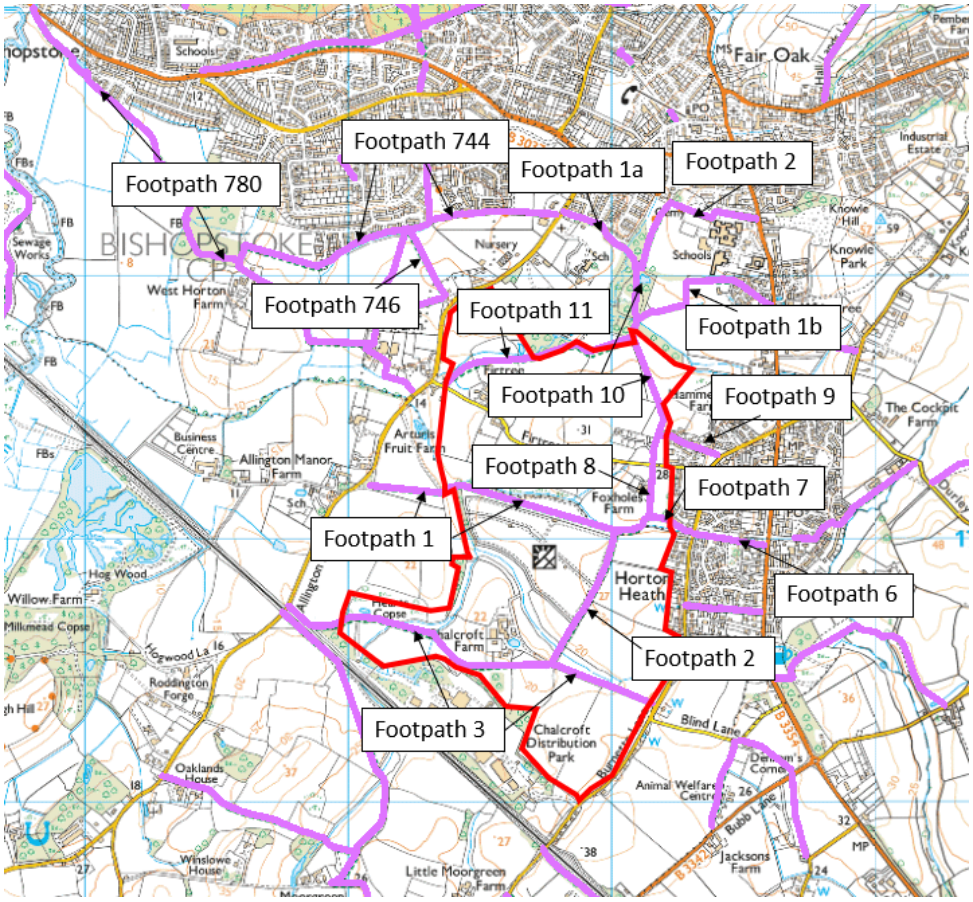


Figure 8.1: Local PROW Routes

8.4.41 It is evident the Wider OPA Site and the OPA Phase 1 Site are well connected to the existing PROW network which facilitate access to the key destinations. The Wider OPA TA provides details regarding the Sustainable Transport Strategy and potential upgrades and off-site highway contributions proposed.

8.4.42 In addition to the PROW and on-road routes, there is also an existing local footpath (not a formally registered PROW) which runs to the south of the railway line between Bubb Lane and connects to the southern end of Hedge End Footpath 6b via Hedge End Train Station. This route is currently of an unbound surface but offers a reasonably wide route for the majority which is well overlooked and lit in places. This route may be used to access the train station or new secondary school.

Traffic Flows

8.4.43 The majority of baseline traffic data has been obtained from the site's extant consents, in particular the North West Horton Heath Transport Assessment and baseline data from 2016.

8.4.44 Traffic flow data was collected for 7 additional junctions in 2020 to support the wider study area agreed as part of the pre-application process with HCC Highways. These junctions are reference in paragraph 8.5.21.

8.4.45 The baseline 2016 data has then been used to form a base assessment year of 2020 for the Transport Assessments. The Baseline 2016 data has been growthed to 2020 using an agreed TEMPro growth factor for the Eastleigh area.

8.4.46 To support the air quality and noise assessments AADT data was also taken from the site's extant consents. Appropriate growth factors have again been applied to factor the data to the correct baseline positions.

Personal Injury Accident Data

8.4.47 Personal Injury Accident (PIA) data has been acquired from Hampshire Constabulary to assess and consider the existing safety situation on the local road network. The scope of PIA assessment was agreed through the highway pre-application scoping exercise with HCC.

8.4.48 The patterns displayed in the data have been assessed within the TAs with regards to the proximity, frequency and severity of incidents that have occurred which may require further in-depth consideration. The PIA data has been collected for the most recent 5-year period between January 2015 and December 2019.

8.4.49 The PIA assessment for the Wider OPA considers incidents on roads and incidents at junction which has been split into the four key travel corridors:

- West Horton Heath to Eastleigh Corridor
- West Horton Heath to Fair Oak/Colden Common Corridor
- West Horton Heath towards Hedge End
- Southampton, Hedge End and West End

8.4.50 The study area for the OPA Phase 1 application is much smaller and includes the following junctions (and their associated links)

- Fir Tree Lane/Allington Lane Priority Junction
- Allington Lane/Fair Oak Road Priority Junction
- Fair Oak Road/Sandy Lane/Blackberry Drive Signal Junction

- Botley Road/Eastleigh Road/Stubbington Way Signal Junction
- Botley Road/Snakemoor Lane/Winchester Road/Bubb Lane Roundbaout
- Bubb Lane/Bubb Lane/Tollbar Way Priority Junction
- Tollbar Way/Maunsell Way Roundabout
- Botley Road/Horton Heath Service Station
- Botley Road/Blind Lane Priority Junction
- Botley Road/Tollbar Way/Bradbeers Roundabout
- Tollbar Way/Whites Way Priority Junction
- Tollbar Way/Wellington Park Roundabout

8.4.51 Additional junctions which are located between two junctions within the above list were included within the assessment, however no incidents were recorded during the study period.

8.4.52 Full details of the assessments are included within the associated TAs and have not been reproduced in this ES chapter due to the large amount of information included.

8.4.53 In summary, the five-year PIA records and assessment for both the Wider OPA and OPA Phase 1 demonstrate a relatively even distribution of incidents through time with incidents occurring across all 7-days of the weeks and at various times of the day. The majority of incidents record causation factors relating to human error as opposed to highway design.

8.4.54 Whilst some roads and junctions may appear to exhibit a high concentration of accidents this must be considered against the strategic nature of some of these routes and the volume of traffic using these corridors. At several junctions and links, the number of incidents is considered typical for busy links and junctions on major routes

8.4.55 The accidents also appear to mainly be a result of human error citing factors such as ‘failed to look properly’, ‘failed to judge path or speed’, ‘nervous/uncertain/panic’ or ‘sudden braking’ for example.

8.4.56 Of the PIA’s assessed of total of 11 incidents that occurred on road/links involved a pedal cycle whilst 8 involved pedestrians with the remaining involving a form of motor vehicle, including motorcyclist. Of the junctions assessed, a total of 42 incidents involved a pedal cycle and 19 involved pedestrians.

8.4.57 It is also important to note that no 'fatal' incidents were recorded meaning all incidents were 'slight' or 'serious' in nature.

8.4.58 Notwithstanding this, any mitigation measures, schemes or contributions which are secured through the planning applications or recommended within the TAs would also ensure that the additional traffic associated with the developments can be satisfactorily accommodated by the local highway network with the proposed site access in particular being safe to accommodate expected demand.

8.5 INHERENT DESIGN MITIGATION

Mixed Use Development

8.5.1 The Wider OPA Site is proposing a mixed-use development which includes general residential dwellings, retirement flats/care home units, commercial uses, a local centre and a 3 form entry primary entry primary school. The provision of a mixed-use development should inherently reduce the need of users of the development to travel off-site to fulfil everyday needs. Mixed use schemes assist the containment of journeys within the site, encouraging more sustainable modes of travel and modal shift

8.5.2 The mixed-use scheme would also benefit existing local residents who may have previously travelled further afield to access certain amenities which are now being proposed on site.

Bubb Lane to Burnetts Lane to Allington Lane Link Road

8.5.3 The primary means of vehicular access to the proposed development would be via the link road with a roundabout in the northwest which connects Allington Lane to the link road, a roundabout to the south east which connects the development with another section of the link road and Burnetts Lane and a roundabout at the Bubb Lane/Link Road connection.

8.5.4 The new link road will provide the following functions:

- Access to the Chalcroft Business Park
- Reduce HGV use along Burnetts Lane (particularly the southern end which is used to access the Chalcroft Business Park
- An important piece of infrastructure to help accommodate the wider development aspirations outlined in EBCs Emerging Local Plan
- Provide access to the proposed development
- Provide a new pedestrian and cycle link between Bubb Lane and Allington Lane

8.5.5 The design criteria for the new link road primarily reflects Manual for Streets, Manual for Streets 2 and HCC's A Companion Guide to Manual for Streets due to the majority of the route reflecting a 30mph design speed.

8.5.6 The Allington Lane/Link Road roundabout provide access to the north west section of the OPA and has 3 arms all of which have a two-lane approach with an Inscribed Circle Diameter (ICD) of 44m. This roundabout is also supported by a 3m wide footway/cycleway on the north eastern side which connects onto a proposed/extended footway/cycleway along Allington Lane being delivered by One Horton Heath. This connection ensures there is a continuous route along Allington Lane from the site to the north and up to Fair Oak Road.

8.5.7 The Burnetts Lane/Link Road Roundabout constitutes a 4-arm roundabout with an ICD of 50m with a two-lane approach on each arm of the roundabout. Burnetts Lane to the south of the roundabout is provided with a turning head as Burnetts Lane will no longer be a through route past Chalcroft Business Park. This roundabout provides access onto the link road to the east and west of Burnetts Lane, Burnetts Lane and an access into Chalcroft Business Park. The access into Chalcroft Business Park provides wider highway operational and safety benefits by connecting the park straight onto a new link road which negates the need to use Burnetts Lane, which in the southern section is more rural nature. Refuge island crossing points with dropped kerbs and tactile paving are provided on all arms of the junctions and measure a minimum of 2.2m wide to safely accommodate a cyclist waiting to cross. This roundabout would provide access to both the Wider OPA and OPA Phase 1 developments.

8.5.8 The roundabout would also be supported by a 3m wide footway/cycleway which flanks the northern boundary of the roundabout from the link road to the east of Burnetts Lane and onto the link road to the west of Burnetts Lane where the 3m wide footway/cycleway continues along the link road. A 2m wide footway is also provided on the southern side of the roundabout which connects into the Chalcroft Business Park and south of Burnetts Lane.

8.5.9 The Bubb Lane/Link Road Roundabout is a three-arm roundabout located to the north east of an existing electricity sub-station. The roundabout has an ICD of 40m and has two lanes on all approaches to the roundabout. Refuge island crossing points are provided on all arms of the junctions equipped with dropped kerbs and tactile paving which are a minimum of 2.0-2.4m wide/deep to sufficient accommodate a cyclist waiting to cross. This roundabout would provide access to both the Wider OPA and OPA Phase 1 developments.

8.5.10 The Bubb Lane/Link Road roundabout would be supported by a 3m wide footway/cycleway on all arms of the roundabout with the link road flanked by a 3m footway/cycleway to the north and the southwestern arm of Bubb Lane being provided with a 3m footway/cycleway which

leads to the crossing point to ensure the shortest distance is travelled for those wishing to travel south. An additional dropped kerb crossing point is provided circa 20m to the south of the roundabout.

8.5.11 The section of link road between Burnetts Lane and Bubb Lane has been designed (and approved) to adequately mitigate any noise or visual impact with neighbouring properties.

Distributor Roads

8.5.12 Two primary distributor roads are proposed to route through the Wider OPA Site. The first travels west to east and connects from the link road in the west, travels south of the existing Fir Tree Lane alignment and connects back up to Fir Tree Lane in the east. The second runs north to south, with southern section also travelling through the OPA Phase 1 development. This north to south route connects from the link road and up to local centre past the primary school. This latter route would also result in reduced traffic using Burnetts Lane travelling north/south. The routes would also be supported by strong pedestrian and cyclist infrastructure.

Fir Tree Lane

8.5.13 The Fir Tree Lane/Burnetts Lane Priority Junction would act as a secondary access route into the Wider OPA Site where improvements are proposed to upgrade the routes. The upgrades including widening the carriageway to a continuous 5.5m road width (although with a small traffic calming feature with a raised table and pinch points to discourage high vehicle speeds).

8.5.14 Circa 215m to the west of the Fir Tree Lane/Burnetts Lane Priority Junction and past the local centre it is proposed Fir Tree Lane is downgraded with vehicle rights removed to create an attractive sustainable travel corridor with a wide area for pedestrians and cyclists to travel east to west. Vehicles would still be able to travel east to west, but via the new distributor road aforementioned which would provide more appropriate geometries.

8.5.15 At the western end, the Fir Tree Lane/Allington Lane junction would remain as existing to allow existing rights of access, however this would eventually form a dead end.

Burnetts Lane

8.5.16 Traffic calming measures are proposed along the OPA Phase 1 Site boundary to encourage lower vehicle speeds and prevent this route from becoming a rat ran and discourage people from using this route and encourage more to use the link road. This should improve conditions along Burnetts Lane.

8.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

8.6.1 This section identifies the potential environmental impacts and effects of the proposed development. The impacts are assessed against a background which includes committed development.

Construction Impacts and Effects

8.6.2 The overall Wider OPA construction period is likely to take in the region of 15 years, although this is dependent on the number of sale outlets, market conditions and types of housing being built. The school and local centre would be built out as and when required to support the development and local environment although these will be a priority for EBC as developer. There is limited demolition on site which has not already taken place through the extant consents.

8.6.3 For the OPA Phase 1, the construction period is likely to take in the region of 3 years, although is again dependent on the number of sale outlets, market conditions and types of housing being built.

8.6.4 Construction working periods are expected to be 0800-1700 Monday to Friday and 0800-1300 on Saturdays with no night-time shifts. Deliveries will be made on weekdays only and the car driver mode share for staff is assumed to be 70%. This mode share assumption is robust because there is likely to be much higher car occupancy with construction worked arriving in multiple occupancy vehicles.

8.6.5 Based on the length of the link road and earthworks required, it has been estimated that the construction of the section of link road between Burnetts Lane and Allington Lane is likely to generate on average around 10 HGV and 20 workforce arrivals per day for the duration of the construction of the road. It is estimated that the link road would take around a year to construct. The section of link road between Bubb Lane and Burnetts Lane is currently under construction though the extant consents and as such has not been considered within this ES.

8.6.6 During the busiest construction phase (assumed to be 166 dwellings per year), it is predicted that there will be some 115 vehicle arrivals (100 cars/vans and 15 HGVs) per day. It is important to highlight that as working periods begin at 0800, the majority of on-site workers are likely to travel outside the AM peak period.

8.6.7 The other associated land uses are expected to be built alongside the residential construction programme. It is estimated that the other land uses will generate on average in the region of

40 vehicle arrivals (30 cars/vans and 10 HGVs) per day during the busiest period of construction. Again, workers are likely to arrive prior to 0800, to start work at 0800 and thus would travel outside the traditional morning peak travel period when traffic volumes and flows are at their highest.

8.6.8 In combination, for the Wider OPA, the construction of up to 166 dwellings a day and the other land uses, during the busiest periods the site could be expected to generate 155 vehicle arrivals, 135 of which would be in cars/vans and 25 as HGVs. Such figures are substantially lower than the total anticipated traffic generation of the Wider OPA development once fully built and occupied, effectively construction traffic associated with 166 properties per annum is less traffic than generated by 166 occupied dwellings and a lesser peak period impact.

8.6.9 The above figures represent the highest average daily construction vehicle trips across the entire construction programme. There is likely in practice to be some variation depending on the particular construction phase and activities taking place on site.

8.6.10 The IEA Guidelines for the Environmental Assessment of Road Traffic sets out that 'highway links should be assessed when traffic flows have increased by more than 30% or other sensitive areas are affected by traffic increased of at least 10%'.

8.6.11 Construction vehicle traffic would be routes where possible to travel via the Strategic Road Network (SRN) and would also utilise the new link road to gain access to the site. On this basis, the predicted increases in flow do not exceed the above thresholds and as such the demolition and construction period of the proposed development would have negligible adverse effects in terms of:

- Severance;
- Pedestrian Delay
- Pedestrian Amenity
- Accidents and Safety

8.6.12 Regarding driver delay, the construction activity period would continue whilst certain sections of the site are occupied. The residents and users of the development once occupied would also generate some travel demand and would thus place additional traffic movements on the local highway network. Therefore, there is the potential for a combined slight adverse effect, without mitigation, in terms of driver delay.

8.6.13 The construction of the Wider OPA or OPA Phase 1 developments are not expected to involve the transfer of hazardous loads to or from the Wider OPA Site or the OPA Phase 1 Site. The effect of the proposed development will therefore be negligible adverse.

8.6.14 It is likely the OPA Phase 1 average build per year may be slower than for the wider OPA. This is due to the OPA Phase 1 creating and developing bespoke house types which can then be readily applied to elsewhere on the development. There are also development aspirations associated with the Wider OPA to look at alternative construction methods which may speed up construction, such as modular housing. The estimates therefore regarding the Wider OPA are therefore higher than likely for the OPA Phase 1 application and are therefore also considered robust for the OPA Phase 1 construction impact.

Hazardous Loads

8.6.15 There should be no hazardous loads associated with either the Wider OPA or OPA Phase 1 and therefore the effect of the proposed development would be neutral.

8.6.16 The sensitivity of the receptor being local road network users ranges from low to very high with low accounting for hazardous loads and very high being against driver delay.

Occupation Impacts and Effects

Traffic Flows

8.6.17 Chapter 11 of the Wider OPA TA and Chapter 9 of the OPA Phase 1 TA outline the proposed traffic generation associated with the proposals whilst the appendices include detailed traffic flow diagrams of all the scenarios included within the assessment, including committed development traffic.

8.6.18 Table 8.4 summarises the proposed vehicular trip generation of the Wider OPA and OPA Phase 1, although it should be noted that all traffic associated with OPA Phase 1 is included within the Wider OPA assessment and would therefore not be additional to the local road network.

Table 8.4: Proposed Vehicle Trip Generation for Wider OPA and OPA Phase 1

Land Use	AM Peak (0800-0900)		PM Peak (1700-1800)	
	Arrivals	Departures	Arrivals	Departures
2,225 C3 General Residential (-7.5%)*	307	807	776	461
275 Retirement Flats/Care Home Units	19	22	15	13
9,300sqm Commercial Use (-5%)*	64	26	18	51
9,500sqm of Office Use (-5%)*	194	12	20	199
3 Form Entry Primary School	64	0	0	64
Wider OPA Total	648	867	829	788
Of which				
Up to 399 C3 General Residential	59	156	150	89
OPA Phase 1 Total	59	156	150	89

* The percentages in brackets account for the internalisation factor as included within the extant consents and re-agreed through the pre-applications

8.6.19 The pre-application scoping exercises completed with HCC Highways for both the Wider OPA and OPA Phase 1 agreed a methodology for calculating the distribution of traffic from the proposed development which follows the principles established as part of the extant consents.

8.6.20 In summary, for the residential distributions which has also been applied to the retirement flat/care home land uses, these are based on 2011 Census Journey to Work data as well as a gravity modelling exercise completed as part of the two extant planning permissions. The distributions proposed 45.3% of residential trips utilising the Allington Lane/Link Road Roundabout, 18.7% utilising the Fir Tree Lane/Burnetts Lane secondary access and 36% of traffic anticipated to use the Burnetts Lane/Link Road roundabout.

8.6.21 The commercial traffic distributions are also based on 2011 Census Journey to Work data but for inbound trips as well as the masterplan and where such areas are proposed. These distributions (as agreed) have been applied to the commercial use, office use and primary school traffic. In summary, 21.1% of trips are anticipated to use the Allington Lane/Link Road roundabout, 14.7% utilise the Fir Tree Lane/Burnetts Lane Secondary Access and 64.2% utilise the Burnetts Lane/Link Road roundabout.

8.6.22 For the OPA Phase 1, the residential distributions differ slightly to that of the Wider OPA due the Fir Tree Lane/Burnetts Lane access not being readily available for use. It is therefore proposed 45.3% of vehicles would utilise the Allington Lane/Link Road roundabout and 54.7% of vehicles utilise the Burnetts Lane/Link Road roundabout.

8.6.23 A full explanation of the agreed vehicle distributions per land use is included in Chapter 11 of the Wider OPA TA and Chapter 9 of the OPA Phase 1 TA.

Impact

8.6.24 The IEA Guidelines for the Environmental Assessment of Road Traffic sets out that 'highway links should be assessed when traffic flows have increased by more than 30% or other sensitive areas are affected by traffic increases of at least 10%.

8.6.25 Utilising data submitted as part of the extant consents and the new traffic generation data and scenarios a comparison between the 'Baseline 2030 Plus Committed Development' and 'Baseline 2030 Plus Committed Development Plus Proposed Development' and then between 'Baseline 2036 Plus Committed Development' and 'Baseline 2036 Plus Committed Development Plus Proposed Development' have been completed to understand the percentage impact. A summary of the links which experience over a 10% increase is provided in Table 8.5, with links in green representing a 10-30% increase and those in red a +30% increase.

Table 8.5: Links with 10-30% and +30% increase in traffic (Wider OPA)

2030 Comparison	2036 Comparison
Burnetts Lane	Burnetts Lane
Fir Tree Lane	Fir Tree Lane
Allington Lane	Allington Lane
Proposed Link Road	Proposed Link Road
Moorgreen Road	Moorgreen Road
Bubb Lane West	Bubb Lane West
Bubb Lane North	Bubb Lane North
Tollbar Way	Tollbar Way
Winchester Road (North of Wessex Way)	Winchester Road (North of Wessex Way)
Sandy Lane	Sandy Lane

8.6.26 The links reference in Table 8.5 have therefore been assessed against the criteria referenced in Para 8.6.11.

8.6.27 When the same assessment is completed for the OPA Phase 1 with only the Baseline 2030 scenarios (as per the agreed TA scope of assessment), the 2030 percentage impact identifies only the link road is identified as a link which would fall within the categories, and would

experience a +30% increase. No further or additional assessment is considered necessary to support the OPA Phase 1 application given the minimal impact demonstrated.

Severance

8.6.28 The IEA guidelines define severance as "the perceived division that can occur within a community when it becomes separated by a major traffic artery". The IEA Guidelines suggest that a 30%, 60% and 90% increase in traffic flow will respectively have a 'slight', 'moderate' and 'substantial' change in severance, although allowance needs to be made for the presence of crossing facilities.

8.6.29 It is therefore identified that Fir Tree Lane would have a slight adverse effect on severance without mitigation given the proposals would result in a highest percentage increase of 45.67%. The link road would in theory result in a substantial change in severance with a 100% increase, however this is based the link road only being available for use once the development starts occupying so is an expected value, but would not in practice results in a substantial effect.

8.6.30 With regards to the slight adverse effect on Fir Tree Lane it should be noted that there would be few affected parties along Fir Tree Lane given its rural nature and the limited number of properties this section of highway serves. There is also currently limited non-motorised user facilities along Fir Tree Lane, except for the eastern 100m between Burnetts Lane and Angelica Gardens/Fir Tree Close. The concept masterplan proposes downgrading the majority of Fir Tree Lane to the west of the Local Centre to provide an east to west pedestrian/cycleway, with an alternative vehicle route proposed to the south of the current alignment to still allow east to west movements. Therefore, whilst there is an increase in severance, future traffic volumes would be such that the overall level of severance is considered to be negligible adverse.

8.6.31 As confirmed, as a result of the OPA Phase 1, it is only the link road which would experience an increase in traffic flow above 30%, which is considered acceptable given the link road accompanies the applications. No further assessment associated with the OPA Phase 1 is required in regards to Severance.

Driver Delay

8.6.32 Chapter 12 of the Wider OPA TA fully details the associated highway impacts of the proposed development through capacity assessments of all junctions included within the study area whilst this is detailed within Chapter 10 of the OPA Phase 1 TA. The capacity assessment reviews junction operation under various scenarios pre and post development and provides

outputs relating to junction performance including a Ratio of Flow to Capacity (RFC) for priority junctions and roundabouts or Degree of Saturation (DoS) for signal junctions, as well as vehicle queue lengths and delay in seconds.

8.6.33 The highway capacity assessments demonstrate several existing junctions across the study area which currently experience delay during peak times within the Baseline 2020 scenario, before committed development or proposed development traffic is added to the models.

8.6.34 The below junctions have been assessed and are expected to operate within capacity in the final 'Baseline 2036 Plus Committed Development Plus Proposed Development'. Therefore no mitigation measures are required. The effect in terms of driver delay at these junctions is therefore slight adverse.

- Allington Lane/Link Road Roundabout
- Burnetts Lane/Link Road Roundabout
- Fir Tree Lane/Allington Lane Priority Junction
- Romsey Road (A335)/Upper Market Street Signal Junction
- Romsey Road/Leigh Road/Leigh Road Signal Junction
- Fir Tree Lane/Burnetts Lane Priority Junction
- Main Road (B3354)/Spring Lane/Dunsfords Ride Signal Junction
- Main Road (B3354)/Highbridge Road Priority Junction
- High Street (B3335)/Hazeley Road/Finch's Lane Signal Junction
- B3335/M3 Junction 11 Signal Junction
- Allington Lane/Upmill Close/Oak Vale Roundabout
- Tollbar Way/Pets at Home/Marks and Spencer's Roundabout

8.6.35 The Botley Road/Eastleigh Road/Stubbington Way Signal Junction is expected to be operating at or close to capacity in the 'Baseline 2036 Plus Committed Development Plus Proposed Development Scenario', and therefore the effect regarding driver delay is considered to be moderate adverse.

8.6.36 All other junctions included within the assessment have been identified as operating at or over theoretical capacity, either in the baseline years, baseline years plus committed development or baseline years plus committed development plus proposed development. The impact on driver delay at these junctions therefore range from slight adverse to substantial adverse.

8.6.37 As part of the Application Site's extant consents, a series of off-site highway works and/or contributions were secured. Circa £2.8 million has been paid upfront by EBC as developer to HCC Highways to deliver the previously agreed improvements. It is therefore considered that a substantial sum of money has also been paid and secured to mitigate the developments and impact, although further discussions may be required with HCC through the planning application process. However, in most cases the impact on driver delay should be considered slight adverse. This is detailed in full within Chapter 12 of the Wider OPA TA. A summary of the junctions where contributions have already been paid are provided below:

- Allington Lane/Fair Oak Road Priority Junction
- Fair Oak Road/Sandy Lane/Blackberry Drive Signal Junction
- Botley Road/Eastleigh Road/Stubbington Way Signal Junction
- Botley Road/Winchester Road/Mortimers Lane Priority Junction
- Winchester Road/Portsmouth Road (Fishers Pond) Signal Junction
- Botley Road/Snakemoor Lane/Winchester Road/Bubb Lane Roundabout
- Bubb Lane/Bubb Lane/Tollbar Way Priority Junction
- Tollbar Way Maunsell Way Roundabout
- Moorgreen Road/High Street/Telegraph Road Double Mini-roundabouts
- Botley Road/Tollbar Way/Bradbeers Roundabout
- Charles Watts Way/Tollbar Way/Turnpike Way Roundabout

8.6.38 In order to mitigate the impact of the development, the following junctions have been identified as requiring additional improvements (beyond the contributions already paid for):

- Bishopstoke Road/Chickenhall Lane Mini Roundabout – Contribution towards improvements identified in EBC's Emerging Local Plan

- Bishopstoke Road/Romsey Road/Twyford Road Roundabout – Contribution towards improvements identified in EBC's Emerging Local Plan
- Burnetts Lane/Botley Road/Knowle Lane Signal Junction – Contribution towards changes to equipment and phasing/staging operation
- Winchester Road/Sandy Lane Priority Junction – To convert into signal junction
- Winchester Road/Church Lane/Wessex Way Roundabout – Contribution towards amendments on Winchester Road arm
- Allington Lane/Swaythling Road (A27)/Townhill Way Roundabout – Contribution towards improvements identified in EBC's Emerging Local Plan
- Bubb Lane/Link Road roundabout

8.6.39 The Charles Watts Way/Grange Road/Wildern Lane/Botley Road roundabout and M27 Junction 7 roundabout both demonstrate capacity constraints in all pre-development scenarios and once development traffic is added to the junctions the impact is not considered severe.

8.6.40 With the improvements the development therefore has a slight adverse significance.

8.6.41 For the OPA Phase 1 application and associated TA a smaller study area was included, however all junctions were included within the Wider OPA TA and therefore no additional commentary is provided with regards to driver delay as this is sufficiently covered within the above review.

Pedestrian Delay

8.6.42 Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads.

8.6.43 The Proposed Development would generate an increase in traffic volumes in the local area as well as an increase in pedestrian and cyclist movements. Generally, where increases in traffic volumes are experienced, pedestrian delay is also likely to increase as pedestrians wait to cross roads.

8.6.44 The IEA Guidelines recommend that rather than rely on thresholds of pedestrian delay; the assessor should use judgement to determine whether there would be a significant impact on pedestrian delay.

8.6.45 Pedestrian use of Fir Tree Lane which traverses the site east to west is limited principally to the eastern end (circa 100m between Burnetts Lane and Angelica Gardens/Fir Tree Close) where there are currently pedestrian footways on both sides of the carriageway. A small number of pedestrians may also use the western end of Fir Tree Lane to access the few properties in this location. However, Fir Tree Lane at the eastern end would only form a secondary vehicular access point and therefore it is unlikely pedestrian flows would reach levels where pedestrian delays are likely to be significant given the small number of existing properties served by this highway and pedestrian crossing activity likely to be limited. As such the effect in terms of pedestrian delay on Fir Tree Lane is likely to be of slight adverse significance.

8.6.46 At the western end of Fir Tree Lane, traffic volumes would more significantly decrease as the Fir Tree Lane/Allington Lane Priority Junction would solely be used by the existing residential properties and therefore traffic levels will reduce along this section of Fir Tree Lane. Again pedestrian activity in this area is also likely to be minimal and thus overall there would be a negligible adverse effect upon pedestrian delay.

8.6.47 Burnetts Lane runs to the east of the proposed development. It is envisaged that only a small percentage of vehicles associated with the proposed development would use Burnetts Lane (to the north of the new roundabout). The construction of the new roundabout also stops Burnetts Lane from becoming a through route to the south of the Chalcroft Business Park and thus traffic levels overall are predicted to decreased through that section, with more vehicles entering via the link road. It is therefore considered that traffic flows would not reach levels where pedestrian delay is likely to be material.

8.6.48 Allington Lane runs to the west of the Wider OPA Site where pedestrian activity is largely concentrated at the northern extent close to the Allington Lane/Fair Oak Road Priority Junction. There are unlikely to be particular peak pedestrian demand times, with pedestrian movements likely to spread out across the day depending on destination. It is therefore considered the impact of pedestrian delay would be moderate adverse of significance.

Pedestrian Amenity

8.6.49 The attractiveness of a pedestrian route and journey is partly affected by traffic volumes, composition and the amenities available such as route width, separation and street lighting in particular. A tentative threshold for changes in pedestrian amenity is where traffic flows are halved or doubled. With reference to Table 8.2, it is only the proposed link road which would experience more than a doubling in traffic flow. Therefore, the development is expected to have a negligible or slight beneficial effect on pedestrian amenity.

Accidents and Safety

8.6.50 A full review of the Personal Injury Accident (PIA) data review is included within Chapter 6 of the Wider OPA TA and Chapter 6 of the OPA Phase 1 TA, with a summary also included within this ES chapter.

8.6.51 The review of data demonstrates a relatively even distribution of incidents through time with incidents occurring across all 7-days of the week and at various times of the day. Whilst some roads and junction may appear to exhibit a high concentration of accidents, this must be considered against the strategic nature of some of these routes and the volume of traffic using these corridors, and as such the accidents records are not considered unusual for the surrounding highway network.

8.6.52 The Proposed Development is therefore expected to have a slight adverse effect on accidents and safety without any mitigation. Some improvements are likely at junctions within the study area to improve highway capacity which may also in turn benefit accidents and safety.

Hazardous Loads

8.6.53 There should be no hazardous loads associated with both the Wider OPA and OPA Phase 1 and therefore the effect of the Proposed Development would be neutral.

Railway Generation and Impact

8.6.54 The impact of the Wider OPA on railway use is fully detailed in the Wider OPA Transport Assessment. However, the proposed development is likely to generate circa 164 daily vehicle trips and thus 41,656 annual trips based on a 5-day working week. A 5-day working week is considered acceptable given the majority of railway trips are associated with office use and thus employment. When the annual railway trip generation is compared against the Office of Road and Rail's recorded annual total entries and exits at Hedge End and Eastleigh train station of 522,492 and 1,665,426 respectively, the impact of the development would be considered to have a slight adverse effect given the increase, but is such that would not require mitigating.

Receptors

8.6.55 The sensitivity of the receptor being local road network users ranges from low to very high with low accounting for hazardous loads and very high being against driver delay.

8.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

8.7.1 This section sets out the proposed mitigation associated with the development proposals.

Construction

8.7.2 To support the construction of the development, a Construction Environmental Management Plan would be prepared, alongside a Construction Traffic Management Plan. The plan would include details such as:

- The use of appropriate and approved routes for deliveries and staff which would be signposted
- The management of working hours and delivery times to minimal disturbance caused by traffic (e.g. avoid deliveries during peak travel periods)
- The covering of loads coming to and leaving the Application Site
- Provision of wheel washing facilities, vehicle cleaning facilities or securing a commitment for a road sweeper if required
- Inspection of the local highway network for cleaning and repairs if required

8.7.3 The Construction Environmental Management Plan and Construction Traffic Management Plan would be agreed with the appropriate consultees, including HCC and EBC to deliver the required mitigation measures during construction to meet planning conditions and Section 106 legal obligations. The purpose of such management strategies is to reduce the risk of adverse effect of construction on sensitive environmental resources and to minimise disturbance to local residents.

8.7.4 The Construction Environmental Management Plan and Construction Traffic Management Plan would describe the checking, monitoring and audit processes that would be implemented to ensure that the construction activities are undertaken in accordance with these requirements, together with measures to ensure that appropriate corrective actions or mitigation measures are taken.

8.7.5 The Construction Environmental Management Plan and Construction Traffic Management Plan would also form part of the overall Project Management and as such, the activities described will be integrated with other Quality, Sustainability and Health and Safety management processes.

Occupation

8.7.6 To mitigate the transport related effects of the Completed Development, a comprehensive sustainable transport strategy is detailed within Chapter 10 of the Wider OPA TA. All measures included within this chapter would also benefit the OPA Phase 1, albeit some measures may only come forward with further development phases associated with the Wider OPA.

8.7.7 Chapter 8 of the OPA Phase 1 TA details the measures included specific to the OPA Phase 1 application which includes:

- A footway/cycleway which flanks one side of the link road and the eastern distributor road through the OPA Phase 1 proposed site layout
- A new pedestrian/cycle access from/onto Burnetts Lane in the location of the existing Chalcroft Farm Access road and improvements to the eastern c.430m stretch of WEF3 and associated crossing point
- Allowing connections onto other local PROW route which border the OPA Phase 1 site, including the western stretch of WEF3 and West End Footpath 2
- Proposed layout designed with consideration to bus use
- Provision of a Full Travel Plan

8.7.8 The proposed strategy complies with the aims of national, regional and local transport policy guidance to deliver sustainable new development, whilst providing considerable assistance in resolving the existing transport issues in the area, which includes the delivery of the local centre and commercial uses as part of the Wider OPA and can result in shorter travel distances to key local amenities.

8.7.9 The main objectives of the sustainable transport strategy include:

- Encourage users of the proposed development and existing residents of Horton Heath and Fair Oak to undertake local trips by sustainable modes of travel, including, walking, cycling and public transport
- Provide a development and associated infrastructure which maximises the potential for ‘walkable’ neighbourhoods where walking and cycling become the normal mode of travel
- Fully integrate the Wider OPA Site (including OPA Phase 1) with the surrounding local settlements, including Fair Oak, Horton Heath and Hedge End by providing improved connections for pedestrians, cyclists and public transport users

- To contain as many trips as possible within the site to reduce the number of traffic movements generated by the proposed development by providing key amenities and facilities on site

8.7.10 The development's proposed access strategy and masterplan seeks to encourage user of the development to walk and cycle with designated pedestrian and cyclists facilities. This includes the following:

- A high quality 3m wide footway/cycleway which flanks the eastern side of the link road which connects from Bubb Lane in the south to Allington Lane in the north along with associated crossing points
- A high quality 3m wide footway/cycleway which flanks the eastern distribution road which connects up to the Primary School and local centre
- A new pedestrian/cycle access from/onto Burnetts Lane in the location of the existing Chalcroft Farm Access road and improvements to the eastern c.430m stretch of WEF3 and associated crossing point
- Improved pedestrian facilities on Fir Tree Lane to provide a continuous footway along one side which connects with the local centre
- Upgrades to FOHHF7 to accommodate all year round use for pedestrians and cyclists
- Allowing connections onto other local PROW route which border the site, including the western stretch of WEF3 and a route towards the Lapstone Playing fields which could be via Fair Oak and Horton Heath Footpath 10, 1b or 2.
- Provision of 3m wide footway/cycleway on eastern side of Allington Lane to connect with existing/recently constructed pedestrian/cyclist infrastructure
- Off-site Highway contributions (£773,955.19 and £1,350,930.60) secured as part of the extant consents paid for by EBC as developers in October 2020 which include and thus secures PROW improvements to Dean Road (FOHHF1a) and Wyvern College (FOHHF2) and routes 746 and 780

8.7.11 Consideration of the route to the new secondary school; Deer Park and Hedge End Railway Station has also been assessed as part of the Wider OPA TA with contributions likely proposed towards improvements to the local footpath route to the east of Bubb Lane/Tollbar Way which runs to the south of the railway line.

8.7.12 A specific Public Transport Strategy has also been developed within the Wider OPA TA with the masterplan developed with consideration (and consultation) given to local bus operators as well as the CIHT's 'Buses in Urban Developments' (January 2018) guidance. Similar to the planning conditions and obligations secured as part of the two extant consents, it is proposed a bus service is secured for a defined time period along with appropriate bus stop

infrastructure. The service to be provided should be agreed in discussions with Bluestar and Xelabus to determine which route and proposed frequency. Conditions/obligations are also likely to be secured towards bus stop waiting facilities

8.7.13 A Framework Travel Plan has also been prepared to support the Wider OPA whilst a Full Travel Plan has been prepared to support the OPA Phase 1. Both Travel Plans focus on promoting measures to encourage the uptake of walking, cycling, car sharing and traveling via public transport. The plans both provide Action Plans, with the Full Travel Plan providing a more detailed and costed Action Plan referencing implementation, management and review.

8.7.14 To achieve the overarching aim of encouraging sustainable travel all users of the development would be issued with travel information, through a variety of means including a website, leaflets, noticeboards or printed Welcome Packs. Such marketing communication would provide details on local walking and cycle routes, public transport timetables, car sharing initiatives, benefits of using electric vehicles and the benefits and purpose of a Travel Plan

8.7.15 Several junctions have been identified within this ES and the Wider OPA TA as requiring mitigation (including those where contributions have now been made). Full details regarding the proposed mitigation are detailed within the TA, whilst a summary of the additional junctions where contributions/works are required to mitigate the development impact are summarised below (above those previously considered/secured with the extant consent):

- Bishopstoke Road/Chickenhall Lane Mini Roundabout – Contribution towards improvements identified in EBC's Emerging Local Plan
- Bishopstoke Road/Romsey Road/Twyford Road Roundabout – Contribution towards improvements identified in EBC's Emerging Local Plan
- Burnetts Lane/Botley Road/Knowle Lane Signal Junction – Contribution towards changes to equipment and phasing/staging operation
- Winchester Road/Sandy Lane Priority Junction – To convert into signal junction
- Winchester Road/Church Lane/Wessex Way Roundabout – Contribution towards amendments on Winchester Road arm
- Allington Lane/Swaythling Road (A27)/Townhill Way Roundabout – Contribution towards improvements identified in EBC's Emerging Local Plan

8.7.16 To support the extant consents a series of off-site highway contributions and mitigation measures were secured, and EBC as developer have paid £2,880,776.74 to HCC upfront to cover the previously agreed mitigation (as per Table 1 of the Wider OPA TA). This includes the following:

- Alternative scheme to be delivered at the junction of B3037 Fair Oak Road/Allington Lane/B3037 Fair Oak Road/Sandy Lane
- Botley Road controlled crossing
- Public Right of Way improvements to Dean Road and Wyvern College
- Moorgreen Road traffic management measures
- Charles Watts Way/Turnpike Way/Tollbar Way Junction improvements
- Moorgreen Road/High Street/Telegraph Road Junction Improvements
- Botley Road/Burnetts Lane/Knowle Lane equipment upgrade
- Tollbar Way/Maunsell Way Roundabout
- Bubb Lane/Tollbar Way Priority Junction Improvement Works
- Tollbar Way/Maunsell Way Junction Improvement Works
- Improvements to the local Public Rights of Way including routes 746 and 780
- Improvements to the Charles Watts Way/Turnpike Way Roundabout
- Improvements to the Botley Road/Tollbar Way Junction
- Improvements to the Portsmouth Road/Winchester Road (Fishers Pond) Junction
- Improvements to Winchester Road/Church Lane Junction
- Traffic Regulation Order (TRO) contributions towards parking restrictions at junctions, primary school entrance, local centre and commercial areas and towards the closure of Burnetts Lane (south of Burnetts Lane/Link Road Roundabout)
- SCOOT traffic light improvements to Junction 7 of the M27

8.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

Construction (for both Wider OPA and OPA Phase 1)

8.8.1 Construction activities would be controlled as previously set out and hence mitigation of the effects of construction traffic is an inherent part of the planning application. Therefore, any residual effects would remain negligible.

Occupation OPA Phase 1

8.8.2 As detailed in the previous sections of this ES and the OPA Phase 1 TA, a series of specific mitigation measures have been identified in response to traffic and thus environmental impacts of the OPA Phase 1 site. The mitigation measures would particularly benefit pedestrian amenity.

8.8.3 The proposed pedestrian improvements both on and off site would also mitigate the effects of severance.

Severance

8.8.4 The effect of severance would mitigated through the improvements proposed through the OPA Phase 1 Proposed Development Site Layout and sustainable transport improvements such as the provision of upgraded pedestrian and cycle routes.

8.8.5 Elsewhere the mitigation measures and OPA Phase 1 Site layout would offer the potential for the development to have a negligible or slight effect on severance in the local area.

Driver Delay

8.8.6 The OPA Phase 1 TA outlined that the three roundabouts currently under construction to provide access would operate below capacity with minimal queues and delay. The remaining 5 off-site junctions assessed are demonstrated to operate over or close to theoretical capacity before development traffic is added. However, a series of off-site highway contributions have been secured and now paid from by EBC as developer which are considered sufficient to address concerns at the junctions associated with the Phase 1 TA and thus the mitigation measures (in the form of highway contributions) would there have either a nil-detriment or slight beneficial effect.

Pedestrian Delay and Amenity

8.8.7 The proposed site layout associated with the OPA Phase 1 is likely to have a slight beneficial effect in terms of pedestrian delay by improving connections and the attractiveness of routes and reducing some walking distances. The impact on pedestrian amenity is likely to be slight beneficial.

8.8.8 Elsewhere, the proposed development is likely to have a slight adverse effect on pedestrian delay.

Accidents and Safety

8.8.9 The mitigation measures and off-site highway contributions aforementioned offer the potential for the proposed development to have a slight beneficial effect in terms of accidents and safety.

8.8.10 Elsewhere the proposed development is likely to have a slight adverse effect in terms of Accidents and Safety.

Hazardous Loads

8.8.11 It is concluded that the OPA Phase 1 Site would have a negligible effect in terms of hazardous loads without mitigation.

Occupation Wider OPA

8.8.12 As detailed in the previous sections of this ES and the Wider OPA TA, a variety of mitigation measures (including contributions) have been identified in response to traffic and thus environmental impacts. The mitigation measures would particularly benefit driver delay and pedestrian amenity.

8.8.13 The proposed pedestrian improvements both on and off site would also mitigate the effects of severance.

Severance

8.8.14 The effect of severance would mitigated through the improvements proposed through the masterplan and Sustainable Transport Strategy including pedestrian and cycle improvements along routes.

8.8.15 Elsewhere the mitigation measures and masterplan proposals would offer the potential for the development to have a negligible or slight effect on severance in the local area.

Driver Delay

8.8.16 The associated TAs and this ES have outlined a number of mitigation measures including off-site highway contributions towards wider Local Plan improvements in response to the effect on driver delay. The majority of the mitigation measures ensure the development does not result in an impact, where some driver delay constraints may remain due to the baseline levels of traffic. The mitigation measures would there have either a nil-detriment or beneficial effect.

8.8.17 Elsewhere, with the proposed development is likely to have a slight adverse effect in terms of driver delay.

Pedestrian Delay and Amenity

8.8.18 The Sustainable Transport Strategy and proposed masterplans associated with both the OPA and OPA Phase 1 are likely to have a slight beneficial effect in terms of pedestrian delay by improving connections and the attractiveness of routes and reducing some walking distances. The impact on pedestrian amenity is likely to be slight beneficial.

8.8.19 Elsewhere, the proposed development is likely to have a slight adverse effect on pedestrian delay.

Accidents and Safety

8.8.20 The mitigation measures and off-site highway contributions aforementioned offer the potential for the proposed development to have a slight beneficial effect in terms of accidents and safety.

8.8.21 Elsewhere the proposed development is likely to have a slight adverse effect in terms of Accidents and Safety.

Hazardous Loads

8.8.22 It is concluded that the Wider OPA Site would have a negligible effect in terms of hazardous loads without mitigation.

8.9 CUMULATIVE EFFECTS

8.9.1 To assess the impact of cumulative effects, a schedule of committed schemes is provided within Chapter 5 of this ES.

8.9.2 Reviewing the Schedule of Committed Developments identified in Chapter 5 it is confirmed that the following committed developments are not included within the Transport Assessments associated with the wider OPA and OPA Phase 1. A summary of why such development has not been included is provided also:

- Chalcroft Business Park (F/18/83945) – Due to no request from HCC for its inclusion
- Land off Botley Road (O/15/76418) – Due to scale of development and no request from HCC for its inclusion
- Southampton International Airport (F/19/86707) – Due to no request from HCC for its inclusion

- The Mount Hospital (O/12/71007) – Due to scale of development and no request from HCC for its inclusion
- Eastleigh Police Station (F/19/85332) – Due to scale of development and no request from HCC for its inclusion
- Land off St John's Road (F/15/76804) – Due to location of development respective to Application Site and no request from HCC for its inclusion
- Serenity, Heath House Lane (F/19/86829) – Due to location of development respective to Application Site and no request from HCC for its inclusion
- Land West of Waylands Place (F/17/80651) – Due to location of development respective to Application Site and no request from HCC for its inclusion
- Land at Park Farm/North Stoneham Park (F/19/86946) – Due to location of development respective to Application Site and no request from HCC for its inclusion
- Land South of Chestnut Avenue, North Stoneham Park (O/15/76023) – Due to location of development respective to Application Site and no request from HCC for its inclusion
- Land South of Bursledon Road (O/15/77121) – Due to location of development respective to Application Site and no request from HCC for its inclusion

8.9.3 All other Committed Developments set out within the schedule have been included with the Transport Assessment work. It should be noted that some Committed Developments included within the TA are not included with the ES Committed Development schedule and therefore the assessment is still considered robust.

8.9.4 The scope of Committed Development included within the Transport Assessment was discussed with Hampshire County Council Highways through the pre-application process. The scope is primarily based on those included within the sites previous extant consents and therefore covers a similar geographical area. HCC requested four additional sites to be included to support the new Wider OPA. The same committed developments have also been included in the assessment of the OPA Phase 1 and therefore covers a robust assessment.

8.9.5 The TAs prepared to support the Wider OPA and OPA Phase 1 have been prepared with the inclusion of Committed Development. The scenarios are assessed before any Committed Development, with Committed Development and then with the Committed Development and Proposed Development in the appropriate assessment years. It is evident in the assessments that several junctions experience capacity concerns in the Baseline scenarios and the Baseline plus Committed Development scenarios as such that once Proposed Development traffic is added the junction operates more under stress. The cumulative effects of the

background growth of traffic 10 and 16 years into the future and the addition of Committed Development traffic is considered within the Transport Assessments.

8.9.6 Of the 20 junctions identified in paragraphs 8.6.33, 8.6.34 and 8.635, 16 junctions are identified as having capacity concerns in either the Baseline 2020 or Baseline 2030 scenarios before any Committed Development or Proposed Development traffic is added. 2 junctions are demonstrated with capacity problems after the Committed Development traffic is added and 2 junctions are demonstrated with capacity problems after the Committed Development traffic and Proposed Development traffic is added. It is therefore added that in the majority of cases it is the growth in background traffic in isolation which causes the capacity concerns (which are then worsened by development). The cumulative impacts are therefore considered slight to moderate adverse, given only 4 of the 20 junctions with capacity concerns appear solely as a result of the Committed Development or Proposed Development traffic.

8.9.7 No in-combination effects are considered relevant to Transport and Access.

8.10 IMPACT OF CLIMATE CHANGE

8.10.1 This section of the ES has been prepared in accordance with the IEMA guidance titled 'Environmental Impact Assessment Guide to: Climate Change Resilience and Adaption' (2020).

8.10.2 The proposed development is not expected to be directly impacted by the potential effects of climate change from a transport and access perspective. The UKCP18 projections relating to temperatures would not have an impact on driver delay, severance, accidents and safety, pedestrian delay or pedestrian amenity.

8.10.3 The proposed development could result in an adverse effect on emissions and this the impact of climate change on other disciplines, principally relating to driver delay. However, appropriate mitigation measures are proposed to reduce/avoid driver delay and thus reduce congestion and emissions.

8.10.4 The sustainable transport strategy would also have a positive impact on the effect of climate change by encouraging users of the development to travel via sustainable modes of travel, such as walking, cycling or public transport use. This should in turn reduce single occupancy vehicle trips and reduce congestion and vehicle emissions associated with the proposed development and thus contribute to an overall benefit in regards to Greenhouse Gas emissions.

8.10.5 The Wider OPA and OPA Phase 1 developments are also developing a unique parking strategy which aims at reducing individual car ownership through the provision of a high percentage of spaces being unallocated and through the provision of a dedicated site car club. All residential dwellings would also be provided with the infrastructure to accommodate electric vehicle charging although not all will be installed with the charging unit, but given the infrastructure is in place this is easy to construct. These methods should also contribute towards lower greenhouse gas emissions.

8.11 ASSESSMENT SUMMARY

8.11.1 The below tables summarise the potential impact and effects, mitigation and residual effects.

8.11.2 Tables 8.6 and 8.7 summarises the predicted effects for the OPA Phase 1 and Wider OPA respectively in terms of their significance, whether they are beneficial, adverse or neutral, any proposed additional mitigation and the resultant residual effect.

8.11.3 Tables 8.8 and 8.9 lists the proposed mitigation for the OPA Phase 1 and Wider OPA respectively, associated with the transport impacts and how such measures are controlled, implemented and verified.

Table 8.6: Transport and Access Assessment Summary (OPA Phase 1)

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Significance/Impact Magnitude	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects						
Severance	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Driver Delay	Very High	Temporary	Slight Adverse	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Delay	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Amenity	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Accidents and Safety	Medium	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Hazardous Loads	Low	Temporary	Negligible	Construction Environmental Management Plan	Negligible	
Operation Effects						
Severance	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Improvements and Off-site highway contributions	Negligible or slight adverse	Permanent
Driver Delay	Very High	Permanent	Slight to Moderate Adverse	Sustainable Transport Improvements and Off-site highway contributions	Slight adverse	Permanent
Pedestrian Delay	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Improvements and Off-site highway contributions	Negligible or Slight Adverse	Permanent
Pedestrian Amenity	High	Permanent	Negligible	Sustainable Transport Improvements and Off-site highway contributions	Slight beneficial	Permanent
Accidents and Safety	Medium	Permanent	Slight to Moderate Adverse	Sustainable Transport Improvements and Off-site highway contributions	Slight adverse	Permanent
Hazardous Loads	Low	Permanent	Negligible	Not Required	Negligible	
Cumulative Effects						

Effect	Description	Mitigation	Significance
N/A	N/A	N/A	N/A

Impact of Climate Change			
Effect	**Description**	**Mitigation**	**Significance**
N/A	N/A	N/A	N/A

Table 8.7: Transport and Access Assessment Summary (Wider OPA)

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Significance/Impact Magnitude	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects						
Severance	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Driver Delay	Very High	Temporary	Slight Adverse	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Delay	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Amenity	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Accidents and Safety	Medium	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Hazardous Loads	Low	Temporary	Negligible	Construction Environmental Management Plan	Negligible	
Operation Effects						
Severance	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Negligible or slight adverse	Permanent
Driver Delay	Very High	Permanent	Slight to Moderate Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Slight adverse	Permanent
Pedestrian Delay	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Negligible or Slight Adverse	Permanent
Pedestrian Amenity	High	Permanent	Negligible	Sustainable Transport Strategy, Off-site highway works and contributions	Slight beneficial	Permanent
Accidents and Safety	Medium	Permanent	Slight to Moderate Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Slight adverse	Permanent
Hazardous Loads	Low	Permanent	Negligible	Not Required	Negligible	
Cumulative Effects						
Effect	**Description**			**Mitigation**		**Significance**

N/A	N/A	N/A	N/A
Impact of Climate Change			
Effect	**Description**	**Mitigation**	**Significance**
N/A	N/A	N/A	N/A

Table 8.8: Mitigation Implementation (OPA Phase 1)

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Bubb Lane to Burnetts Lane link road and associated junctions	Developer	S278/S38	N/A	Spring 2021
Pedestrian/cycle route along eastern end of WEF3 (Chalcroft Farm Access Road)	Developer	S278/S38	N/A	TBC
Traffic calming along Burnetts Lane	Developer or HCC	S278/S106	N/A	TBC
Financial contributions towards surfacing improvements at local PROW routes	HCC	S106	N/A	TBC
Infrastructure at Bubb Lane/Link Road roundabout including extended footway and pedestrian crossing	Developer	S278/S106	N/A	TBC
Proposed OPA Phase 1 Site Layout provision of pedestrian and cycle routes	Developer	S278/S38	N/A	TBC
Proposed OPA Phase 1 Site Layout securing routes appropriate for bus use	Developer or HCC	S106	N/A	TBC
Off-site highway contributions (EBC as developer has already paid £2,880,776.74)	HCC	S106	N/A	TBC
Proposed OPA Phase 1 Site Layout allowing connections onto other local PROW routes	Developer	S278/S38	N/A	TBC
Provision of a Full Travel Plan	Developer	S106	N/A	3 months prior to 1st occupation

Table 8.8: Mitigation Implementation (Wider OPA)

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Bubb Lane to Burnetts Lane link road and associated junctions	Developer	S278/S38	N/A	Spring 2021
Burnetts Lane to Allington Lane link road	Developer	S278/S38	N/A	TBC
Improvement to eastern end of Fir Tree Lane	Developer	S278/S38	N/A	TBC
Pedestrian/cycle route along eastern end of WEF3 (Chalcroft Farm Access Road)	Developer	S278/S38	N/A	TBC
Traffic calming along Burnetts Lane	Developer or HCC	S278/S106	N/A	TBC
Improvements to local footpath route which runs to the south of the railway (route to secondary school)	Developer or HCC	S278/S106	N/A	TBC
Upgrades to FOHHF7 to accommodate pedestrians and cyclists	Developer or HCC	S278/S106	N/A	TBC
Financial contributions towards surfacing improvements at local PROW routes	HCC	S106	N/A	TBC
Infrastructure at Bubb Lane/Link Road roundabout including extended footway and pedestrian crossing	Developer	S278/S106	N/A	TBC
Masterplan provision of pedestrian and cycle routes	Developer	S278/S38	N/A	TBC
Downgrading of central section of Fir Tree Lane to become footway/cycleway	Developer	S278/S38	N/A	TBC
Provision of bus serving the development and associated infrastructure	Developer or HCC	S106	N/A	TBC
Off-site highway contributions (EBC as developer has already paid £2,880,776.74)	HCC	S106	N/A	TBC
Provision of Framework Travel Plan	Developer	S106	N/A	3 months prior to 1st occupation

CHAPTER 9: BUILT HERITAGE

9.1 INTRODUCTION

9.1.1 This chapter of the ES has been produced by Cotswold Archaeology to assess the Proposed Development in relation to the effects it would have upon built heritage. The built heritage resource which may be affected by the Proposed Development includes designated and non-designated heritage assets located within the Site and in its surroundings.

9.1.2 The chapter describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the cumulative effects associated with the Proposed Development in combination with other committed schemes. This chapter is supported by a heritage desk-based assessment which forms Appendix 9.1, in Volume 2 of this ES (Cotswold Archaeology 2020).

9.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessment

9.2.1 The northern and southern parts of the Site were previously subject to two separate outline planning applications for mixed use developments, with permission granted in November 2017 (O/16/79354) and December 2017 (ref. O/14/75735), respectively. As part of these applications, a Heritage Statement and Built Heritage ES Chapter were prepared. An overarching Heritage Desk-Based Assessment (DBA), discussing the archaeology and built heritage resource within the Site has been prepared and forms Appendix 9.1 of this ES. As part of the DBA, a site visit and historic building assessment have been carried out.

Scoping Opinion

9.2.2 A Scoping Report was submitted to Eastleigh Borough Council on 20 April 2020 and a Scoping Opinion was received on 12 August 2020. The Scoping Opinion makes clear that the ES should contain a thorough assessment of the likely effects which the Proposed Development might have upon the significance of built heritage assets, including the Grade II Listed Firtree Farmhouse. It states that the ES should consider embedded mitigation measures to avoid and minimise harm to built heritage assets, the nature and design of any mitigation measures, and identify any opportunities for securing wider benefits for the future conservation and management of heritage assets. Specifically, it states that the assessment

should also take account of the potential impacts which may arise in relation to associated activities, such as construction, servicing and maintenance, and associated traffic.

9.2.3 The comments raised in the Scoping Opinion are appropriately addressed within this ES chapter.

Legislative Context

9.2.4 The *Planning (Listed Buildings and Conservation Areas) Act 1990*[1] states that 'in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State, shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest that it possesses' (Section 66).

Planning Policy and Guidance

National Planning Policy

9.2.5 The *National Planning Policy Framework Section 16: Conserving and enhancing the historic environment* (NPPF)[2] is the principal national guidance on the importance, management and safeguarding of the historic environment recourse within the planning process. The aim is to ensure that Local Planning Authorities (LPA), developers and owners of heritage assets adopt a holistic and consistent approach to conserving the historic environment.

9.2.6 Heritage assets include designated and non-designated sites, and policies within the NPPF relate to both the treatment of heritage assets themselves, and of their settings, both of which are a material consideration in development decision making. LPA are urged to request applicants to describe the significance of any heritage assets affected by a scheme, including any contribution made by their setting. The level of detail required should be proportionate to the importance of the assets, and no more than sufficient to understand the potential effects of the proposal on their significance.

9.2.7 The key tenets of the NPPF are that:

[1] 'Planning (Listed Buildings and Conservation Areas) Act 1990', Act of UK Parliament

[2] Ministry of Housing and Local Government (2019); National Planning Policy Framework

- when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be (Paragraph 193);

- significance can be harmed or lost through alteration or destruction of an asset or development within its setting. Any harm or loss to the significance of designated assets should require clear and convincing justification. Substantial harm to, or loss of, a Grade II listed building, park or garden should be exceptional. Substantial harm to, or loss of, designated heritage assets of the highest significance, notably scheduled monuments, protected wreck sites, battlefields, Grade I and II* listed buildings, Grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional (Paragraph 194);

- where proposed development will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use (Paragraph 196); and

- with regard to non-designated heritage assets, a balanced judgement will be required having due regard to the scale of any harm or loss, and to the significance of the heritage asset affected (Paragraph 197).

Local Planning Policy

Current Planning Policy

9.2.8 The current planning policy within the Eastleigh Borough Council comprises the saved policies of the Eastleigh Borough Local Plan Review 2001-2011[3], which was adopted in 2006. Policies of relevance to the protection of heritage assets include:

- Policy 174.LB – Listed Buildings Alterations, which pertains alteration or development within the curtilage of a Listed Building, including where development may have detrimental impact on the building's setting;

[3] Eastleigh Borough Council 2006 Eastleigh Borough Local Plan Review (2001-2011) - https://www.eastleigh.gov.uk/planning-and-building/planning-policy-and-implementation/local-plan/local-plan-2001-2011

- Policy 175.LB – Buildings of Local Importance, which states that development which would have a detrimental impact on a building of local importance or its setting will not be permitted.

9.2.9 It should be noted however, these policies do not apply to any buildings within the Site (i.e. no Listed Buildings or Buildings of Local Importance are located within the Site).

Emerging Planning Policy

9.2.10 The Council is preparing a new local plan for the Borough, which was submitted to the Secretary of State for formal examination on 31 October 2018. The emerging policy of heritage relevance, contained within the submitted Local Plan 2016-2036 (July 2019)[4], comprises Policy DM12: Heritage Assets. This states that development of a heritage asset or within its setting will be permitted, provided '*it does not harm or detract from the significance or special interest of the asset, and sustains and enhances its special character and qualities*' and meets other criteria, where relevant. The policy also requires for a heritage statement to be submitted with the planning application.

9.2.11 In addition, Policy HH1: Land west of Horton Heath of the submitted Local Plan requires that development at Horton Heath should follow a set design principles and a high-level design code which ensure *'…a layout of development within and around the Chalcroft Farm complex and Firtree Farmhouse that retains and enhances the heritage and architectural value of buildings and landscape features…*'.

<u>Guidance/ Best Practice</u>

9.2.12 Preparation of the DBA and ES chapter has been informed by the following guidance documents:

- *NPPF Planning Practice Guidance: Historic environment*[5] (updated July 2019). This provides further guidance on the policies within the NPPF, including the assessment of significance and the judgement left to the decision maker of whether the proposal would result in substantial harm. In the assessment of harm, it is stated that '*the*

[4] Eastleigh Borough Council 2019 Submitted Eastleigh Borough Local Plan (2016-2036) https://www.eastleigh.gov.uk/media/5713/ed33-submitted-eblp-track-change-mods-agreed-delegated-signoff-version.pdf

[5] Ministry of Housing, Communities and Local Government (2019) National Planning Practice Guidance: Historic Environment

degree of harm to the asset's significance rather than the scale of development' needs to be assessed;

- Chartered Institute for Archaeologists' (CIfA) *Standard and Guidance for Historic Environment Desk-Based Assessment*[6] defines good practice for the execution and reporting of desk-based assessments, in line with other regulations and Code of Conduct of the CIfA;

- Historic England guidance *Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment*[7] sets out approaches to making decisions about the historic environment in England. The assessment of significance is based upon the following criteria: evidential value, historical value, aesthetic value and communal value;

- Historic England's *Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking*[8] provides further information on good practice in implementing historic environment policy, including advice on the assessment of significance of heritage assets in support of applications;

- Historic England's *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets*[9] includes guidance on setting and development management, including assessment of the implications of proposals, and recommends a stepped approach for assessing the impacts; and

- Historic England's *Advice Note 12: Statements of Heritage Significance: Analysing Significance in Heritage Assets*[10], which provides advice with regard to the NPPF

[6] Chartered Institute for Archaeologists (2020) Standard and Guidance for Historic Environment Desk-Based Assessment

[7] English Heritage (2008) Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment

[8] Historic England (2015) Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment

[9] Historic England (2017) Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (Second Edition)

[10] Historic England (2019) Advice Note 12: Statements of Heritage Significance: Analysing Significance in Heritage Assets

requirement for applicants to describe heritage significance and help understand potential impacts of the proposal with regard to change to heritage assets.

Baseline Data Collection

9.2.13 As part of the DBA (Volume 2, Appendix 9.1), the following sources of heritage information were consulted:

- National Heritage List for England, for designated heritage assets, such as Listed Buildings and Scheduled Monuments;
- Hampshire and Winchester City Historic Environment Records, for records of archaeological discoveries and heritage assets;
- Historic England Archive, for database of any further records of archaeological discoveries and heritage assets and aerial photographs;
- Documentary sources and historic mapping relevant to the historic development of the Site, available at Hampshire Record Office and online;
- Environment Agency LiDAR imagery;
- On-line sources, including British Geological Survey, and previous reports; and
- A Site visit, which was initially undertaken on 6 November 2018. Further site visits were undertaken on 17 June 2020 and 5 August 2020 to allow detailed assessment of Grade II Listed Firtree Farmhouse and its setting.

9.2.14 Further information with regard to the methodologies utilised to produce the DBA and ES baseline is contained ES Volume 2, Appendix 9.1.

Assessment Methodology

Assessment of Significance of Heritage Assets

9.2.15 A heritage asset is defined by the NPPF as '*a building, monument site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing)'*.

9.2.16 Heritage significance is defined as the value of a heritage asset to this and future generations because of their heritage interest. That interest may be archaeological, architectural, artistic or

historic in nature. The assessment of significance within this Chapter has been guided primarily by the key industry-standard policies and guidance contained in Conservation Principles, where it is described with reference to the following four key forms of value:

- Evidential value: derived from the potential of a place to yield evidence about past human activity. It is primarily associated with the physical remains or the historic fabric of an asset. This value is proportionate to the potential of the asset to contribute to the understanding of the past. When there are no written records, physical remains, i.e. archaeological deposits, may provide the only source of information about the past.

- Historical value: derived from the ways in which past people, events and aspects of life can be connected through a site to the present. It can be illustrative (where asset can provide links and insights into past communities and their activities) or associative (related to the association of an asset with a notable historic family, person, event or movement).

- Aesthetic value: derived from the ways in which people draw intellectual and sensory stimulation from a place, developer either through conscious design or as a result of the fortuitous evolution of the place over time. It may include the asset and its setting.

- Communal value: derived from the meaning of a place for the people. The commemorative and symbolic aspects reflect the meanings of an asset for the people who draw part of their identity from it or have emotional links to it (such as memorials). The social aspect is associated with places perceived as source of identity or distinctiveness and spiritual value is attached to places of worship.

9.2.17 Significance derives not only from a heritage asset's physical fabric, but also from its setting. The setting of a heritage asset is defined as the surroundings within which it is experienced; its extent is not fixed and may change as the asset and its surroundings evolve. However, setting is not a heritage asset in its own right, nor is it a heritage designation in its own right. Its importance lies in what it contributes to the significance of the heritage asset. This contribution may be positive, negative or neutral (i.e. does not contribute to the asset's significance).

9.2.18 Paragraph 189 of the NPPF is clear in its recognition of the need for local planning authorities to require an Applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. It is also unequivocal on the matter of scope, as it mentions that the level of detail should be proportionate to the importance of the asset, and no more than sufficient to understand the potential impact of a development on that significance.

9.2.19 The way in which heritage significance is expressed within this ES Chapter has been specifically developed, based on good practice, to ensure that it is fully aligned with the Planning (Listed Buildings and Conservation Area) Act 1990, the NPPF and "Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment.

9.2.20 The statements of significance developed for each of the assets reflect the language of the Planning Act 1990, utilising terms such as 'character and appearance' (of Conservation Areas), and 'architectural and historic interest' (of Listed Buildings). Further frames of reference, found within Conservation Principles, allow for terms such as 'evidential', 'historical', 'aesthetic' and 'communal' to be used to convey the many heritage values that combine to make up the heritage significance of an asset.

9.2.21 The statements of significance describe 'what matters and why', i.e. which aspects of an asset and its setting contribute to the heritage significance of the asset and how. Although the statements rightly acknowledge the fabric of heritage assets as representing the principal embodiment and physical manifestation of their heritage significance, the surroundings of the assets, and the ways in which they can be experienced, often contribute to their overall significance. This will be assessed in line with the settings assessment methodology (ES Volume 2, Appendix 9.1).

9.2.22 Although terms such as High, Medium or Low value, and National, Regional or Local importance are often adopted in EIA to express a summary description of the 'relative significance' heritage assets, they are not universally recognised or accepted terms within heritage sector guidance and amongst heritage professionals. This is because these concepts require complex definitions to properly allow for their application, and do not directly relate to the language or key tests required in determining planning applications or heritage consents.

9.2.23 The criteria adopted for this ES Chapter are laid out in **Table 9.1**, with terminology used derived directly from the NPPF. The language used in this ES Chapter is entirely consistent with the NPPF and the Planning Act 1990, and provides the decision-maker with sufficient information to understand how change could bring benefit or harm to the heritage significance of an asset(s), thus enabling an informed judgement to be reached.

Table 9.1: Criteria for Assessing the Significance of Heritage Assets

Heritage significance	Description of Criteria
Designated heritage assets of the highest significance	As defined in the NPPF, these include: Scheduled Monuments, Protected Wreck Sites, Registered Battlefields, Grade I and II* Listed Buildings, Grade I and II* Registered Parks and Gardens, and World

	Heritage Sites. Heritage assets displaying considerable evidential, historic, aesthetic or communal value, as identified by Conservation Principles, which are of comparable significance to designated heritage assets of the highest significance (including assets of archaeological interest which are demonstrably of equivalent significance to Scheduled Monuments), would also fall within this category.
Designated heritage assets of less than highest significance	In accordance with the NPPF, these include Grade II Listed Buildings and Grade II Registered Parks and Gardens. Although not mentioned specifically, Conservation Areas are considered to fall within this category as they are not listed as of highest significance.
Non-designated heritage assets	This includes archaeological remains, built heritage or historic landscape features which are not designated, but which display evidential, historic, aesthetic or communal values, as identified by Conservation Principles, and thus have a degree of significance meriting consideration in planning decisions on the basis of their heritage interest. The July 2019 revision of the Planning Practice Guidance defines non-designated heritage assets as those identified as such in publicly accessible lists or documents provided by the plan-making body. Where these sources do not specifically define assets as non-designated heritage assets, they will be referred to as heritage assets for the purpose of this ES. The assessment of non-designated heritage assets and heritage assets will be equivalent in this ES, in line with industry standards and guidance on assessing significance and impact. They may not, however, carry equivalent weight in planning as set out within the provisions of the NPPF.
Uncertain	Heritage assets, the significance of which has not yet been ascertained.
Negligible	Remains that do not have sufficient significance to warrant consideration in planning decisions, and which are therefore not considered to constitute heritage assets.

Assessment of Effects of the Proposed Development

9.2.24 The methodology presented here moves away from the more traditional ‘scalar’, quantitative, matrix-led approach, adopting a descriptive, qualitative presentation of the findings of the assessment. This is because the descriptions of anticipated Proposed Development impacts upon heritage assets are qualitative rather than quantitative and the adopted approach allows for greater accuracy in understanding the potential harm the Proposed Development may cause to the significance of heritage assets. As with the approach adopted in assessing heritage significance of heritage assets, this approach directly reflects key concepts in planning policy and heritage guidance with regard to the assessment of Proposed Development effects upon heritage assets. It therefore offers an appropriate way to define such effects. Clear statements of significance (the ‘what matters and why’ approach), and a sound understanding of the character of the Proposed Development, as presented in this

assessment methodology, allow for a transparent articulation of the nature/degree of any identified impacts.

9.2.25 The effects of the Proposed Development arise as a result of change (impact) to the heritage assets. The significance of a heritage asset can be harmed or lost through alteration, destruction or development within its setting. In terms of harm though changes to setting, as clearly illustrated within the NPPF, any attempt to convey the impact or harm of a development has to be framed within the tightly defined parameters of harm to the significance of the heritage asset itself. This is a fundamental principle. In summary, a project could bring about change within the setting of a heritage asset, resulting in harm to its significance, or the way in which that significance is experienced. References such as 'harm to setting' are therefore avoided.

9.2.26 The assessment of the effect of the Proposed Development upon cultural heritage resource takes into account numerous factors, including the scale of development, the type and extent of physical disturbance and the visual effects. Proposed Development impacts may be:

- Direct or indirect. Direct impacts arise from physical change to the resource, which affects its physical remains or fabric (i.e. alterations to historic buildings). Indirect impacts relate to changes within the setting of heritage assets.

- Permanent or temporary. Due to their character, direct impacts upon the physical remains of heritage assets are permanent, and not reversible. However, impacts on the settings of heritage assets may be temporary, if the Proposed Development has a limited lifespan. These temporary effects can be short, medium or long-term.

- Beneficial, when the Proposed Development leads to the enhancement of the heritage resource, or adverse, when it results in harm to, or loss of, the significance of a heritage asset. If the resource will not be affected by the Proposed Development, there will be no impact.

9.2.27 To further assist in the decision-making process, the following approach to the assessment of effects upon heritage assets (**Table 9.2**) is adopted This has been done in order to improve the intelligibility of the assessment results for purposes of quick reference and ready comprehension. The language used here is entirely consistent with the NPPF and the Planning Act 1990, and provides sufficient information to reach informed judgement.

Table 9.2: Levels of Effects upon Heritage Assets

Level of Effect	Description	Applicable policies
Heritage benefit	The proposals would enhance the heritage significance of a heritage asset.	Enhancing the significance of a heritage asset is a desirable Application Scheme outcome in respect of heritage. It is consistent with key policy and guidance, including the NPPF paragraphs 185, 192 and 200
No harm	The proposals would preserve the significance of a heritage asset.	Preserving a Listed Building and its setting is consistent with Section 66 of the Planning (Listed Buildings and Conservation Areas) Act 1990. Sustaining the significance of a heritage asset is consistent with paragraph 185 of the NPPF and should be at the core of any material local planning policies in respect of heritage.
Less Than Substantial Harm	The proposals would be anticipated to result in a restricted level of harm to the significance of a heritage asset, such that the asset's contributing heritage values would be largely preserved (lower end). The proposals would lead to a notable level of harm to the significance of a heritage asset. A reduced, but appreciable, degree of its heritage significance would remain (upper end).	In determining an application, this level of harm with regard to designated heritage assets (of highest and less than highest significance) should be weighed against the public benefits of the proposals, as per paragraph 196 of the NPPF. Proposals involving change to a Listed Building or its setting, or any features of special architectural or historic interest which it possesses, must also be considered within the context of the Planning Act 1990. With regard to non-designated heritage assets, the scale of harm or loss should be weighed against the significance of the asset, in accordance with paragraph 197 of the NPPF.
Substantial Harm	The proposals would very much reduce the designated heritage asset's significance or vitiate that significance altogether	With regard to designated heritage assets, Paragraphs 194 and 195 of the NPPF would apply. These state that substantial harm or loss to designated heritage assets of the highest significance should be wholly exceptional and to assets of less than highest significance – exceptional. Application Scheme leading to such harm should be refused unless it is demonstrated that this substantial harm is necessary to achieve substantial public benefits. The Planning Act 1990 may also apply. In relation to non-designated heritage assets, the scale of harm or loss should be weighed against the significance of the asset, in accordance with paragraph 197 of the NPPF.

9.2.28 In this approach to the EIA, the extent of the effects identified is defined through appropriate description of the anticipated degree of harm upon any sensitive heritage receptors. Such descriptions will define whether the effects will affect the assets or their settings and assess, if assets are affected directly, whether the assets are to be wholly or partly removed. Professional judgement is used to ascertain the significance of effect on the sensitive heritage assets, taking into account the heritage significance of the assets as well as the identified effects and their extent.

9.2.29 The approach to the assessment of the significance of effect, in EIA terms, with regard to heritage assets, is defined as follows:

- In line with EIA best practice, it is considered that 'substantial harm' to designated heritage asset would equate to a **Substantial** or **Major Adverse (significant) Effect** in line with the language used within the Town and Country Planning (Environmental Impact Assessment) Regulations 2017;

- 'Less than substantial harm' to designated heritage assets could also trigger the same significant effect, resulting in **Major** or **Moderate Adverse (significant) Effect**, but no prescriptive criteria are proposed to prejudge this threshold, leaving it to professional judgement as this will be dependent on the extent of harm and its effect on the significance of the asset. Where effects on the heritage assets are limited, this harm would result in **Minor Adverse Effect (not significant)**.

- With regard to the harm to non-designated assets, professional judgment will be used to ascertain whether the significant effect (i.e. **Major** or **Moderate Adverse (significant) Effect**) is triggered, taking into account the relative significance of such assets as well as the level of harm upon them.

- No harm to designated or non-designated heritage assets would result in a **Neutral (not significant) Effect**.

- Where heritage benefits are identified (to designated or non-designated heritage assets), professional judgement will be used to ascertain the significance of the effect.

Geographical Scope

9.2.30 As part of the DBA, a 1km study area, drawn around the boundary of the Site, was adopted as this is considered sufficient to provide the necessary context for understanding the heritage significance in respect of the Site. Designated heritage assets located within the Site and the study area were considered, as well as several non-designated (locally listed) assets. Further

detail was obtained for the Site itself, including a review of historic maps, focused on the Site, and assessment of historic buildings within the Site, including the Grade II Listed Firtree Farmhouse.

Temporal Scope

9.2.31 Potential effects of the Proposed Development upon heritage assets are assessed in relation to temporary and permanent impacts. Any direct impacts upon heritage assets (which are likely to occur during the construction phase) would be permanent as these would lead to a permanent change to an asset. Indirect impacts (i.e. change within the setting) would be temporary during the construction phase, and permanent during the operation phase.

Assumptions & Limitations

9.2.32 The baseline assessment has been informed by secondary information derived from a variety of sources, only some of which have been directly examined for the purpose of this assessment. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

9.2.33 Reasonable internal and external access was provided to Firtree Farm to allow for an assessment of its significance, and external access was available for Victoria House.

9.3 CONSULTATION

9.3.1 As stated above, a consultation response in relation to built heritage was received as part of Eastleigh Borough Council's Scoping Opinion. This highlighted the Grade II Listed Firtree Farmhouse within the Site and other listed buildings nearby as being potentially sensitive to development within their settings.

9.4 BASELINE ENVIRONMENT

Introduction

9.4.1 This section of the ES Chapter presents a summary of the built heritage resource within the OPA Phase 1 Site and the Wider OPA Site and its surroundings. Further detail is presented in the Heritage Assessment in ES Volume 2, Appendix 9.1.

OPA Phase 1

9.4.2 The built heritage resource concerning the OPA Phase 1 Site is very limited. A number of Grade II Listed Buildings are situated within the wider surrounding landscape, with the nearest comprising Moorgreen Farmhouse and an associated granary, *c*. 870m to the south-west

(Appendix 9.1, Figure 4). These assets are effectively screened from the Site by the Chalcroft Business Park and railway embankments, and do not share any visual or experiential associations with the Site. The DBA (Appendix 9.1) determined that the Proposed Development would not alter the setting, or affect the significance of these Listed Buildings, or any additional heritage assets within the wider landscape. These were therefore scoped out of further assessment, and no sensitive receptors have been identified in relation to OPA Phase 1.

Wider OPA

9.4.3 This section focuses primarily upon the Grade II Listed farmhouse at Firtree Farm. The farmstead buildings to the south, now known as Victoria House, are a modern replacement of historic structures. This is discussed only in so far as it contributes to the setting of Firtree Farm. Within the Site boundary there are (or were) a further two historic (non-designated) farmsteads which have been scoped out from further assessment: Foxholes Farm, which has been demolished as part of a consented Prior Notification of Demolition; and Chalcroft Farm, which is subject to a separate application for demolition.

9.4.4 The settings of designated and non-designated heritage assets within the surrounding landscape are also discussed.

Firtree Farmhouse

9.4.5 A detailed assessment of Firtree Farmhouse is provided in the DBA which forms Appendix 9.1 of this ES. The historic development, setting, and significance of the building are described in brief below.

Historic development

9.4.6 The Grade II Listed Firtree Farmhouse (Appendix 9.1: Figure 4) is situated within the Site, to the north of Firtree Lane. The farmhouse was constructed in the 18th century, and is of two storeys in height with redbrick walling in Flemish and Monk bond. It has a hipped roof which was replaced in the early 19th century. A late 19th century extension adjoins the building to the rear.

9.4.7 As detailed within the historic map regression presented within the DBA, the farmstead is depicted on Milne's map of 1791, along with Foxholes Farm and Chalcroft Farm, and underwent a number of changes over the course of the 19th century, including enlargements to the farmhouse and the addition of a barn and additional buildings the farmyard in *c*. 1830. The farmhouse is suggested to have been rebuilt in 1897, with a number of late Victorian

features. A secondary access was introduced from Firtree Lane sometime after *c*. 1895, and by the time of the Third Edition OS Map in 1909, the gardens had been subdivided.

9.4.8 Further development of the farmyard occurred throughout the 20th century, including the construction of cattle sheds to the south of the yard by the 1960's, and the removal of outbuildings at the eastern edge of the yard. By 1985 the farm had shifted north-west, housed in a number of large sheds that had been built on the northern side of Firtree Lane, followed shortly later by a new dwelling built to serve the repositioned farm. The farmhouse had been subdivided by this time, with the southern wing named as Firtree Farmhouse Cottage, a small stable block added within a large paddock to the north and a stand-alone garage constructed for the cottage. This is largely as Firtree Farmhouse survives today.

Farmstead assessment

9.4.9 The Listed farmhouse shares a close visual relationship with the former farmyard, now known as Victoria House. Somewhat unusually, the farm buildings are separated from the farmhouse across Firtree Lane, with the farmhouse facing away from the farmyard, implying a high status to the building. As a result of the extensive modifications to the farmhouse, unsympathetic rebuilding of the historic farm buildings as Victoria House and shift in location of the farmstead to the northern side of Firtree Lane, the functional relationship between the historic Firtree Farmhouse and the farm buildings has been severed, and the farmstead function as a whole at Firtree Farm is now lost.

9.4.10 Together with Lake Farm, Allington Manor Farm, Foxholes Farm and Chalcroft Farm (among others), Firtree Farm correlates with the wider pattern of development locally and regionally of isolated farmsteads in the area. As seen today, the layout of the farmyard is the product of late-19th century developments, and the shift to dairy farming in the inter-war period. On the basis that the buildings at Victorian House are all modern replacements, however, the barns should not be considered heritage assets in their own right. At most, these visually contribute to legibility of a farmstead here on the basis of the agricultural-style character and courtyard layout of the rebuild, however they do not contribute to the significance of the farmhouse or the farmstead.

Significance of Firtree Farmhouse

9.4.11 Situated in a rural position, Firtree Farmhouse retains highly attractive architectural features, principally from the 19th century, which project its evolution and incorporate elements of an earlier building as a subservient wing. The property sits behind a low wall obscured from the road by verdant hedging, with a forecourt fronting to the east accessed via a gated entrance, which gives it a sense of seclusion within its private gardens. The private grounds to the north

are more informal, and the whole garden is well-screened by trees with occasional glimpses of agricultural fields beyond. The orientation of the building combined with the qualities of its garden and distinct separation from the farmstead to the south combine to portray the image of a high status and polite 'country house'.

9.4.12 The significance and special interest of Firtree Farmhouse derives to a substantial degree from the readable multi-phased historical construction and its adaption as a refined country house, the quality of its architecture, particularly the east wing and principal elevation, and the internal and external features that remain substantially intact from the 19th century remodelling. As a Grade II Listed Building, Firtree Farmhouse is a **designated heritage of less than the highest significance**.

Contribution of setting

9.4.13 The Listed Building also derives a level of significance from its setting, with the architectural, aesthetic and historic interest of the asset being best experienced from within the private garden. The garden retains its sense of separation from the surrounding countryside and worked agricultural landscape. Legibility of the historic garden curtilage is implied by the ground level differences surrounding the building, with much of the higher ground to the east and north having historically been planted as orchard. Despite this now being more open, there is never-the-less a strong legibility of the garden curtilage as seen on historic maps, enclosed by boundary hedgerows and trees creating a sense of enclosure and privacy which distinctly separates it from the broader agricultural landscape. The surviving large and spacious garden setting reinforces its status as a gentrified farmhouse, informed by its relationship with the former farmstead to the south and surrounding rural landscape which allows for the interpretation of farmstead use.

9.4.14 At present, the relative isolation of the enclave within the rural landscape, means the farmhouse retains its historic aspect over the reconstructed farm buildings (and fields beyond). However, these views are relatively limited due to existing deciduous vegetation in leafy months and topography, particularly to the east where the ground slopes up and affords no designed or important view of the surrounding landscape. There are a limited number of fortuitous views to the north from the single first floor window in the bedroom through the boundary vegetation looking over the fieldscapes to the northern adjoining the historic grounds of Fair Oak Lodge. Although not principally a 'designed' view, the window was inserted at a later date, presumably to give an aspect over the garden. The windows in the principal east elevation afford similar views, but these were not likely 'designed' to give the view so much as to articulate the polite symmetrical composition of the elevation. Victoria House tends to block any views to the south.

9.4.15 Within the grounds, the most important experiential aspect of the Listed Building's setting is the sense of enclosure and privacy afforded by the boundary hedgerows and mature trees, as well as the relative tranquillity afforded its situation within the rural area. The insertion of the modern domestic features such as the swimming pool and tennis court and the later move towards equine activity (not associated with the historic narrative) make a more neutral contribution to the setting.

Built heritage assets within the surrounding landscape

9.4.16 A further nine Grade II Listed Buildings located within the 1km study area surrounding the Site. These comprise:

- Grade II Listed Rambler's Cottage, located, c. 130m to the east;
- Grade II Listed Saxon Court, located c. 250m to the east;
- Grade II Listed The Cockpit at The Cockpit Farm, located c. 730m to the east;
- Grade II Listed The Bush, located c. 300m to the north-east;
- Grade II Listed The Old George Public House, located c. 1km to the north;
- Grade II Listed West Horton Farm Cottages, located c. 800m to the west;
- Grade II Listed Moorgreen Farmhouse, located c. 850m to the south at Moorgreen Farm; and
- Grade II Listed Granary to the south-east of Moorgreen Farmhouse, located c. 850m to the south at Moorgreen Farm; and
- Grade II Shamblehurst Farmhouse, located c. 1.4km to the south-east.

9.4.17 In addition, a small number of locally listed buildings are located in Fair Oak to the north of the Site. Further groups of non-designated heritage assets are located at Lake Farm, c. 160m to the west of the Site, and Allington Manor Farm, *c*. 420m to the west (Appendix 9.1: Figure 4).

9.4.18 Initial assessment of the above assets as part of the DBA, including analysis of cartographic sources, aerial photographic sources and the site visit, revealed that the Site was considered to make no contribution to the significance of these designated and non-designated built heritage assets, and shared no intervisibility with the heritage assets concerned. It was clear that the Proposed Development would not have the potential to change the setting, or affect

the significance of these buildings and, in conforming with Stage 1 of the Historic England guidance on setting, all of these buildings were scoped out from further assessment.

9.5 INHERENT DESIGN MITIGATION

9.5.1 For OPA Phase 1, the assessment concluded there are no sensitive built heritage receptors, and no inherent mitigation is required.

9.5.2 For the Wider OPA, the proposals are outline in nature at this stage, with all matters in respect of design and layout to be brought forward in phases. The Proposed Development surrounding the Listed Building is to be brought forward as part of Phases 3 and 6, subject to detailed reserved matters applications. Any works to the Listed Building itself will require Listed Building Consent. It is anticipated that the primary mitigation measures incorporated into the Proposed Development will be informed by the statutory duty and relevant policies which protect the significance of designated heritage assets in terms of their historic fabric, architectural or historic features and setting.

9.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

OPA Phase 1

Construction Impacts and Effects

9.6.1 As outlined within the Baseline, no sensitive receptors have been identified in relation to OPA Phase 1, and no impacts will occur at the Construction stage.

Occupation Impacts and Effects

9.6.2 No impacts have been identified in relation to built heritage during the Occupation stage of OPA Phase 1.

Wider OPA

9.6.3 The Proposed Development will include areas of housing, with associated drives and gardens, as well as areas of employment, education and recreation, and areas where the uses are more mixed. An area of employment uses would be focused around Firtree Farmhouse in the northern part of the Wider OPA Site, with residential housing beyond.

9.6.4 At this stage, the Proposed Development surrounding Firtree Farmhouse is presented in outline only, based on the EIA Parameter Plans. As such, the proposals for Firtree Farm and the areas surrounding it have not been developed in detail. These are expected to be detailed as part of the later Phase 3 and Phase 6 reserved matters applications. The indirect, non-

physical impacts arising from development within the setting of the Listed Building are assessed on this basis. Additionally, the detail and consideration of uses which may result in direct, physical impacts on the Listed Building, will be incorporated as part of Phase 3 works and are not fully known at this stage.

9.6.5 It is acknowledged that there will be impacts on Firtree Farmhouse as a sensitive receptor within the Site, resulting both from physical and non-physical impacts, however it has not been possible at this stage to determine the levels of these impacts. The consideration of effects on the Listed Building is based on the information available as part of the outline application proposals.

Construction Impacts and Effects

Physical Impacts in relation to Firtree Farmhouse

9.6.6 The proposed change of use of the Listed Building is expected to require internal and external alterations, which would occur during the Construction Phase and which would result in direct, physical impacts upon Firtree Farmhouse. The suggested use of Firtree Farmhouse and land to the west within the Proposed Development is related to employment uses. Whilst a public use could produce heritage benefits in terms of better revealing the building's special interest to the wider public, where other uses are to be considered, the full implications of those uses (in terms of building regulations, thermal upgrades, accessibility, fire safety, etc) will need to be carefully balanced against maintaining the significance of the building. The DBA (Volume 2, Appendix 9.1) has identified the potential for physical impact on the Listed Building dependent on the proposed use of the building and the degree to which this can be facilitated without substantial alterations to its physical fabric, features and plan form, as well as any implications of the use itself. As defined by the Planning Practice Guidance, the optimum viable use is '*the one likely to cause the least harm to the significance of the asset, not just through necessary initial changes, but also as a result of subsequent wear and tear and likely future changes'* (Paragraph: 015 Reference ID: 18a-015-20190723).

9.6.7 These physical impacts and resultant change of use could affect the heritage significance of this asset and result in a **Negative effect**. At present, however, as details of the works have not yet been developed, it is not possible to ascertain the severity of the effect. As the Proposed Development could potentially result in an adverse significant effect, appropriate measures will need to be implemented at the reserved matters stage.

Non-physical Impacts in relation to Firtree Farmhouse

9.6.8 As part of the Construction Phase, works in the vicinity of Firtree Farmhouse could result in impacts in relation to the setting of the Listed Building.

9.6.9 The Proposed Development as part of Phase 3 would result in the demolition of Victoria House which sits to the south of Firtree Farmhouse across Firtree Lane. The DBA (Volume 2, Appendix 9.1) has established that these buildings were rebuilt in the late-20th century. As a result, Victoria House has not been found to possess any heritage significance, nor have they been found to positively contribute to the significance of Firtree Farmhouse. The DBA concludes that their demolition would not adversely affect the setting of the Listed Building, and may offer a slight enhancement to its setting in terms of removing features which lack authenticity in design terms and compete with the Listed Building. This has been identified as being of negligible significance and would result in a **Neutral (not significant) effect**.

9.6.10 During construction, setting impacts are likely to occur due to the presence temporary security fencing or hoardings, machinery and compounds. Vegetation removal has the potential to create new sightlines within the landscape and temporarily introduce new views of or from the Listed Building. Other experiential impacts will likely include construction noise and traffic within the Site. Construction operations of this nature would be temporary and the resulting impacts would be relatively limited, short-term and reversible in nature when compared with the completed development. Whilst not permanent, this would produce a **Minor Negative (not significant) effect**.

Occupation Impacts and Effects

Physical Impacts in relation to Firtree Farmhouse

9.6.11 The physical impacts affecting the historic fabric of Firtree Farmhouse would be confined to the construction phase. As such, there would be no adverse effects in relation to the Listed Building fabric during the operation phase of the Proposed Development.

Non-physical Impacts in relation to Firtree Farmhouse

9.6.12 The key change to the setting of Firtree Farmhouse resulting from the Proposed Development would become fully visible during the operation phase.

9.6.13 The new buildings and associated roads, services and landscaping within the Site have the potential to introduce permanent change into the setting of Firtree Farmhouse. The DBA has set out the significance of the Listed Building and identifies key aspects of its setting, which is considered to be most sensitive within the defined garden enclave, enclosed by the wooded boundaries. It also derives a level of significance from its relationship with wider rural

landscape, especially to the east, and the experience of it along the modest country lane that is Firtree Lane.

9.6.14 Following completion, the Proposed Development has the potential to negatively impact on the significance of the asset through development within these particularly sensitive parts of its setting, from which it derives significance. In particular, the proximity of potential development to the west/north-west of the Listed Building as shown on the EIA Parameter Plans has the potential to affect its significance, where the scale, design and placement of built-form will need to be carefully considered to reduce or mitigate effects.

9.6.15 The Proposed Development to the east of Firtree Farmhouse also has the potential to introduce change and potentially harmful effects to the setting of the Listed Building. The Building Heights Parameter Plan suggests that this could be up to 3 storeys in height for those areas within closest proximity to the north, east and west of the building, and up to four storeys for those areas to the south, albeit beyond the retained boundary planting which forms part of the Green Infrastructure of the Proposed Development. The DBA has shown a limited number of views out in the easterly direction from the upper floors of the Listed Building in which this Proposed Development will be read, producing a change from the current agricultural fieldscapes.

9.6.16 There is potential for these changes within the wider landscape setting of Firtree Farmhouse to affect its significance as a designated heritage asset. The degree to which this will impact on its significance will depend on the detailed design of the Phase 6 works and will need to be assessed in the future in terms of building heights, scale and massing, layout including pattern and urban grain, as well as soft landscaping and vegetation. As this is one of the later phases of work, density will also be a key consideration, as viability can change over time. Higher densities of built form to the immediate east of the Listed Building could result in greater impacts, though there appears to be scope for this to potentially be absorbed in other places as necessary.

9.6.17 Areas of housing are also proposed to the north, west and south of the grade II Listed Building. Current proposals indicate that there may be some intervisibility between Firtree Farmhouse and these areas of proposed housing, particularly to the south. Thus, the Proposed Development may alter part of the wider setting of the Grade II Listed Building. At present, these areas make a very minor contribution to its significance.

9.6.18 These non-physical impacts are expected to affect the heritage significance of this Listed Building and result in a **Negative effect**. As only outline proposals are known, it is not possible to ascertain the severity of the effect. Therefore, as the Proposed Development could

potentially result in an adverse significant effect, appropriate measures will need to be implemented at the relevant reserved matters stage(s).

9.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

9.7.1 The planning policies and guidance, as set out above, require a mitigation response to potential impacts upon the historic environment in order to avoid, minimise or offset such impacts as appropriate. The NPPF makes the following provisions in respect of impacts to the significance of designated heritage assets: 'Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification' (Paragraph 194).

9.7.2 Where significant effects are anticipated, mitigation may be necessary to adequately address these effects, in order to reduce or offset the harm (effect on) to the importance (significance) of designated heritage assets.

OPA Phase 1

9.7.3 No mitigation or enhancement measures are necessary in relation to OPA Phase 1.

Wider OPA

Construction

Mitigation to Address Physical Impacts in relation to Firtree Farmhouse

9.7.4 As the proposed change of use is likely to result in physical impacts upon the Listed Building itself, which could result in an adverse effect upon its significance, the potential effects will need to be appropriately considered within future applications (i.e. as part of the reserved matters application for Phase 3, as well as Listed Building Consent, which will be required for any proposals affecting the physical fabric of the structure). It is proposed that a staged process is implemented in formulating detailed proposals affecting the building, which would ensure that any new use represents the optimum viable use and that the physical alterations respond sympathetically to the building's heritage sensitivities, particularly in terms of historic fabric, surviving historic features, character and plan form.

9.7.5 When a new use has been identified and proposals have been formulated, a more targeted Heritage Impact Assessment would ensure that the proposals respond to the building's heritage sensitivities and mitigate against any harm to its significance, and support any applications for Listed Building Consent or Planning Permission.

9.7.6 It is recommended that any detailed designs are developed in consultation with heritage specialists and stakeholders, to ensure that any harm is avoided/minimised, works within the Listed Building are sensitive, and opportunities for enhancement are created. For instance, historic features within the building such as stairs should be protected from damage and ideally, not used, by construction personnel during the implementation of any physical works to the Listed Building which might lead to inadvertent damage or excessive wear and tear. This would have to potential to lead to significant effects on the Listed Building, but potential harm could be mitigated through development of a construction methodology for works to the Listed Building. The proposal plans would inform a targeted Heritage Impact Assessment, focusing on the potential for the development to affect the significance of the farmhouse, to be submitted as part of reserved matters and Listed Building Consent applications.

9.7.7 Following the finalisation of the optimum proposals to the Listed Building, if further measures are required to mitigate the identified effects, these measures could be secured via appropriately worded planning conditions, attached to the reserved matters consent and any necessary Listed Building Consents. The scope and scale of such works is unknown at the moment, and would be agreed through consultation with heritage advisors to the LPA, but for instance this could include a historic building watching brief during works which could affect, or reveal, historic fabric.

Mitigation to Address Non-physical Impacts in relation to Firtree Farmhouse

9.7.8 No specific measures have been identified to reduce the potential for impact in the Construction Phase beyond the normal restrictions on hours of operations. Some of the vegetation on the boundary may need to be temporarily removed to facilitate construction within the grounds and/or works to the Listed Building itself. Where necessary, this should be limited in scale and carefully sited (i.e. corresponding with areas of permanent removal as needed) to limit the potential for longer-term impacts. The details of any such works should be provided within the reserved matters application, and thoroughly considered within an appropriate targeted Heritage Impact Assessment, as necessary.

9.7.9 The degree to which development within the setting of the Listed Building will impact on its significance will depend on the detailed design of the anticipated Phase 3 and Phase 6 works where the scale, design and placement of built-form will need to be carefully considered to reduce or mitigate effects. It is recommended that any detailed designs are developed in consultation with heritage specialists and stakeholders, to ensure that proposals sensitively respond to the setting of the Listed Building in terms of density, building heights, scale and massing, layout including pattern and urban grain, as well as soft landscaping and vegetation. Through the adoption of appropriate design standards and layout of the structures within the

Proposed Development, any harm to its significance will be minimised. Further mitigation may be achieved by the maintenance and enhancement of vegetative screening around the margins of the Wider OPA Site.

Occupation

Mitigation to Address Physical Impacts in relation to Firtree Farmhouse

9.7.10 Beyond normal wear and tear, there will not be any physical impacts to the Listed Building to in relation to the occupation phase of the Proposed Development, and as such no mitigation is required.

Mitigation to Address Non-physical Impacts in relation to Firtree Farmhouse

9.7.11 The details of the Proposed Development in relation to the surroundings of the Listed Building are not yet finalised. However, there will be opportunities at the reserved matters stage.

9.7.12 Retention of the key aspects of the immediate garden setting of Firtree Farmhouse would protect the Listed Building from the encroaching effects of the Proposed Development and allow it to retain the feeling of spaciousness. Limited inter-visibility through current and enhanced tree screening would help retain the experience of privacy and seclusion from within the grounds and could be enhanced by the consideration of a green buffer zone around the garden enclosure to the north and east. Within its historic garden area, enhancement could be taken further to include reinstatement of elements of orchard planting which would reference the former use of part of the grounds, or other formal garden features which might help to screen any built-form or incongruous features (such as parking).

9.7.13 While the assessed levels of potential visual impact would likely not result in anything but less than substantial harm to the significance of the asset, some degree of mitigation could be achieved by the maintenance and enhancement of vegetative screening around the margins its historic curtilage, and by the adoption of appropriate design standards and layout of the structures within the broader Wider OPA Site.

9.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

OPA Phase 1

9.8.1 There will be no residual impacts on the built heritage resource as a result of OPA Phase 1.

Wider OPA

Construction

9.8.2 The Proposed development is likely to affect the significance of the Listed Building, largely as a result of physical impacts during the construction phase. Although the extent of the impacts is not known at this stage, as detailed plans have not yet been formulated, it is it is anticipated that the resultant effect would be **non-significant (minor negative)**, subject to these following an appropriate process and ensuring proposals are developed sensitively in response to the identified heritage significance of the asset, together with the implementation of appropriate mitigation measures.

Occupation

9.8.3 Once completed, the non-physical effects of occupation of the Proposed Development are also likely to affect the significance of the Listed Building. As detailed plans have not yet been formulated, and the extent of these impacts is therefore not known, it is considered that if an appropriate process is followed, and the proposals respond sensitively to the identified heritage significance of the asset and with implementation of appropriate mitigation measures, it is anticipated that the resultant effect would be **non-significant (minor negative)**.

9.9 CUMULATIVE EFFECTS

9.9.1 A schedule of committed schemes presented in Chapter 5 have been considered with regard to the cumulative effects of the Proposed Development on the built heritage resource. The Listed Firtree Farmhouse is situated at a distance from the committed developments, and the key impacts relate to the Proposed Development (physical change to the building's fabric, as well as development within its immediate setting). Following completion of the Proposed Development, the Listed Building would not be affected in any way by the committed schemes and there would be no change to the effects as discussed in section 9.8 of this ES chapter.

9.10 IMPACT OF CLIMATE CHANGE

9.10.1 Historic England advocates sympathetic, informed maintenance, upgrade and reuse of existing buildings as an inherently sustainable approach. They have done extensive studies into 'Carbon in the Built Historic Environment'[11] and have adopted a position statement on climate change and sustainability[12] based on their understanding of sustainability over the long term. Part of this involves promoting the 'whole building approach' and consideration of the 'whole-life carbon of materials'.

[11] https://historicengland.org.uk/research/heritage-counts/2019-carbon-in-built-environment/

[12] https://historicengland.org.uk/whats-new/statements/statement-on-climate-change-and-sustainability/

9.10.2 Based on the UKCP18 projections identified in relation to the Site, there are no anticipated impacts on built heritage assets due to climate change in the short-term beyond general maintenance of the building in order to minimise risks to the fabric (from increased rainfall, driving winds, etc.). In the medium- to long-term, measures to improve the building's thermal performance may be desirable, but should be contextualised within an understanding of how the building actually performs and embodied carbon in the historic fabric. English Heritage's guidance on Climate Change and the Historic Environment (2008) recognises that decisions to adapt or introduce upgrades need to be well-informed as poorly specified measures can '*not only diminish the significance of historic assets but also reduce their flexibility to respond to future climate change*'.

9.11 ASSESSMENT SUMMARY

9.11.1 Under Section 16 of the Planning (Listed Buildings and Conservation Areas) Act 1990, the statutory duty requires 'special regard' to be paid to 'the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses'. The significance of the Listed Building is also protected under Section 16 of the NPPF, requiring 'great weight' to be given to its conservation (Paragraph 193) with any harm to significance to be convincingly justified (Paragraph 194) and balanced against any public benefits (Paragraph 195-196). It is clear within the NPPF (Paragraph 194) that significance of a heritage asset can be harmed through development within its setting.

9.11.2 This chapter has shown that there is potential for adverse effects on designated heritage assets within the Site boundary. This includes Firtree Farmhouse, Grade II Listed Building that may be subject to significant effects in the completed, occupational phase. With appropriate design mitigation, any effects can likely be reduced, so as not to result in significant effects.

Table 9.3: OPA Phase 1 - Built Heritage Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
None identified	N/A	Not required	N./A	None identified	N/A	Not required	N./A
Operation Effects							
None identified	N/A	Not required	N./A	None identified	N/A	Not required	N./A
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
None identified	N/A				Not required		N./A
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**
None identified	N/A	None identified	N/A		None identified	N/A required	None identified	N/A

Table 9.4: Wider OPA - Built Heritage Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects							
Physical impact to Firtree Farmhouse as a result of change in use (arising from changes to building fabric and possible wear	Grade II Listed Building – designated heritage asset of less than the highest significance	Direct, permanent	Negative (level cannot be ascertained on the basis of current information)	Negative (level cannot be ascertained on the basis of current	Heritage Impact Assessment following identification of new change of use. Potential further measures could	Minor Negative	Minor Negative

and tear associated with new use)				information)	include historic building watching brief.		
Non-physical impact to Firtree Farmhouse as a result of construction traffic, machinery, noise and vibrations, hoarding, and alteration of views due to removal of vegetation	Grade II Listed Building – designated heritage asset of less than the highest significance	Indirect, temporary	Minor Negative	Minor Negative	Any required hedgerow removal should be carefully sited and limited in scale. Appropriate siting of construction activities.	Minor Negative	Minor Negative
Non-physical impact to Firtree Farmhouse due to removal of Victoria House	Grade II Listed Building – designated heritage asset of less than the highest significance	Indirect, permanent	Neutral	Neutral	None required	Neutral	Neutral
Operation Effects							
Non-physical impact to Firtree Farmhouse due to changes in its setting resulting from presence of new development	Grade II Listed Building – designated heritage asset of less than the highest significance	Indirect, permanent	Negative (level cannot be ascertained on the basis of current information)	Negative (level cannot be ascertained on the basis of current information)	Retention of the key aspects of the immediate garden setting of Firtree Farmhouse and potential reinstatement of orchard planting. Retention and enhancement of existing vegetation screening. Adoption of appropriate design standards and layout of new buildings.	Minor Negative	Minor Negative
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
None identified	N/A				Not required		N./A
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**

Potential impact to historic fabric of Firtree Farmhouse	Potential damage to and/or deterioration of building fabric as a result of increased rainfall and driving winds.	Adopt and implement an appropriate maintenance strategy. Improvements to building's thermal performance, should be undertaken with due consideration of the appropriate guidance and an understanding of the performance of the building fabric.	Minor Negative

Table 9.5: OPA Phase 1 - Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
None required	N/A	N/A	N/A	N/A

Table 9.6: Wider OPA - Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Heritage assessment following identification of change of use to Firtree Farmhouse	Developer	Listed Building Consent; Planning Condition	Assessment to be submitted as part of future planning application and Listed Building Consent.	At reserved matters application for Phase 3 (or any stand-alone application for works to the Listed Building).
Mitigation by design to ensure appropriate layout and design which responds sensitively to the Listed Building and its setting	Developer/LPA	Planning Condition	Through planning application as part of reserved matters stages for Phases 3 and 6.	At reserved matters application stage for Phases 3 and 6.

CHAPTER 10: ECOLOGY

10.1 INTRODUCTION

10.1.1 This chapter of the Environmental Statement assesses the likely effects of the Proposed Development with reference to ecology, including designated sites and different habitats and species. The chapter should be read in conjunction with Chapter 3: The Proposed Development and with reference to relevant parts of Chapter 7: Air Quality, Chapter 11: Hydrology, Chapter 12: Noise and Vibration, and Chapter 13 Landscape and Visual, where common receptors have been considered and where there is an overlap or relationship between the assessment of effects. In addition to the information set out in the main body of this Chapter of the ES, a series of associated Appendices provide further detailed information as set out below:

- Appendix 10.1 Desk Study
- Appendix 10.2: Extended Phase 1 Habitat Survey
- Appendix 10.3: Watercourses and Fish Habitat
- Appendix 10.4: Bats
- Appendix 10.5: Great Crested Newt
- Appendix 10.6: Otter and Water Vole
- Appendix 10.7: Dormouse
- Appendix 10.8: Birds
- Appendix 10.9: Badger
- Appendix 10.10: Reptiles
- Appendix 10.11: Ecological Lighting Baseline
- Appendix 10.12: Landscape and Ecological Mitigation and Enhancement Masterplan
- Appendix 10.13: Habitat Change

- Appendix 10.14: Information to Inform Appropriate Assessment

10.1.2 In summary, the Proposed Development comprises the comprehensive development of the Site delivering up to 2,500 residential dwelling, local employment, local retail, leisure, employment and community facilities, primary school, formal and informal publically accessible open space, including formal sports facilities, landscaping, green infrastructure and sustainable drainage systems. From an ecological perspective, this includes the provision of 15.09 ha of informal open space and 5.85ha of amenity space as well as the SuDS system, which will contribute to the long term ecologically rich habitats and biodiversity of the site.

10.1.3 The ES considers the delivery of the One Horton Heath project, and incorporates formal assessment of two planning applications submitted at the same time. These are:

- An Outline Planning Application ('the wider OPA') for the whole One Horton Heath Project, together with the delivery of a new link road that would be aligned across the whole wider OPA site; and

- A Full planning application for the first phase of the One Horton Heath project ('OPA Phase 1') for up to 400 dwellings that is considered to be part of the Wider OPA rather than a stand-alone scheme.

10.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessment

O/14/75735 and O/16/79354 Application Surveys

10.2.1 Eastleigh Borough Council (EBC) resolved to grant outline planning permission in June 2015 for the West Horton Heath development (reference no O/14/75735), comprising up to 950 dwellings, a primary school and secondary school, employment uses, creation of a village centre at Chalcroft Farm (including a community building), and associated infrastructure (including public open space, landscaping, drainage, new access road, public rights of way, footpath and cycle links and utilities infrastructure). The planning permission includes the demolition and/ or conversion / change of use of existing buildings at Chalcroft Farm.

10.2.2 Subsequently, an outline planning application for the North West Horton Heath (NWHH) development was submitted to EBC in 2016 (reference no O/16/79354), comprising construction of up to 450 dwellings with new road and access onto Fir Tree Lane and Allington

Lane and with associated highway modifications, infrastructure, public open space, landscaping and drainage. Outline planning permission was granted in November 2017.

10.2.3 A range of historic ecological surveys have been completed by Ecological Associates Ltd as part of these earlier applications.

10.2.4 A summary of the historic surveys that have been completed in 2014/15 (including both O/14/75735 and O/16/79354) is provided below.

- Extended Phase I habitat surveys identified stream corridors, woodland and hedgerows as being valuable habitats. Two areas of invasive plant species were also identified (Himalayan balsam and Japanese knotweed).
- A detailed botanical survey identified several areas were found to retain a moderately species rich flora, particularly where the better-quality vegetation occurs on areas liable to winter flooding. Over 7km of “important” hedgerows were also identified.
- Badger surveys - only one active badger sett was recorded on site, with a number of disused setts noted.

Bat surveys

- Emergence/Re-entry surveys of the buildings on site recorded:
- Brown long-eared bat maternity roost (on site);
- Three common pipistrelle roosts of undefined nature (conclusion of previous surveys – these have since been defined);
- Two long-eared bat roosts of undefined nature (conclusion of previous surveys – these have since been defined);;
- A brown long-eared maternity roost
- Activity Transect Surveys recorded:
- Noctule, Serotine, Myotis sp., Long eared bats, common and soprano pipistrelle species.
- No Annex II species of bat were recorded.

- Important features for long eared bats were identified as being linear tracks and hedges.
- The highest bat diversity and activity along the woodland edge and watercourse on the western site boundary and watercourses north and west of the solar farm.

Great Crested Newts

- Two distinct populations (single metapopulation) were identified on Site.

Water Vole

- Signs of water vole activity and burrows were identified on Site during historic surveys in 2014/15, particularly on the western and central watercourses.

Otter

- No evidence of otter was recorded on site; however, prints were identified immediately adjacent to the Site and presence has been confirmed within the wider catchment.

Dormouse

- No evidence of dormouse was found.

Birds

- Breeding
- A common breeding bird assemblage was recorded. Evidence of barn owl was found associated with Foxholes Farm buildings (N.B. since demolished under licence with two barn owl boxes erected, one of which was occupied by a breeding pair in 2020).
- Wintering
- A kingfisher, listed in Schedule 1 of the Wildlife and Countryside Act was recorded on site. Other species typical of common wintering bird assemblages associated with the habitats present were recorded (redwing, starling, house sparrow, dunnock, song thrush).

Reptiles

- Slow worm – good population (mainly associated with boundary habitats).

- Grass snake – low population present along site boundaries.
- Common lizard low population present along site boundaries.

Invertebrates

- No surveys were undertaken because of the absence of high quality habitats in the development footprint (dominated by grazed improved or poor semi-improved grassland and arable fields).

O/14/75735 and O/16/79354 Condition Discharge Surveys

10.2.5 Further ecological surveys and assessment were completed by Johns Associates in 2018 and 2019 in order to discharge the ecological conditions relating to the above consents that also facilitated the initial infrastructure works.

10.2.6 The 2018/19 summary survey results are further added to by additional ecological surveys and investigations carried out in 2020 by Johns Associates.

10.2.7 The 2018/19 and the 2020 baseline have been integrated into comprehensive habitat and species specific baseline reports that can be found in the Appendices of this ES Chapter and summarised in Section 10.4 of this Chapter.

Scoping Opinion

10.2.8 An EIA Scoping Report was submitted to Eastleigh Borough Council in January 2020 with a request for a formal Scoping Opinion. The Ecology Chapter of the Scoping Report and suggested scope of assessment drew on the baseline established in the 2014/15 work carried out by Ecologica Associates Ltd and the 2018/19 work carried out by Johns Associates. Ongoing baseline surveys and Scoping has continued with an updated Scoping Opinion received from Eastleigh Borough Council dated 12 August 2020 which is reproduced here in the italicised text.

There are no Statutory Designated Sites of nature conservation interests within the Site, although a number are located in the surrounding area including the River Itchen SSSI, Moorgreen Meadows SSSI, the Solent and Southampton Water Special Protection Area and Ramsar site and the Solent Maritime SAC and the New Forest SPA. The LPA considers that there is likely to be a significant effect on biodiversity as a result of the construction, recreation al and operational aspects of the proposal. Baseline information will inform the type, scope and

range of surveys to be carried out. The applicant has committed to undertake further surveys, and the Local Planning Authority would endorse the completion of these surveys. This information will also need to be supplemented by Air Quality and Water Quality assessments (which should include surface water flows).

Regarding invasive species, Section 10.2.5 should include further details on the recording of their presence and an invasive species management plan, with advice taken from the Environment Agency.

Water vole should be included under Table 10.5 and assessed, as they and their places of shelter or protection are protected under the Wildlife and Countryside Act 1981 (as amended). Whilst the most recent survey did not find any active signs, this species has been noted previously along the western and central watercourses. Road and footbridge crossings (both permanent and any temporary crossing required to facilitate development) could result in loss, fragmentation of and damage to the habitat of this species, especially if the crossings are situated where active burrows and areas of refuge are currently located. As the location of these crossing points has not yet been decided, this important ecological feature could be affected by the proposed development. In addition, this feature is sensitive to disturbance which may increase as a result of development on the site.

With reference to Quobleigh Ponds and woods SINC as included in Table 10.5, any changes to hydrological regimes on site should be included as potential significant effects to be assessed (plus any other standing water features on site).

With reference to Table 10.5 and effects on watercourses, rivers are a Priority Habitat under the Natural Environment and Rural Communities Act (2006). The ES should include assessment of the potential significant effects to these habitats on site, and this should include habitat fragmentation (as a result of crossings), construction and operational water quality/pollution and changes to hydrological regimes on the site. Changes of quantity and direction of overland surface water flow could impact on receiving waters and wetlands (also include in Chapter 11 Hydrology).

The table identifies the potential of Ndep to affect the habitats present. However, the Air Quality chapter appears to be addressing only dust impacts during the construction phase on ecological receptors within 50m of the site. It does not appear to be considering Ndep levels on ecological receptors which it will need to do in order to address this potential ecological impact.

Section 10.5 sets out avoidance and mitigation measures. Watercourse crossings should be as few as possible, clear span and as narrow in width as possible to minimise effects on watercourses and any species dependent on them, including avoiding fragmentation of these important habitats. Depending upon bridge designs, mammal crossings may need to be provided. Shading and loss of watercourse corridors with the vehicular and pedestrian access crossings should also be included.

A thorough and detailed understanding of hydrological regimes on the site is essential when looking to avoid and mitigate for impacts on wetland habitats and watercourses, and when looking to achieve biodiversity net gain.

It is understood from the information in the Scoping Report regarding noise that piling may be required for the proposed development. Fish are particularly sensitive to vibration that may arise as a result of piling or other noisy percussive activities during construction within or close to watercourses. This and other habitats should be included as a potential significant effect to be assessed in the ES. Following discussion at the 1HH Ecology Working Group further information on the impacts from sediments and on salmon spawning specifically is needed.

Recreation and disturbance (including noise) impacts could also be extensive and affect all retained and created habitats, including hedgerows which will also need to be assessed in terms of masterplanning and layout to make sure that the site design doesn't encourage use of ecologically sensitive sites for recreation.

Any additional mitigation following the above comments should be included in 10.5 Mitigation.

Section 10.5.4 should make reference to the required 50m buffers to ancient woodlands.

Climate change needs to be considered in this chapter. The ES should also contain reference to Policy HH1 of the Submitted Eastleigh Borough Local Plan (2016-2036).

Potential additional effects requiring further assessment

10.2.9 A wide range of potential effects are being considered by this Chapter of the ES, based on the original Scoping Report, the Scoping Opinion and ongoing scoping as part of preparing the ES. The full scope of the assessment is set out in Section 10.6 of this ES.

Ecological Receptors Scoped Out of This Assessment

10.2.10 The following receptors and potential effects are unlikely to be significant (or fall beyond the remit of this project) and do not require further assessment.

10.2.11 Wintering Birds – No species of importance, other than those listed above and particularly with respect to designated sites or protected species, have been recorded on site.

10.2.12 Loss of lower value and common and easily re-creatable habitats, e.g. improved grassland, arable, poor semi-improved grassland, tall ruderal vegetation, scattered scrub and short perennial/ ephemeral vegetation.

10.2.13 Likewise, the loss of common species not listed above, e.g. small mammals and common amphibians is not considered to be significant as the mitigation and habitat enhancement measures for receptors (such as great crested newt and reptiles for the purpose of this example) will adequately avoid direct harm and replace/enhance the site for these species.

10.2.14 Southern Water will supply potable water to the OPA Phase 1 residents as part of its statutory function. Southern Water has a legal obligation to mitigate effects of abstraction through the preparation, consultation and implementation of its Water Resource Management Plan (WRMP) and any more focused measures set out when applying for new abstraction licences from the Environment Agency. As such, consideration of potential effects on water levels and hydrology associated with potable water supply to One Horton Heath has been scoped out of this assessment. Further information on the robust justification for scoping this out can be found in Chapter 11 of this ES.

Legislative Context

10.2.15 The legislation relevant to ecology (sites, habitats and species) and the assessment that will be presented within the Environmental Statement (ES) is summarised in the following text.

10.2.16 Whilst a significant change in legislation is expected due to the departure of the UK from the EU, the existing EU and UK regulations have been included as described herein and assumes that there will be no significant changes to the existing methodology of the assessment and mitigation of environmental effects.

10.2.17 Special Areas of Conservation (SAC) and Special Protection Areas (SPA) are European sites of international importance for wildlife. SACs and SPAs are protected in the UK under the Conservation of Habitats and Species Regulations 2017 as amended ('Habitat Regulations).

10.2.18 The Habitats Regulations (UK Government, 2017) impose stringent protection on SACs and SPAs. Regulation 63 requires all 'competent authorities', to undertake a formal assessment (Habitats Regulations Assessment or HRA) of the implications of any new plans or projects that may be capable of affecting the designated interest features of European Sites before deciding whether to undertake, permit or authorise such a plan or project. The HRA must consider the impacts of a plan or project alone and in combination with other plans and projects. Development which would adversely affect the integrity of a SAC or SPA, either alone or in-combination with other development, is highly unlikely to be granted planning permission as it will not be capable of passing stringent tests[1] Importantly, Regulation 63 and associated case law requires the application of the precautionary principle, i.e. where the impacts of development are uncertain, the Competent Authority must assume that negative impacts will adversely affect the integrity of the SAC and not grant permission for the plan or project.

10.2.19 Ramsar sites are wetlands of international importance designated under the Ramsar Convention, which was ratified by the UK in 1976. Although many Ramsar sites are also underpinned by SAC and SPA designations, Government have also issued policy statements that extend the same protection at a policy level to listed Ramsar sites in respect of new development as that afforded by the Habitats Regulations (see Section 1.4.2 below).

10.2.20 The Wildlife and Countryside Act (1981)[2] confers statutory protection to Sites of Special Scientific Interest (SSSI). It is an offence to intentionally or recklessly damage, disturb or destroy land known to be an SSSI or intentionally or recklessly disturb the wildlife in an SSSI. Statutory bodies have a general duty to take reasonable steps to further the conservation and enhancement of the special feature of SSSIs. SSSIs also receive strong protection under national policy (see Section 1.4.2 below).

10.2.21 Many species of animal and plant receive some degree of legal protection. For the purposes of this chapter, legal protection refers to: species included on Schedules 2 and 5 of the

1 Where development will adversely affect the integrity of a SAC, it must: a) be required for imperative reasons of overriding public interest; b) demonstrate that there are no alternative solutions; and c) ensure that adequate compensatory measures are secured to ensure the overall coherence of the network of European (Natura 2000) sites.

2 UK Government. (1981). The Wildlife and Countryside Act 1981(WCA 1981) as in force today (including any amendments) within the United Kingdom, from. Retrieved from www.legislation.gov.uk: http://www.legislation.gov.uk/ukpga/1981/69

Conservation of Natural Habitats and Species Regulations 2017[3]and Schedules 1, 5, 8 and 9 of the Wildlife and Countryside Act (1981)

10.2.22 Legal offences associated with species listed on Schedule 2 of the Habitats Regulations and Schedule 5 of the Wildlife and Countryside Act in England and Wales include inter alia:

- Deliberate capture, injury or killing of animals or taking or destroying their eggs;
- Deliberately disturb animals in a way that would significantly affect their local distribution or abundance, or affect their ability to survive, breed or rear young;
- Intentional or reckless disturbance of an animal in its place of shelter or protection;
- Damaging or destroying a resting place or breeding site;
- Intentionally or recklessly obstructing access to a place of shelter or protection; and
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead animal or any part of an animal.

10.2.23 Relevant species listed on these Schedules receive full protection from all legal offences listed above. Common reptile species receive partial protection under the Wildlife and Countryside Act in that they are protected from killing and injury only.

10.2.24 All species of wild bird are protected under the Wildlife and Countryside Act (1981) (as amended) from killing or injury. In addition, it is an offence to take or damage / destroy their eggs and to damage or destroy a nest whilst it is in use. Species listed on Schedule 1 (such as barn owl and kingfisher) receive additional protection in that it is illegal to disturb birds or their young whilst occupying, or near to, an active nest.

3 UK Government. (2017). Conservation of Habitats and Species Regulations 2017 as amended. Statutory Instrument 2017 No. 1012. Retrieved 211020, from www.legislation.gov.uk: https://www.legislation.gov.uk/uksi/2017/1012/contents

10.2.25 Badgers are protected under the Protection of Badgers Act 1992[4] which makes it an offence to wilfully kill, injure or take (or attempt to kill, injure or take) a badger; or to disturb badgers whilst occupying their setts.

10.2.26 A number of wild plants and animals (including slow worm, common lizard, great crested newt, skylark and some species of bat) are also included within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (UK Government, 2006)[5] which lists flora, fauna and habitats considered by the Secretary of State to be of principal importance for conserving biodiversity. The publication of the "England Biodiversity List" satisfies the requirements of Section 41 of the NERC Act 2006 for the conservation of biodiversity. Section 40 of the NERC Act 2006 requires public bodies, including local planning authorities, to have regard for the conservation of biodiversity in England, when carrying out their normal functions.

10.2.27 The EU Water Framework Directive [6] introduced a comprehensive river basin management planning system to help protect and improve the ecological health of rivers, lakes, estuaries and coastal and groundwaters. This is underpinned by the use of environmental standards to help assess risks to the ecological quality of the water environment and to identify the scale of improvements that would be needed to bring waters under pressure back into a good condition.

10.2.28 The Salmon and Freshwater Fisheries Act 1975[7] defines which methods of fishing for salmon, trout and freshwater fish are permitted, consider obstructions to the passage of fish, including fishing weirs, screens and sluices; dictating when and where they can be used as well as offences associated with disturbance effects on spawn or spawning fish. The Act also deals with problems of pollution making it an offence to knowingly permit the flow of poisonous matter and polluting effluents into river courses.

10.2.29 The Environment Bill is progressing through Parliament and is likely to be enacted during the multi-phase construction programme associated with One Horton Heath. Legally binding binding targets will be introduced for air quality, nature, water and resource and waste efficiency,

[4] UK Government. (1992, 01 01). *Legistation.gov.uk - Protection of Badgers Act 1992.* Retrieved from Legislation.gov.uk: http://www.legislation.gov.uk/ukpga/1992/51/contents

[5] UK Government. (2006, 05 02). *Legislation - Natural Environment and Rural Communities Act 2006.* Retrieved from Legislation.gov.uk: http://www.legislation.gov.uk/ukpga/2006/16/contents

[6] Jncc.defra.gov.uk. (2010). EU Water Framework Directive. [online] Available at: http://jncc.defra.gov.uk/page-1375 [Accessed 15 Mar. 2018].

[7] UK Government, 1975. The Salmon and Freshwater Fisheries Act 1975 Available at: https://www.legislation.gov.uk/ukpga/1975/51/section/43 [Checked 21/02/2020]

and a new, independent Office for Environmental Protection (OEP) will be created to hold government and public bodies to account for their environmental credentials. This legislation will also formalise the requirement for Biodiversity Net Gain from new developments.

Planning Policy and Guidance

10.2.30 There are a number of policies and guidance documents at the national and local level that are relevant to Ecology. These are discussed in turn in the following sections.

National Planning Policy Framework (NPPF) 2019

10.2.31 Section 15 of the National Planning Policy Framework (NPPF) 2019[8] requires impacts to biodiversity to be minimised. Paragraph 176 of the NPPF applies the same protection to Ramsar sites as that conferred by the Habitats Regulations to SACs and SPAs. The NPPF requires development to:

- Minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressure;
- Ensure that there will be no adverse impacts to SSSIs (such development would not normally be permitted);
- Ensure that there will be no loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees), unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- Where significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequate mitigation, or as a last resort compensation, must be provided.

10.2.32 The NPPF and associated Planning Practice Guidance also emphasise the requirement for ecological networks to be created throughout the wider landscape (paragraph 174).

[8] UK Government. (February 2019). Gov.uk - Publications - National Planning Policy Framework. Retrieved from ww.gov.uk: https://www.gov.uk/government/publications/national-planning-policy-framework--2

Local Planning Policy

Current Planning Policy

10.2.33 Current adopted policy for Eastleigh comprises the Eastleigh Borough Local Plan Review (2001 – 2011)[9] (adopted in May 2006). Saved policies 22.NC, 23.NC, 25.NC and 26.NC provide protection for SSSIs, locally designated sites and the overall wildlife network; and promote biodiversity conservation overall. In particular, Policy 23.NC states that:

- 'Development which is likely to have a direct or indirect adverse effect on a Site of Importance for Nature Conservation (SINC) will not be permitted, unless it can be demonstrated to the satisfaction of the Borough Council that the benefits of the development clearly outweigh the need to safeguard the nature conservation value of the Site. If development is to be permitted, the Council will require appropriate measures to be taken to mitigate for the adverse effects on the SINC.'

10.2.34 Policy DM11 provides strong protection for locally-designated sites and biodiversity and states that:

- 'Development will not be permitted if it is likely to have a direct or indirect adverse effect on a Site of Importance for Nature Conservation (SINC) or Local Nature Reserve as shown on the policies map (or on a more recent plan provided by the Hampshire Biodiversity Information Centre), unless it can be demonstrated to the satisfaction of the Borough Council that:

  i. the benefits of the development clearly outweigh the adverse effects on the nature conservation value of the Site;

  ii. the adverse impacts are unavoidable;

  iii. measures are taken to mitigate or, if this is not possible, compensate for the adverse effects, such that the development will result in at least no net loss of biodiversity; and

  iv. buffers free from development are provided to Locally designated sites within or

[9] Council, E. B. (2006, May). *Adopted Local Plan Review 2001 - 2011.* Retrieved from https://www.eastleigh.gov.uk/planning-and-building/planning-policy-and-implementation/local-plan/local-plan-2001-2011

adjacent to developments to alleviate recreational impact and impacts on edge habitats and to maintain dark skies.'

Impacts on priority habitats and protected and priority species will not be permitted unless the applicant can evidence that:

- there has been thorough habitat and species surveys;
- there is an overall biodiversity gain;
- protected species impacts have been avoided or mitigated and their needs taken into consideration within the development design;
- the great crested newt strategic survey and strategy have been considered in all developments within 500m of a great crested newt pond; and
- the strategic bat trapping survey has been considered in all developments within the locality of a woodland surveyed or connected habitat networks.'

Emerging Planning Policy

10.2.35 Emerging policy is set out in the Eastleigh Borough Local Plan 2016 – 2036 (Proposed Submission Local Plan)[10]. This emerging policy should be considered as a material planning consideration. Policy DM11 requires development to achieve the following:

- Protect, conserve and enhance areas subject to international, national and local nature conservation designations;
- Assist in achieving national, county and local biodiversity targets as set out in Biodiversity Action Plans (BAPs);
- Protect, conserve and enhance networks of natural habitats and features, including the Priority Biodiversity Areas and Priority Biodiversity Links identified in the Eastleigh Borough Biodiversity Action Plan 2012-2022, and watercourses and wetland complexes, woodland

[10] Eastleigh Borough Council. (2018, June). *Proposed Submission Local Plan 2016 - 2036.* Retrieved from Eastleigh Borough Council: https://www.eastleigh.gov.uk/media/3484/final-local-plan-document-june-2018-print.pdf

trees and hedgerows important to biodiversity and local character

- On new development sites seek enhancement of biodiversity through the protection and connection of existing and provision of new habitats and features compatible with the native biodiversity characteristics of the Borough.

Other Relevant Policy

10.2.36 The Solent Recreation Mitigation Strategy[11] aims to prevent bird disturbance from recreational activities, particularly through a growth in local population. It seeks to do this through a series of management measures which actively encourage all coastal visitors to enjoy their visits in a responsible manner rather than restricting access to the coast or preventing activities that take place there. Prepared by the Solent Recreation Mitigation Partnership of local authorities (including Eastleigh Borough Council) and conservation bodies, the strategy was published for consultation in July 2017 and changes incorporated as a result. The Strategy proposes:

- a team of 5-7 coastal rangers to advise people on how to avoid bird disturbance, liaise with landowners, host school visits, etc;
- communications, marketing and education initiatives and an officer to implement them;
- initiatives to encourage responsible dog walking and an officer to implement hem;
- preparation of codes of conduct for a variety of coastal activities;
- site-specific projects to better manage visitors and provide secure habitats for the birds;
- providing new/enhanced greenspaces as an alternative to visiting the coast;
- a partnership manager to coordinate and manage all the above.

10.2.37 Implementation of these measures and monitoring of their effectiveness, will be funded by 'developer contributions' calculated according to the bedroom numbers of the property, equivalent to an average of £564 per dwelling (increased annually to take into account inflation). This applies to new homes built within 5.6 kilometres of the SPAs. (This 5.6 kilometre zone is

[11] **https://solent.birdaware.org/strategy** checked 30/10/20

where the majority of coastal visitors live.) Some developments may require additional mitigation due to their size or proximity to a SPA.

10.2.38 The developer contributions will be collected by the local authorities and transferred to the Partnership which will implement the measures. Some of the money received will be set aside to fund the measures 'in-perpetuity' (calculated on an 80 years basis) after 2034.

10.2.39 Natural England have issued an updated Ancient woodland, ancient trees and veteran trees: protecting them from development wherein the requirement for a 50m buffer was removed in favour of a 15m buffer subject to the scale of the development. This advice note has been considered and the buffer specification is considered to comply with this guidance and has been agreed with Natural England and EBC.[12]

Technical Guidance/ Best Practice

10.2.40 There are a number of technical guidance documents that have been used to define the adopted approach to undertaking the Ecology aspects of Environmental Impact Assessment (EIA). These include methods for characterising the ecological baseline and the appropriate interpretation of data, as well as the specific approach to be adopted for Ecological Impact Assessment (EcIA). Technical guidance directly applicable to this technical specialism is described below.

- *British Standards Institute (BSI): BS 42020:2013 Biodiversity – Code of practice for planning and development[13]:* Provides recommendations on topics such as professional practice, proportionality, pre-application discussions, ecological surveys, adequacy of ecological information, reporting and monitoring.

- *BSI: BS 8596:2015 Surveying for bats in trees and woodland[14]*: Provides best practice guidance for assessing the presence of bats in trees and woodland.

- Chartered Institute of Ecology and Environmental Management (CIEEM): Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and

12 https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences - accessed 20.11.20

13 British Standards Institute (BSI) (2013). BS 42020:2013 Biodiversity – Code of practice for planning and development (First Ed.) London. BSI.

14 BSI, 2015. BS 8596:2015 Surveying for bats in trees and woodland. Guide. London. BSI, [online]. Available at: https://shop.bsigroup.com/ProductDetail/?pid=000000000030273056 [Checked 28/11/18].

Marine[15]: Provides technical guidance for assessing the potential ecological impacts of a development. EcIA is a process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems. EcIA can be used for the appraisal of projects of any scale including the ecological component of EIA. When undertaken as part of an EIA, EcIA is subject to the relevant EIA Regulations. Includes guidance on scoping; establishing the baseline; identifying important ecological features; assessing potential impacts; incorporating measures to avoid, reduce and compensate ecological impacts and the provision of ecological enhancements. Guidance on the consideration of the legal and policy framework throughout the EcIA process is also included.

- *UK Government*[16]: Provides standing advice on assessing the impacts of development on a range of protected species, including bats, great crested newts (GCN), badgers, dormouse, reptiles, wild birds, protected plants, invertebrates and ancient woodland. Includes guidance on survey effort, methods, assessing impacts and mitigation. Incorporates current Natural England (NE) guidance.

- Bat survey guidelines for professional ecologists: Good practice guidelines[17]: Guidance on bat surveys, data analysis, interpretation and reporting.

- *Bats and lighting in the UK*[18]: Guidance on the impacts of lighting on bats and developing mitigation strategies to minimise those impacts.

- *Bat tree habitat key*[19]: Guidance on the use of trees by bats.

- *Bat Mitigation Guidelines*[20]: Guidance on good practice in relation to land-use planning and

[15] Chartered Institute of Ecology and Environmental Management (CIEEM), 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine (September 2018) CIEEM.*

[16] UK Government (2019) Natural environment, [online]. Available at: **https://www.gov.uk/guidance/natural-environment** [Checked 20/10/20].

[17] Bat Conservation Trust (2016). *Bat survey guidelines for professional ecologists: Good practice guidelines* (Third ed.) London. BCT.

[18] Bat Conservation Trust (2009). Bats and lighting in the UK. London. BCT.

[19] Andrews, H. (2013). Bat tree habitat key. *Andrews Ecology.*

[20] Mitchell-Jones, A.J. (2004). Bat Mitigation Guidelines. *English Nature.*

development where bats are known or suspected to occur.

- *Bats and Artificial Lighting in the UK*[21]: Specific guidance on the impact of lighting on bats and associated mitigation for different scenarios.
- WC1060 Development of a cost-effective method for monitoring the effectiveness of mitigation for bats crossing linear transport infrastructure[22]. A methodology to assess the likelihood of road collision impacts on commuting bats.
- *The Dormouse Conservation Handbook*[23]: Guidance on survey techniques and habitat requirements for dormice.
- *Herpetofauna Worker's Manual*[24]: Guidance on survey techniques and habitat requirements for amphibian and reptile species.
- *Advice Sheet 10: reptile survey*[25]: Guidance on survey techniques for reptiles.
- *Surveying Badgers*[26]: Guidance on surveying badgers.
- *Badgers*[27]: Guidance on survey techniques and ecology of badgers.
- *Handbook for Phase 1 Habitat Survey – a technique for environmental audit*[28]: Standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The handbook provides information on the planning and execution of habitat surveys, together with definitions of the standard habitat types, alphanumeric reference codes and mapping colour codes.

21 Institute of Lighting Professionals and the Bat Conservation trust (2018). Bats and Artificial Lighting in the UK. *Bats and the Built Environment Series.* Guidance Note 08/18.

22 WC1060 Development of a cost-effective method for monitoring the effectiveness of mitigation for bats crossing linear transport infrastructure (J. Altringham & A. Berthinussen, 2015);

23 English Nature (2006). *The Dormouse Conservation Handbook.* (Second Ed.).

24 Gent, A.H. and Gibson, S.D. (2003). *Herpetofauna Worker's Manual.* Peterborough. Joint Nature Conservation Committee (JNCC).

25 Froglife. (1999). *Advice Sheet 10: reptile survey.* Froglife, Halesworth.

26 Harris, S. Cresswell, P. and Jeffries, D. (1989). *Surveying Badgers* (First Ed.). London. Mammal Society.

27 Neal, E. and Cheeseman, C. (1996). *Badgers.* London. Poyser Natural History.

28 JNCC (2010). *Handbook for Phase 1 Habitat Survey – a technique for environmental audit.* London. JNCC.

- *River Habitat Survey*[29] - River Habitat Survey is a standard methodology for recording habitat features for wildlife and hydromorphology that was designed by the Environment Agency, England and Wales and has since been applied in many other countries. It focuses on standard survey reaches of 500m length and uses a series of regular transects and a sweep-up survey to capture key information.

- *Water Vole*[30]- surveys for this species have been conducted historically and by Johns Associates. Surveys are based on a close examination of the waterways and ponds (up to at least 2m from the water) between April and October by an ecologist experienced in water vole ecology. A detailed search for key signs is conducted, which are recorded on a map if found. These signs include: faeces, latrines, feeding stations, burrows, footprints, runs or pathways. The survey aims to gather information on the size and extent of the population on and adjacent the development site.

- *Otter*[31]- surveys for this species focused on watercourses and riparian corridors, searching for both sightings of otter and characteristic field signs including, spraints, anal jelly, prints, feeding remains, slides and key resting places such as holts. Evidence would be recorded on a plan.

Baseline Data Collection

10.2.41 The additional survey and data collation methods set out in this Section were used (in conjunction with the historic investigations described in Section 10.2.4) to confirm the baseline for the ecological chapter of the ES and associated evalutaions including the Appropriate Assessment set out in Appendix 10.14 of this Chapter of the ES. These investigations commenced in July 2018 and were completed in November 2020.

10.2.42 The baseline ecological conditions on site have been informed by a comprehensive suite of surveys (see Table 10.2.1).

29 Environment Agency 2003. Version 1. *River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual*.

30 Dean, M., Strachan, R., Gow, D., & Andrews, R. (2016). *The Water Vole Mitigation Handbook* (Mammal Society Mitigation Guidance Series). Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London.

31 Natural England (2015) *Otters: surveys and mitigation for development projects*. **https://www.gov.uk/guidance/otters-protection-surveys-and-licences**

Desk Study

10.2.43 A formal ecological desk study was completed in 2018 to inform the initial scope of surveys. This was then updated in March 2020. Data was requested (in October 2018 and March 2020) from the Hampshire Biodiversity Information Centre (HBIC) for land within the Site boundary and an adjacent 2km buffer zone with an extended radius of 5km applied for Statutory sites and bat roosts for priority habitats and species, controlled and legally-protected species within the Site boundary and an adjacent 2 km buffer zone for other ecological receptors (the likely Zone of Influence (ZoI) of the Site). In line with current CIEEM guidance, these are the sites, habitats and species that are of sufficient importance that effects on them could be significant.

10.2.44 The Multi-Agency Geographical Information for the Countryside (MAGIC) website (www.magic.gov.uk) was also used to obtain information relating to statutory designated sites of international nature conservation importance within 10km of the Site; and for statutory sites of national or local nature conservation importance within 2km of the Site.

10.2.45 The following strategic documents for Eastleigh Borough Council were reviewed to inform the baseline understanding of habitats and species present, or likely to be present, within or adjacent to the Site:

- Eastleigh Borough Council (2012) Biodiversity Action Plan for Eastleigh Borough 2012 – 2022.
- Eastleigh Borough Council (2018). Eastleigh Borough Local Plan 2016-2036. Great Crested Newt Study
- Rushbrook, B (2018). Southern Damselfly Survey and Habitat Assessment Study, Eastleigh Borough.
- The Highwood Group and Drew Smith Group (2017). Strategic Eastleigh Site Bat Trapping and Radio-tracking Baseline Report and Evaluation

10.2.46 The subsequent desk study report (Johns Associates, 2020) is included as Appendix 10.1 to this ES Chapter.

Habitats

10.2.47 An extended Phase 1 habitat survey of the Site and immediately adjacent areas was conducted on 21 November 2019, updated on 15 April 2020, 18 August 2020, on 9th October 2020, but

inspection and updates have been ongoing throughout the project during the course of many hundreds of hours spent surveying the One Horton Heath site between 2018 and 2020. These were undertaken by Johns Associates Ltd to establish the baseline ecological conditions and to inform the Scoping Report and this subsequent ES Chapter. The survey was conducted following JNCC guidelines for Phase 1 Habitat Survey. In addition, the habitat types recorded were also recorded as UK Habitat Classification System[32] (UKHab) typologies, to enable direct translation into the use of the Defra Biodiversity Metric 2.
The Phase 1 habitat survey was extended to include characteristic signs, habitat features and/or observations associated with legally protected and/or notable species.

10.2.48 This included:

- searching for badger setts and signs and classification of any recorded setts;
- assessing the suitability of habitat for notable plant species, invertebrates, birds, dormouse, reptiles, amphibians, and other mammals;
- conducting potential roost assessment surveys of trees and the one building on site;
- updating the Habitat Suitability Index assessment of accessible ponds;
- searching for evidence of hedgehog (e.g. in leaf piles, characteristic droppings);
- assessment of boundary hedgerows;
- evaluation of potential impacts and effects, source, pathway receptor relationships including habitat connectivity, hydrological and groundwater relationships where present.

10.2.49 Use of Google Earth and other aerial images have also been used to place the habitats at the Site into context within the wider landscape.

10.2.50 The subsequent Phase 1 Habitat Survey report (Johns Associates, 2020) is included as Appendix 10.2 to this ES Chapter.

[32] **https://ukhab.org** checked 30/10/20

10.2.51 A River Habitat Survey of the watercourses associated with the application site was carried out by Johns Associates in July 2020.

Species

10.2.52 A wide range of species specific surveys were undertaken between 2018 and 2020 to build on the baseline work already completed from historic ecological investigations. These additional studies are highlighted in Table 10.1 below.

Table 10.1 Ecological Investigations Completed to Inform the Baseline (2018- 2020)

Receptor	Investigations	Technical Guidance	Location in this ES Chapter
Sites	October 2018 Ecological Desk Study	CIEEM. (2017, December 01). *Guidelines for Preliminary Ecological Appraisal, Second Edition.* Retrieved December 18, 2017, from https://www.cieem.net/data/files/Publications/Guidelines_for_Preliminary_Ecological_Appraisal_Dec2017.pdf	Appendix 10.1
Bats	Activity Transects	BSI., 2015. *BS 8596:2015 Surveying for bats in trees and woodland. Guide.* London. BSI. Bat Conservation Trust., 2016. *Bat survey guidelines for professional ecologists: Good practice guidelines* (Third ed). London. BCT. Bat Conservation Trust., 2009. *Bats and lighting in the UK.* London. BCT. Andrews, H. (2013). *Bat tree habitat key.* Andrews Ecology. Mitchell-Jones, A. J., 2004. *Bat Mitigation Guidelines.* English Nature.	Appendix 10.4
	Trapping/Radio tracking		
	Crossing Point Surveys		
	Automated Detector Surveys		
	Bat Roost Inspection (BRI) (Buildings)		
	Bat Roost Inspection (Trees)		

Receptor	Investigations	Technical Guidance	Location in this ES Chapter
	Emergence/Re-entry Surveys (Buildings)	Institute of Lighting Professionals and the Bat Conservation Trust, 2018. *Bats and Artificial Lighting in the UK.* Bats and the Built Environment Series. Guidance Note 08/18	
	Emergence/Re-entry Surveys (Trees)		
	Baseline Lux surveys	Institute of Lighting Professionals and the Bat Conservation Trust, 2018. *Bats and Artificial Lighting in the UK.* Bats and the Built Environment Series. Guidance Note 08/18	Appendix 10.11
Otter	Field Survey	Natural England. (2014, October 6). *Otters: Surveys and mitigation for development projects*. Retrieved from GOV.UK: https://www.gov.uk/guidance/otters-protection-surveys-and-licences Joint Nature Conservation Committee. *Common Standards Monitoring Guidance for Mammals*. Updated August 2004. ISSN 1743-8160.	Appendix 10.6
Water Vole	Field Survey	Strachan, R. M. (2011). *Water Vole Conservation Handbook: Third Edition.* Oxford: Wildcru	Appendix 10.6
	Camera Trapping		
Birds	Barn Owl	Gilbert, G., Gibbons, D.W. & Evans, J., 1998. *Bird Monitoring Methods.* British Trust for Ornithology. Natural England. (2015). *Wild birds: surveys and mitigation for development projects.* Retrieved from UK Gov: https://www.gov.uk/guidance/wild-	Appendix 10.8

Receptor	Investigations	Technical Guidance	Location in this ES Chapter
		birds-surveys-and-mitigation-for-development-projects#survey-methods	
Badger	Field Survey for setts and other evidence	Harris, S., Cresswell, P. & Jeffries, D., 1989. *Surveying Badgers* (First ed.) London. Mammal Society. Neal, E. & Cheeseman, C.,1996. *Badgers*. London. Poyser Natural History.	Appendix 10.9
Habitats	Phase 1 Habitat Survey	JNCC., 2010. *Handbook for Phase 1 Habitat Survey – a technique for environmental audit.* London. JNCC.	Appendix 10.2
Great Crested Newts	Habitat Suitability Index Assessment Presence/Absence/Population Size Class Assessment (ponds) Terrestrial Refugia Searches	Gent, A. H. & Gibson, S. D., 2003. *Herpetofauna Worker's Manual.* Peterborough. Joint Nature Conservation Committee (JNCC). Oldham, R. K. (2000). *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus).* Herpetological Journal, 143-155.	Appendix 10.5
Reptiles	Refugia Survey	Gent, A. H. & Gibson, S. D., 2003. *Herpetofauna Worker's Manual.* Peterborough. Joint Nature Conservation Committee (JNCC). Froglife. (1999). *Advice Sheet 10: reptile survey.* Froglife, Halesworth.	Appendix 10.10
Terrestrial Invertebrates	Historical surveys have been completed. Mapping/charact	https://www.cieem.net/invertebrates-terrestrial-	See Extended Phase 1 habitat survey in Appendix 10.2

Receptor	Investigations	Technical Guidance	Location in this ES Chapter
	erisation of key terrestrial invertebrate habitats to inform impact extent and mitigation will be completed. N.B. Invertebrates have been scoped out of this assessment as the Site is considered to offer suitable habitat for predominantly common species within boundary habitats only. These areas are to be retained and enhanced as part of the Proposed Development, which will increase their value to this group.		
Fish	River Habitat Survey to characterise physical habitat quality and diversity, also	Environment Agency. 2003. River Habitat Survey in Britain and Ireland. A Field Survey Guidance Manual.	Appendix 10.3

Receptor	Investigations	Technical Guidance	Location in this ES Chapter
	acting as a benchmark for future stream restoration proposals.		
Dormouse	Nest Tube and nut search	English Nature, 2006. *The Dormouse Conservation Handbook.* (Second ed).	Appendix 10.7

Assessment Methodology

Identification of Receptors that Could be Subject to Likely Significant Effects

10.2.53 The identification of receptors is informed by the Scoping Opinion and consultation carried out to inform Chapter 10 of this ES, based on relevant guidance and the professional judgement of qualified technical specialists who have undertaken a desk study and ecological field surveys at the Site.

10.2.54 In some cases, even without quantified information, it is reasonable to conclude that some potential receptors will not experience significant effects. This is the result of the type and condition of the habitat present and mitigation measures that have been integrated into the Proposed Development.

10.2.55 The following considerations have been taken into account when identifying receptors:

- The importance (or value) of the receptor at a local, regional and national level;
- The extent to which important ecological receptors will be affected by changes that are expected to result from the Proposed Development;
- The sensitivity of the important ecological receptors to the changes that are likely to occur;
- The likely magnitude, duration and other characteristics of the effects; and
- Relevant best-practice and guidance where specialist methodologies have been developed

as detailed below.

Potential Receptors

10.2.56 A key consideration in assessing the effects of the Proposed Development on flora and fauna is to define the habitats and species that need to be included in the assessment. In identifying these receptors, it is important to recognise that a development can affect flora and fauna both within the Site (e.g. through the land-take required) as well as beyond the Site (e.g. through noise generation, changes in air quality or local hydrology etc.). The approach that has been taken in preparing this Chapter is to identify important or valuable ecological resources (the sites, habitats and species of sufficient importance that effects upon them could be significant), as well as considering legally protected species.

10.2.57 Assessment of the effects of the Proposed Development on ecology was undertaken in accordance with the CIEEM's EcIA Guidelines[33].

Statutory nature conservation sites

10.2.58 Internationally important sites (collectively referred to in this Chapter as European sites – whilst recognising that Ramsar sites are designated at a global level):

- Special Areas of Conservation (SACs)[34];
- Candidate SACs[35];
- Sites of Community Importance (SCIs)[36];

[33] CIEEM, 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine,* [online]. Version 1.1. Updated September 2019. Available at: https:///www.CIEEM.net/data/files/EcIA%20Guidelines.pdf [Checked 30/10/20].

[34] SACs are designated under Article 4(4) of Directive 92/43/EEC

[35] Candidate SACs are designated under Article 4.1 of Directive 92/43/EEC

[36] SCIs are sites that have been nominated or submitted by Member States and entered onto the list of sites compiled by the European Commission that form (along with Sacs and SPAs) the Natura 2000 network. SCIs are subject to the provisions of Article 6(2) of Directive 92/43/EEC. SCIs are afforded full protection by law under the Conservation of Habitats and Species Regulations 2017 (regulation 8(1)(b))

- Special Protection Areas (SPAs)[37];
- Listed or proposed Ramsar sites, potential SPAs, possible/ proposed SACs[38]; and
- Sites identified or required as compensatory measures for adverse effects on other European sites[39].

10.2.59 Nationally important sites:

- Sites of Special Scientific Interest (SSSIs)[40]; and
- National Nature Reserves (NNRs).

10.2.60 Locally important sites:

- Local Nature Reserves (LNR): Statutory sites that are of importance for recreation and education as well as ecology. Their level of importance is defined by their other statutory or any non-statutory designations (e.g. if an LNR is also an SSSI but is not a European site, it will be of national importance). If an LNR has no other statutory or non-statutory designation it should be treated as being of borough/ district-level importance for biodiversity (although it may be of greater socio-economic value).

10.2.61 Non-statutory nature conservation sites:

- Sites of county importance – non-statutory nature conservation sites (Sites of Importance for Nature Conservation (SINC)).

Priority Habitats and Species

[37] SPAs are classified pursuant to the requirements of Directive 2009/147/EC (Article 4). As European Sites, they are provided with full protection by law under the Conservation of Habitats and Species Regulations 2017.

[38] Government Policy in England (see paragraph 118 of the NPPF) protects Ramsar sites, potential SPAs and possible SACs as if they were fully classified SPAs or a fully designated SACs.

[39] Government policy in England (see paragraph 118 of the NPPF) is that any such compensatory land or water must itself be protected as if it were a fully classified SPA or a fully designated SAC.

[40] Some SSSIs also wholly or partially fall within a European Site boundary.

10.2.62 In this Chapter (and following the CIEEM guidance), the geographic level at which a species/habitat has been identified as a priority for biodiversity conservation is referred to as its level of 'species/habitat importance'. For example, habitats and species of principal importance for the conservation of biological diversity in England are identified as being of national species or habitat importance reflecting the fact that the importance of these species or habitats has been defined at a national level. The level of importance pertains to the species or habitat as a whole rather than to individual areas of habitat or species populations, which cannot be objectively valued (other than for waterfowl, for which thresholds have been defined for national/or international 'population' importance).

- International importance: populations of species or areas of habitat for which European sites are designated;
- International importance: populations of birds meeting the threshold for European importance (1% of the relevant international population)[41];
- National importance: priority habitats and species of principal importance (HPI and SPI[42]) for the conservation of biological diversity in England[43];
- National importance: species listed as being of conservation concern in the relevant UK Red Data Book (RDB) or the Birds of Conservation Concern (BoCC) Red List;
- National importance: Nationally Rare and Nationally Scarce species, which are species recorded from, respectively,1-15 and 16-100 hectads (10x10km squares of the national grid) respectively;
- National importance: populations of birds comprising at least 1% of the relevant British

[41] The JNCC prepared guidelines to assist in the selection of SPAs (The Birds Directive: Selection guidelines for Special Protection Areas). Stage 1 of the two-stage process identifies those areas used regularly by 1% or more of the Great Britain (or in Northern Ireland, the all-Ireland) population of a species listed in Annex I of the Birds Directive in any season. The JNCC undertakes reviews of the SPA network and populations of its qualification species at roughly decadal intervals with the last (third) review published in 2016.

[42] Habitats and Species of Principle Importance (HPI and SPI).

[43] Natural England (2018). UK BAP priority species and habitats, [online]. Available at: http://naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/prioritylist.aspx [Checked 28/11/18].

breeding/ wintering population (where data are available); and

- Borough/ district importance: habitats and species listed in the Borough or District Biodiversity Action Plan (BAP).

Legal Protection

10.2.63 Many species of animal and plant receive some degree of legal protection. For the purposes of this document, legal protection refers to:

- Species included in Schedules 1, 5 and 8 of the WCA (as amended), excluding:
- Species that are only protected in relation to their sale (see Section 9(5) and 13(2) of the WCA 1981), given that the Proposed Development does not include any proposals relating to the sale of species; and
- Species that are listed in Schedule 1 of the WCA 1981 that are likely to breed on or near the Site (given that this schedule is only applicable whilst birds are breeding).
- Species included in Schedules 2 and 5 of the Habitats Regulations 2017 as amended;
- Badgers, which are protected under the Protection of Badgers Act 1992; and
- Hedgerows, some of which are protected under the Hedgerows Regulations 1997.
- Fish, protected under The Salmon and Freshwater Fisheries Act 1975 and the Eels Regulations 2009
- Waterbodies and associated ecological receptors protected under the Water Framework Directive

Legal Control

10.2.64 Schedule 9 of the WCA 1981 lists species of animal that it is an offence to release or allow to escape into the wild and species of plant that it is an offence to plant or otherwise cause to grow in the wild.

Assessment Methodology

10.2.65 Assessment of the effects of the Proposed Development on ecology was undertaken with reference to CIEEM's Guidelines for Ecological Impact Assessment in the United Kingdom. The assessment has focused on designated sites, legally protected and otherwise importance ecological resources.

10.2.66 The starting point for the assessment was to undertake an exercise, using the baseline data that were collected through the desk study, site survey and knowledge of the local area, to sub-divide the recorded (and likely) ecological receptors (i.e. designated sites, together with species populations and habitats) into:

- Those that could be significantly affected by the Proposed Development or for which the development could result in the contravention of relevant legislation, and that therefore required more detailed assessment; and
- Those that were assessed as not being likely either to be significantly affected or whose presence was not likely to result in any relevant legislation being contravened, and that did not therefore require further assessment (i.e. that were 'scoped out' of the assessment).

10.2.67 For sites/ habitats/ species that meet the criteria given in the above section, the next stage of the scoping assessment is to determine whether the identified receptors are likely to be of sufficient 'ecological conservation value' that an effect upon them could be significant. In this context:

- Ecological conservation value relates to the quality and/or size of sites or habitats, or the size of species populations; and
- Potential significance means that the effect could be of sufficient concern, or for positive effects, of such substantial benefit that it could influence the decision about whether or not development consent or a specified other consent should be granted.

Impact characterisation

10.2.68 Characterisation of impacts considers the baseline conditions and likely changes as a result of the construction and operation of the Proposed Development. The following parameters are considered in this assessment:

- Magnitude - the 'size' or 'amount' of an impact, determined on a quantitative basis where

possible;

- Extent – the area over which an impact is expected to occur;
- Duration - the time for which the impact is expected to last prior to recovery or replacement of the resource or feature;
- Reversibility – an irreversible (permanent) impact is one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A reversible (temporary) impact is one from which spontaneous recovery is possible or for which effective mitigation is both possible and an enforceable commitment has been made; and
- Timing and frequency – some impacts will only occur if an activity takes place at a certain time of day/ year (i.e. when a species is active).

Approach to mitigation

10.2.69 Consideration and application of avoidance, mitigation and compensation to the OHH development proposals have been considered from the earliest possible stage and has been an iterative process in the project design. Appropriate measures included in this ES Chapter are realistically achievable where a high likelihood of success is expected, based on good practice guidance and evidence. Commitments would be secured through appropriate planning conditions and/or legal agreements.

10.2.70 A sequential process has been adopted:

- Avoidance of potentially adverse impacts is best achieved through consideration of potential impacts of a project from the earliest stages of scheme design and throughout its development.
- Mitigation involves reduction or minimisation of adverse impacts. Measures fundamentally incorporated into the scheme design are described as ‘inherent design mitigation’. This includes the iterative re-design of the layout of the scheme or adjusting the location of certain activities.
- Where a predicted adverse impact cannot be acceptably mitigated, there may be opportunity for implementation of compensatory environmental measures. Compensation comprises measures taken to make up for loss of, or permanent damage to, ecological features, despite

application of mitigation.

1.1.1 Where appropriate, biodiversity enhancements have been identified for incorporation into the planning application in accordance with planning policy.

Assumed and Inherent Design Mitigation

10.2.71 The assessment has assumed the implementation of a number of 'mitigation' measures that are either considered assumed and inherent to the Proposed Development design. This section will explicitly outline elements of the scheme design that have been assumed as in place when undertaking the assessments and would be particularly important to ensure are retained.

10.2.72 For the purpose of the assessment, it is acceptable to include measures that would be commonly implemented as part of the delivery of the scheme. These should be set out here. For example, it can be assumed that a robust CEMP to avoid and minimise any construction related effects to acceptable and non-significant levels, will be produced, implemented, monitored and enforced. Any assumed mitigation is carried forward and presented within the mitigation summary tables at the end of the chapter clearly stating how this would be delivered e.g. via planning condition.

10.2.73 The assessment for the Wider OPA will be undertaken on the basis of the outline parameter plans that have been prepared for the Wider OPA Site.

10.2.74 The Wider OPA Site boundary is shown on Drawing No. EAST200403-RLP-01, Rev. P1 (Site Boundary Plan). These measures are shown on the following parameter plans:

- Access – Drawing No. EAST200403-PP01-P14
- Land Use – Drawing No. EAST200403-PP02-P19
- Green Infrastructure – Drawing No. EAST200403-PP03-P19
- Building Heights – Drawing No. EAST200403-PP04-P16
- Demolition – Drawing No. EAST200403-DEP01-P1

<u>Additional Mitigation, Compensation and Enhancement Measures</u>

10.2.75 Best practice for mitigation is to 'avoid, reduce or compensate'. Additional mitigation measures are those that can be applied in addition to the design proposals to reduce the potential effects.

Mitigation measures proposed are realistic and achievable in terms of the proposed development and have been agreed by the Client/ design team. This section will also include details on how the mitigation will be achieved. Mitigation will be used to enhance positive effects further and this should be considered wherever possible.

Biodiversity Net Gain

10.2.76 The overall aim for ecology will be to deliver a net gain in biodiversity through the Proposed Development. This will either be delivered on site and/or through an appropriate funding mechanism with Eastleigh Borough Council for the delivery of any required off-site biodiversity net gain. The evaluation of Biodiversity Net Gain associated with this pre-submission version of the ES has been conducted by focusing on the net change in areas associated with those ecological habitat receptors scoped into the ES as being Important receptors i.e. Priority Habitats listed under the Natural Environment and Rural Communities Act 2006.

10.2.77 It is recognised that the current Defra 2 Biodiversity Metric 2.0[44] (JP029) is currently in beta test with a number of inconsistencies in the current version. The formal Version 3 is due to be finalised and released in January / February 2021. This is considered to be the best available method for this type of evaluation available and will be used prior to planning determination to assess Biodiversity Net Gain associated with the whole site, including those habitats not considered to be Important ecological receptors.

Identifying significance of residual ecological effects

10.2.78 A 'significant residual effect' (both positive and negative) is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' after considering inherent and additional ecological mitigation. Significant effects require assessment (including to appropriate geographical scale) to inform the decision maker of the environmental consequences of permitting a project.

10.2.79 In determining whether a residual ecological effect is 'significant' or not, the following has been considered:

- Designated sites – whether construction and/or operation is likely to undermine conservation

[44] http://publications.naturalengland.org.uk/publication/5850908674228224

objectives, affect the conservation status or condition.

- Ecosystems – whether the project is likely to cause changes in structure and function.
- Habitats – the effect on conservation status (including cumulative effects).
- Species – the effect on conservation status (including cumulative effects).

Cumulative Impact Assessment

10.2.80 Cumulative effects within the same Zone of Influence have been considered in the following way (using criteria set out by CIEEM):

- Additive/ incremental effects from multiple activities/ projects that may give rise to a significant effect (additive or synergistic) due to their proximity in time and space;
- Associated/ connected effects arising because of an enabling effect from one development on another development e.g. phased development occurring as part of separate planning applications.

10.2.81 Developments for inclusion in the cumulative assessment have been assessed on national guidance and have been agreed with Eastleigh Borough Council. Table 10.8 in Section 10.9 lists committed developments that have been identified by Eastleigh Borough Council as offering potential cumulative effect in-combination with One Horton Heath.

Geographical Scope

10.2.82 The spatial scope of the assessment of each potential significant effect reflects:

- The area occupied by the receptor that is being assessed; and
- The Zone of Influence associated with the environmental changes that will result from the Proposed Development that are likely to affect the receptor.

10.2.83 Thus, if part of a designated biodiversity site is located within the ecological zone of influence ZoI relating to a particular environmental change, an assessment is made of the effects on the Site as a whole. A similar approach has been taken for areas of notable habitat. For species that occur within an ecological ZoI that relates to a change that could significantly affect the species, an assessment has been carried out on the total area that is used by the affected individuals or population of the species (e.g. for foraging or commuting).

10.2.84 Receptors that are of sufficient value that an effect upon them would have the potential to be significant, together with all relevant legally protected species, are taken through to the assessment stage. This involves identifying, for each receptor:

- Any environmental changes that are likely to be caused by the Proposed Development which have the potential to lead to a significant effect and/ or to contravene relevant legislation;
- For these environmental changes, determining the area within which each change could cause a likely significant effect or could contravene relevant legislation (i.e. an 'ecological ZoI');
- Comparing the area where the receptor occurs with the ecological ZoI; and
- If the receptor occurs or is likely to occur within the ZoI, concluding that either the receptor could be subject to a significant effect and/ or the relevant legislation could be contravened, in which case the effects upon the receptor are scoped in, or no significant effect is likely to occur and it is scoped out.

10.2.85 The ecological ZoI is the area affected by land-take and direct land-cover changes associated with the Proposed Development. This zone is the same for all affected ecological features. Environmental changes can extend beyond this area (e.g. changes in disturbance associated with increased lighting associated with roads and other infrastructure, or discharges to surface water courses), therefore the ZoI may vary between ecological features, dependent upon their sensitivity and the nature of the change.

10.2.86 In view of these complexities, the definition of the ZoI that extends beyond the land-take area will be based upon professional judgement, informed by discussions with the technical specialists who are working on other chapters of the ES (e.g. air quality and hydrology). Environmental changes within their assessments will be combined aligned with ecological information about feature sensitivity to define the extent of each ecological ZoI.

10.2.87 The Zone of Influence associated with the Proposed Development is considered at two levels:

- A radius of 10 km was considered to be appropriate to consider potential effects on sites of International value and 5km for with more mobile species, e.g. bats. NB the New Forest SPA/SAC is included as part of the scoping process, which lies just beyond this buffer.
- A radius of 2 km was deemed appropriate for consideration of potential effects on habitats

and species of national value and sites and habitats of local value, although designated sites with an environmental pathway characterised by surface water flow paths and emissions to air were considered further away (e.g. up to 10km).

Temporal Scope

10.2.88 The proposed EIA will assess the effects of the One Horton Heath Project arising during the anticipated construction phase and occupation phase and will be based upon the following scenarios:

- Baseline/Future Baseline + OPA Phase 1 with the Link Road delivered concurrently and completed by occupation of 100 units of OPA Phase 1;
- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered);
- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered) + Cumulative Development.

10.2.89 In the Future Baseline / 'do-nothing' scenario, no significant changes or trends are predicted to occur to the habitats and species populations associated with the Site. Habitats within the Site boundary would continue to be managed intensively for agriculture.

10.2.90 The assessment of potential likely significant effects has been completed for the temporal periods as set out below:

- Construction-phase – Pre-commencement tasks including implementation of relevant protected species or important ecological receptor related ecological mitigation, removal of vegetation/ topsoil, hedgerows and trees; Construction tasks including activities associated with the building phase, including vehicle/ plant movements, air quality changes, dust, lighting etc.
- Occupation-phase - Commencement of occupation of new residential and other buildings and full occupation of the new settlement and use of all associated infrastructure.

10.2.91 Using information about the way in which sites/ habitats/ species are likely to be affected by the Proposed Development, each change (change from the baseline situation) that is assessed has been assigned a level of 'magnitude', based on the definitions set out in Table 10.2.

Table 10.2 Guidelines for the assessment of change magnitude

Magnitude of change	Criteria and resultant effects
High	The change permanently (or over the long term) negatively affects the conservation status of a habitat/ species, reducing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/ species population, a large area of habitat or large proportion of the wider species population is affected. For designation sites, integrity is compromised. There may be a decrease in the level of ecological conservation value of the receptor.
Medium	The change permanently (or over the long term) negatively affects the conservation status of a habitat/ species reducing the ability to sustain the habitat or the population level of the species within a given geographic area. Relative to the wider habitat resource/ species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a decrease in the level of biodiversity conservation value of the receptor. Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations would experience little or no reduction. Any changes are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/ species receptors or the integrity of designated sites.
Low	The quality of extent of designated sites or habitats or the size of species populations, experience some small-scale reduction. These changes are likely to be within the range of natural variability and there is not expected to be any permanent change in the conservation status of the species/ habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in terms of its ecological conservation value.
Very Low/ Neutral	A change to the level of which is so low, it is not discernible on the designated sites or habitats or the sizes of species populations, or changes that balance each other out over the lifespan of a project.

10.2.92 The criteria in Table 10.2 refer to the terms ‘integrity’ and ‘conservation status’. For habitat areas and species, an affect is assessed as being significant if the favourable conservation status of a receptor would be changed by the Proposed Development. Conservation status is defined by the CIEEM Guidelines as follows:

- For habitats: the sum of the influence acting on the habitat and its typical species, that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area; and

- For species: the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.

Negative Effects

10.2.93 A negative effect is considered to be significant if the favourable conservation status of a receptor is compromised by the Proposed Development.

10.2.94 A similar procedure has been used for designated sites that are affected by the development, except that the focus is on the integrity of each site, defined by the CIEEM guidelines as:

10.2.95 "…the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified"

10.2.96 The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the site has been designated.

10.2.97 The decision as to whether the favourable conservation status has been compromised is made using informed judgement based on the findings of the assessment of how the resource would be affected.

Positive Effects

10.2.98 A positive effect is assessed as being significant if the development activities are predicted to cause:

- An improvement in the condition of a habitat/ species population from unfavourable to unfavourable recovering or favourable (noting that condition data are only available for SSSIs but that professional judgement has been used to apply the same principle to habitats/ species elsewhere); or

- Partial or total restoration of a site's favourable condition.

10.2.99 If a species population, habitat or site is already in favourable condition, it is still possible for there to be a significant positive effect. There is, however, no simple formula for determining when such effects are significant and decisions about significance therefore have to be made on a case by case basis using professional judgement.

Evaluation matrix

10.2.100 Significance evaluation involves combining information about the sensitivity, importance or value of a receptor, and the magnitude and other characteristics of the changes that affect the receptor. The approach to using this information for significance evaluation is outlined below.

Receptor sensitivity, importance or value

10.2.101 The sensitivity or value of a receptor is largely a product of its importance, as informed by legislation and policy and as qualified by professional judgement. For example, receptors for ecology or the historic environment may be defined as being of international or national importance. However, lower value resources may still be defined as sensitive or important at a county or district level.

Magnitude of change

10.2.102 The magnitude of change affecting a receptor is identified on a scale from very low to very high. As with receptor sensitivity and value, a rationale is provided that explains how the categories of environmental change are defined.

Determination of significance

10.2.103 The significance of effects is determined with reference to the nature of the development, the receptors that could be significantly affected and their sensitivity, importance or value, together with the magnitudes of environmental change that are likely to occur.

10.2.104 Sensitivity/value and the characteristics of environmental changes can be combined using a matrix (refer to Table 10.3). In addition, professional judgement is applied since, the distinction between the sensitivities or magnitudes of change may not be clearly defined. Consequently, the resulting assessment conclusions explain how professional judgement has been applied to arrive at the level of effect.

10.2.105 Within the matrix that is used in most significance evaluation exercises, reference is made to:

- Major effects, which will always be determined as being significant in EIA terms;
- Moderate effects which could be significant, although there may be circumstances where such effects are considered not significant on the basis of professional judgement; and
- Minor or negligible effects, which will always be determined as not significant.

Table 10.3: Significance evaluation matrix

		Magnitude (of change)					
		Very high	High	Medium	Low	Very Low	Will not occur
Importance/ value / sensitivity (of receptor)	Very high	Major (significant)	Major (significant)	Major (significant)	Major (significant)	Moderate (could be significant)	Minor (not significant)
	High	Major (significant)	Major (significant)	Major (significant)	Moderate (could be significant)	Minor (not significant)	Minor (not significant)
	Medium	Major (significant)	Major (significant)	Moderate (could be significant)	Minor (not significant)	Negligible (not significant)	Negligible (Not significant)
	Low	Major (significant)	Moderate (could be significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)	Negligible (not significant)
	Very low	Moderate (could be significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)	Negligible (not significant)	Negligible (not significant)
	Negligible	Minor (not significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)	Negligible (not significant)	Negligible (not significant)

Note: Significant effects are those shown as 'Major'. 'Moderate' effects could be significant. Notwithstanding this, this is not always the case, although this very much depends on the environmental topic and the appropriate application of professional judgement.

Assumptions & Limitations

10.2.106 Assumed that mitigation measures elsewhere are technically robust and provide a reliable solution (see other relevant chapters of this ES);

10.2.107 Tree Roost Assessment – ground based and climbing assessments only. Most trees are on perimeter, retained protected by eco buffer and unlit. Small number of trees offering potential for roosting bats exist in the development site and a precautionary approach has been taken and assume they support the most likely bat roost associated with a given feature and species recorded on site. Mitigation has been included that will accommodate needs for sensitive roost/species. Potential Tree Roosts fall outside of the Phase 1 OPA and as such are considered by the Outline planning application at this stage, with appropriate mitigation detailed on a precautionary basis. Detailed further surveys will be undertaken for Reserved Matters applications/licencing to confirm specific placing of mitigation features.

10.3 CONSULTATION

10.3.1 A wide range of consultation has taken place during 2018 to 2020 to both inform the scope fo the assessment, mitigation, compensation and enhancement measures, and to inform this Chapter of the ES. Formal consultation responses from statutory consultees were received in the Scoping Opinion received in August 2020 (see Section 10.2).

10.3.2 Key statutory consultees identified at this stage are:

- Eastleigh Borough Council (EBC);
- Natural England (NE);
- Hampshire and Isle of Wight Wildlife Trust (HIoWWT);
- Environment Agency (EA).

10.3.3 To date, EBC, NE, EA and HIoWWT have been engaged through the formation and meeting of a steering group in respect of biodiversity interest, baseline assessment and mitigation design.

10.3.4 Formal agreement with the steering group on the evolution of the project has been sought regularly and iteratively covering all baseline surveys and the assessment methodology, together with mitigation and enhancement design and to agree the strategy and target for the delivery of biodiversity net gain though the development. This has been established as a series of three Memorandum of Understanding (covering baseline, ecological buffers and Biodiversity Net Gain).

10.3.5 A OHH website https://www.eastleigh.gov.uk/planning-and-building/housing-and-development/one-horton-heath has been made available to the public, providing access to information, plans, timescales and a series of information videos.

10.3.6 Biodiversity also was a key topic featured as part of public consultation undertaken during 2nd and 3rd September 2020.

10.3.7 A short video has been prepared and is available on the OHH website which sets out the approach to biodiversity (including EIA) taken by the project.

10.3.8 Table 10.4 provides a summary of the consultation with statutory consultees, undertaken to date, to inform the production of this ES Chapter.

Table 10.4: Summary of Consultation with Statutory Consultees

Consultation	Date	Organisations Present
Ecological Steering Group	17.10.18	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	20.11.18	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	18.12.18	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	07.02.19	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	27.11.19	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	02.12.19	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	13.02.20	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA), Hampshire & Isle of Wight Wildlife Trust (HIWWT)
Ecological Steering Group	30.03.20	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA),
Ecological Steering Group	18.06.20	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA),
Ecological Steering Group	14.07.20	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE), Environment Agency (EA),
Water Quality and Recreation Mitigation Strategy Consultation	29.07.20	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE),
Drainage Strategy Consultation	15.09.20	Eastleigh Borough Council (planning & ecology) (EBC), Natural England (NE),

10.4 BASELINE ENVIRONMENT

Ecological Context

10.4.1 The Proposed Development is associated with an area of grassland, woodland and riparian habitats covering approximately 120 Ha, located to the west of the existing settlement of Horton Heath, Eastleigh Borough, Hampshire.

10.4.2 The Proposed Development site is characterised by gently undulating agricultural land currently used to produce arable crops in the northern component, close to Fir Tree Lane and cattle grazed grassland in the southern component, adjacent to Chalcroft Farm. The site is bisected by an area of woodland and minor watercourse, running east to west across the Site. An extensive network of hedgerows exists with large mature standard trees present in the northern section. An area of mature deciduous woodland lies in the northern section (Quobleigh Wood) that is complimented by a number of small but mature (some ancient) woodlands located along the northern, western and southern boundaries.

10.4.3 Small watercourses, tributaries of the River Itchen, are present, flowing westwards and northwards. A number of ponds are present within the Chalcroft Farm complex, in the south, and associated with Quobleigh Wood, in the north, that support breeding populations of great crested newts.

10.4.4 The site contains clusters of residential and agricultural buildings, a number of which are now unoccupied. A commercial meat processing facility is currently operational within Chalcroft Farm. A number of these buildings support active bat roosts including maternity and satellite roosts.

10.4.5 Immediately adjacent to the east, lies the settlement of Horton Heath with residential areas and associated gardens and infrastructure. To the south, the commercial development at Chalcroft Business Park lies adjacent to the Site, separating it from the railway. To the west and north lie areas of agricultural land, woodland and small farm and school building complexes. To the north, the Site adjoins woodland.

10.4.6 Habitats are summarised in Table 10.5 below.

Table 10.5 : Summary of Phase 1 Habitats present

Phase 1 Habitat Type	Summary description
Scattered scrub	Small areas of scattered scrub exist across the Site associated with less managed areas of marshy grassland and disused farm complexes.
Scattered Trees	A number of scattered trees are present across site, the majority of which are broadleaved a number of these are large, mature trees. The area south of Chalcroft Farm supports an area containing several large oak trees in a parkland setting.
Hedgerows	An extensive network is present comprising both intact and defunct hedgerows, the majority of which are species rich, albeit regularly flailed to ~2m.
Fence	Wire fences associated with grazed fields and field boundaries are present throughout the Site.
Wall	Mortared stone walls are present associated with the building complexes.
Broadleaved woodland	Areas on site can be broadly separated in to dry and wet woodland habitats with species indicative of ancient woodland present.
Parkland	An area of parkland exists south of Chalcroft Farm. This contains so large parkland oak trees but the ground flora is improved grassland and subject to intensive grazing.
Improved grassland	Extensive areas of the Site are intensively cattle and sheep grazed with very little in the way of species diversity.
Poor semi-improved grassland	The areas of improved grassland are interspersed with patches of slightly more diverse grassland habitat.
Other tall herb and fern – ruderal	Thistles and nettles indicative of local enrichment are present around the farmyards and form a mosaic with the ephemeral and bare ground habitats.
Standing water	Four standing waterbodies are present on site comprised of three ponds and a swimming pool. These are supplemented by a number of ephemeral pools associated with the small watercourses.
Running Water	One minor tributary of the River Itchen is present running from south to north along the western boundary and two small watercourses flow from east to west across the Site with associated woodland, and marshy riparian vegetation.
Cultivated/disturbed land – amenity grassland	Areas of managed landscaped grassland are associated with residential gardens on site.
Cultivated/disturbed land – ephemeral/short	Small areas of ephemeral perennial habitat are associated with the areas of bare ground around the building complexes on site.
Cultivated/disturbed land – arable	Areas of arable habitat are present, restricted to the north of the Site.
Buildings	A number of extensive agricultural complexes are present on site that include barns, stables, farmhouses and number of modern residential buildings.
Bare ground	Extensive areas of bare ground are associated with the farm complexes across the Site.
Swamp	Areas immediately bounding Quobleigh woods to the west. These areas have substantial coverage of Himalayan balsam.

Designated Sites of Nature Conservation Interest

10.4.7 There are five internationally important and designated sites (and their constituent sites) associated with the River Itchen, Emer Bog and the Solent within 10km of One Horton Heath with three further sites associated with the New Forest SPA within 11km. These are listed in Table 10.6.

10.4.8 There are two nationally important and designated sites within 2km of One Horton Heath. These are listed in Table 10.6.

10.4.9 Nine sites of Importance for Nature Conservation (SINC) lie adjacent to the Site. A further 9 SINCS are located within 2km of One Horton Heath. These are listed in Table 10.6.

Table 10.6. Designated Sites Within ZOI

Site name	Reason for designation	Location relevant to Horton Heath site boundary
Solent and Southampton Water Special Protection Area (SPA)	Supports breeding populations of the following species listed on Annex I of the Directive: common tern, little tern, Mediterranean gull, roseate tern, sandwich tern. Supports populations of the following migratory over-wintering species: black-tailed godwit, dark-bellied brent goose, ringed plover, teal. The area also qualifies by regularly supporting at least 20,000 waterfowl	4 km south east
Solent and Southampton Water Ramsar Site	The site is designated under the following Ramsar criteria: Criterion 1: The site is one of the few major sheltered channels between a substantial island and mainland in European waters. It includes many wetland habitats characteristic of the biogeographic region: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs Criterion 2: The site supports an important assemblage of rare plants and invertebrates. At least 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site. Criterion 5: supports a species assemblage in the winter of international importance (assemblage of wintering waterfowl). Criterion 6: supports species populations of international importance (migratory ringed plover; and wintering black-tailed godwit, teal and dark-bellied brent geese).	4 km south east

Solent Maritime SAC	Supports the following Annex I habitats that are a primary reason for designation: Estuaries Salt marsh with Spartina swards Atlantic salt meadows (Glauco-Puccinellietalia maritimae). The site also supports a range of Annex I habitats that are present as a qualifying feature, but not a primary reason for selection as follows: Sandbanks which are slightly covered by sea water all the time. Mudflats and sandflats not covered by sea water at low tide. Coastal lagoons Annual vegetation of drift lines Perennial vegetation of stony banks Salicornia and other annuals colonising mud and sand Shifting dues along the shoreline with *Ammophila arenaria* ("white dunes") The site also supports Desmoulin's whorl snail *Vertigo moulinsiana,* which is present as a qualifying feature, but not as a primary reason for selection.	3.6km south east
River Itchen Special Area of Conservation (SAC)	Supports the following Annex I habitats that are a primary reason for designation: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Supports the following Annex II species which are a primary reason for selection of this site: Southern damselfly *Coenagrion mercuriale*. Bullhead Cottus gobio. The site also supports the following Annex II species present as qualifying features but not as primary reasons for site selection: White-clawed crayfish Austropotamobius pallipes Brook lamprey Lampetra planeri Atlantic salmon *Salmo salar* Otter *Lutra lutra*	950m west
Emer Bog SAC	Designated due to the occurrence of the following Annex I habitat: transition mires and quaking bogs. The basin is surrounded by more mature willow *Salix* woodland and open heathland.	9.4km north west
New Forest SAC	Supports Annex 1 Habitats that are a primary reason for selection of this site: oligotrophic waters containing very few minerals of sandy plains (Litorelletalia uniflorae), Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea, Northern Atlantic wet heaths with Erica tetralix, European dry heaths, Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), Deptressions on peat surfaces of the Rhynchosporion, Atlantic acidophilous beeech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Illici-Fagenion), Asperulo-Fagetum beech forests, Old acidophilous oak woods with Quercur robur on sandy plains, Bog woodland, Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae). Supports Annex 1 habitats present as a qualifying features, but not a	11km south west

	primary reason for selection of this site: Transition mires and quaking bogs, Alkaline fens. Annex II species that are a primary reason for selection of this site: Southern damselfly, Stag beetle. Annex II species present as a qualifying feature, but not a primary reason for site selection. Great crested newt.	
New Forest SPA	Qualifies under Article 4.1 by regularly supporting in summer over 300 pairs of nightjar, 51-54 pairs of woodlark, 454 pairs of Dartford warbler, and 2 pairs of honey buzzard. Notable are up to 10 pairs of Kingfisher.. In winter the site qualifies under Article 4.1 by regularly supporting about 15 hen harriers. It qualifies under Article 4.2 by supporting in summer, up to 25 pairs of hobby, in excess of 350 pairs of wood warble. Notable are breeding populations of lapwing, redshank, curlew, snipe, stonechat and redstart. In addition to its importance for individual species, the site is of exceptional scientific importance for its assemblage of lowland heathland breeding birds, including nightjar, woodlark, Dartford warbler and stonechat.	11km south west
New Forest Ramsar	An extensive complex of woodland, dry and wet heath and over 90 valley mires, associated seepages and peatlands situated on acidic and nutrient-poor soils. Pools in the heath-mire matrix contain nutrient-enriched water supporting a species-rich assemblage of plants. Several species of plants, invertebrates and birds occurring at the site are rare, vulnerable, endangered or nationally scarce. The site is important for breeding, feeding and roosting birds characteristic of the heathland environment and wintering raptors, with up to 15 Circus cyaneus feeding or roosting in the area. Human activities include tourism, recreation, and increased development around the periphery. The decline in livestock grazing has caused a reduction in the floral diversity.	11km south west
Moorgreen Meadows SSSI	Neutral meadows and alder wood flanking a small tributary of the River Hamble on the Bracklesham Beds of the Hampshire Basin.	945m south west
River Itchen SSSI	This site is notified for classic chalk stream and river, fen meadow, flood pasture and swamp habitats, particularly formations of in-channel vegetation dominated by water crowfoot Ranunculus spp, riparian vegetation communities (including wet woodlands) and side channels, runnels and ditches associated with the main river and former water meadows. The site supports nationally important invertebrate assemblages; and is also notified for the assemblage of breeding birds including tufted duck *Aythya fuligula,* pochard *A. ferina* and shoveler *Anas clypeata*, the waders lapwing *Vanellus vanellus*, redshank *Tringa totanus* and snipe *Gallinago gallinago*, and wetland passerines including sedge warbler *Acrocephalus schoenobaenus*, reed warbler *A. scirpaceus* and Cetti's warbler *Cettia cettia.*	950m west
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	The Chalcroft Distribution Park woodlands comprise a complex series of (mainly) recent semi-natural woodland, situated in the edges of, and to the immediate west of, the Distribution Park grounds, Botley, South Hampshire.	Adjacent to southern boundary

Round Copse, West End SINC	Comprises a small and predominantly ancient semi-natural oak-hazel woodland, located against the eastern boundary of the Chalcroft Distribution Park, West End, Hampshire. The site is structurally diverse and supports at least 15 ancient woodland indicator species.	Adjacent to southern boundary
Hearts Copse, West End SINC	The wood, which lies on very gently sloping heavy clay soils, is mostly ash and hazel coppice with field maple in the eastern and western sides and patches of alder woodland on the southern, wetter ground.	Adjacent to south western boundary
Treeline Break SINC	Treeline Break is a narrow strip of ancient semi-natural woodland, situated in a small and quite deeply incised stream valley, on the north-western edge of the new solar farm, south of Allington Lane, Eastleigh. 18 ancient woodland indicators were recorded within this site.	Adjacent to western boundary
Field West of Treeline Break (Long Field) SINC	Situated on the western side of the small stream valley south of Allington Lane, West End. Supports significant areas of unimproved fen meadow, supporting species such as sneezewort *Achillea ptarmica* and brown sedge *Carex disticha.*	Adjacent to western boundary
Quobleigh Pond and Woods SINC	The site is an area of mixed habitats located on the edge of Fair Oak. Woodland is the main habitat and the majority of the woodland is wet and much is ancient. There is a high diversity of woodland species including 31 ancient woodland indicators. There are two ponds within the Site.	Located partly within site boundary
Fair Oak School Meadow SINC	The site is a field and woodland strip located on the outskirts of Fair Oak. The site is adjacent to Quobleigh Pond and Wood SINC. Within the field there is an excellent range of unimproved grassland communities, both dry and marshy with over 100 species noted including an excellent 10 acid/neutral grassland indicators. The woodland strip along the south edge is not ancient but there is some wet woodland present. There is also a small pond on site.	Adjacent to north western boundary
Wyvern Technical College Meadow SINC	Covered by the Fair Oak Meadows SINC survey – see above.	See above
Ponds and Meadow adjacent to Wyvern Technical College SINC	Covered by the Fair Oak Meadows SINC survey – see above.	See above

Species

Flora

10.4.10 Data provided by Hampshire Biodiversity Information Centre returned records of; stinking chamomile, box, oak-leaved goosefoot, buckler fern, white ramping-fumitory, Jersey cudweed and greater duckweed to be present within wider landscape within the last 10 years.

10.4.11 Two stands of the invasive and Schedule 9 species, Japanese knotweed, have been recorded on site at Chalcroft pond and on the northern boundary of the central woodland, together with a large stand of the invasive and Schedule 9 species Himalayan balsam located within Quobleigh Wood. An additional, small stand is located immediately south of Quobleigh wood. This species is common and extensive along a number of the site boundary and east-west flowing watercourses (recorded by Johns Associates in 2019 & 2020).

10.4.12 A small population of an IUCN vulnerable plant Mousetail (*Myosurus minimus*) has been recorded in the NW of phase 1. This is proposed to be translocated to a suitable receptor site on site that is not subject to disturbance.

Bats

10.4.13 Data provided by Hampshire Biodiversity Information Centre returned; 10 records of serotine, 1 record of Brandt's, 5 records of Daubenton's, 4 records of whiskered, 11 records of Natterer's, 21 records of noctule, 52 records of common pipistrelle and 32 records of soprano pipistrelle. These are all field records; no records of roost were returned within the data search.

10.4.14 Ten species have been confirmed to be present on Site through various surveys carried out (see Appendix 10.4 Bats):

- Barbestelle: A very low level of activity was recorded through static detector surveys however; this species was recorded at all detector locations and in all months with the exception of May. Maximum of 16 passes recorded (median 0.15 passes per night of recording effort).

- Serotine: No roosts identified on site. Two adult males recorded during trapping, both southwest of Chalcroft Farm. Low activity levels observed (maximum 1.03 median passes per night in August) despite high detectability and distinctive call structure. Few records (28 passes recorded within emergence window over 1133 recording nights) indicating potential presence of low status non-breeding roost within ZOI. 20 total passes within potential impact height recorded at all crossing point locations.

- Brown long-eared: Two maternity roosts present on site (Fir Tree Farmhouse and Chalcroft Farm). Fir Tree Farmhouse (Northern Colony) – static data indicates that these bats are

using the two main connective habitats leading both north and south across Fir Tree Lane from the Farmhouse, presumably to the highly suitable foraging habitats in Quobleigh Wood and the central/western stream corridor respectively (ST11 and ST12). Two Post lactating female BLE and one adult male were caught in Quobleigh Wood in August 2020. Chalcroft Farm (Southern Colony) – Maternity roost present in Pond Cottages to the north of Chalcroft pond. Additional satellite roosts identified in tree in Hearts Copse and within the stables building (A6). Key supporting habitats are considered to be Hearts Copse (offsite) with the marshy grassland and riparian corridor of the southwest and western areas of the site. Trapping in the vicinity of Hearts Copse in 2020 caught 4 lactating female bats, two adult males and two juvenile bats (male and female). Key connective corridors are the hedgerows to the south and the riparian corridor to the north and west of Chalcroft Farm. Radiotracking in 2019 recorded a female adult post lactating female from this colony roosting in Round Copse and foraging repeatedly in the central and eastern woodland utilising the central hedgerow east of the solar park and the western riparian corridor. One confirmed tree roost was found (T23) during the survey of a brown long-eared roost which was found on the 20th October and re-checked on the 27th October with the maximum count of 2 individuals present on the 20th October. 10 crossing events were recorded within the collision risk height band (locations CP2 – 5, CP3 – 3 & CP4-2). No crossing events were recorded for this species at CP1 or CP5.

- Natterer's: One roost record on site in B18 in 2018. This building has subsequently been demolished under licence. Static detector surveys are limited to providing additional information at genus level. This genus is represented at all locations sampled. Radiotracking surveys tracked a post lactating female to two maternity roosts to the east of Horton Heath (both tree roosts, colony size 20-30). This bat foraged along the central woodland belt and within a young woodland within the existing housing estate each night of the survey. Trapping surveys recorded a total of 19 Natterers bats with female lactating bats captured in Quobleigh Wood, Hearts Copse and the Central Woodland. Males and juveniles were also present in these areas. Crossing point data recorded 45 crossing events by this genus within the predicted road traffic collision height range with 33 of these at location CP1 (Quobleigh Stream Crossing). This value is likely to be comprised of a high proportion of Daubenton's bats given the riparian habitats present at this location.

- Daubenton's: No known roosts present on site. Anecdotal observation of two Daubenton's bats entering oak tree in parkland south of Chalcroft during trapping surveys. 1 male was captured in Chalcroft Farm Parkland in 2018. 8 females (4 adults and 4 juveniles) were caught in Hearts Copse, 14 males (2 adult and 12 juveniles caught in Hearts copse and Chalcroft

Farm Parkland. 1 adult female and 3 adult males were caught in Quobleigh Woods. These were predominantly males (18 in total) and juveniles. No evidence of the use of the site of lactating females was recorded. One adult male bat caught in Quobleigh Woods on the 22nd Aug 2019, was radiotagged but the tag failed within minutes of application. Key locations are considered to be the riparian corridors, particularly the western site boundary connecting Quobleigh Wood and the habitats south of the site to the River Itchen and to Itchen Valley Country Park. Crossing point data recorded 45 crossing events by this genus within the predicted road traffic collision height range with 33 of these at location CP1 (Quobleigh Stream Crossing). This value is likely to be comprised of a high proportion of Daubenton's bats given the riparian habitats present at this location.

- Nathusius Pipistrelle: 51 passes over 1133 recording nights, 26 of which at location ST16. 41 of these were recorded in October 2020. No records in July or August. Not recorded during crossing point surveys.

- Noctule: The majority of records for this species were recorded at ST1, ST2, ST3, ST5, ST6 and ST16 with ST5 recording the highest median number of recordings in total. Tree 19 (an Ash next to the pond at Charlcroft Farm) has been confirmed as a meting roost. Noctule were heard lekking from the tree in 2018 and emergence surveys on the tree in September 2020 confirm 3 noctules emerging from a tear out at the top of the tree. In total 4 adult noctules were caught (2 post-lactating females and 2 males) all in Charlcroft Parkland. 55 crossing were recorded in total across all the crossing point locations by noctule. Of those only 1 at CP4 and 2 at CP3 were within the highest collision risk category.

- Common pipistrelle: Common pipistrelle were recorded at high levels at all static locations. The majority of records for this species were recorded at ST1, ST5 and ST14. The median bat passes per hour per month found April, June and July to have the highest activity for common pipistrelle which is within the peak maternity period for this species. ST14 recorded the highest number of pre-sunset recordings with 100 recordings, Recordings made within the species-specific emergence window (Russ J. , 2012) are considered to give an indication as to the likelihood of a roost being nearby. Therefore, recordings made close to or pre-sunset are likely to give a stronger indication of a roost nearby. 40 common pipistrelles were captured during the trapping surveys; 18 females (4 post lactating and 6 juveniles) and 22 males (12 adults and 10 juveniles). They were caught in all years and at all locations. Crossing point surveys recorded; 20 at CP1, 26 at CP2, 125 at CP3, 87 at CP4 and 181 at CP5 at the highest collision risk category for this species. CP1, 3 and 4 are considered to be on commuting routes while CP2 and 5 recorded more foraging activity.

- Soprano pipistrelle: The majority of static records for this species were recorded at ST1, ST2 and ST4 with ST2 recording the highest median number of recordings in total. The median bat passes per hour per month found April recorded the highest level of recordings with the lowest number of recordings in May and then a similarly low level of recordings for the remaining months. 18 soprano pipistrelle were captured during the trapping surveys; 5 females (2 parous and 1 juveniles) and 13 males (10 adults and 3 juveniles). They were caught in all years and at all locations. Crossing point surveys recorded; 2 at CP1, 8 at CP2, 16 at CP3, 1 at CP4 and 2 at CP5 at the highest collision risk category for this species. CP1, 3 and 4 are considered to be on commuting routes while CP2 and 5 recorded more foraging activity.

Badgers

10.4.15 Data provided by Hampshire Biodiversity Information Centre returned 17 records for badger were from between 2010-2020. There were no badger records located within the Site boundary. The nearest record is approximately 450m east of the Site, this record is from 2009. Due to the sensitivity of the sett locations, the exact location and type of record has not been revealed.

10.4.16 Historic surveys carried out by Ecologica Ltd in 2014 and 2015 showed a very low level of badger activity throughout the site and found no occupied setts on site, however scattered signs of badger were discovered including, fresh latrines, badger hair and scratching posts. Three abandoned setts were recorded along a hedgerow along the north-west boundary of the site.

10.4.17 Johns Associates have carried out a series of badger surveys across the wider Horton Heath Site in 2018, 2019 and recently updated in 2020. No other active or partially active setts were observed. All previously recorded active and partially active setts from 2018 and 2019 were found disused, caved in or used by other mammal species such as fox or rabbits in the most recent update surveys in 2020.

Amphibians

10.4.18 Data provided by Hampshire Biodiversity Information Centre returned six records for common toad and nine records for great crested newts were returned from between 2006-2016. There were two GCN records located within the Site boundary, pond records related to pond 47 and the other record was located within the woodland shelter belt north of the solar park. Three other records were located adjacent to the site boundary within Quobleigh woods to the north of the site.

10.4.19 Ordnance Survey maps of the area depict the presence of Quobeligh pond within Quobleigh Wood, however, during the Phase One survey conducted by Johns Associates in 2018 and the habitat suitability assessment conducted by Johns Associates in 2019 the compounding structure has collapsed and there is no longer a pond present in this location, rather an area of seasonally inundated wet woodland.

10.4.20 Historic surveys carried out by Ecosupport Ltd conducted GCN surveys in 2013 & 2014 found presence of a metapopulation of GCN in the of the Site and present over five ponds with a peak count of 73 in total overall the ponds and presence of GCN within the pond at Charlcroft Farm with a peak count of 12. Repeated surveys by Ecosupport in 2015 found the Quobleigh Metapopulation had decreased in 2015 to a peak count of 15, Chalcroft was not surveyed in this year. And Surveys carried out by WYG in 2016 the Quobleigh Metapopulation had decreased in 2015 to a peak count of 23 and the Chalcroft Farm population had reduced to a peak count of 2.

10.4.21 Surveys carried out in 2019 by Johns Associates recorded the presence of GCN in only two of the water bodies surveyed during 2019: ponds 41 (onsite) and 47(offsite), which are approximately 1.4km from one another. Population size class assessments based on the 2019 results concluded the following:

- West Horton Heath population (Chalcroft); Low population with a peak count of 5 in pond 47. Eggs present.
- Quobleigh Metapopulation; Medium metapopulation with a peak count of 11 in pond 41. Eggs present.

Reptiles

10.4.22 Data was provided by Hampshire Biodiversity Information Centre returned no historic desk study records in the last ten years within the site boundary of any reptile species. The nearest record of slow worm (*Anguis fragilis*) is approximately 350m north east of the site adjacent to Botley Road. The closest record for grass snake (*Natrix helvetica*) is 1.1km north east of the site in Fairoak. The nearest record of common lizard (*Zootoca vivipara*) is approximately 100m north of the site close to Quobleigh pond. There are no records of adder (*Vipera berus*) within 2km of the site.

10.4.23 Previous surveys undertaken by Ecologica Ltd in 2014 recorded six grass snake, five common lizard and 76 slow worm in total over the survey period. The repeat survey in 2015 recorded

one common lizard and 27 records of slow worm in total. All records are associated with field boundaries, with most of the records associated with the northern most boundary of the site.

10.4.24 The vast majority of the Site comprises a combination of heavily-grazed pasture and arable land which is unsuitable as reptile habitat. Although there are small pockets of semi-natural habitat comprising tussocky grassland and marshy grassland within the Site, the key available habitats for reptiles comprise a network of linear habitats i.e. hedgerows, unmanaged field boundaries, and woodland edge. However, it should be noted that much of this linear habitat in the southern part of the Site in particular is intensively grazed, which significantly reduces suitability for reptiles.

10.4.25 2018 survey results recorded a total of 15 slow worms and a single juvenile grass snake. A peak count of six slow worms was recorded within the Site which represents a good population size within this area.

10.4.26 The 2020 update surveys recorded one common lizard and one adult grass snake within the Site, this represents a low population of both species within these areas.

10.4.27 The habitat suitability for reptiles across the Horton Heath Site remains similar to that of the 2018 surveys. Therefore, it should be assumed that low populations of reptiles (common lizard, grass snake and slow-worm) remain present in all areas where previously recorded. The suitability of habitats across the site is locally restricted and patchy with reptile presence largely restricted to the boundaries of the site, particularly in areas adjacent to woodland or domestic gardens.

Breeding birds

10.4.28 Comprehensive breeding bird and barn owl surveys have been conducted over a number of years covering the One Horton Heath site. Survey methodologies and detailed results are described in detail in appendix 10.8 Birds.

10.4.29 A breeding pair of barn owl are present, successfully nesting in the nest box south of Chalcroft Farm in 2020. Evidence of roosting was also observed in the stables building at the far southern extent of the Chalcroft Farm complex. The site is considered to support one home range for these birds.

10.4.30 Passerine species of note are:

- Species of Principal Importance in England under s41 of the Natural Environment and Rural

Communities (NERC) Act (2006):

Skylark (also Hampshire BAP Priority Species)

- One singing male was observed in the areas both north and south of the Chalcroft farm track. A possible pair was observed in this area during the second survey visit but these were absent during the third visit and are unlikely to have bred in this area in 2020.

House Sparrow

- Seven house sparrow nests were recorded in 2020 clustered around Chalcroft Farm and the unoccupied Fir Tree Farm. Additional activity was observed associated with the gardens and properties immediately adjacent to the site on the eastern boundary.

- Hampshire Biodiversity Action Plan Priority Species

Song Thrush

- Three singing males were recorded on site with one confirmed nest identified in a hedgerow just north of Quobleigh stream containing 4 chicks.

Linnet

- One singing male was observed on two occasions singing from the hedgerow immediately to the north of the Chalcroft Farm track. A subsequent record of a pair with two juveniles in this area could indicate breeding but a direct link between these records, and therefore breeding on site, is uncertain. The habitats in this area are considered suitable nesting habitat for this species.

BOCC Red list Species

Starling

- Activity was dispersed over the site with multiple records of foraging and singing adults. Four nests were confirmed (including 2 within holes in telegraph poles and 2 in buildings) with a number of foraging sorties observed with adult birds returning to nests within the adjacent Horton Heath residential areas.

- Additional observations in late summer/autumn recorded small post breeding flocks of adults and juvenile birds with the largest group comprising 20 birds. No large murmurations or

aggregations of this species have been recorded on site through the suite of 2018-2020 surveys delivered on site for multiple species however previous winter surveys conducted in 2014/15 observed post breeding groups of up to 20-30 birds

Mistle Thrush

- A pair of mistle thrush were observed in the large dead oak tree in the south west of the site, flying into the Chalcroft distribution Park woodland on two separate visits in April and June. This pair is assumed to be breeding within this woodland.

Hedgehogs

10.4.31 Data provided by Hampshire Biodiversity Information Centre returned 15 records of hedgehog within the last 10 years.

10.4.32 Hedgehog have been recorded to be present within the site being observed during bats surveys in August 2018 within the Charlcroft Farm complex and Foxholes Farm area.

10.4.33 The Site itself is considered to offer suitable foraging and hibernation habitat for this species, particularly along the edges of the Site and within boundary hedgerows and deadwood. Pastures used for cattle are known to be important foraging areas for hedgehogs.

Dormouse

10.4.34 Arboreal habitat potentially suitable for hazel dormouse *Muscardinus avellanarius* at Horton Heath are the ancient woodland blocks to the north and south of the site and elements of the network of hedgerows that border and traverse the Site (those that are connected, continuous and of sufficient size/maturity). The remaining woodlands have been dissected into smaller copses and left as fragmented blocks of suitable habitat with connectivity being restricted by the railway to the south and urban development to the north and east. The network of hedgerows across the site have undergone regular management resulting (generally) in species poor hedges that provide little in the way of important food or dispersal corridors between these woodlands. Habitat suitability would indicate potential dormouse presence within the woodlands but likely to be only a small population due to the habitat isolation and the limited connectivity for the exchange of animals between local populations, with large lengths of the hedgerows not providing suitable conditions). Data provided by Hampshire Biodiversity Information Centre identified one record of Hazel Dormouse 1.6km east of the Site boundary. This record was identified as hazel nut evidence inferring species presence. Historic survey

results from Ecologica in 2014 and Johns Associates in 2018 concluded that dormouse were not present on Site. The results of updated survey conducted in 2020 have confirmed presence of dormouse in one section of woodland at Horton Heath (north of the solar farm) with a confirmed sighting of a dormouse and three nests present and the potential habitats associated with the Site.

Otter and Water Vole

10.4.35 Data provided by Hampshire Biodiversity Information Centre returned 1 record of water vole within the Site footprint in the last 10 years. There are also a number of other records approximately 1.8km north west of the Site near Bishopstoke. Historic surveys carried out by Ecologica Ltd in 2014 showed a very low level of otter and water vole activity throughout the site, further surveys in 2015 found no signs of water vole.

10.4.36 There are no desk study records of Otter within the site boundary. There are however five historical records of Otter within the last ten years approximately 1.8km north west of the Site near Bishopstoke. Historic surveys conducted by Ecologica Associates Ltd in 2014 found only one set of footprints in the northwest corner of the site. Repeat surveys done in 2015 found no evidence of otter.

10.4.37 There are no reported desk study records of mink (Neovision vison) being within or in close proximity to the site. Previous surveys by Ecologica Associates Ltd in 2014 recorded three mink tracks. One in the south west corner of the Site and three in the north west corner. Mink evidence was also found during the repeat surveys in 2015 with footprints being found in the north west boundary. During the surveys conducted by Johns Associates Ltd in 2018 and 2020, one potential mink scat was recorded along a watercourse to the north of the site. Potential mink footprints were also found along a hedgerow to the south of the site.

10.4.38 Results of the water vole surveys carried out by Johns Associates between 2018 and 2020 suggest that, due to the deterioration of suitability of the watercourses and grazing pressure, it is likely that this species is absent from the site. Otter surveys have not identified confirmed presence, however, otter are likely to use the site as connective habitat within the wider landscape.

Invertebrates

10.4.39 The Site offers habitats suitable for a range of invertebrate species including marshy grassland and riparian woodland. The majority of the grassland has limited floristic diversity and therefore offers limited suitability to invertebrates.

10.4.40 Overall, the Site is considered likely to support an invertebrate assemblage comprising predominantly common and widespread species, (owing to the grazed improved grassland that is dominant), although more floristically diverse and complex habitats (such as the boundary woodlands and marshy grassland) may support more notable species.

10.5 INHERENT DESIGN AND ASSUMED MITIGATION

10.5.1 During the assessment of the potential effects of the Proposed Development on ecological receptors for this ES Chapter (see Section 10.6), a specification for inherent design mitigation measures has been developed based on current the parameter plans for the Site. The Wider OPA Site boundary is shown on Drawing No. EAST200403-RLP-01, Rev. P1 (Site Boundary Plan). These measures are shown on the following parameter plans:

- Access – Drawing No. EAST200403-PP01-P14
- Land Use – Drawing No. EAST200403-PP02-P19
- Green Infrastructure – Drawing No. EAST200403-PP03-P19
- Building Heights – Drawing No. EAST200403-PP04-P16
- Demolition – Drawing No. EAST200403-DEP01-P1

10.5.2 These ecological measures are set out in Table 10.7

10.5.3 In designing appropriate measures, it is important to consider what is realistically achievable and the likely extent to which success can be guaranteed, based on good practice guidance and evidence. Existing proposed inherent mitigation features (as defined in Table 10.7) are considered realistically achievable, locally relevant and will result in a high level of success.

10.5.4 Additional mitigation, enhancement and compensation is also included in the Proposed Development and is detailed in Table 10.11 and Section 10.7 of this Chapter.

Table 10.7. Inherent Design and Assumed Mitigation

Receptor and Potential Effect	Inherent Design and Assumed Mitigation
All on-site and off-site receptors	Construction – all OPA phases Production of a detailed Construction Environmental Management Plan (CEMP) to include (but not limited to): - Clear construction site demarcation to ensure minimal footprint of temporary/permanent development. - General best practice pollution prevention and response measures - Access and construction routing - Phasing and timings schedule - A comprehensive suite of measures to avoid sediment transport and deposition at source (e.g. locations of stockpiles away from watercourses, grassing/sheeting of longer term spoil heaps, methodologies for materials transportation and the cleaning of machinery and control measures for the suppression of construction dust and the installation temporary SuDS features as appropriate) combined with additional interception measures (e.g. erection of slit barrier fencing, settlement lagoons) and provision of other control measures e.g. Siltbuster or equivalent to prevent sediment discharge in extreme weather. - Suppression of construction dust and litter - Limit to the duration and timing of construction activities to avoid crepuscular activity periods and other sensitive periods (e.g. to local residents) - Restrictions to lighting during sensitive periods - Chemical handling and storage control measures - Regular inspection of measures and habitats to ensure effectiveness and to identify remedial actions. - Tree and hedgerow protection and provision of other barrier fencing where needed; - Measure to protect wildlife (e.g. those needed under any protected species method statements/licences), detailed method statements, Ecological Clerk of Works, monitoring and management intervention; - Avoidance of open excavations and entrapment risk for wildlife - Measures to control and prevent the spread of invasive species - CEMP management responsibilities, duties, monitoring, reporting, improvement plan - Communications and complaints reporting system
Watercourses	Construction and Operation - all phases - All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) (measured from the bank edge of water limit when watercourse is full).

	Watercourse severance has been minimised through the development.
Hedgerows	Construction and Operation - all phases - Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created. Construction - all phases - Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas.
Woodland	Construction and Operation - all phases - Woodland and tree removal and severance has been minimised through the design process. Retained existing woodlands will be enhanced through the introduction of a high quality Woodland Management Plan, discussed later in the ES Chapter.
Ponds	Construction and Operation – Wider OPA only - One poor condition pond at Chalcroft Farm will be protected and restored through the development. A net increase in ponds will be delivered by the proposals. All ponds will be subject to high quality conservation management, discussed later in the ES Chapter.
Marshy Grassland	Construction and Operation – Wider OPA only - Areas of important marshy grassland have been excluded from the development area where possible and will be enhanced by the project. These areas will be subject to high quality conservation management discussed later in the ES Chapter.

10.5.5 A key aim of the Proposed Development is to deliver Biodiversity Net Gain through the creation and enhancement of habitats. Almost all areas of Important habitats including Priority habitats have been avoided by the project design process and these are being retained and enhanced in perpetuity as part of the development. Important habitats will be created or extended through the development, resulting in a net gain in priority habitats and wider biodiversity. The development has primarily been situated on low value habitats (primarily improved grassland

and arable land), not classified as being Important receptors and scoped out of further assessment in this ES. An assessment of the net change and gains in these Important habitats is presented in this ES Chapter.

10.5.6 The Biodiversity Metric 3.0[45] will be used in 2021, prior to planning determination to determine a further evaluation of habitat loss and compensatory habitat requirement using these criteria.

10.5.7 Areas of newly created habitat will subsequently be incorporated into the detailed Site design for future Reserved Matters applications to ensure that Biodiversity Net Gain is achieved.

10.5.8 There also remains the potential to deliver additional Biodiversity Net Gain off site through a suitable and effective funding mechanism or directly delivered on EBC owned land, to be agreed with Eastleigh Borough Council.

10.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

10.6.1 Potential impacts and effects on ecological receptors are assessed after considering the inherent design mitigation outlined in Table 10.7.

10.6.2 The assessment has been informed by the specific details of all proposed development works and inherent design mitigation. The evaluation of effects on receptors are considered following the methodology presented below, and in the context of the construction methodology set out in Chapter 3 of this Environmental Statement, which describes the methods and approaches to the delivery of construction and occupation of the Proposed Development. Inherent design mitigation consists of those set out in Table 10.7.

10.6.3 For some environmental topics, published guidance is available with regard to significance evaluation. Where such guidance exists, even in draft, it has been utilised to inform the development of the significance evaluation methodologies contained within this ES. This is applicable to Chapter 10: Ecology which uses Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal20.

[45] Natural England Joint Publication JP029 the Biodiversity Metric 2.0
http://publications.naturalengland.org.uk/publication/5850908674228224

10.6.4 Potential impacts and effects are set out in Table 10.8.

Table 10.8 Potential Impacts and Effects

Receptor	Important/valued and/or legally protected?	Relevant criteria	Potentially significant effects/legal contravention and causal changes
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI	Biodiversity conservation value Legal Status	Internationally and nationally important Habitat Regulations	Construction – all phases Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes (in particular *Rununculion fluitantis* and *Callitricho-Batrachio* vegetation), macroinvertebrates (in particular Southern damselfly *Coenagrion mercurial*), fish (notably Bullhead *Cottus gobio*, Brook lamprey *Lampetra planeri* and Atlantic salmon *Salmo salar*) and otter (*Lutra lutra*), notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion

			etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665 Occupation – all phases Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates and fish, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.
Solent Maritime SAC and relevant constituent sites i.e. SSSI and NNR etc including: Bouldnor and Hamstead Cliffs SSSI Chichester Harbour SSSI Eling and Bury Marshes SSSI	Biodiversity conservation value Legal Status	Internationally and nationally important Habitat Regulations	Construction – all phases Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the Solent resulting in a reduction in water quality including

Hurst Castle and Lymington River Estuary SSSI Hythe to Calshot Marshes SSSI King's Quay Shore SSSI Langstone Harbour SSSI Lee-on-The Solent to Itchen Estuary SSSI Lincegrove and Hackett's Marshes SSSI Lower Test Valley SSSI Medina Estuary SSSI Newtown Harbour SSSI North Solent SSSI Thorness Bay SSSI Upper Hamble Estuary and Woods SSSI Yar Estuary SSSIBoldre Foreshore LNR Calshot Marshes LNR Chichester and Langstone Harbours Ramsar Chichester and Langstone Harbours SPA Gutner Point LNR Hackett's Marsh LNR Hayling Billy LNR Hook with Warsash LNR Manor Farm LNR			exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with potential effects on eutrophication levels and associated features of interest. Occupation – all phases Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses and transport into the Solent introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the Solent influencing a possible reduction in water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and transport into the Solent.

Mercury Marshes LNR Newtown Harbour NNR Newtown Marshes (Now an NNR, but small part retained as an LNR) LNR North Solent NNR Nutborne Marshes LNR Pilsey Island LNR Solent and Dorset Coast pSPA Solent and Southampton Water Ramsar Solent and Southampton Water SPA Sturt Pond LNR The Kench, Hayling Island LNR West Hayling LNR Yarmouth to Cowes MCZ			
Solent SPA and constituent sites i.e. SSSI, NNR etc Brading Marshes to St. Helen's Ledges SSSI Eling and Bury Marshes SSSI Hurst Castle and Lymington River Estuary SSSI Hythe to Calshot Marshes SSSI King's Quay Shore SSSI	Biodiversity conservation value Legal Status	Internationally and nationally important Habitat Regulations	Construction – all phases Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with

Lee-on-The Solent to Itchen Estuary SSSI Lincegrove and Hackett's Marshes SSSI Lower Test Valley SSSI Lymington River Reedbeds SSSI Lymington River SSSI Medina Estuary SSSI Newtown Harbour SSSI North Solent SSSI River Test SSSI Ryde Sands and Wootton Creek SSSI Sowley Pond SSSI The New Forest SSSI Thorness Bay SSSI Titchfield Haven SSSI Upper Hamble Estuary and Woods SSSI Whitecliff Bay and Bembridge Ledges SSSI Yar Estuary SSSI Bembridge MCZ Boldre Foreshore LNR Calshot Marshes LNR Chessel Bay LNR Hackett's Marsh LNR Hook with Warsash LNR Lymington-Keyhaven Marshes LNR			potential effects on eutrophication levels and associated features of interest. Occupation/operation – all phases Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. Species associated with this site are: Black-tailed godwit (Limosa limosa islandica), Non-breeding Common tern (Sterna hirundo), Breeding Dark-bellied brent goose (Branta bernicla bernicla), Non-breeding Little tern (Sternula albifrons), Breeding Mediterranean gull (Ichthyaetus melanocephalus), Breeding Ringed plover (Charadrius hiaticula), Non-breeding Roseate tern (Sterna dougallii), Breeding Sandwich tern (Thalasseus sandvicensis), Breeding Teal (Anas crecca), Non-breeding Waterbird assemblage, Non-breeding Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. The site contains a range of habitats that support these bird species including estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.

Manor Farm LNR Mercury Marshes LNR Newtown Harbour NNR Newtown Marshes (Now an NNR, but small part retained as an LNR) LNR North Solent NNR Solent and Dorset Coast pSPA Solent and Isle of Wight Lagoons SAC Solent and Southampton Water Ramsar Solent Maritime SAC South Wight Maritime SAC Sturt Pond LNR Titchfield Haven LNR Titchfield Haven NNR Yarmouth to Cowes MCZ			
Solent and Southampton Water Ramsar	Biodiversity conservation value Legal Status	Internationally important Ramsar Convention	Construction – all phases Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with

			potential effects on eutrophication levels and associated features of interest. Occupation/operation – all phases Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. Species associated with this site are: Ringed plover Dark-bellied brent goose Teal Black-tailed godwit Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and thereby the Solent associated features of interest. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.
New Forest SPA and constituent sites ie:	Biodiversity conservation value Legal Status	Internationally and nationally important Habitat Regulations Wildlife and Countryside Act 1981 as amended	Construction – all phases No likely significant effects Occupation/operation – all phases Recreational disturbance and habitat degradation e.g. erosion/poaching from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. Species associated with this site are: Nightjar (*Caprimulgus europaeus*) Woodlark (*Lullula arborae*) Dartford warbler (*Sylvia undata*) Honey buzzard (*Pernis apivorus*) Kingfisher (*Alcedo atthis*)

			Hobby (*Flaco Subbuteo*) Wood warbler (*Phylloscopus trohilus*) Lapwing (*Vanellus vanellus*) Redshank (*Tringa tetanus*) Curlew (*Numenius arquata*) Snipe (*Gallinago gallinago*) Stonechat (*Saxicola torquata*) Redstart (*Phoenicurus phoenicurus)* Assemblage or lowland heathland birds
New Forest SAC and constituent sites ie: Landford Bog SSSI Langley Wood and Homan's Copse SSSI Loosehanger Copse and Meadows SSSI Roydon Woods SSSI The New Forest SSSI Whiteparish Common SSSI	Biodiversity conservation value Legal Status	Internationally and nationally important Habitat Regulations Wildlife and Countryside Act 1981 as amended	Construction – all phases No likely significant effects Occupation/operation – all phases Recreational disturbance and habitat degradation e.g. erosion/poaching from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. Change in nutrient status in localised areas and change in associated habitat condition from dog urine/faeces Habitats and species associated with this site are: H3110. Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*); Nutrient-poor shallow waters with aquatic vegetation on sandy plains H3130. Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*; Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath H4030. European dry heaths H6410. Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*); Purple moor-grass meadows H7140. Transition mires and quaking bogs; Very wet mires often identified by an unstable `quaking` surface

			H7150. Depressions on peat substrates of the *Rhynchosporion* H7230. Alkaline fens; Calcium-rich springwater-fed fens H9120. Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae or Ilici-Fagenion*); Beech forests on acid soils H9130. *Asperulo-Fagetum* beech forests; Beech forests on neutral to rich soils H9190. Old acidophilous oak woods with *Quercus robur* on sandy plains H91D0. Bog woodland* H91E0. Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*); Alder woodland on floodplains* S1044. *Coenagrion mercuriale*; Southern damselfly S1083. *Lucanus cervus*; Stag beetle S1166. *Triturus cristatus*; Great crested newt
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction – All phases Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater

			catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC Occupation – All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is limited to the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.
Round Copse, West End SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction – All phases Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to

			substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC Occupation - All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of adjacent habitat areas.
Hearts Copse, West End SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of	Construction - All phases Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other

		Principal Importance Local BAP Priority Habitats WCA 1981	deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC Occupation- All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of adjacent habitat areas.

Treeline Break SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction All phases Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC Occupation - All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban

			operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of adjacent habitat areas.
Field West of Treeline Break (Long Field) SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction All phases Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC Occupation All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality

			including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas from the PRoW in the centre of this site.
Quobleigh Pond and Woods SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction All phases Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion

			etc and change in flow characteristics and quality entering the SINC Occupation - All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Fair Oak School Meadow SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction All phases No effect Occupation All phases Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Wyvern Technical College Meadow SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.

Ponds and Meadow adjacent to Wyvern Technical College SINC	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Occupation -All phases Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Various non-statutory designated sites – Air Quality Only (Details to be confirmed once air quality modelling outputs completed and in consultation with EBC and NE)	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction Deposition of dust arising from construction activities. Operation Change to vegetation composition due to an increase in nitrogen deposition (arising from increased road traffic movements).
Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction All phases Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the watercourses, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the watercourses through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the watercourses and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion

			etc and change in flow characteristics and quality entering the watercourses Occupation All phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the watercourses affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Ponds – Priority Habitat – see bats, birds, amphibians and reptiles as well	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction All phases Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the ponds, affecting notable features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged into the ponds through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the watercourses and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including ponds) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of

			sediment/erosion etc and change in flow characteristics and quality entering the ponds Fragmentation through the construction process and introduction of artificial features including roads, drainage and changes in levels/impermeable surfaces Occupation – All Phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses / surface runoff and into the ponds affecting notable features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Parkland – Priority Habitat	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction – all phases Deposition of dust and foliage dieback Change in local drainage conditions causing dieback Operation – all phases Lack of sensitive specimen management leading to dominance by a few species and poor condition becoming established leading to a reduction in biodiversity Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Marshy Grassland – see also bats, barn owl, amphibians and reptiles	Biodiversity conservation value Legal status	County importance. none	Construction – all phases Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the habitat, affecting its notable features through reduction in soil and water quality including exposure to

			substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the habitat through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the habitat and associated features of interest. Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland) or supply of water to this habitat, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the watercourses Occupation – all phases Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into marshy grassland and into the habitat affecting it through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development, with potential effects on eutrophication levels in the marshy grassland and associated features of interest. Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Hedgerows – Priority Habitat – see also bats, birds, amphibians and reptiles	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance	Construction – all phases Deposition of dust and foliage dieback Direct loss and/ or fragmentation of habitat Compaction and damage within root protection area causing die back

		Local BAP Priority Habitats Hedgerow Regulations	Change in local drainage conditions causing dieback Operation - all phases Lack of hedgerow management leading to dominance by a few species and poor condition becoming established
Broadleaved Semi-Natural Woodland – Priority Habitat - – see also bats, dormouse, birds, amphibians and reptiles	Biodiversity conservation value Legal status	County importance. *NERC Act 2006* section 41 Habitats and Species of Principal Importance Local BAP Priority Habitats WCA 1981	Construction – all phases Deposition of dust and foliage dieback Direct loss and/ or fragmentation of habitat Compaction and damage within root protection area causing die back Change in local drainage conditions causing dieback Operation – all phases Lack of woodland management leading to dominance by a few species and poor condition becoming established leading to a reduction in biodiversity Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.
Bats	Biodiversity conservation value Legal status	Internationally and nationally important. Habitats Regulations NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species WCA 1981	Construction Direct loss of bat roosts in buildings and trees and risk of injury / killing Direct loss of key foraging habitat Severance of key habitat connecting roost and feeding/breeding areas etc Operation Road collision mortality Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat)
Great crested newt	Biodiversity conservation value Legal status	Internationally and nationally important. Habitats Regulations	Construction Direct loss of great crested newt resting, overwintering and breeding habitat and risk of injury / killing

		NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species WCA 1981	Direct loss of key foraging habitat Severance of key habitat connecting breeding and foraging/resting/overwintering habitat Pollution of breeding ponds and connecting ditches Operation Road collision mortality Entrapment in road and drainage infrastructure Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat) Increased predation from growth in resident cat population
Otter	Biodiversity conservation value Legal status	Internationally and nationally important. Habitats Regulations NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species WCA 1981	Construction Habitat fragmentation due to habitat loss and disturbance Injury / killing from construction traffic collisions Operation Increase road collision risk Pollution of watercourses and direct acute/chronic effects potentially leading to mortality or reduction in fish / food Influence on habitat connectivity as a result of increased lighting from roads, housing and other infrastructure, recreational disturbance including growth in resident dog population and severance of rivers through road crossings
Water Vole	Biodiversity conservation value Legal status	Nationally important. NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species WCA 1981	Construction Habitat fragmentation due to habitat loss and disturbance Permanent land take causing death/injury/ disturbance/loss of bank top habitat and places of shelter and protection. Operation Pollution of watercourses and direct acute/chronic effects potentially leading to mortality or reduction in fish / food

			Influence on habitat connectivity and suitability as a result of increased lighting from roads, housing and other infrastructure, recreational disturbance including growth in resident dog and cat population and severance of rivers through road crossings
Dormouse	Biodiversity conservation value Legal status	Nationally important. Habitats Regulations NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species WCA 1981	Construction Habitat fragmentation and severance due to habitat loss and disturbance Permanent land take causing death/injury/ disturbance/loss of arboreal habitat and places of shelter and protection. Operation Influence on habitat connectivity and suitability as a result of increased lighting from roads, housing and other infrastructure, recreational disturbance. Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat) Increased predation from growth in resident cat population
Reptiles	Biodiversity conservation value Legal status	District Importance WCA 1981 NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species	Construction Direct loss of reptile resting, overwintering and breeding habitat and risk of injury / killing Direct loss of key foraging habitat Severance of key habitat connecting breeding and foraging/resting/overwintering habitat Operation Road collision mortality Entrapment in road and drainage infrastructure Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat) Increased predation from growth in resident cat population

Badger	Legal status	Local importance *Protection of Badgers Act 1992*	Construction Damage/destruction of setts Killing/ injury of individuals Disturbance to badgers including from piling if required Loss of some foraging habitat, and/or access to some foraging habitat Potential for isolation of a main sett Operation Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on setts foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat) Increased disturbance arising from increased recreational disturbance
Breeding birds including barn owl	Biodiversity conservation value Legal status	District Importance WCA 1981 NERC Act 2006 section 41 Species of Principal Importance Local BAP Priority Species	Construction Direct loss of bird nesting, breeding and feeding habitat and risk of injury / killing Direct loss of key nesting/foraging habitat Severance of key habitat Disturbance, in particular to Schedule 1 species (Barn owl and Kingfisher) recorded on site, including from piling if required. Operation Road collision mortality Disturbance from recreational pressure, in particular to Schedule 1 species (Barn owl) recorded on site Increased predation from growth in resident cat population
Invertebrates	Biodiversity conservation value Legal status	District Importance WCA 1981 NERC Act 2006 section 41 Species of	Construction Habitat fragmentation due to habitat loss and disturbance, modification of key life stage plants, microclimate and wet/dry habitats. Operation

		Principal Importance Local BAP Priority Species	Increase in lighting modifying the behaviour of and availability of habitat to night flying species Decline in habitat diversity through a lack of conservation management and recreational pressure.
Fish	Biodiversity conservation value Legal status	District Importance WCA 1981 NERC Act 2006 section 41 Species of Principal Importance Salmon and Freshwater Fisheries Act 1975 Local BAP Priority Species	Construction Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects. Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest. Piling may be required for the proposed development. Fish are particularly sensitive to vibration that may arise as a result of piling or other noisy percussive activities during construction within or close to watercourses. Occupation Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses, deposition of the sediment may affect key habitat features, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects. Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of

			fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development, with potential effects on eutrophication levels. Change in riverine flow associated with modified drainage and effects on fish and associated habitat features from a change in flow regime.
Invasive Species	Invasive and Non Native Species requiring control/eradication	Wildlife and Countryside Act 1981 as amended	Construction A range of invasive non-native species of plants are present within the development site (including Japanese knotweed, Himalayan balsam, Rhododendron and variegated yellow archangel) and these could be transferred across the site through construction activities if not adequately identified, suitable construction control measures and put in place and INNS management measures implemented Operation A range of invasive non-native species of plants are present within the development site and these could be transferred across the site through occupational and management activities if not adequately identified, suitable construction control measures and put in place and INNS management measures implemented.

10.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

10.7.1 This section outlines the additional mitigation, compensation and enhancement measures that are required to address the significant effects which remain following the implementation of the inherent design mitigation measures outlined in Table 10.7. Those measures only applicable to the Wider OPA and Link Road are highlighted with an asterisk *, otherwise it should be assumed that the measures shown apply to all aspects of the One Horton Heath development

10.7.2 Table 10.11 details the additional mitigation, compensation and enhancement measures required in order to properly mitigate for the remaining significant effects described in Section 10.6.

Table 10.11 Additional mitigation, compensation and enhancement measures

Topic	Mitigation
River Itchen Special Area of Conservation (SAC) and Riven Itchen SSSI	OPERATION – ALL PHASES A - Discharge of foul water (sewage) to Peel Common Waste Water Treatment Works and not into the River Itchen. Suitable treatment at Peel Common Wastewater Treatment Works within consented limits. Comprehensive SuDS infrastructure including features such as interceptors, permeable paving, rain gardens, swales, vegetated SuDS ponds, sediment forebays. Successful treatment of nitrates and phosphates using robust methodology. Purchase of Defra/NE/ EBC nutrient credits if necessary to demonstrate overall net zero nutrient emissions from the development, monitoring regime to demonstrate no emissions and feedback mechanism to enable effective management intervention if necessary. This approach has been designed with the express requirement that the development is nutrient neutral and does not result in any increase in nitrate, phosphate or sediment runoff into the receiving watercourses, the River Itchen and the Solent systems. Please refer to Chapter 11 of this ES for full details. CONSTRUCTION AND OPERATION – ALL PHASES B - Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from the bank edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses. CONSTRUCTION AND OPERATION – ALL PHASES C - Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net

	zero nutrient and sediment emission measures described in above. CONSTRUCTION AND OPERATION – ALL PHASES D - A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of these features is maintained. Please refer to Chapter 11 of this ES for full details. OPERATION – ALL PHASES E - Potable water abstraction and balancing River Itchen flows is comprehensively dealt through strategic measures being implemented by Southern Water e.g. Review of Consent process and Water Resource Management Plan. Please refer to Chapter 11 of this ES and Environment Agency for full details. CONSTRUCTION – ALL PHASES F - Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.
Solent SAC/SPA/Ramsar	See A-F OPERATION – ALL PHASES G - Provision of an extensive network of footpaths and play/sports facilities within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km (optional shorter 2.5km) SANG route, that includes at least 2.5km of this within semi-natural settings that offer a greater element of open space provision provided by more distant open greenspace, including at least 2.5km of route that allows informal access and dog walking. Please refer to Chapter 14 of this ES and the SANG Comparison assessment prepared by Tyler Grange for full details. OPERATION – ALL PHASES H - Subject to final negotiations between EBC and with Natural England in relation to the extent on-site features prevent recreational impacts, if required, an appropriate financial contribution will be paid into the Solent Aware SPD fund, to effectively prevent associated disturbance effects that could result in likely significant effects on the features of interest (bird assemblage and supporting habitats). Please refer to Chapter 14 of this ES and SANG Comparison assessment prepared by Tyler Grange for full details.
New Forest SAC and SPA	See A-H
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	CONSTRUCTION AND OPERATION – * WIDER OPA AND LINK ROAD ONLY I - A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux

	The 15m ecological buffer will be demarcated with a significant species rich hedgerow, fence earth bank and ditch features to prevent public access into these areas. The ecological buffer will be designed to effectively extend the existing habitats within the SINC woodland and to provide a transitional habitat and structure, replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the following restricted uses and constraints: Footpaths Cycleways SuDS Biodiversity enhancement permitted Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux. It is envisaged that ecological enhancement measures will be delivered at the earliest available opportunity. CONSTRUCTION AND OPERATION – ALL PHASES J - Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs. CONSTRUCTION AND OPERATION – ALL PHASES K - A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement. CONSTRUCTION AND OPERATION – ALL PHASES L - A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat creation measures and to inform a responsive system of remedial works to ensure that the condition of retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC; therefore, the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence. OPERATION – ALL PHASES M - An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. OPERATION – ALL PHASES N - The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details.

Round Copse, West End SINC	* WIDER OPA AND LINK ROAD ONLY See G and I to N There is no public access to this SINC
Hearts Copse, West End SINC	* WIDER OPA AND LINK ROAD ONLY See G and I to N There is no public access to this SINC as it is in private ownership
Treeline Break SINC	* WIDER OPA AND LINK ROAD ONLY See G and I to N CONSTRUCTION AND OPERATION – ALL PHASES O - A 15m ecological buffer subject to the specifications as described in G will be implemented between the link road and the woodland to protect the habitat and to ensure that root protection areas are respected. OPERATION – ALL PHASES P - Acoustic fencing will be installed to minimise operational phase noise disturbance from the link road on sensitive habitats (and associated species receptors e.g. breeding birds). Please refer to Chapter 12 of this ES for full details. There is no public access to this SINC
Field West of Treeline Break (Long Field) SINC	* WIDER OPA AND LINK ROAD ONLY See G and I to N OPERATION – ALL PHASES Q - Provision of circa 2.2ha of grassland recreational areas delivered through the Allington Lane infrastructure works will provide suitable alternative areas for recreation as part of the OHH open space strategy. CONSTRUCTION AND OPERATION – ALL PHASES Q - The new woodland and grassland extension to the west of the existing woodland will provide high value habitat for a broad range of receptors including GCN, bats, birds, invertebrates and reptiles.
Quobleigh Pond and Woods SINC	See A to N CONSTRUCTION AND OPERATION – ALL PHASES R - Flight pond will be restored and enhanced for invertebrates, fish, amphibian, reptiles, birds and mammals.
Fair Oak School Meadow SINC	* WIDER OPA AND LINK ROAD ONLY See A to N
Wyvern Technical College Meadow SINC	* WIDER OPA AND LINK ROAD ONLY See A to N
Ponds and Meadow adjacent to Wyvern	* WIDER OPA AND LINK ROAD ONLY See A to N

Technical College SINC	
Watercourses	CONSTRUCTION AND OPERATION _ ALL PHASES See A to N S - A watercourse restoration plan following best practice as defined by the UK River Restoration Centre will be implemented, linked to a Woodland Management Plan for associated woodlands.
Hedgerows	CONSTRUCTION AND OPERATION – ALL PHASES T - Hedgerows with mature trees at regular intervals (SINC or non SINC) will have a 15m buffer (measured from tree stems) Hedgerows without mature trees or only occasional trees (SINC or non SINC) will have a minimum 5m ecological buffer (plus RPA around any mature trees to be retained) measured from the centre line of the hedgerow. These buffers will be subject to the following constraints: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux All hedgerows will be managed for biodiversity in accordance with a long-term management plan, including new planting to infill gaps in hedgerows and ongoing high quality management. See A to N
Parkland	* WIDER OPA AND LINK ROAD ONLY See A to N CONSTRUCTION AND OPERATION U - Parkland will also be extended and enhanced through adapting the grassland management and the planting of large, protected specimen oak trees in this field.
Woodland	* WIDER OPA AND LINK ROAD ONLY See A to N CONSTRUCTION AND OPERATION – ALL PHASES V - Where the removal or severance of woodland is unavoidable, compensatory native species rich planting will occur in accordance with the prescriptions agreed with Eastleigh Borough Council. New areas of woodland and woodland extension are also included in the proposals. Woodland management and monitoring will be implemented from the start of the project delivery process if not before to maximise habitat value, structure and longevity, including the control of non-native invasive species. A woodland management plan will be prepared and implemented for all woodlands.

Bats	CONSTRUCTION– ALL PHASES W - Roost Loss A number of low status roosts for common bats species are present within the buildings on site, the majority of which are to be demolished. These will be compensated for through the provision of roost type/species appropriate bat boxes and "natural" roost features created on retained trees in appropriate locations (i.e. in close proximity to existing flight lines, adjacent to high value habitat, relatively undisturbed and unlit areas). A maternity roost for brown long-eared bats will be directly affected by the demolition. A mitigation roost will be constructed in the vicinity of Hearts Copse following the criteria for this roost type as described in the bat mitigation guidelines and delivered under licence. Substantial tree and shrub planting will reinforce the connection this location to existing flight lines and maternity roost locations within Hearts Copse. The removal of mature trees has been minimised through careful masterplan layout. Where trees containing potential roost features are retained, these will be protected by the buffer specifications as described for hedgerows (O & P) and woodland (G). Where trees with potential roost features are required to be removed, a precautionary principle will be applied that assume the presence of the most likely roost type for the feature. This is considered appropriate as tree roosts are dynamic and can be readily occupied/abandoned by a variety of species at any given time, making firm assessment of the roost types present particularly challenging. Mitigation and licensing requirements will therefore be informed by subsequent inspections prior to any impacts on these features. CONSTRUCTION AND OPERATION – ALL PHASES X - Bat Habitat Severance/Road - Collision Mitigation Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. • Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation • Minimising the width of the road crossing • Clear span design • Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. • A minimum height of 3m under bridge crossings. • Sensitive design of any lighting that may be required in these areas. • Additional compensatory habitat may be required.

	Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses. CONSTRUCTION AND OPERATION – ALL PHASES Y - Bat Loss/degradation of foraging habitat Mitigation The loss of foraging habitat across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (see G, H, I, O & P). OPERATION – ALL PHASES Z - Bat Lighting Mitigation (also for other nocturnal species). Specific design measures have been included as a key design principle to keep additional lighting to a minimum across the site. Where lux levels must exceed 0.5 lux on any valuable retained or created habitat, a further detailed assessment of the lighting design to include wavelength, directionality and duration/timing of lighting will be conducted to inform lighting design for each phase of development to ensure no deleterious effect on affected habitats. OPERATION – ALL PHASES AA - Bats and cat predation (also relevant to other fauna). Home owner packs will provided to identify the effects of cat predation on biodiversity and to encourage homeowners to not own cats, or if they do to take a responsible approach including keeping cats in at night, use of bells etc. CONSTRUCTION AND OPERATION – ALL PHASES AB - Bat mitigation efficacy. A suite of species and habitat specific monitoring regimes will be implemented to provide feedback on the efficacy of mitigation and habitat creation measures for specific receptor species in accordance with legislative and policy requirements. This monitoring will inform a responsive system of remedial measures to ensure that the intended function of these measures is realised and maintained in perpetuity. See A to N and T to X above.
Great crested newt and common amphibians	CONSTRUCTION – ALL PHASES AC - Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat to two restored and two created and optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial

	habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation. The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan. OPERATION – ALL PHASES See A to N
Otter	CONSTRUCTION AND OPERATION – ALL PHASES AD - Watercourse road crossing points locations to be designed as single span to facilitate continuation of hydrological regime and landscape permeability for terrestrial mammals including otter. Mammal crossings will be included where provision for mammal access cannot be incorporated along the stream at water level. CONSTRUCTION AND OPERATION – ALL PHASES AE - Watercourse restoration using best practice measures (e.g. as defined by the UK River Restoration Centre) to increase physical habitat diversity, reconnect to the floodplain, increase light levels to the channel and riparian corridor and maximise species diversity, controlling non-native species. See A – N

Water Vole	CONSTRUCTION AND OPERATION – ALL PHASES AF - Water vole has not been recorded during 2018-2020, although historic records are present. Further surveys will be conducted on a precautionary basis to ensure no effects and legal compliance. Measures outlined in A – O will be relevant to habitat that could be used by this species. Measures set out in FF and GG are also relevant and will avoid effects on water vole should they be recorded in the area in the future.
Reptiles	CONSTRUCTION AND OPERATION – ALL PHASES See A – N and AB above.
Badger	CONSTRUCTION – ALL PHASES AG - Precautionary surveys will continue to ensure any new setts or re-activated setts are taken into account in the construction programme. Should it be necessary Natural England badger licences will be sought to ensure legal compliance in terms of disturbance of any setts and any requirements for exclusions/sett closure/provision of artificial setts. Deep excavations will be covered at night or suitable mammal ladders/earth maps will be provided to allow large mammals including badger to exit excavations. See A to N and T to X above
Breeding birds	See measures listed above CONSTRUCTION – ALL PHASES AH - Habitats requiring works during the nesting season (March-September inclusive) will be subject to a pre-works nesting bird check with measures implemented to protect any active nests likely to be affected by the works. Please refer to Chapter 12 for full details on measures to minimise construction disturbance through noise and vibration. CONSTRUCTION – ALL PHASES AI - Where areas of suitable nesting habitat for valued bird species is lost, suitable alternative nesting habitat will be provided on site through a network of bird boxes, features incorporated to buildings, new tree and shrub planting and enhanced grassland, woodland, wetlands. CONSTRUCTION AND OPERATION – ALL PHASES AJ - The existing barn owl nest box will be relocated into the area in the vicinity of Hearts Copse (>600m from link road) to reduce road collision risk associated with the link road. Sections where the road is situated on an embankment present the highest risk followed by sections at existing ground levels. In these areas, the creation of obstacles (natural or artificial with a preference for natural) which force birds to fly higher across roads will be incorporated into the scheme. Verges south of the link road will be maintained in a short, thatchless condition to reduce the potential for field vole. Enhancement of grassland habitats and hedgerow buffers for small mammals will provide additional foraging resource for barn owl to compensate for the loss of low value foraging habitats. CONSTRUCTION AND OPERATION – ALL PHASES AK - Measures to minimise the risk of disturbance to birds during nesting will be implemented as defined elsewhere above in A to O, including both on site and off sites notably SSSI, SPA and SAC habitats Please refer to Chapter 12 for full details on measures to minimise construction and occupation disturbance through noise and vibration.
Invertebrates	CONSTRUCTION AND OPERATION – ALL PHASES AL - The loss of high value invertebrate habitats across the site has been minimised through the retention of key high value habitats. These habitats will be

	protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (See measures listed above).
Fish	See A – N, S and other measures listed above. Please refer to Chapter 12 for full details on measures to minimise construction disturbance through noise and vibration.
Dormouse	* WIDER OPA AND LINK ROAD ONLY See A- N and other measures above CONSTRUCTION AM - Ongoing annual dormouse tube monitoring to inform licencing requirements for each phase of the project. CONSTRUCTION AN - Avoidance of hedgerow severance within 150m of confirmed records (currently only within woodland north of solar farm). OPERATION AO - No lighting associated with road crossings of woodland copses CONSTRUCTION AND OPERATION AP - Installation of suitable aerial structure (e.g. Peoples Trust for Endangered Species, 2019[46]) across roads severing woodland, in combination with suitable planting to strengthen vegetated corridors OPERATION AQ - Provision of replacement woodland adjacent to key retained woodland corridor to ensure no net loss of habitat and to maximise availability of food plants throughout the active part of the year. CONSTRUCTION AND OPERATION AR - Provision of 150 dormouse nest boxes within retained woodland corridors to maximise and extend suitable nesting habitats. Annual nest box monitoring to be carried out. CONSTRUCTION AND OPERATION AS - Sensitive woodland management to restore and maximise opportunities for dormouse (e.g. Forestry Commission 2019[47] and the Hampshire Dormouse Group[48]) OPERATION AT - Provision of suitable advice in homeowner packs and on information boards regarding dormouse and responsible enjoyment of the countryside. NB public access is prevented to key habitats suitable for dormouse.

46 https://ptes.org/wp-content/uploads/2019/09/White-Hughes-2019-dormouse-bridge.pdf

47 Forestry Commission. 2019. A Protocol for Undertaking Woodland Management in England Where Dormice Are Present. Protocol Version 4.

48 https://hampshiredormousegroup.co.uk/resources/woodland-habitat-management/

Invasive species	CONSTRUCTION AND OPERATION – ALL PHASES AU - An invasive species management plan will be implemented to control the existing populations of Japanese Knotweed, Himalayan Balsam, Variegated Yellow Archangel, Rhododendron , Mink and other non-native species, present on site.

10.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

River Itchen Special Area of Conservation (SAC) and Constituent River Itchen SSSI

Baseline Conditions

10.8.1 The River Itchen SAC comprises the River Itchen SSSI. SSSI are designated for national (as opposed to international) nature conservation interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

10.8.2 A summary of the SSSI condition as specified by Natural England[49] is presented below:

- Favourable Condition – 10.37%
- Unfavourable Recovering – 55.74%
- Unfavourable No Change – 27.99%
- Unfavourable Declining – 5.51 %
- Destroyed- 0.39%.

10.8.3 Key reasons for more adverse conditions include: inappropriate water levels, siltation, nutrient enrichment, water abstraction, forestry and woodland management, agriculture – undergrazing, inappropriate cutting/mowing.

Predicted Effects and Their Significance

10.8.4 NE has identified key objectives that need to be met in order to maintain or restore the integrity of the site, and that contributes to achieving the Favourable Conservation Status of its Qualifying Features of Interest by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;

[49] https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

10.8.5 Consideration of how the development proposals could affect these objectives and therefore cause a negative effect on the Favourable Conservation Status of the SAC and/or SSSI is set out below, separated into constructional and operational effects and for the OPA Phase 1 application and Wider OPA Application and Link Road.

Construction OPA Phase 1

10.8.6 The site preparation and construction activities associated with OPA Phase 1 will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ditches and other drainage features associated with the site. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter the watercourses draining the site, which in turn form a confluence with the River Itchen, upstream of Itchen Valley Country Park.

10.8.7 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including paints, solvents, plastics etc could be transported through soil and through water into the watercourses draining the site, and into the River Itchen.

10.8.8 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there

is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.9 The adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.10 Consequently, taking into account the very high Sensitivity of the River Itchen SAC and SSSI, and the likely Low magnitude of change after the implementation of the inherent and adopted mitigation, Moderate effects, that could be significant are predicted.

10.8.11 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the River Itchen from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.12 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the River Itchen. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the Itchen from the site.

10.8.13 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of

bare soil are minimised in extent and duration. The development of permeant vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.14 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the Sensitivity of the Itchen remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant) effects could arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a **Not Significant Likely Construction Effect** will occur to the River Itchen SAC and SSSI from sediment or other associated pollution during construction associated with the OPA Phase 1.

10.8.15 During the implementation of each phase of the development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease. Inputs of these nutrients to the soil or water environment as part of construction will not occur. At the start of the phased construction works i.e. the duration of the OPA Phase 1 construction, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Itchen would not occur. This would result in a **Not Significant Likely Construction Effect** occurring from a reduction in nutrient inputs.

10.8.16 No air quality effects from emissions associated with the construction of (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the OPA Phase 1 will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Construction Wider OPA

10.8.17 The site preparation and construction activities associated with OPA Phase 1 will act as a proof of evidence for the Wider OPA and associated Link Road. They will demonstrate that the

inherent and adopted mitigation set out in Table 10.7 in Section 10.7 of this Chapter of the ES and the Additional Mitigation set out in Table 10.11 are a robust set of pollution and erosion prevention measures, that will continue to be prescribed in a site wide and multi-phase Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.18 The development will also result in the phased cessation of agricultural activities across the whole of the site, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the River Itchen. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural and progressive reduction in baseline sediment input to the Itchen from the site.

10.8.19 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from each specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.20 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.21 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the Sensitivity of the Itchen is Very High, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant) effects could arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a **Not Significant Likely Construction Effect** will occur to the River Itchen SAC and SSSI from sediment or other associated pollution during construction associated with the Wider OPA and Link Road.

10.8.22 During the implementation of each successive phase of the wider development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease and existing areas of bare soil largely associated with arable fields and localised areas of cattle poaching including along watercourses will also cease to be present. Inputs of these nutrients to the soil or water environment as part of construction will not occur. During the predicted 10 year phased construction works i.e. the duration of the Wider OPA, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Itchen will be Low (e.g. after year 5 of no new inputs occurring to each phase), thereby resulting in a **Significant positive likely construction effect** from a reduction in site baseline nutrient effects occurring**.**

10.8.23 No air quality effects from emissions associated with the construction of the Wider OPA (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, **no significant construction likely effects** associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Occupation OPA Phase 1

10.8.24 The developed OPA Phase 1 will result in a change from the agricultural land use to maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable

e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1 and the Link Road. Soil erosion from these areas is considered to be negligible.

10.8.25 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1 and Link Road.

10.8.26 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.27 Specifications in The SuDS Manual[50] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details). With regards to potential criticism of SuDS in treating fine sediment, the OHH water specialists consider it is not appropriate to assess the performance of the proposed SuDS scheme at OHH against other SuDS schemes that have been designed and built in recent years.

10.8.28 Until very recently, surface water drainage systems that were being offered for adoption by sewerage undertakers were required to be designed in accordance with Sewers for Adoption (SfA). SfA required the system being offered for adoption to comprise a continuous pipe system from inlet to outfall. This led to SuDS features being moved 'offline' such that the treatment processes associated with them were bypassed in the most polluting events. Southern Water implemented this by requiring all SuDS and above ground storage features to have no hydraulic link back in to the system being offered for adoption. The effect of this was that attenuation storage for rainfall events up to the 1 in 30 year return period had to be located within the underground system being offered for adoption.

10.8.29 The issue was exacerbated by SfA's requirement for surface water pipe systems to be 'self-cleansing'. These requirements forced designers to produce surface water drainage systems that transported sediment through the drainage system to the outfall to avoid siltation of

[50] https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

underground assets. With OFWAT's approval of the Code for Adoption in October 2019, and its implementation in April 2020, designers now have much more flexibility to utilise the treatment processes within SuDS features.

10.8.30 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.31 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.32 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.33 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption of Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver (not the Itchen) within a consented discharge limit. The on-

site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients.

10.8.34 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England[51] and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.35 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.36 No air quality effects from emissions associated with the operation/occupation of the OPA Phase 1 (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, **no significant operational/occupational likely effects** associated with the OPA Phase 1 will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Occupation Wider OPA

10.8.37 The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving,

51 Advice on Achieving Nutrient Neutrality for New Development in the Solent Region (Natural England, 2020)

amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.

10.8.38 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the Wider OPA and Link Road and these have been discussed in detail in the previous Section associated with the OPA Phase 1 and Link Road. The implementation and successful monitoring and management of these will act as a incrementally growing proof of evidence for each reserved matter application associated with the Wider OPA as they come forward and are completed and occupied. As such there will be a robust phase by phase increment of both site occupation and treatment and management of sediments, other contaminants and nutrients.

10.8.39 As previously discussed, sediment generated from the Wider OPA will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.40 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance.

10.8.41 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore

No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.

10.8.42 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen. Please refer to Chapter 11 of this ES for full details.

10.8.43 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver (not the Itchen) within a consented discharge limit. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients. Please refer to Chapter 11 of this ES for full details.

10.8.44 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions. Please refer to Chapter 11 of this ES for full details.

10.8.45 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.46 No air quality effects from emissions associated with the operation/occupation of the Wider OPA (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, no significant operational/occupational likely effects associated with the Wider OPA and Link Road will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Solent Maritime SAC (and other constituent designated sites)

Baseline Conditions

10.8.47 The Solent Maritime SAC comprises a large number of constituent SSSI that are listed in Table 10.8 of this Chapter of the ES, alongside a number of Local Nature Reserves, National Nature Reserves and a Marine Conservation Zone. SSSI and NNR are designated for national (as opposed to international) nature conservation interest, with LNR being of more local interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

10.8.48 A summary of the SSSI condition for each of the constituent SSSIs as specified by Natural England[52] is presented below in Table 10.12:

Table 10.12. Summary of SSSI Condition for Solent Maritime SAC

Bouldnor and Hamstead Cliffs SSSI • Favourable Condition – 82.93% • Unfavourable Recovering – 14.48%
Chichester Harbour SSSI • Favourable Condition – 6.77% • Unfavourable Recovering – 3.10% • Unfavourable No Change – 9.69% • Unfavourable Declining – 80.44 %

[52] https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

Eling and Bury Marshes SSSI • Favourable Condition – 11.45% • Unfavourable No Change – 88.55%
Hythe to Calshot Marshes SSSI • Unfavourable Recovering – 89.35% • Unfavourable No Change – 10.65%
King's Quay Shore SSSI • Favourable Condition – 86.15% • Unfavourable Recovering – 4.62% • Partially Destroyed- 0.2%.
Langstone Harbour SSSI • Favourable Condition – 8.39% • Unfavourable Recovering – 91.05% • Unfavourable No Change – 0.56%
Lee on Solent to Itchen Estuary SSSI • Favourable Condition – 73.40% • Unfavourable No Change – 26.60%
Lincegrove and Hacketts Marshes SSSI • Unfavourable No Change – 100%
Lower Test Valley SSSI • Favourable Condition – 65.15% • Unfavourable Recovering –34.85%
Medina Estuary SSSI • Favourable Condition – 14.25% • Unfavourable No Change – 85.75%
Newtown Harbour SSSI • Favourable Condition – 55.95% • Unfavourable Recovering – 9.16% • Unfavourable No Change – 34.55% • Unfavourable Declining – 0.35 %

North Solent SSSI • Favourable Condition – 67.39% • Unfavourable Recovering – 30.87% • Unfavourable No Change – 0.83% • Unfavourable Declining – 0.91 %
Thorness Bay SSSI • Favourable Condition – 30.18% • Unfavourable Declining – 69.82 %
Upper Hamble Estuary and Woods SSSI • Favourable Condition – 86.01% • Unfavourable Recovering – 11.23% • Unfavourable No Change – 2.76%
Yar Estuary SSSI • Favourable Condition – 31.52% • Unfavourable Recovering – 2.01% • Unfavourable No Change – 66.47%

10.8.49 Key reasons for more adverse conditions relevant to OHH include water pollution, freshwater pollution, high nutrient status, agriculture runoff.

Predicted Effects and Their Significance

10.8.50 NE has identified key objectives that need to be met in order to maintain or restore the integrity of the site, and that contributes to achieving the Favourable Conservation Status of its Qualifying Features of Interest by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;

- The populations of qualifying species; and
- The distribution of qualifying species within the site.

10.8.51 Consideration of how the development proposals could affect these objectives and therefore cause a negative effect on the Favourable Conservation Status of the SAC and/or SSSI is set out below, separated into constructional and operational effects and for the OPA Phase 1 application and Wider OPA Application and associated Link Road.

Construction OPA Phase 1

10.8.52 The site preparation and construction activities associated with OPA Phase 1 will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ditches and other drainage features associated with the site. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter the watercourses draining the site, which in turn form a confluence with the River Itchen, upstream of Itchen Valley Country Park and flow downstream to the Itchen Estuary and the wider Solent Maritime SAC.

10.8.53 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including paints, solvents, plastics etc could be transported through soil and through water into the watercourses draining the site, and into the River Itchen and then downstream to the wider Solent Maritime SAC.

10.8.54 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.55 The inherent and adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan and implemented, that will adopt

all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success. Please refer to Chapter 11 of this ES for full details.

10.8.56 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the Solent Maritime SAC and constituent SSSI, NNR, LLN, MCZ etc from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.57 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the Solent. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the Itchen from the site.

10.8.58 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.59 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction

phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the Sensitivity of the Solent is very high, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant) effects could arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a **Not Significant Likely Construction Effect** will occur to the Solent Maritime SAC and SSSI from sediment or other associated pollution during construction associated with the OPA Phase 1.

10.8.60 During the implementation of each phase of the development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease. Inputs of these nutrients to the soil or water environment as part of construction will not occur. At the start of the phased construction works i.e. the duration of the OPA Phase 1 and Link Road construction, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Solent Maritime SAC would not occur. This would result in a **Not Significant Likely Construction Effect** occurring from a reduction in nutrient inputs.

10.8.61 No air quality effects from emissions associated with the construction of (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the OPA Phase 1 and Link Road will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Construction Wider OPA

10.8.62 The site preparation and construction activities associated with OPA Phase 1 and the Link Road will act as a proof of evidence for the Wider OPA and associated Link Road that the inherent and adopted mitigation set out in Table 10.7 in Section 10.7 of this Chapter of the ES and the Additional Mitigation set out in Table 10.11 are a robust set of pollution and erosion prevention measures, that will continue to be prescribed in a site wide and multi-phase Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of

the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.63 The development will also result in the phased cessation of agricultural activities across the whole of the site, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the Solent Maritime SAC. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural and progressive reduction in baseline sediment input to the Itchen from the site.

10.8.64 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from each specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.65 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the downstream Solent Maritime SAC.

10.8.66 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent Maritime SAC is Very High, the Magnitude of change is Very Low and therefore Moderate (could be significant) effects could arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a **Not Significant Likely**

Construction Effect will occur to the Solent Maritime SAC and SSSI from sediment or other associated pollution during construction associated with the Wider OPA.

10.8.67 During the implementation of each successive phase of the wider development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease and existing areas of bare soil largely associated with arable fields and localised areas of cattle poaching including along watercourses will also cease to be present. Inputs of these nutrients to the soil or water environment as part of construction will not occur. During the predicted 10 year phased construction works i.e. the duration of the Wider OPA, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Solent Maritime will be Low (e.g. after year 5 of no new inputs occurring to each phase), thereby resulting in a **Significant positive likely construction effect** from a reduction in site baseline nutrient effects would occur**.**

10.8.68 No air quality effects from emissions associated with the construction of the Wider OPA (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the SPA (or constituent SSSIs) as a result of changes in air quality.

Occupation OPA Phase 1

10.8.69 The developed OPA Phase 1 will result in a change from the agricultural land use to a maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1. Soil erosion from these area is considered to be negligible.

10.8.70 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1 and Link Road.

10.8.71 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.72 Specifications in The SuDS Manual[53] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details).

10.8.73 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details.

10.8.74 Taking into account the change in land use and Additional Measures set out in Table 10.7 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent Maritime SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.75 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance

[53] https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

of the greenfield runoff rate, factoring in changes attributed to climate change. As a result there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.76 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver within a consented discharge limit which then flows into the Solent maritime SAC between Gosport and Lee on the Solent. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients.

10.8.77 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.78 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent Maritime SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.79 No air quality effects from emissions associated with the operation/occupation of the OPA Phase 1 (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, **no significant operational/occupational likely effects** associated with the OPA Phase 1 and Link Road will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Occupation Wider OPA

10.8.80 The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA. Soil erosion from these areas is considered to be negligible.

10.8.81 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the Wider OPA and Link Road and these have been discussed in detail in the previous Section associated with the OPA Phase 1. The implementation and successful monitoring and management of these will act as an incrementally growing proof of evidence for each reserved matter application associated with the Wider OPA as they come forward and are completed and occupied. As such there will be a robust phase by phase increment of both site occupation and treatment and management of sediments, other contaminants and nutrients.

10.8.82 As previously discussed, sediment generated from the Wider OPA will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.83 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any

SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details.

10.8.84 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent Maritime SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.85 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen and Solent Maritime OPA.

10.8.86 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver within a consented discharge limit and the Solent Maritime SAC between Gosport and Lee on the Solent. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients. Please refer to Chapter 11 of this ES for full details.

10.8.87 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.88 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent Maritime SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.89 No air quality effects from emissions associated with the operation/occupation of the Wider OPA (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, **no significant operational/occupational likely effects** associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the SAC (or constituent SSSIs) as a result of changes in air quality.

Solent SPA (and other constituent designated sites)

Baseline Conditions

10.8.90 The Solent SPA comprises a large number of component SSSI, NNR, LNR and MCZ. SSSI are designated for national (as opposed to international) nature conservation interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

10.8.91 A summary of the SSSI condition as specified by Natural England[54] is presented below in Table 10.13.

[54] https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

Table 10.13 SSSI Condition for the Solent SPA

Brading Marshes to St. Helen's Ledges SSSI • Favourable Condition – 32.18% • Unfavourable Recovering – 46.69% • Unfavourable No Change – 9.32% • Unfavourable Declining – 11.80 %
Eling and Bury Marshes SSSI • See Table 10.12
Hurst Castle and Lymington River Estuary SSSI • See Table 10.12
Hythe to Calshot Marshes SSSI • See Table 10.12
King's Quay Shore SSSI • See Table 10.12
Lee-on-The Solent to Itchen Estuary SSSI • See Table 10.12
Lincegrove and Hackett's Marshes SSSI • See Table 10.12
Lower Test Valley SSSI • See Table 10.12
Lymington River Reedbeds SSSI • Favourable Condition – 35.50% • Unfavourable Recovering – 64.50%

Lymington River SSSI • Unfavourable No Change – 100%
Medina Estuary SSSI • See Table 10.12
Newtown Harbour SSSI • See Table 10.12
North Solent SSSI • See Table 10.12
River Test SSSI • Favourable Condition – 17.91% • Unfavourable Recovering – 37.53% • Unfavourable No Change – 43.52% • Unfavourable Declining – 1.03 %
Ryde Sands and Wootton Creek SSSI • Favourable Condition – 71.92% • Unfavourable Recovering – 22.25% • Unfavourable No Change – 5.84%
Sowley Pond SSSI • Favourable Condition – 66.62% • Unfavourable No Change – 33.38%

The New Forest SSSI • Favourable Condition – 54.82% • Unfavourable Recovering – 41.63% • Unfavourable No Change – 2.11% • Unfavourable Declining – 1.43 %
Thorness Bay SSSI • Favourable Condition – 26.04% • Unfavourable Declining – 69.82 %
Titchfield Haven SSSI • Favourable Condition – 17.91% • Unfavourable Recovering – 37.53% • Unfavourable No Change – 43.52% • Unfavourable Declining – 1.03 %
Upper Hamble Estuary and Woods SSSI • See Table 10.12
Whitecliff Bay and Bembridge Ledges SSSI • Favourable Condition – 99.07% • Unfavourable No Change – 0.93%
Yar Estuary SSSI • See Table 10.12

10.8.92 Key reasons for more adverse conditions relevant to OHH include: General public disturbance, public access-disturbance, coastal squeeze, freshwater pollution, water pollution, agriculture/runoff, pollution discharge, nutrients-nitrogen.

Predicted Effects and Their Significance

10.8.93 NE has identified key objectives that need to be met in order to maintain or restore the integrity of the site, and that contributes to achieving the Favourable Conservation Status of its Qualifying Features of Interest by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

10.8.94 Consideration of how the development proposals could affect these objectives and therefore cause a negative effect on the Favourable Conservation Status of the SPA and/or SSSI etc is set out below, separated into constructional and operational effects and for the OPA Phase 1 application and Wider OPA Application and associated Link Road.

Construction OPA Phase 1

10.8.95 The site preparation and construction activities associated with OPA Phase 1 will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ditches and other drainage features associated with the site. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter the watercourses draining the site, which in turn form a confluence with the River Itchen, upstream of Itchen Valley Country Park and flow downstream to the Itchen Estuary and the wider Solent and Southampton Water SPA and associated SSSI.

10.8.96 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including paints,

solvents, plastics etc could be transported through soil and through water into the watercourses draining the site, and into the River Itchen and then downstream to the wider Solent and Southampton Water SPA and associated SSSI.

10.8.97 The detailed design of the drainage system and site-wide water management plan will ensure that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.98 The inherent and adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.99 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the wider Solent and Southampton Water SPA and associated SSSI etc from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.100 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil

that can feed sediment into the receiving watercourses and the Solent. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the Itchen from the site.

10.8.101 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.102 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the Sensitivity of the Solent is very high, the Magnitude of change reduces to negligible and therefore **No Likely Significant Effect** will occur to the wider Solent and Southampton Water SPA and associated SSSI from sediment or other associated pollution during construction associated with the OPA Phase 1.

10.8.103 During the implementation of each phase of the development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease. Inputs of these nutrients to the soil or water environment as part of construction will not occur. At the start of the phased construction works i.e. the duration of the OPA Phase 1 construction, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the wider Solent and Southampton Water SPA and associated SSSI would be negligible. This would result in a **Not Significant Likely Construction Effect** occurring from a reduction in nutrient inputs.

10.8.104 No air quality effects from emissions associated with the construction of (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the OPA Phase 1 and Link Road will occur to the habitats or species that comprise the designated features of interest of the SPA (or constituent SSSIs) as a result of changes in air quality.

Construction Wider OPA

10.8.105 The site preparation and construction activities associated with OPA Phase 1 will act as a proof of evidence for the Wider OPA and associated Link Road that the inherent and adopted mitigation set out in Table 10.7 in Section 10.7 of this Chapter of the ES and the Additional Mitigation set out in Table 10.11 are a robust set of pollution and erosion prevention measures, that will continue to be prescribed in a site wide and multi-phase Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.106 The development will also result in the phased cessation of agricultural activities across the whole of the site, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the Solent and Southampton Water SPA. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural and progressive reduction in baseline sediment input to the Itchen from the site.

10.8.107 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from each specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.108 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As

a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the downstream Solent Maritime SAC. Please refer to Chapter 11 of this ES for full details.

10.8.109 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to negligible and therefore **No Significant Likely Construction Effect** will occur to the Solent and Southampton Water and constituent SSSIs from sediment or other associated pollution during construction associated with the Wider OPA and associated Link Road.

10.8.110 During the implementation of each successive phase of the wider development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease and existing areas of bare soil largely associated with arable fields and localised areas of cattle poaching including along watercourses will also cease to be present. Inputs of these nutrients to the soil or water environment as part of construction will not occur. During the predicted 10 year phased construction works i.e. the duration of the Wider OPA and associated Link Road, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Solent and Southampton Water SPA and constituent SSSIs will be Low (e.g. after year 5 of no new inputs occurring to each phase), thereby resulting in a **Significant positive likely construction effect** from a reduction in site baseline nutrient effects would occur**.**

10.8.111 No air quality effects from emissions associated with the construction of the Wider OPA (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the SPA (or constituent SSSIs) as a result of changes in air quality.

<u>Occupation OPA Phase 1</u>

10.8.112 The developed OPA Phase 1 will result in a growth in 400 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere. The Solent coast, particularly its mudflats, shingle and saltmarshes, provide essential winter feeding and roosting grounds for birds that spend the winter here. The Solent and Southampton Water SPA is designated for its feeding and roosting estuarine birds.

10.8.113 A wide range of recreational activities which take place on the Solent coast (including those areas associated with the Solent and Southampton Water SPA, Ramsar Site and associated SSSI) can disturb birds. Birds may need to be more alert, reducing the amount of food that they eat. They may move away from the disturbance, reducing their feeding time and using energy to fly. Substantial disturbance may cause food-rich areas to be little used by the birds or avoided altogether, leading to other areas hosting a higher density of birds and intensifying the competition for the available food. Cumulatively this can lead to increased bird mortality, or to a bird having less energy available at the end of the winter period to fly back to its breeding grounds. If birds cannot complete their migratory journey or are not in sufficiently good condition to breed when they arrive, then the bird population can drop[55].

10.8.114 Research carried out in 2009-2013 found that by far the most popular activity taking place at the Solent coast is walking. Along with jogging and cycling, this accounted for 91% of all recreational activity. Other types of recreational use included surfing, horse riding and rowing. Dogs off lead accounted for 47% of all incidents where birds flew more than 50m to escape disturbance. The research predicted a 13% increase in visitor numbers to the Solent coast as a result of planned new housing[56].

10.8.115 The Phase 1 OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and in high quality green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities (including connected Public Rights of Way linking to other greenspace) and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access

[55] Bird Aware Solent (2017) *Solent Recreation Mitigation Strategy*, https://solent.birdaware.org/media/29372/Bird-Aware-Solent-Strategy/pdf/Solent_Recreation_Mitigation_Strategy.pdf

[56] Ibid.

and dog walking. Please refer to Chapter 14 of this ES for full details of these measures and how they meet the requirements of formal SANG. These would be delivered as part of the Wider OPA application.

10.8.116 The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys, residents of One Horton Heath will wish to also visit the Solent and Southampton SPA / Solent Maritime SAC. This is because many people who visit the Solent coast do so for the sea views and the feeling of 'being beside the sea'. In a survey of visitors to the Solent, one-third of respondents stated that nothing could be done to make an alternative site more attractive to them[57]. The Phase 1 OPA part of One Horton Heath, comprising 300 homes, is located within the Solent Mitigation and Disturbance Zone. The journey from parts of One Horton Heath to the SPA/SAC is relatively direct, on B roads, and less than 5.6km.

10.8.117 Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites.

10.8.118 With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to negligible and therefore **No Significant Likely Occupational/Operational Effect** will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the Phase 1 OPA.

[57] Ibid.

10.8.119 The developed OPA Phase 1 will result in a change from the agricultural land use to a maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1 Road. Soil erosion from these areas is considered to be negligible.

10.8.120 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1.

10.8.121 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.122 Specifications in The SuDS Manual[58] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details).

10.8.123 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced

58 https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91 (accessed 20.11.20)

performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details.

10.8.124 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water SPA and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.125 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.126 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption of Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver within a consented discharge limit which then flows into the Solent and Southampton Water SPA between Gosport and Lee on the Solent. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients.

10.8.127 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.128 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water SPA and associated SSSIs has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.129 No air quality effects from emissions associated with the operation/occupation of the Wider OPA (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, **no significant operational/occupational likely effects** associated with the OPA Phase 1 and Link Road will occur to the habitats or species that comprise the designated features of interest of the SPA (or constituent SSSIs) as a result of changes in air quality.

Occupation Wider OPA

10.8.130 The developed Wider will result in a growth in up to 2500 local housing units, directly associated with the OHH project together with the associated Link Road. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere. The Solent coast, particularly its mudflats, shingle and saltmarshes, provide essential winter feeding and roosting grounds for birds that spend the winter here. The Solent and Southampton Water SPA is designated for its feeding and roosting estuarine birds.

10.8.131 A wide range of recreational activities which take place on the Solent coast (including those areas associated with the Solent and Southampton Water SPA, Ramsar Site and associated SSSI) can disturb birds. Birds may need to be more alert, reducing the amount of food that they eat. They may move away from the disturbance, reducing their feeding time and using energy to fly. Substantial disturbance may cause food-rich areas to be little used by the birds or avoided altogether, leading to other areas hosting a higher density of birds and intensifying the competition for the available food. Cumulatively this can lead to increased bird mortality, or to a bird having less energy available at the end of the winter period to fly back to

its breeding grounds. If birds cannot complete their migratory journey or are not in sufficiently good condition to breed when they arrive, then the bird population can drop[59].

10.8.132 Research carried out in 2009-2013 found that by far the most popular activity taking place at the Solent coast is walking. Along with jogging and cycling, this accounted for 91% of all recreational activity. Other types of recreational use included surfing, horse riding and rowing. Dogs off lead accounted for 47% of all incidents where birds flew more than 50m to escape disturbance. The research predicted a 13% increase in visitor numbers to the Solent coast as a result of planned new housing[60].

10.8.133 The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details.

10.8.134 The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys. However, residents of One Horton Heath will wish to also visit the New Forest SPA.

10.8.135 Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites.

10.8.136 With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational

[59] Bird Aware Solent (2017) *Solent Recreation Mitigation Strategy*, https://solent.birdaware.org/media/29372/Bird-Aware-Solent-Strategy/pdf/Solent_Recreation_Mitigation_Strategy.pdf

[60] Ibid.

Mitigation Strategy SPD, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore **No Significant Likely Occupational/Operational Effect** will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the Wider OPA.

10.8.137 The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA. Soil erosion from these areas is considered to be negligible.

10.8.138 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the Wider OPA and Link Road and these have been discussed in detail in the previous Section associated with the OPA Phase 1. The implementation and successful monitoring and management of these will act as an incrementally growing proof of evidence for each reserved matter application associated with the Wider OPA as they come forward and are completed and occupied. As such there will be a robust phase by phase increment of both site occupation and treatment and management of sediments, other contaminants and nutrients.

10.8.139 As previously discussed, sediment generated from the Wider OPA will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.140 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details.

10.8.141 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water SPA and associated SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.142 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen and Solent and Southampton Water SPA and constituent SSSIs from the Wider OPA.

10.8.143 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver within a consented discharge limit and the Solent and Southampton Water SPA and constituent SSSIs between Gosport and Lee on the Solent. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient

inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients. Please refer to Chapter 11 of this ES for full details.

10.8.144 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.145 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water SPA and constituent SSSIs has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.146 No air quality effects from emissions associated with the operation/occupation of the Wider OPA (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Please refer to Chapter 7 for full details. Consequently, **no significant operational/occupational likely effects** associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the SPA (or constituent SSSIs) as a result of changes in air quality.

Solent and Southampton Water Ramsar (and other constituent designated sites)

Baseline Conditions

10.8.147 The Solent and Southampton Water Ramsar comprises a large number of component SSSI. SSSI are designated for national (as opposed to international) nature conservation interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

10.8.148 A summary of the SSSI condition as specified by Natural England[61] is presented below in Table 10.14.

Table 10.14 SSSI Condition for the Solent and Southampton Water Ramsar Site

Brading Marshes to St. Helen's Ledges SSSI • See Table 10.12
Eling and Bury Marshes SSSI • See Table 10.12
Gilkicker Lagoon SSSI • Favourable - 100%
Hurst Castle and Lymington River Estuary SSSI • See Table 10.12
Hythe to Calshot Marshes SSSI • See Table 10.12
King's Quay Shore SSSI • See Table 10.12
Lee-on-The Solent to Itchen Estuary SSSI • See Table 10.12
Lincegrove and Hackett's Marshes SSSI • See Table 10.12
Lower Test Valley SSSI • See Table 10.12
Lymington River Reedbeds SSSI • Favourable Condition – 35.50% • Unfavourable Recovering – 64.50%
Lymington River SSSI • Unfavourable No Change – 100%

[61] https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

Medina Estuary SSSI • See Table 10.12
Newtown Harbour SSSI • See Table 10.12
North Solent SSSI • See Table 10.12
River Test SSSI • See Table 10.12
Ryde Sands and Wootton Creek SSSI • See Table 10.12
Sowley Pond SSSI • See Table 10.12
The New Forest SSSI • See Table 10.12
Thorness Bay SSSI • See Table 10.12
Titchfield Haven SSSI • See Table 10.12
Upper Hamble Estuary and Woods SSSI • See Table 10.12
Whitecliff Bay and Bembridge Ledges SSSI • See Table 10.12
Yar Estuary SSSI • See Table 10.12

10.8.149 Key reasons for more adverse conditions relevant to OHH include: General public disturbance, public access-disturbance, coastal squeeze, freshwater pollution, water pollution, agriculture/runoff, pollution discharge, nutrients-nitrogen.

Predicted Effects and Their Significance

10.8.150 NE has identified key objectives that need to be met in order to maintain or restore the integrity of the site, and that contributes to achieving the Favourable Conservation Status of its Qualifying Features of Interest by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

10.8.151 Consideration of how the development proposals could affect these objectives and therefore cause a negative effect on the Favourable Conservation Status of the SPA and/or SSSI etc is set out below, separated into constructional and operational effects and for the OPA Phase 1 and Link Road application and Wider OPA Application.

Construction OPA Phase 1

10.8.152 The site preparation and construction activities associated with OPA Phase 1 will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ditches and other drainage features associated with the site. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter the watercourses draining the site, which in turn form a confluence with the River Itchen, upstream of Itchen Valley Country Park and flow downstream to the Itchen Estuary and the wider Solent and Southampton Water Ramsar and associated SSSI.

10.8.153 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including

paints, solvents, plastics etc could be transported through soil and through water into the watercourses draining the site, and into the River Itchen and then downstream to the wider Solent and Southampton Water Ramsar and associated SSSI.

10.8.154 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.155 The inherent and adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success. Please refer to Chapter 11 for full details.

10.8.156 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the wider Solent and Southampton Water Ramsar and associated SSSI etc from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats. Please refer to Chapter 11 for full details.

10.8.157 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the Solent. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the Itchen from the site.

10.8.158 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment. Please refer to Chapter 11 for full details.

10.8.159 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the Sensitivity of the Solent is very high, the Magnitude of change reduces to negligible and therefore **No Likely Significant Effect** will occur to the wider Solent and Southampton Water Ramsar and associated SSSI from sediment or other associated pollution during construction associated with the OPA Phase 1 and Link Road.

10.8.160 During the implementation of each phase of the development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease. Inputs of these nutrients to the soil or water environment as part of construction will not occur. At the start of the phased construction works i.e. the duration of the OPA Phase 1 and Link Road construction, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the wider Solent and Southampton Water Ramsar and associated SSSI would be negligible. This would result in a **Not Significant Likely Construction Effect** occurring from a reduction in nutrient inputs.

10.8.161 No air quality effects from emissions associated with the construction of (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the OPA Phase 1 and Link Road will occur to the habitats or

species that comprise the designated features of interest of the Ramsar (or constituent SSSIs) as a result of changes in air quality.

Construction Wider OPA

10.8.162 The site preparation and construction activities associated with OPA Phase 1 will act as a proof of evidence for the Wider OPA that the inherent and adopted mitigation set out in Table 10.7 in Section 10.7 of this Chapter of the ES and the Additional Mitigation set out in Table 10.11 are a robust set of pollution and erosion prevention measures, that will continue to be prescribed in a site wide and multi-phase Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success. Please refer to Chapter 11 for full details.

10.8.163 The development will also result in the phased cessation of agricultural activities across the whole of the site, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the Solent and Southampton Water Ramsar. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural and progressive reduction in baseline sediment input to the Itchen from the site.

10.8.164 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permanent vegetation will aid the gradual cessation of net sediment transport from each specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.165 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into

account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the downstream Solent and Southampton Water Ramsar. Please refer to Chapter 11 of the ES for full details.

10.8.166 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water Ramsar and constituent SSSIs remains the same, the Magnitude of change reduces to negligible and therefore **No Significant Likely Construction Effect** will occur to the Solent and Southampton Water and constituent SSSIs from sediment or other associated pollution during construction associated with the Wider OPA.

10.8.167 During the implementation of each successive phase of the wider development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease and existing areas of bare soil largely associated with arable fields and localised areas of cattle poaching including along watercourses will also cease to be present. Inputs of these nutrients to the soil or water environment as part of construction will not occur. During the predicted 10 year phased construction works i.e. the duration of the Wider OPA, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Solent and Southampton Water Ramsar and constituent SSSIs will be Low (e.g. after year 5 of no new inputs occurring to each phase), thereby resulting in a **Significant positive likely construction effect** from a reduction in site baseline nutrient effects would occur**.**

10.8.168 No air quality effects from emissions associated with the construction of the Wider OPA (including dust) are predicted as a result of the implementation of inherent and adopted, as well as additional mitigation and management measures as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7: Air Quality. Consequently, no significant construction likely effects associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the Ramsar (or constituent SSSIs) as a result of changes in air quality.

Occupation OPA Phase 1

10.8.169 The OPA Phase 1 will result in a growth in 400 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere. The Solent coast, particularly its mudflats, shingle and saltmarshes, provide essential winter feeding and roosting grounds for birds that spend the winter here. The Solent and Southampton Water SPA is designated for its feeding and roosting estuarine birds.

10.8.170 A wide range of recreational activities which take place on the Solent coast (including those areas associated with the Solent and Southampton Water SPA, Ramsar Site and associated SSSI) can disturb birds. Birds may need to be more alert, reducing the amount of food that they eat. They may move away from the disturbance, reducing their feeding time and using energy to fly. Substantial disturbance may cause food-rich areas to be little used by the birds or avoided altogether, leading to other areas hosting a higher density of birds and intensifying the competition for the available food. Cumulatively this can lead to increased bird mortality, or to a bird having less energy available at the end of the winter period to fly back to its breeding grounds. If birds cannot complete their migratory journey or are not in sufficiently good condition to breed when they arrive, then the bird population can drop[62].

10.8.171 Research carried out in 2009-2013 found that by far the most popular activity taking place at the Solent coast is walking. Along with jogging and cycling, this accounted for 91% of all recreational activity. Other types of recreational use included surfing, horse riding and rowing. Dogs off lead accounted for 47% of all incidents where birds flew more than 50m to escape disturbance. The research predicted a 13% increase in visitor numbers to the Solent coast as a result of planned new housing[63].

10.8.172 The Phase 1 OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG

[62] Bird Aware Solent (2017) *Solent Recreation Mitigation Strategy*, https://solent.birdaware.org/media/29372/Bird-Aware-Solent-Strategy/pdf/Solent_Recreation_Mitigation_Strategy.pdf

[63] Ibid.

(suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on-site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details.

10.8.173 The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys, residents of One Horton Heath will wish to also visit the Solent and Southampton SPA / Solent Maritime SAC. This is because many people who visit the Solent coast do so for the sea views and the feeling of 'being beside the sea'. In a survey of visitors to the Solent, one-third of respondents stated that nothing could be done to make an alternative site more attractive to them[64]. The Phase 1 OPA part of One Horton Heath, comprising 100 homes, is located within the Solent Mitigation and Disturbance Zone (see Figure 4). The journey from parts of One Horton Heath to the SPA/SAC is relatively direct, on B roads, and less than 5.6km.

10.8.174 Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites.

10.8.175 With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water Ramsar and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore **No**

[64] Ibid.

Significant Likely Occupational/Operational Effect will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the OPA Phase 1.

10.8.176 The developed OPA Phase 1 will result in a change from the agricultural land use to a maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1. Soil erosion from these areas is considered to be negligible.

10.8.177 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1.

10.8.178 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.179 Specifications in The SuDS Manual[65] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details).

10.8.180 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows

65 https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. See Chapter 11 of this ES for full details.

10.8.181 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water Ramsar and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.182 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.183 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver within a consented discharge limit which then flows into the Solent and Southampton Water Ramsar between Gosport and Lee on the Solent. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients.

10.8.184 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.185 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water Ramsar and associated SSSIs has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.186 No air quality effects from emissions associated with the operation/occupation of the Wider OPA (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, **no significant operational/occupational likely effects** associated with the OPA Phase 1 and Link Road will occur to the habitats or species that comprise the designated features of interest of the Ramsar (or constituent SSSIs) as a result of changes in air quality.

Occupation Wider OPA

10.8.187 The developed Wider OPA will result in a growth in up to 2500 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere. The Solent coast, particularly its mudflats, shingle and saltmarshes, provide essential winter feeding and roosting grounds for birds that spend the winter here. The Solent and Southampton Water SPA is designated for its feeding and roosting estuarine birds.

10.8.188 A wide range of recreational activities which take place on the Solent coast (including those areas associated with the Solent and Southampton Water SPA, Ramsar Site and associated SSSI) can disturb birds. Birds may need to be more alert, reducing the amount of food that they eat. They may move away from the disturbance, reducing their feeding time and using energy to fly. Substantial disturbance may cause food-rich areas to be little used by the birds or avoided altogether, leading to other areas hosting a higher density of birds and intensifying the competition for the available food. Cumulatively this can lead to increased bird mortality, or to a bird having less energy available at the end of the winter period to fly back to

its breeding grounds. If birds cannot complete their migratory journey or are not in sufficiently good condition to breed when they arrive, then the bird population can drop[66].

10.8.189 Research carried out in 2009-2013 found that by far the most popular activity taking place at the Solent coast is walking. Along with jogging and cycling, this accounted for 91% of all recreational activity. Other types of recreational use included surfing, horse riding and rowing. Dogs off lead accounted for 47% of all incidents where birds flew more than 50m to escape disturbance. The research predicted a 13% increase in visitor numbers to the Solent coast as a result of planned new housing[67].

10.8.190 The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking.

10.8.191 The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys, residents of One Horton Heath will wish to also visit the Solent and Southampton SPA / Solent Maritime SAC. This is because many people who visit the Solent coast do so for the sea views and the feeling of 'being beside the sea'. In a survey of visitors to the Solent, one-third of respondents stated that nothing could be done to make an alternative site more attractive to them[68]. The Wider OPA part of One Horton Heath, comprising up to 2500 homes, is located within the Solent Mitigation and Disturbance Zone (see Figure 4). The journey from parts of One Horton Heath to the SPA/SAC is relatively direct, on B roads, and less than 5.6km.

10.8.192 Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation

[66] Bird Aware Solent (2017) *Solent Recreation Mitigation Strategy*, https://solent.birdaware.org/media/29372/Bird-Aware-Solent-Strategy/pdf/Solent_Recreation_Mitigation_Strategy.pdf

[67] Ibid.

[68] Ibid.

Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites.

10.8.193 With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water Ramsar and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore **No Significant Likely Occupational/Operational Effect** will occur to the Solent and Southampton Water Ramsar from recreational pressure associated with the Wider OPA.

10.8.194 The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA. Soil erosion from these areas is considered to be negligible.

10.8.195 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1 and Link Road and these have been discussed in detail in the previous Section associated with the OPA Phase 1 and Link Road. The implementation and successful monitoring and management of these will act as a incrementally growing proof of evidence for each reserved matter application associated with the Wider OPA as they come forward and are completed and occupied. As such there will be a robust phase by phase increment of both site occupation and treatment and management of sediments, other contaminants and nutrients.

10.8.196 As previously discussed, sediment generated from the Wider OPA will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.197 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance.

10.8.198 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water Ramsar and associates SSSIs has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of sediment (or other associated contaminant) emissions.

10.8.199 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen and Solent and Southampton Water Ramsar and constituent SSSIs from the Wider OPA.

10.8.200 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption Peel Common WwTW as the location where any foul effluent

associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver within a consented discharge limit and the Solent and Southampton Water Ramsar and constituent SSSIs between Gosport and Lee on the Solent. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients. Please refer to Chapter 14 of this ES for full details.

10.8.201 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.202 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the Solent and Southampton Water Ramsar and constituent SSSIs has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore **No Significant occupation likely effect** will occur as a result of nutrient emissions.

10.8.203 No air quality effects from emissions associated with the operation/occupation of the Wider OPA (including NoX, nitrogen nutrient, or acidity) are predicted as a result of the outcome of the air quality modelling (including traffic emissions) as documented in Chapter 7: Air Quality. Consequently, **no significant operational/occupational likely effects** associated with the Wider OPA will occur to the habitats or species that comprise the designated features of interest of the Ramsar (or constituent SSSIs) as a result of changes in air quality.

New Forest SPA/Ramsar (and other constituent designated sites)

Baseline Conditions

10.8.204 The New Forest SPA/Ramsar comprises a large number of component SSSI. SSSI are designated for national (as opposed to international) nature conservation interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of

the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

10.8.205 A summary of the SSSI condition as specified by Natural England[69] is presented below in Table 10.15.

Table 10.15 SSSI Condition of the New Forest SPA / Ramsar

Lymington River SSSI • Unfavourable No Change – 100%
Norley Copse and Meadow SSSI • Favourable – 58.67% • Unfavourable Recovering – 41.33%
River Avon System SSSI • Favourable – 3.48% • Unfavourable Recovering – 36.96% • Unfavourable No Change – 56.76% • Unfavourable Declining – 2.8%
The New Forest SSSI • Favourable – 54.82% • Unvavourable recovering – 41.63% • Unfavourable No Change – 2.11% • Unfavourable Declining – 1.43%

10.8.206 Key reasons for more adverse conditions relevant to OHH include nutrient input.

Predicted Effects and Their Significance

[69] https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

10.8.207 NE has identified key objectives that need to be met in order to maintain or restore the integrity of the site, and that contributes to achieving the Favourable Conservation Status of its Qualifying Features of Interest by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Construction OPA Phase 1 and Link Road

10.8.208 Although the New Forest SPA/Ramsar and its constituent SSSIs are of Very High Importance, it is considered reasonable to conclude that there are no construction phase environmental pathways that would result in any Magnitude of Effect occurring at this site, and as such no construction Likely Significant Effects will occur from the Phase 1 OPA and Link Road.

Construction Wider OPA

10.8.209 Although the New Forest SPA/Ramsar and its constituent SSSIs are of Very High Importance, it is considered reasonable to conclude that there are no construction phase environmental pathways that would result in any Magnitude of Effect occurring at this site, and as such no construction Likely Significant Effects will occur from the Wider OPA and Link Road.

Occupation OPA Phase 1 and Link Road

10.8.210 The OPA Phase 1 will result in a growth in 100 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere.

10.8.211 Like the Solent and Southampton Water SPA, the New Forest SPA/Ramsar hosts a range of birds that are sensitive to disturbance. Of these, ground and near-ground nesting birds

such as the Dartford warbler, nightjar and woodlark are particularly sensitive. The breeding success of nightjar is significantly lower close to paths, and nightjar populations decrease with proximity of housing. Dartford warblers in heavily disturbed areas delay the start of their breeding, preventing multiple breeds. Most of this disturbance is from dogs running through vegetation. Removal of human disturbance results in an increase of 13 – 48% in the breeding population of woodlark. Other impacts from visitor pressure include arson, litter and fly-tipping, trampling and soil compaction, localised nutrient and predation by people and pets.[70] In addition, consideration needs to be given to localised nutrient increased from dog urine/faeces and emissions to air and associated deposition from road traffic.

10.8.212 The New Forest National Park received 15.2 million recreation and leisure visitor-days (one person coming for at least part of one day) in 2017[71]. A telephone survey of 2000 people – including 138 from Eastleigh Borough Council – was carried out in late 2018 to investigate factors that lead to tourism visits to the New Forest. Of the 138 interviewees from Eastleigh:

10.8.213 About two-thirds (64%) had visited the New Forest heaths and woods in the past year

10.8.214 The proportion of people visiting the New Forest, and the number of visits, declined the further people lived from the New Forest, as did the proportion of visits to the New Forest compared with other green space locations

10.8.215 The most common frequency of visits from people living 10-25km away was less than once a month, followed by once a month

10.8.216 The most common activity carried out by interviewees in the New Forest was walking and dog walking. The proportion of dog walking generally declined with distance, but dog walkers tended to visit more frequently than other users. [72]

[70] Urban Edge (2019) Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036, https://www.eastleigh.gov.uk/media/5477/ed12a-41-hra-main-report.pdf.

71 https://www.newforestnpa.gov.uk/conservation/managing-recreation/future-forest/recent-changes-affecting-forest/

[72] Eastleigh Borough Council (2019) Eastleigh Borough Local Plan 2016-2036, Interim New Forest Recreation Mitigation, https://www.eastleigh.gov.uk/media/5479/ed12c-update-44-new-forest-interim-mitigation.pdf

10.8.217 The Phase 1 OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking, which will be delivered through the Wider OPA.

10.8.218 The on-site recreational provision at One Horton Heath is expected to cater for most day-to-day walking and cycling journeys, however, residents of One Horton Heath may also wish to visit the New Forest SAC.

10.8.219 Eastleigh Borough Council has therefore provided further local recreational resources within the OHH site in line with the requirements for SANG to maximise the local opportunities for absorbing any increase in recreational pressure from One Horton Heath, removing this additional pressure from the New Forest (please refer to Chapter 14 of this ES for full details). One Horton Heath will therefore provide high quality green infrastructure, open space and a strong network of footpaths and associated amenity features, including provision for dog walking, that will help to draw in the residents of One Horton Heath to use the on-site facilities and minimise the need to visit the New Forest SPA/Ramsar on a regular basis (e.g. for daily dog walking), which is also accentuated by the distance from the boundary of these designated sites.

10.8.220 The provision of the significant on site recreational resources (see Chapter 14) within the high quality green infrastructure at One Horton Heath, characterised by woodland, grassland and wetlands, together with the connected wider Public Right of Way Network provides an extensive resource for walking, exercising dogs and other recreational activities that will be both immediately available and of value to the new residents of One Horton Heath. These on-site facilities will help limit the number and frequency of visits to the New Forest SPA, reducing the magnitude of any disturbance to features of interest that are sensitive to recreational disturbance.

10.8.221 With the inclusion of the additional on site and local recreational resources set out in Chapter 14 of this ES and summarised in Table 10.11 of Section 10.7 of this Chapter of the ES, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such,

whilst the sensitivity of the New Forest SPA and constituent SSSIs remains Very High, the Magnitude of change will be Negligible and therefore **No Significant Likely Occupational/Operational Effect** will occur to the New Forest SPA/Ramsar from recreational pressure associated with the Phase 1 OPA.

10.8.222 Results from Chapter 7: Air Quality confirms that No Significant Likely Occupational/Operational Effect will occur to the New Forest SPA/Ramsar from a change in air quality arising from an increase in road traffic associated with the Phase 1 OPA.

Occupation Wider OPA

10.8.223 The Wider OPA will result in a growth in up to 2500 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere.

10.8.224 Like the Solent and Southampton Water SPA, the New Forest SPA/Ramsar hosts a range of birds that are sensitive to disturbance. Of these, ground and near-ground nesting birds such as the Dartford warbler, nightjar and woodlark are particularly sensitive. The breeding success of nightjar is significantly lower close to paths, and nightjar populations decrease with proximity of housing. Dartford warblers in heavily disturbed areas delay the start of their breeding, preventing multiple breeds. Most of this disturbance is from dogs running through vegetation. Removal of human disturbance results in an increase of 13 – 48% in the breeding population of woodlark. Other impacts from visitor pressure include arson, litter and fly-tipping, trampling and soil compaction, localised nutrient and predation by people and pets.[73] In addition, consideration needs to be given to localised nutrient increased from dog urine/faeces and emissions to air and associated deposition from road traffic.

10.8.225 The New Forest National Park received 15.2 million recreation and leisure visitor-days (one person coming for at least part of one day) in 2017[74]. A telephone survey of 2000 people – including 138 from Eastleigh Borough Council – was carried out in late 2018 to investigate factors that lead to tourism visits to the New Forest. Of the 138 interviewees from Eastleigh:

73 Urban Edge (2019) Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036, https://www.eastleigh.gov.uk/media/5477/ed12a-41-hra-main-report.pdf.

74 https://www.newforestnpa.gov.uk/conservation/managing-recreation/future-forest/recent-changes-affecting-forest/

10.8.226 About two-thirds (64%) had visited the New Forest heaths and woods in the past year

10.8.227 The proportion of people visiting the New Forest, and the number of visits, declined the further people lived from the New Forest, as did the proportion of visits to the New Forest compared with other green space locations

10.8.228 The most common frequency of visits from people living 10-25km away was less than once a month, followed by once a month

10.8.229 The most common activity carried out by interviewees in the New Forest was walking and dog walking. The proportion of dog walking generally declined with distance, but dog walkers tended to visit more frequently than other users. [75]

10.8.230 The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on-site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details.

10.8.231 The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys, however, residents of One Horton Heath may wish to also visit the New Forest SPA.

10.8.232 Eastleigh Borough Council has therefore provided further local recreational resources within the OHH site in line with the requirements for SANG to maximise the local opportunities for absorbing any increase in recreational pressure from One Horton Heath, removing this additional pressure from the New Forest (please refer to Chapter 14 of this ES for full details). One Horton Heath will therefore provide high quality green infrastructure, open space and a strong network of footpaths and associated amenity features, including provision for dog walking, that will help to draw in the residents of One Horton Heath to use the on-site facilities

75 Eastleigh Borough Council (2019) Eastleigh Borough Local Plan 2016-2036, Interim New Forest Recreation Mitigation, https://www.eastleigh.gov.uk/media/5479/ed12c-update-44-new-forest-interim-mitigation.pdf

and minimise the need to visit the New Forest SPA/Ramsar on a regular basis (e.g. for daily dog walking), which is also accentuated by the distance from the boundary of these designated sites.

10.8.233 The significant on-site recreational resources (See Chapter 14) within the high quality green infrastructure designed in line with recognized SANG criteria at One Horton Heath is characterised by woodland, grassland and wetlands. These features, together with the connected wider Public Right of Way Network provides an extensive resource for walking, exercising dogs and other recreational activities that will be both immediately available and of value to the new residents of One Horton Heath. These on-site facilities will help limit the number and frequency of visits to the New Forest SPA/Ramsar, reducing the magnitude of any disturbance to features of interest that are sensitive to recreational disturbance.

10.8.234 With the inclusion of the additional on-site resources set out in Chapter 14 of this ES and summarised in Table 10.11 of Section 10.7 of this Chapter of the ES, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the New Forest SPA/Ramsar and constituent SSSIs is Very High same, the Magnitude of change will be Negligible and therefore **No Significant Likely Occupational/Operational Effect** will occur to the New Forest from recreational pressure associated with the Phase 1 OPA.Results from Chapter 7: Air Quality confirms that No Significant Likely Occupational/Operational Effect will occur to the New Forest SPA/Ramsar from a change in air quality arising from an increase in road traffic associated with the Phase 1 OPA.

New Forest SAC (and other constituent designated sites)

Baseline Conditions

10.8.235 The Solent and Southampton Water SAC comprises a large number of component SSSI. SSSI are designated for national (as opposed to international) nature conservation interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

10.8.236 A summary of the SSSI condition as specified by Natural England[76] is presented below in Table 10.16.

Table 10.16 SSSI Condition of New Forest SAC

Landford Bog SSSI • Favourable – 73.097% • Unfavourable Recovering – 26.93%
Langley Wood and Homan's Copse SSSI • Unfavourable No Change – 98.88% • Unfavourable Declining – 1.12%
Loosehanger Copser and Meadows SSSI • Favourable Condition –11.07% • Unfavourable Recovering – 11.07% • Unfavourable Declining – 88.93%
Royden Woods SSSI • Favourable – 100%
The New Forest SSSI • Favourable – 54.82% • Unfavourable Recovering – 41.63% • Unfavourable No Change – 2.11% • Unfavourable Declining – 1.43%
Whiteparish Common SSSI • Favourable – 93.11% • Unfavourable Recovering – 6.89%

10.8.237 Key reasons for more adverse conditions relevant to OHH include: Nutrients.

[76] https://designatedsites.naturalengland.org.uk/SiteSearch.aspx

Predicted Effects and Their Significance

10.8.238 NE has identified key objectives that need to be met in order to maintain or restore the integrity of the site, and that contributes to achieving the Favourable Conservation Status of its Qualifying Features of Interest by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Construction OPA Phase 1

10.8.239 Although the New Forest SAC and its constituent SSSIs are of Very High Sensitivity, it is considered reasonable to conclude that there are no construction phase environmental pathways that would result in any Magnitude of Effect occurring at this site, and as such no construction Likely Significant Effects will occur from the Phase 1 OPA.

Construction Wider OPA and Associated Link Road

10.8.240 Although the New Forest SAC and its constituent SSSIs are of Very High Sensitivity, it is considered reasonable to conclude that there are no construction phase environmental pathways that would result in any Magnitude of Effect occurring at this site, and as such no construction Likely Significant Effects will occur from the Wider OPA and Link Road.

Occupation OPA Phase 1

10.8.241 The OPA Phase 1 will result in a growth in 400 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere.

10.8.242 The New Forest SAC hosts a range of habitats and species that are sensitive to disturbance or related effects such as trampling. Most of this disturbance is from dogs running through vegetation. Other impacts from visitor pressure include arson, litter and fly-tipping, trampling and soil compaction, localised nutrient and predation by people and pets.[77] In addition, consideration needs to be given to localised nutrient increased from dog urine/faeces and emissions to air and associated deposition from road traffic.

10.8.243 The New Forest National Park received 15.2 million recreation and leisure visitor-days (one person coming for at least part of one day) in 2017[78]. A telephone survey of 2000 people – including 138 from Eastleigh Borough Council – was carried out in late 2018 to investigate factors that lead to tourism visits to the New Forest. Of the 138 interviewees from Eastleigh:

- About two-thirds (64%) had visited the New Forest heaths and woods in the past year
- The proportion of people visiting the New Forest, and the number of visits, declined the further people lived from the New Forest, as did the proportion of visits to the New Forest compared with other green space locations
- The most common frequency of visits from people living 10-25km away was less than once a month, followed by once a month
- The most common activity carried out by interviewees in the New Forest was walking and dog walking. The proportion of dog walking generally declined with distance, but dog walkers tended to visit more frequently than other users. [79]

10.8.244 The Phase 1 OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG

77 Urban Edge (2019) Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036, https://www.eastleigh.gov.uk/media/5477/ed12a-41-hra-main-report.pdf.

78 https://www.newforestnpa.gov.uk/conservation/managing-recreation/future-forest/recent-changes-affecting-forest/

79 Eastleigh Borough Council (2019) Eastleigh Borough Local Plan 2016-2036, Interim New Forest Recreation Mitigation, https://www.eastleigh.gov.uk/media/5479/ed12c-update-44-new-forest-interim-mitigation.pdf

(suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking, which will be delivered through the Wider OPA.

10.8.245 The on-site recreational provision at One Horton Heath is expected to cater for most day-to-day walking and cycling journeys, residents of One Horton Heath may wish to also visit the New Forest SAC.

10.8.246 Eastleigh Borough Council will therefore provide further local recreational resources within the Borough focusing on land it owns and to the equivalent value of the financial contributions to the Solent Recreation Mitigation Strategy to maximise the local opportunities for absorbing any increase in recreational pressure from One Horton Heath, but in locations not susceptible to recreational pressure, removing this additional pressure from the New Forest. One Horton Heath will provide high quality green infrastructure, open space and a strong network of footpaths and associated amenity features, including provision for dog walking, that will help to draw in the residents of One Horton Heath to use the on-site facilities and minimise the need to visit the New Forest SAC on a regular basis (e.g. for daily dog walking), which is also accentuated by the distance from the boundary of these designated sites.

10.8.247 The provision of the significant on site recreational resources (see Chapter 14) within the high quality green infrastructure at One Horton Heath (set out in Chapter 14 of this ES), characterised by woodland, grassland and wetlands, together with the connected wider Public Right of Way Network provides an extensive resource for walking, exercising dogs and other recreational activities that will be both immediately available and of value to the new residents of One Horton Heath. These on-site facilities will help limit the number and frequency of visits to the New Forest SAC, reducing the magnitude of any disturbance to features of interest that are sensitive to recreational disturbance.

10.8.248 With the inclusion of the additional on site and local recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES, it is considered reasonable to conclude that any changes in recreational pressure on the SAC (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the New Forest SAC and constituent SSSIs is Very High, the Magnitude of change will be Negligible and therefore **No Significant Likely Occupational/Operational Effect** will occur to the New Forest from recreational pressure associated with the Phase 1 OPA.

10.8.249 Results from Chapter 7: Air Quality confirms that **No Significant Likely Occupational/Operational Effect** will occur to the New Forest SAC from a change in air quality arising from an increase in road traffic associated with the Phase 1 OPA.

Occupation Wider OPA and Associated Link Road

10.8.250 The Wider OPA will result in a growth in up to 2500 local housing units, directly associated with the OHH project. This growth in local population will result in an associated growth in recreational need and recreational activities, both on site and elsewhere.

10.8.251 The New Forest SAC hosts a range of habitats and species that are sensitive to disturbance or related effects such as trampling. Most of this disturbance is from dogs running through vegetation. Other impacts from visitor pressure include arson, litter and fly-tipping, trampling and soil compaction, localised nutrient and predation by people and pets.[80] In addition, consideration needs to be given to localised nutrient increased from dog urine/faeces and emissions to air and associated deposition from road traffic.

10.8.252 The New Forest National Park received 15.2 million recreation and leisure visitor-days (one person coming for at least part of one day) in 2017[81]. A telephone survey of 2000 people – including 138 from Eastleigh Borough Council – was carried out in late 2018 to investigate factors that lead to tourism visits to the New Forest. Of the 138 interviewees from Eastleigh:

- About two-thirds (64%) had visited the New Forest heaths and woods in the past year
- The proportion of people visiting the New Forest, and the number of visits, declined the further people lived from the New Forest, as did the proportion of visits to the New Forest compared with other green space locations
- The most common frequency of visits from people living 10-25km away was less than once a month, followed by once a month
- The most common activity carried out by interviewees in the New Forest was walking and dog walking. The proportion of dog walking generally declined with distance, but dog walkers

80 Urban Edge (2019) Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036, https://www.eastleigh.gov.uk/media/5477/ed12a-41-hra-main-report.pdf.

81 https://www.newforestnpa.gov.uk/conservation/managing-recreation/future-forest/recent-changes-affecting-forest/

tended to visit more frequently than other users. [82]

10.8.253 The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on-site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details.

10.8.254 The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys, residents of One Horton Heath may also wish to also visit the New Forest SAC.

10.8.255 Eastleigh Borough Council has therefore provided further local recreational resources within the OHH site in line with the requirements for SANG to maximise the local opportunities for absorbing any increase in recreational pressure from One Horton Heath, removing this additional pressure from the New Forest (please refer to Chapter 14 of this ES for full details). One Horton Heath will therefore provide high quality green infrastructure, open space and a strong network of footpaths and associated amenity features, including provision for dog walking, that will help to draw in the residents of One Horton Heath to use the on-site facilities and minimise the need to visit the New Forest SAC on a regular basis (e.g. for daily dog walking), which is also accentuated by the distance from the boundary of these designated sites.

10.8.256 The significant on-site recreational resources (see Chapter 14) within the high quality green infrastructure designed in line with recognized SANG criteria at One Horton Heath is characterised by woodland, grassland and wetlands. These features, together with the connected wider Public Right of Way Network provides an extensive resource for walking, exercising dogs and other recreational activities that will be both immediately available and of value to the new residents of One Horton Heath. These on-site facilities will help limit the number

82 Eastleigh Borough Council (2019) Eastleigh Borough Local Plan 2016-2036, Interim New Forest Recreation Mitigation, https://www.eastleigh.gov.uk/media/5479/ed12c-update-44-new-forest-interim-mitigation.pdf

and frequency of visits to the New Forest SAC, reducing the magnitude of any disturbance to features of interest that are sensitive to recreational disturbance.

10.8.257 With the inclusion of the additional on site and local recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES, it is considered reasonable to conclude that any changes in recreational pressure on the SAC (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the New Forest SAC and constituent SSSIs is Very High, the Magnitude of change will be Negligible and therefore **No Significant Likely Occupational/Operational Effect** will occur to the New Forest SAC from recreational pressure associated with the Wider OPA.

10.8.258 Results from Chapter 7: Air Quality confirms that **No Significant Likely Occupational/Operational Effect** will occur to the New Forest SAC from a change in air quality arising from an increase in road traffic associated with the Phase 1 OPA.

Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.259 The Chalcroft Distribution Park woodlands comprise a complex series of (mainly) recent semi-natural woodland, situated in the edges of, and to the immediate west of, the Distribution Park grounds, Botley, South Hampshire. The woodland on the site appears to have developed around what was most probably a Second World War rail yard, and this has developed a diverse wooded cover as the site's use has changed over the last 60 years. This includes supporting at least 21 ancient woodland indicator species. BAP Priority Habitats include Wet Woodland and Lowland Mixed Deciduous Woodland.

10.8.260 No further information pertaining to the current condition of this SINC was available to inform this assessment although views into the site from the OHH land has been possible. A 'reasonable' scenario position has been adopted and it has been assumed that the site is in an 'unfavourable recovering' condition despite a lack of management due to strong natural regeneration and the absence of deer.

Potential Effects and Their Significance

10.8.261 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;
- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.262 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.263 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.264 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.265 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Table s 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.266 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.267 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.268 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Chalcroft Distribution Park SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.269 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.270 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Table s 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.271 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.272 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.273 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Chalcroft Distribution Park SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.274 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES conclude that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.275 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Chalcroft Distribution Park SINC.

10.8.276 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Chalcroft Distribution Park SINC.

Occupation Wider OPA and Link Road

10.8.277 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.278 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Chalcroft Distribution Park SINC.

10.8.279 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Chalcroft Distribution Park SINC.

Round Copse, West End Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.280 Round Copse is a small and predominantly ancient semi-natural Oak-Hazel woodland located against the eastern boundary of the Chalcroft Distribution Park, West End, Hampshire. The site is structurally diverse and is known to support at least 15 ancient woodland indicator species.

10.8.281 No further information pertaining to the current condition of this SINC was available to inform this assessment although views into the site from the OHH land has been possible. A 'reasonable' scenario position has been adopted and it has been assumed that the site is in an 'unfavourable recovering' condition.

Potential Effects and Their Significance

10.8.282 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;
- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.283 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.284 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.285 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.286 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.287 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.288 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.289 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Round Copse, West End SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.290 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.291 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.292 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Table s 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.293 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.294 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Round Copse, West End SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.295 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES conclude that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.296 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Round Copse, West End SINC.

10.8.297 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and associated 35m green infrastructure corridor, therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Round Copse, West End SINC.

Occupation Wider OPA and Link Road

10.8.298 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.299 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Round Copse, West End SINC.

10.8.300 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Round Copse, West End SINC.

Hearts Copse, West End, Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.301 Hearts Copse is a small and predominantly W8 ancient semi-natural *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland located against the south western boundary of the site. The majority of the site is open to cattle grazing and pheasant pens are present. Only 12 ancient woodland indicator species have been recorded but this site is listed in the County Ancient Woodland Inventory.

10.8.302 No information pertaining to the current condition of this SINC was available to inform this assessment and therefore a 'worse-case' scenario position has been adopted and it has been assumed that the site is in an unfavourable recovering condition.

Potential Effects and Their Significance

10.8.303 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;
- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.304 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.305 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.306 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.307 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.308 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.309 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.310 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Hearts Copse, West End SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.311 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.312 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.313 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.314 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.315 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Hearts Copse, West End SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.316 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES conclude that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.317 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Hearts Copse, West End SINC.

10.8.318 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Hearts Copse, West End SINC.

Occupation Wider OPA and Link Road

10.8.319 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.320 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Hearts Copse, West End SINC.

10.8.321 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Hearts Copse, West End SINC.

Treeline Break Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.322 Treeline Break is a narrow strip of ancient semi-natural woodland, situated in a small and quite deeply incised stream valley, on the north-western edge of the solar farm, south of Allington Lane, Eastleigh. The woodland is unmanaged, although there is some limited evidence of former game management.

10.8.323 No further information pertaining to the current condition of this SINC was available to inform this assessment although views into the site from the OHH land has been possible. A 'reasonable' scenario position has been adopted and it has been assumed that the site is in an 'unfavourable recovering' condition.

Potential Effects and Their Significance

10.8.324 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;
- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.325 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.326 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.327 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.328 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.329 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.330 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.331 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Treeline Break SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.332 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.333 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or

commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Table s 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.334 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.335 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.336 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Treeline Break SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.337 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.338 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Treeline Break SINC.

10.8.339 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Treeline Break SINC.

Occupation Wider OPA and Link Road

10.8.340 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.341 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Treeline Break SINC,

10.8.342 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Treeline Break SINC.

Field West of Treeline Break (Long Field) Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.343 Field West of Treeline Break (Long Field) is situated on the western side of the small stream valley south of Allington Lane, West End.

10.8.344 The dominant vegetation types are *Lolium perenne – Plantago major* grassland (MG7) and Holcus lanatus – Juncus effusus rush pasture (MG10)

10.8.345 Essentially this is a very poorly managed unimproved fen meadow with considerable restoration potential.

10.8.346 The northern section of the field (immediately south of the public footpath) has been subject to landfill in the recent past, but the remainder of the site, south to Heart's Row, remains largely

untouched and retains its original land form, with a distinct sandy river terrace dominating the western half of the valley, sloping down abruptly to the damp valley bottom.

10.8.347 There has been extensive historic scrub (and wet woodland) removal.

10.8.348 No further information pertaining to the current condition of this SINC was available to inform this assessment and therefore a 'worse-case' scenario position has been adopted and it has been assumed that the site is in an unfavourable condition.

Potential Effects and Their Significance

10.8.349 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;
- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.350 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.351 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.352 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.353 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.354 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.355 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.356 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Field West of Treeline Break (Long Field) SINC as a result of the Proposed Development.

<u>Construction Wider OPA and Link Road</u>

10.8.357 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.358 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.359 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.360 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.361 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Field West of Treeline Break (Long Field) SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.362 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.363 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Field West of Treeline Break (Long Field) SINC.

10.8.364 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates **no likely significant effects** on Field West of Treeline Break (Long Field) SINC.

Occupation Wider OPA and Link Road

10.8.365 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on biodiversity.

10.8.366 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects** on ecology and Field West of Treeline Break (Long Field) SINC.

10.8.367 Whilst there is no restriction to public access into the site, the nature of the site and ground conditions are not ideal for recreational access and therefore the impact of unrestricted access to this area is likely to be limited.

10.8.368 Subject to agreement with the landowner, consideration will be given to the erection of fencing to exclude public access from the sensitive areas of the site. Therefore, only a low magnitude of change associated with local recreational pressure in the nearby vicinity is

predicted that generates **no likely significant effects on Field West of Treeline Break (Long Field) SINC.**

Quobleigh Pond and Woods Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.369 This site is an area of mixed habitats located on the edge of Fair oak. Woodland is the main habitat and the majority of the woodland is wet and ancient. There is a high diversity of woodland species including an excellent 31 ancient woodland indicators. There are two ponds within the site. The southern pond is old and has become scrubbed over. Open area contains improved grassland and scrub which add to the diversity of the site.

10.8.370 No further information pertaining to the current condition of this SINC was available to inform this assessment although views into the site from the OHH land has been possible. A 'reasonable' scenario position has been adopted and it has been assumed that the site is in an 'unfavourable recovering' condition.

Potential Effects and Their Significance

10.8.371 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;
- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.372 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.373 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.374 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites (other than Felton Common) from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.375 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.376 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.377 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.378 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Quobleigh Ponds and Wood SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.379 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites (other than Felton Common) from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.380 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.381 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.382 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.383 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area (including the restoration of two ponds and creation of two new ponds) and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Quobleigh Ponds and Wood SINC as a result of the Proposed Development.

10.8.384 In addition, the pond within the woodland on site will be restored/enhanced to deliver functional priority habitat. The areas around these ponds will be enhanced for amphibians to provide habitat features, foraging resources and resting places. Non-native plants will be controlled, and a native aquatic/marginal planting scheme delivered.

Occupation OPA Phase 1

10.8.385 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.386 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and Chalcroft Distribution Park SINC.

10.8.387 Public access to the more valuable areas of the SINC will be restricted through fencing and dense hedgerow and woodland creation along the boundary of the woodland and the residential areas. There will be no direct public access to this SINC from the site, other than via existing public rights of way and it is protected by an ecological buffer of 15m and associated 35m green infrastructure corridor. Therefore, only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates no likely significant effects on Quobleigh Ponds and Wood SINC.

Occupation Wider OPA and Link Road

10.8.388 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.389 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and Quobleigh Ponds and Wood SINC.

10.8.390 There is no public access to this SINC, and it is protected by an ecological buffer of 15m and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates no likely significant effects on Quobleigh ponds and Wood SINC.

Wyvern Technology College Meadow Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.391 The site is a field and woodland strip located on the outskirts of Fair oak. The site is adjacent to Quobleigh Pond Wood SINC. Within the field there is an excellent range of unimproved grassland communities, both dry and marshy. The sward is rather rough and scrubbed over in places, but despite this, there is very good species diversity with over 100 species noted including an excellent 10 acid/neutral grassland indicators. The woodland strip along the south edge is not ancient but there is some wet woodland present. There is also a small pond on site which was dry during GCN surveys in 2019.

10.8.392 No further information pertaining to the current condition of this SINC was available to inform this assessment although views into the site from the OHH land has been possible. A 'reasonable' scenario position has been adopted and it has been assumed that the site is in an 'unfavourable recovering' condition.

Potential Effects and Their Significance

10.8.393 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was

designated;

- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.394 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.395 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.396 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.397 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.398 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.399 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.400 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Wyvern Technology College Meadow SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.401 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.402 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.403 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.404 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.405 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Wyvern Technology College Meadow SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.406 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.407 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and Wyvern Technology College Meadow SINC.

10.8.408 The sensitivity of the receptor is medium and, considering the distance the magnitude of the change is very low and therefore **no likely significant effects** are predicted to the Wyvern Technology College Meadow SINC.

Occupation Wider OPA and Link Road

10.8.409 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.410 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and Wyvern Technology College Meadow SINC.

10.8.411 Whilst public access exists to this SINC, the provision of on-site recreation and greenspace is expected to absorb a large proportion of recreation and to satisfy the required needs of the local residents for local greenspace. Only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates no likely significant effects on Wyvern Technology College Meadow SINC.

Ponds and Meadow Adjacent to Wyvern Technical College Site of Importance for Nature Conservation (SINC)

Baseline Conditions

10.8.412 This site is comprised of a continuation of the Quobleigh woodland habitat as it transitions into scrub and grassland. The pond present was confirmed as a GCN breeding pond in 2019.

10.8.413 No information pertaining to the current condition of this SINC was available to inform this assessment and therefore a ‘worse-case’ scenario position has been adopted and it has been assumed that the site is in an unfavourable condition.

Potential Effects and Their Significance

10.8.414 The potential effects associated with the Development has on non-statutory sites could occur in the following ways:

- The extent and distribution of the natural habitats and species for which the site was designated;

- The structure and function (including typical species) of habitats for which the site was designated;
- The structure and function of the habitats of species for which the site was designated;
- The supporting processes on which the habitats and species rely on (for example, maintenance of current hydrological conditions); and
- The populations of the species for which the site was designated and the distribution of those species within the site.

10.8.415 Consideration of how the Proposed Development proposals could affect this site and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.416 There will be no temporary or permanent habitat loss within the non-statutory site as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.417 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance of all sites from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.418 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.419 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.420 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.421 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Ponds and Meadow Adjacent to Wyvern Technical College Meadow SINC as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.422 No air quality effects from emissions associated with construction (including dust) are predicted as a result of the distance from the individual phases of the construction activities and the implementation of adopted and additional mitigation as set out in Table s 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 7 of this ES associated with Air Quality. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.423 Similarly, no receptors have been identified that will be subject to significant noise or vibration effects during the construction phase of the development, that are not already habituated to existing and ongoing noise and vibration associated with agricultural or commercial activities, and/or as a result of the implementation of the integrated mitigation measures set out in in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in

Chapter 12 of this ES associated with Noise and Vibration. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity**.

10.8.424 No significant effects on hydrology arising from construction activities have been predicted as a result of the Proposed Development after taking into account adopted and additional mitigation as set out in Tables 10.7 and 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.425 The measures to avoid and minimise pollution from construction are set out in Table 10.7 and Table 10.11 of this Chapter of the ES and as documented in Chapter 11 of this ES associated with Hydrology and Flood Risk. Consequently, only a low magnitude of change is predicted that generates **no likely significant effects on biodiversity.**

10.8.426 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant construction** effects will occur to Ponds and Meadow Adjacent to Wyvern Technical College Meadow SINC as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.427 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.428 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and Ponds and Meadow Adjacent to Wyvern Technical College Meadow SINC.

10.8.429 This site is located 1.5km north of phase 1 and therefore only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that **generates no likely significant effects** on Ponds and Meadow Adjacent to Wyvern Technical College Meadow SINC.

Occupation Wider OPA and Link Road

10.8.430 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.431 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and Ponds and Meadow Adjacent to Wyvern Technical College Meadow SINC.

10.8.432 Whilst public access exists to this SINC, the provision of on-site recreation and greenspace is expected to absorb a large proportion of recreation and to satisfy the required needs of the local residents for local greenspace. Only a low magnitude of change associated with local recreational pressure in the nearby vicinity is predicted that generates no likely significant effects on

10.8.433 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing located in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant** effects will occur to Ponds and Meadow Adjacent to Wyvern Technical College Meadow SINC as a result of the Proposed Development.

Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat

Baseline Conditions

10.8.434 Chapter 11: Hydrology of this ES provides a good overview of the watercourses associated with the One Horton Heath Site and is reproduced below.

10.8.435 A number of drainage features and watercourses are present within the Wider OPA Site. The watercourses within the Wider OPA Site are tributaries of the River Itchen which is located approximately 1.5km to the west of the Wider OPA Site's boundary.

10.8.436 The watercourse on the western boundary of the Site is classified as a 'Main River' and flows from south to north under Allington Lane and into the River Itchen to the south of Chickenhall Lane Wastewater Treatment Works (WwTW). All other onsite watercourses discharge into this unnamed 'Main River'. This is referred to as the western boundary stream in this Appendix.

10.8.437 An ordinary watercourse is present on the Wider OPA Site's southern boundary to the north of Chalcroft Business Park and drains from southeast to north. A second ordinary watercourse bisects the southern area of the Site and flows from southeast (adjacent to Burnetts Lane) to west (running north of Charlcroft Farm, and south of the Solar Farm). A third ordinary watercourse bisects the central area of the Wider OPA Site and flows from east (in the vicinity of Horton Heath) to west (to the north of the Solar Farm). A number of smaller ditches drain into the onsite watercourses and are adjacent to existing highways which cross the Wider OPA Site located within hedgerows.

10.8.438 A second 'Main River' bisects the northwestern area of the Wider OPA Site and flows from northeast to the west to the north of Firtree Farm. This watercourse is known locally as the Fair Oak Stream.

10.8.439 The natural catchments of the onsite watercourses are defined by the Wider OPA Site's topography.

10.8.440 The unnamed Main River on the Wider OPA Site's western boundary is assessed by the Environment Agency against WFD quality targets. The area where the data is applicable is across the length of the Lower Itchen and its tributaries from Winchester in the north to Swaythling in the south. The overall status in 2019 was assessed as Moderate. The latest monitoring data is summarised in Table 10.17 below.

Table 10.17: River Quality (based on Environment Agency data)

Classification Item	2019
Overall Water Body	Moderate

Classification Item	2019
Ecological	Good
Biological quality elements	Good
Macrophytes and Phytobenthos Combined	Good
Fish	High
Invertebrates	High
Hydromorphological Supporting Elements	Supports Good
Hydrological Regime	Does Not Support Good
Physico-chemical quality elements	High
Acid Neutralising Capacity	High
Ammonia (Phys-Chem)	High
Biochemical Oxygen Demand (BOD)	High
Dissolved oxygen	High
pH	High
Phosphate	High
Temperature	High
Specific pollutants	High
Chemical	Fail
Priority substances	Good
Other Pollutants	Good
Priority hazardous substances	Fail
Polybrominated diphenyl ethers (PBDE)	Fail
Benzo(g-h-i)perylene	Fail
Mercury and Its Compounds	Fail
Other Priority hazardous substances	Good

10.8.441 The reasons for not achieving ‘Good’ status and the reasons for deterioration in the River Itchen are listed as ‘Physical modification’ and ‘Suspect data’ affecting the Hydrological Regime Element.

10.8.442 The Wider OPA Site is located within the catchment of the River Itchen. The River Itchen corridor is designated as a Special Area of Conservation (SAC) and as a Site of Special Scientific Interest (SSSI). The boundary of the designated site is approximately 0.9km downstream of the Wider OPA Site.

10.8.443 Based on the surveys conducted in 2020, it is clear that the watercourses associated with One Horton Heath and in a generally poor condition with limited habitat diversity. This arises from a range of influencing factors including:

- Low flows/dry channels dominated by largely terrestrial vegetation;
- Contamination from agricultural inputs (silts, nutrients, chemicals), urban and road runoff (a range of potential contaminants);
- A lack of management of the dominant woodland and hedgerow/scrub cover;
- Barriers to fish migration and the presence of artificial channel, structures and features;
- Modification to channel form and connectivity (in the south)
- Disturbance from cattle poaching.

Potential Effects and Their Significance

10.8.444 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- The extent and distribution of the natural habitats and species associated with this type of habitat
- The structure and function (including typical species) of this habitat;
- The supporting processes on which the habitat relies (for example, maintenance of current hydrological conditions).

10.8.445 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.446 There will be no temporary or permanent habitat loss as a result of the proposals. Therefore, only potential effects arising from disturbance effects (from construction activities, people and dogs), pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.447 The site preparation and construction activities associated with OPA Phase 1 will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ordinary watercourse associated with this Phase, which also drains to the west into the western watercourse. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter these watercourses draining the site.

10.8.448 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including paints, solvents, plastics etc could be transported through soil and through water into the watercourses.

10.8.449 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.450 The adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.451 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the watercourses from construction phase effects. These include the protection of all

watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.452 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the River Itchen. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the watercourses from the site.

10.8.453 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permeant vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.454 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of this Priority Habitat. As such, whilst the Sensitivity of the Ordinary Wattercourse is Low and the Main River is Medium) remains the same, the Magnitude of change reduces to Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a Not Significant Likely Construction Effect will occur to the watercourse Priority Habitat from sediment or other associated pollution during construction associated with the OPA Phase 1.

10.8.455 During the implementation of each phase of the development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease. Inputs of these nutrients to the soil or water environment as part of construction will not occur. At the start of the phased construction works i.e. the duration of the OPA Phase 1 construction, it is likely that the magnitude of change in

nutrients already present in the soil from being mobilised and transported into receiving watercourses and the Itchen would not occur. This would result in a Not Significant Likely Construction Effect occurring from a reduction in nutrient inputs.

10.8.456 Improvements in habitat quality, diversity and structure to the Ordinary Watercourse will be implemented as part of a comprehensive mitigation and enhancement plan, resulting in its value/sensitivity increasing from low to medium with a High Magnitude of Change resulting in a positive Significant Likely Construction Effect. Enhancements to the wider watercourses will be implemented through the Wider OPA.

Construction Wider OPA and Link Road

10.8.457 The site preparation and construction activities associated with Wider OPA and Link Road will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the remaining Ordinary Watercourse and two Main Rivers associated with the wider site. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter these watercourses draining the site.

10.8.458 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including paints, solvents, plastics etc could be transported through soil and through water into the watercourses.

10.8.459 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.460 The adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local

geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success.

10.8.461 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the watercourses from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.462 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and the River Itchen. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the watercourses from the site.

10.8.463 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permeant vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.464 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of this Priority Habitat. As such, whilst the Sensitivity of the Ordinary Watercourses is

Low and the Main Rivers is Medium) remains the same, the Magnitude of change reduces to Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a Not Significant Likely Construction Effect will occur to the watercourse Priority Habitat from sediment or other associated pollution during construction associated with the OPA Phase 1.

10.8.465 During the implementation of each phase of the development, agricultural inputs of nutrients (e.g. nitrates and phosphates) will cease. Inputs of these nutrients to the soil or water environment as part of construction will not occur. After 5 years of construction associated with the Wider OPA, it is likely that the magnitude of change in nutrients already present in the soil from being mobilised and transported into receiving watercourses an would not occur. This would result in a positive but Not Significant Likely Construction Effect occurring from a reduction in nutrient inputs.

10.8.466 Road crossings of the watercourse will require the retention of the channel, banks and sufficient riparian corridor to be retained intact to prevent a reduction in flow conveyance and flooding, as well as changes to channel geomorphology and habitats). Further details can be found in Chapter 11 of this ES. Taking into account the measures set out in Table 10.11 of this Chapter and details set out in Chapter 11 of this ES, road crossings of the watercourses are considered to result in Low and Medium Sensitivity watercourse receptors experiencing a Medium Magnitude of change and therefore a negative but Not Significant Likely Construction Effect.

10.8.467 Improvements in habitat quality, diversity and structure to the Ordinary Watercourse will be implemented as part of a comprehensive mitigation and enhancement plan, resulting in its value/sensitivity increasing from low to medium with a High or Medium Magnitude of Change resulting in a positive Significant Likely Construction Effect. Enhancements to the wider watercourses will be implemented through the Wider OPA.

Occupation OPA Phase 1

10.8.468 The developed OPA Phase 1 will result in a change from the agricultural land use to maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable

comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1 and the Link Road. Soil erosion from these areas is considered to be negligible.

10.8.469 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1 and Link Road.

10.8.470 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.471 Specifications in The SuDS Manual83 prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details). With regards to potential criticism of SuDS in treating fine sediment, the OHH water specialists consider it is not appropriate to assess the performance of the proposed SuDS scheme at OHH against other SuDS schemes that have been designed and built in recent years.

10.8.472 Until very recently, surface water drainage systems that were being offered for adoption by sewerage undertakers were required to be designed in accordance with Sewers for Adoption (SfA). SfA required the system being offered for adoption to comprise a continuous pipe system from inlet to outfall. This led to SuDS features being moved 'offline' such that the treatment processes associated with them were bypassed in the most polluting events. Southern Water implemented this by requiring all SuDS and above ground storage features to have no hydraulic link back in to the system being offered for adoption. The effect of this was that attenuation storage for rainfall events up to the 1 in 30 year return period had to be located within the underground system being offered for adoption.

10.8.473 The issue was exacerbated by SfA's requirement for surface water pipe systems to be ‘self-cleansing’. These requirements forced designers to produce surface water drainage systems that transported sediment through the drainage system to the outfall to avoid siltation

[83] https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

of underground assets. With OFWAT's approval of the Code for Adoption in October 2019, and its implementation in April 2020, designers now have much more flexibility to utilise the treatment processes within SuDS features.

10.8.474 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.475 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the most sensitive watercourse (the western watercourse Main River) has a Medium level of sensitivity, the Magnitude of change will be Very Low and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions.

10.8.476 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.477 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption of Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated

and discharged to the River Alver (not the watercourses draining the site) within a consented discharge limit. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients.

10.8.478 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England84and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.479 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the watercourses have a low to medium level of sensitivity, the Magnitude of change will be Very Low and therefore No Significant occupation likely effect will occur as a result of nutrient emissions.

10.8.480 Public access to watercourses associated with the woodlands will be prevented and all other areas will be limited to access on adjacent paths.

Occupation Wider OPA and Link Road

10.8.481 The Wider OPA and Link Road will result in a change from the agricultural land use to maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure. Soil erosion from these areas is considered to be negligible.

84 Advice on Achieving Nutrient Neutrality for New Development in the Solent Region (Natural England, 2020)

10.8.482 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1 and Link Road.

10.8.483 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.484 Specifications in The SuDS Manual[85] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details). With regards to potential criticism of SuDS in treating fine sediment, the OHH water specialists consider it is not appropriate to assess the performance of the proposed SuDS scheme at OHH against other SuDS schemes that have been designed and built in recent years.

10.8.485 Until very recently, surface water drainage systems that were being offered for adoption by sewerage undertakers were required to be designed in accordance with Sewers for Adoption (SfA). SfA required the system being offered for adoption to comprise a continuous pipe system from inlet to outfall. This led to SuDS features being moved 'offline' such that the treatment processes associated with them were bypassed in the most polluting events. Southern Water implemented this by requiring all SuDS and above ground storage features to have no hydraulic link back in to the system being offered for adoption. The effect of this was that attenuation storage for rainfall events up to the 1 in 30 year return period had to be located within the underground system being offered for adoption.

10.8.486 The issue was exacerbated by SfA's requirement for surface water pipe systems to be ‘self-cleansing’. These requirements forced designers to produce surface water drainage systems that transported sediment through the drainage system to the outfall to avoid siltation of underground assets. With OFWAT's approval of the Code for Adoption in October 2019, and its implementation in April 2020, designers now have much more flexibility to utilise the treatment processes within SuDS features.

[85] https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

10.8.487 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.488 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the most sensitive watercourse (the western watercourse Main River) has a Medium level of sensitivity, the Magnitude of change will be Very Low and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions.

10.8.489 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.490 A robust approach to managing nutrients has been integrated in the project design. This includes the adoption of Peel Common WwTW as the location where any foul effluent associated with the site will be conveyed via pumped sewerage system before being treated and discharged to the River Alver (not the watercourses draining the site) within a consented discharge limit. The on-site SuDS train is also designed to remove nitrates and phosphates (in particular though the provision of managed wetlands within the SuDS basins and operational monitoring and management). Furthermore, after a period of time from the cessation of

agricultural nutrient inputs (e.g. 5 years) residual nutrient emissions from the underlying soils to receiving watercourses is likely to cease. The provision of robust green infrastructure and additional ecological buffers will also contribute to the onsite capture and treatment of nutrients.

10.8.491 The assessment of nutrient changes and the development of a nutrient strategy, including Nitrate Neutrality is set out in full in Chapter 11 of this ES. This has adopted the standard method provided by Natural England86and confirmed that the project achieves nutrient neutrality. The SUDS measures, notably the vegetated wetlands, in combination with further habitat provision including additional wetlands will ensure minimal phosphate emissions.

10.8.492 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the watercourses have a low to medium level of sensitivity, the Magnitude of change will be Very Low and therefore No Significant occupation likely effect will occur as a result of nutrient emissions.

10.8.493 Public access to watercourses associated with the woodlands will be prevented and all other areas will be limited to access on adjacent paths.

Ponds – Priority Habitat - see also bats, birds, amphibians and reptiles

Baseline Conditions

10.8.494 Two ponds are present on site (ponds 38 and 47) with a further pond (pond 90) immediately downstream of the site boundary on Quobleigh Stream:

10.8.495 Pond 38 is a large, man-made pond located within Quobleigh Woods in the north of the Site. It is an online pond connected to Quobleigh stream and created through the construction of a large earth bund. No submerged or emergent vegetation is present, with turbid water being shaded at a cover of 40% by overhanging grey willow and alder *Alnus glutinosa*. Waterfowl are present within the pond. Marginal vegetation is dominated by Himalayan balsam. The banks of the pond are steep. No GCN were recorded in 2019. This pond is in very poor condition.

10.8.496 Pond 47 is located at Chalcroft Farm covered in duckweed *Lemna minor* with a central island scrubbed over with grey willow Salix cinerea, bramble and buddleja *Buddleia davidii*.

86 Advice on Achieving Nutrient Neutrality for New Development in the Solent Region (Natural England, 2020)

Surrounding trees at the pond margin result in at least 50% cover of shade over the pond surface. Stands of bulrush *Typha latifolia* and yellow flag iris are present at the south, east and west edge of the pond. Emergent vegetation is approximated to cover 20% of the pond's surface. The banks of the pond and island are composed of stone/blockwork in places, resulting in potential refuges for amphibians. A breeding pair of moorhen are present within the pond. This pond is also a confirmed breeding pond for GCN, supporting a low population. However, the water is very turbid, polluted from nearby agricultural and other activities and there is a notable absence of invertebrates or a structured aquatic ecosystem. This pond is in very poor condition.

10.8.497 Pond 90 is an artificial on-line pond formed within the channel of the Quobleigh Stream created by an impounding structure within the curtilage of the adjacent residential property. There is a notable absence of aquatic vegetation and it supports a colony of domestic wildfowl. This pond is in poor condition and delivers little in terms of biodiversity.

Potential Effects and Their Significance

10.8.498 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- The extent and distribution of the natural habitats and species associated with this type of habitat
- The structure and function (including typical species) of this habitat;
- The supporting processes on which the habitat relies (for example, maintenance of current hydrological conditions).

10.8.499 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.500 There will be no temporary or permanent habitat loss as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.501 The ponds present on site are sufficiently distant from this phase and there is no pathway for pollution, therefore there is **no likely significant effect.**

Construction Wider OPA and Link Road

10.8.502 All ponds will be retained and protected and enhanced for wildlife.

10.8.503 No ponds will be directly affected by the construction of the wider OPA and robust tried and testd construction management measures will prevent pollution occurring (see Table 10.7 of this Chapter of the ES). A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **a moderate positive non-significant effect** will occur to pond habitats as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.504 The ponds present on site are sufficiently distant from this phase and there is no pathway for pollution. The ponds are also fenced, and public and dog access is restricted. Therefore, there is **no likely significant effect.**

Occupation Wider OPA and Link Road

10.8.505 The ponds present on site are sufficiently distant from this phase and there is no pathway for pollution, with a wide range of high quality SUDS measures being implemented (see Chapter 11 of tis ES for full details). The ponds are also fenced, and public and dog access is restricted.

10.8.506 The results of the detailed air quality modelling work reported in Chapter 7: Air Quality of this ES concluded that no environmental air quality standards for the protection of vegetation will be exceeded from ground transport emissions. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on biodiversity.

10.8.507 Similarly, potential impacts arising from noise/ vibration as set out in Chapter 12 of this ES, changes to hydrology, surface water quality and/or flood risk as set out in Chapter 11 of

this ES have all been assessed as not significant. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology and pond habitats.

10.8.508 In addition, the ponds on site will be restored/enhanced to deliver functional priority habitat. The areas around these ponds will be enhanced for amphibians to provide habitat features, foraging resources and resting places. Non-native plants will be controlled, and a native aquatic/marginal planting scheme delivered.

10.8.509 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant effects** will occur to pond habitats as a result of the Proposed Development.

Parkland – Priority Habitat

Baseline Conditions

10.8.510 A small area of mature parkland is located south of Chalcroft Fam (denoted by TN27, see **Error! Reference source not found.**). The habitat comprises approximately 20 mature oak trees located within an area of improved grassland. This habitat should be classified under wood-pasture and Parkland BAP priority habitat. However, this parkland area is considered to be in overall poor condition due to grassland being intensively cattle-grazed, this has created a very poor and improved sward which is not recognizable as an associated NVC community for this habitat type. The heavy cattle grazing has prevented a scrub layer developing inhibiting the ability for new tree saplings to grow and develop, as a result only one age class of tree is present. Although there is fallen and standing deadwood evident in this area; and the habitat is likely to have some value for saproxylic invertebrates, bats and hole-nesting birds.

10.8.511 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- The extent and distribution of the natural habitats and species associated with this type of habitat

- The structure and function (including typical species) of this habitat;
- The supporting processes on which the habitat relies (for example, maintenance of current hydrological conditions).

10.8.512 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.513 There will be no temporary or permanent habitat loss as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

10.8.514 This habitat will be enhanced through adapting the management regime to increase the diversity of herb species. This habitat will be extended by 0.2ha (~50%) through the planting of heavy, specimen trees that will be protected.

Construction OPA Phase 1

10.8.515 No parkland Is present within the Phase 1 residential construction area and the construction area is located 125m from any construction activities.

10.8.516 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant effects** will occur to parkland habitats as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.517 No parkland Is present within the Phase 1 residential construction area and the construction area is located 150m from any construction activities at the closest point.

10.8.518 The proposed sensitive and positive management of the retained areas of this habitat will deliver an increased biodiversity value in excess of this loss.

10.8.519 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant effects** will occur to parkland habitat as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.520 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.521 These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on parkland.

10.8.522 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Minor Non-Significant effect.**

Occupation Wider OPA and Link Road

10.8.523 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.524 These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on hedgerows.

10.8.525 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Minor Non-Significant effect.**

Marshy Grassland – see bats, birds, amphibians and reptiles as well – Priority Habitat

Baseline Conditions

10.8.526 Fields within the site where the topography of the ground is lower lying and subject to wetter ground conditions throughout much of the year typically comprises species poor marshy grassland with more than 25% cover of rushes. Typically, these areas support abundant soft rush *Juncus effusus* with frequent common ragwort *Senecio jacobaea*, Yorkshire fog, tufted hair-grass *Deschampsia cespitosa*, creeping buttercup *Ranunculus repens*, broad-leaved dock, water pepper *Persicaria hydropiper*, creeping bent, common fleabane, short-fruited willowherb *Epilobium obscurum*, marsh foxtail and marsh thistle *Cirsium palustre*.

10.8.527 The majority of the marshy grassland habitat on Site has been highlighted as areas of 'Coastal and Floodplain Grazing Marsh' (which is a BAP priority habitat type) on MAGIC maps which is managed by Natural England. This assessment has been made using aerial imagery from 1993 and that the area is located within the Environment Agency Flood Zone 3 containing network of river channels, ditches or drainage channels according to OS Master maps. Throughout the Site none of the marshy grassland habitats have been observed inundated with water, including throughout the winter months, therefore congregations of waders and larger waterfowl are absent from Site and the marshy grassland habitat within the Site is not considered to constitute areas of floodplain grazing marsh

10.8.528 The BAP priority habitat for lowland meadows also includes floodplain meadow grassland. The Phase 1 Habitat Survey of the Site highlighted that overall the marshy grassland present was dominated by soft rush *Juncus effusus* and Yorkshire fog *Holcus lanatus* representing a likeness to a MG10 grassland community which is ubiquitous habitat throughout the British lowlands which is generally a species poor grazed habitat. Given the grassland is not known to be seasonally inundated coupled with the community assemblages present, including those of the more species rich areas, the marshy grassland habitats do not constitute that of a floodplain meadow grassland assemblage (MG4 grassland).

10.8.529 The species poor marshy grassland is dominated by rank tussock forming grasses and rushes with low numbers of forb species present due to agricultural improvement and is in generally poor condition. One small area immediately north of Quobleigh stream is in good condition as it has not been subject to poor management practise and overgrazing. However, this is considered to be an opportunity as changes to the grazing and hydrological regime could create the conditions for a more diverse habitat.

Potential Effects and Their Significance

10.8.530 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- The extent and distribution of the natural habitats and species associated with this type of habitat
- The structure and function (including typical species) of this habitat;
- The supporting processes on which the habitat relies (for example, maintenance of current hydrological conditions).

10.8.531 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.532 There will be no temporary or permanent habitat loss as a result of the proposals. Therefore, only potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.533 No marshy grassland Is present within the Phase 1 residential construction area.

10.8.534 Construction activities associated with the SuDS features have the potential to affect the hydrological regime and water quality.

10.8.535 Recreational disturbance to this habitat could degrade the habitat during occupation.

10.8.536 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant

effects on ecology. Consequently, in summary, **no likely significant effects** will occur to marshy grassland habitats as a result of the Proposed Development.

Construction Wider OPA and Link Road

10.8.537 Construction activities associated with the Link Road and SuDS features have the potential to affect the hydrological regime and water quality, particularly where the link road crossed this habitat.

10.8.538 The construction of the wider OPA will result in the permanent loss of 0.22 ha (2.63% of existing extent) of poor quality marshy grassland habitat to accommodate the SuDS feature north of Fir Tree Lane and the link road crossing to the south west of the solar park. This is measures for the post construction extent and therefore additional areas of temporary habitat loss may be required during construction for access and land forming. This is undefined at present.

10.8.539 The proposed sensitive and positive management of the retained areas of this habitat will deliver an increased biodiversity value in excess of this loss.

10.8.540 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant effects** will occur to pond habitats as a result of the Proposed Development.

Occupation OPA Phase 1

10.8.541 The marshy grassland habitats are largely inaccessible to the public across the site. The large area of marshy grassland to the southwest of the site will be subject to restricted access via the existing PRoW and implementing measures to control unmanaged access by dogs. These measures are described in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant effects** will occur to pond habitats as a result of the Proposed Development.

Occupation Wider OPA and Link Road

10.8.542 The marshy grassland habitats are largely inaccessible to the public across the site. The large area of marshy grassland to the southwest of the site and along the Quobleigh stream corridor will be subject to restricted access via the existing PRoWs and implementing measures to control unmanaged access by dogs. These measures are described in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology. Consequently, in summary, **no likely significant effects** will occur to pond habitats as a result of the Proposed Development.

10.8.543 Hedgerows – Priority Habitat – see also bats, birds, amphibians and reptiles

Baseline Conditions

10.8.544 Detailed descriptions of the hedgerow habitats present on site can be found in Appendix 10.2 Phase 1 Habitats and a detailed description of the change in this habitat from the development in Appendix 10.13. These have been summarised below:

Habitat Type	Length (Km)
J2.1.2 - Intact hedge - species-poor	0.08
J2.2.1 - Defunct hedge - native species-rich	4.70
J2.2.2 - Defunct hedge - species-poor	1.97
J2.3.1 - Hedge with trees - native species-rich	5.12
J2.3.2 - Hedge with trees - species-poor	0.71
Grand Total	**12.58**

10.8.545 Hedgerows are generally in good condition despite annual management and occasional livestock damage. The hedgerows with trees are typically mature oaks and are a valuable landscape feature for wildlife in terms of both foraging and connective functions.

10.8.546 The defunct species poor hedgerow to the north of the solar park (the majority of this particular habitat on site) has been severely impacted by cattle grazing and is in very poor condition.

Potential Effects and Their Significance

10.8.547 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- The extent and distribution of the natural habitats and species associated with this type of habitat
- The structure and function (including typical species) of this habitat;
- The supporting processes on which the habitat relies (for example, maintenance of current hydrological conditions).

10.8.548 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

10.8.549 There will be minimal temporary habitat loss as a result of the proposals. This temporary loss will be mainly associated with the construction of the link road. Temporary losses will be minimised as it is envisaged that construction access will follow the link road route.

10.8.550 The majority of losses will be permanent within the development areas and at the road severance locations.

10.8.551 In addition, potential effects arising from changes to air quality, noise and vibration, disturbance effects (from construction activities, people and dogs), changes in lighting, pollution and surface water quality, and changes in hydrology have been considered further in the remainder of this section.

Construction OPA Phase 1

10.8.552 Phase 1 will result in the loss of ~0.5km of hedgerow, the retention of ~0.7km and the creation of ~1km. This will ultimately deliver a net increase of ~0.5km (a gain of ~50%) of native species rich hedgerow.

10.8.553 Retained and newly planted hedgerows will be protected by a 5m ecological buffer comprising a grassland habitat to compliment the hedgerow habitat. This will be managed to maximise the ecological benefit.

10.8.554 Retained hedgerows will not be subject to artificial light levels in excess of 0.5 lux increase on baseline.

10.8.555 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on ecology.

10.8.556 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Moderate Non-Significant effect.**

Construction Wider OPA and Link Road

Hedgerow - Indicative Habitat Balance Sheet (inclusive of Phase 1 to provide cumulative assessment)

Phase 1 Habitat Type	Baseline (km)	Lost (km)	Retained (km)	Created (km)	Enhanced (km)
J2.1.2 - Intact hedge - species-poor	0.08	0.03	0	0	0.05
J2.2.1 - Defunct hedge - native species-rich	4.70	0.30	3.58	0	0
J2.2.2 - Defunct hedge - species-poor	1.97	0.15	0	0	1.02
J2.3.1 - Hedge with trees - native species-rich	5.12	0.19	4.93	5.18	N/A
J2.3.2 - Hedge with trees - species-poor	0.71	0	0	0	0.71
Grand Total	**12.58**	**1.17**	**9.21**	**6.24**	**2.2**

10.8.557 The table above demonstrates the approach to masterplan design, avoiding key habitats and seeking to enhance retained hedgerows and to create new species rich hedgerows wherever possible.

10.8.558 The OPA net position shows:

- Loss of 1.17 km of hedgerow (9.3% of baseline)
- Retention of 9.21km of hedgerow (73 % of baseline)
- Creation of 6.24 km of new species rich hedgerows This results in a post construction figure of 15.45 km resulting a total species rich hedgerow net gain of 22.8%.
- Enhancement of 2.2km of retained hedgerow from species poor to species rich hedgerows, with standard trees where appropriate. This is in addition to the 22.8% gain in extent.

Occupation OPA Phase 1

10.8.559 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.560 The measures include a 5m minimum ecological buffer for all hedgerows on site.

10.8.561 These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on hedgerows.

10.8.562 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Moderate Non-Significant effect.**

Occupation Wider OPA and Link Road

10.8.563 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.564 These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on hedgerows.

10.8.565 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Moderate Non-Significant effect.**

Woodland - Broadleaved Semi-Natural – Priority Habitat

Baseline Conditions

10.8.566 The northern, western and southern boundaries of the site lie immediately adjacent to a number of woodland SINCs, including two woodlands classified as ancient woodland. In addition, a central riparian woodland corridor is present.

10.8.567 The site supports 6.47 ha of mature woodland, with no ancient woodland present.

10.8.568 Broad-leaved woodland within and immediately adjacent to the Site can be broadly divided into two types (as described in detail in Appendix 10.2): wet woodland and dry woodland. Areas of wet woodland are found within Quobleigh woods (denoted by TN17) and in linear strips along stream corridors (e.g. components of the wooded corridors denoted by TNs 29 and 30). The wet woodland is typically dominated by alder *Alnus glutinosa* with some grey willow *Salix cinerea* and birch *Betula sp*. The ground flora is characterised by remote sedge *Carex remota*, nettle *Urtica dioica*, hemlock water-dropwort and locally-frequent Himalayan balsam.

10.8.569 Drier woodland occurs on the upper slopes of the stream valleys and in blocks adjacent to the southern and western Site boundary (Round Copse, Hearts Copse, Hearts Row and Treeline Break). This woodland is dominated by mature oak *Quercus robur* with frequent ash *Fraxinus excelsior* and a well-developed understorey of hazel *Corylus avellana*, hawthorn Crataegus monogyna, field maple Acer campestre, and bramble (Rubus fruticosus agg.). The ground flora typically comprises bramble, bracken *Pteridium aquilinum*, wood dock *Rumex sanguineus*, ivy *Hedera helix*, wood avens *Geum urbanum*, enchanter's nightshade *Circaea lutetiana*, wood false-brome *Brachypodium sylvaticum*, male fern *Dryopteris filix-mas* and broad buckler-fern *Dryopteris dilatata*.

Construction OPA Phase 1

10.8.570 This phase is outside of 50m from the nearest woodland and is considered unlikely to directly affect this habitat. Nonetheless, an element of the SuDS system for this phase discharges into a ditch adjacent to woodland (Round Copse SINC). Changes in water quality or the hydrological regime have the potential to impact on the condition of trees and vegetation within this woodland.

10.8.571 Measures described above for the protection of Round Copse SNCI will also apply to this habitat for this phase.

Construction Wider OPA and Link Road

10.8.572 The construction of the link road and local road sections will result in the unavoidable loss of 0.8ha (12.3%) of semi-natural broadleaved woodland on site, at either end of the central woodland belt.

10.8.573 Design measures have been taken to minimise the impact of this and locations have been chosen where the fewest mature trees will be affected. The approach of the road in these locations is perpendicular to the woodland, resulting in the lowest possible area of habitat loss. Additional measure swill be incorporated into the crossing design to ensure that there are no changes to the hydrological regime during or post construction.

10.8.574 Measures described in 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES are considered adequate to mitigate for construction phase effects.

10.8.575 The development will result in the creation of 5.6ha of semi-natural broadleaved woodland in areas designed to effectively extend the existing mature woodland and designated SINC sites. This results in a total of 11.3 ha of woodland across the site post construction, a net increase in this priority habitat of 164%. The location of these areas of new habitat will complement the existing habitats and will be more likely to succeed on an accelerated timescale due to the presence of a mature donor habitat immediately adjacent to these locations.

10.8.576 The existing areas of woodland on site will be enhanced through sensitive planting to promote greater species diversity in both species and structure of the woodlands by implementing a planting and management scheme to enhance herb, scrub and canopy layers and to account for the predicted loss of ash trees within the woodlands to Ash Dieback.

Occupation OPA Phase 1

10.8.577 No impacts on this habitat are expected during occupation as the water quality and hydrological regime will be maintained by the SuDS system, with a net decrease in nitrates and phosphates predicted.

Occupation Wider OPA and Link Road

10.8.578 Access is restricted to the majority of woodland sites and will continue to be as part of design measures to control access into sensitive habitats.

10.8.579 The measures described for the following SINCs will also protect the woodland habitats on and adjacent to the site.

10.8.580 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.581 These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on woodlands.

10.8.582 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Moderate Non-Significant effect.**

Bats

Baseline Conditions

10.8.583 Ten species have been confirmed to be present on Site through various surveys carried out (see Appendix 10.4 Bats). High levels of activity have been recorded in key areas across the site, particularly riparian habitats, woodland and major hedgerows with increased levels observed in the west of the site:

10.8.584 This assemblage is broadly consistent with that expected in this region.

Table 10.18 Bat Species – Automated Detector Data

Species	Total Count No.	Percentage of Total
Common pipistrelle	454154	89.08
Soprano pipistrelle	26082	5.12
Myotis (Whiskered, Daubenton's and Natterers all confirmed by trapping surveys)	19927	3.91
Noctule	3927	0.77
Long-eared	2291	0.45

Nyctalus spp.	2001	0.39
Serotine	1372	0.27
Nathusius pipistrelle	51	0.01
Barbastelle	43	0.01

10.8.585 Crossing point surveys observed 1966 crossing events within the anticipated road traffic collision risk range <5m including common pipistrelle (1752), soprano pipistrelle (120), myotis spp. (47), long eared bats (10), serotine (20) and noctule (17 including Nyctalus spp. (2)).

10.8.586 The following roosts are present on site:

Table 10.19 Bat Roosts

Species	Roosts	Retained	Modified	Lost	Gained
Brown Long Eared	2 maternity roosts, 1 satellite roost, 8 day roosts	1 maternity roost 1 day roost	1 maternity roost	1 satellite roost, 7 day roosts	2 satellite roosts 14 day roosts
Common Pipistrelle	13 day roosts	-	-	13 day roosts	26 day roosts
Soprano pipistrelle	2 day roosts	-	-	2 day roosts	4 day roosts
Natterers	1 day roost	-	-	1 day roost	2 day roosts
Noctule	1 mating roost	1 mating roost	-	-	2 mating roosts

10.8.587 Further detailed analysis of the location and timing of records, combined with direct observations of breeding status during trapping surveys indicate that the site is likely to support:

- a common pipistrelle breeding colony that is likely to be located to the north of the site (4 post-lactating females recorded on site).
- a natterers bat maternity roost/colony located to the east of Horton Heath (confirmed – lactating female radiotracked, lactating females recorded in Hearts Copse, Quobleigh Wood and the Central Woodland)
- Noctule maternity roost (post-lactating female bats recorded on site)
- Brown Long eared – an additional maternity/natal roost is present in Hearts Copse

(radiotracked) associated with the maternity roost/colony at Chalcroft Farm

Potential Effects and Their Significance

10.8.588 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- Construction
- Direct loss of roost habitat and killing/injury during building demolition and tree felling operations
- Direct loss of key foraging habitat and/or the indirect loss of foraging resource due to habitat degradation through pollution or inappropriate management.
- Severance of key habitat connecting breeding and foraging locations
- Operation
- Road collision mortality
- Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss and/or degradation of the foraging resource provided by the affected habitat)
- Increased predation from growth in resident cat population

10.8.589 Consideration of how the Proposed Development proposals could affect this receptor and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.590 No bat roosts are present within the construction area of this phase; therefore, no roosts will be directly affected by construction activities.

10.8.591 The hedgerows in the residential areas that will be removed in this phase (see hedgerow section of this chapter) have been monitored and bats have been recorded using these features but at very low levels. The data does not indicate the presence of a roost of high conservation value within the vicinity of this phase that is likely to be reliant on these hedgerows as key connective habitat. The hedgerows proposed to be removed are in the centre of the site and suitable alternative routes along retained hedgerows are present to maintain landscape connectivity across this phase.

10.8.592 Higher levels of activity, particularly for Myotis bats, were recorded along the hedgerow to the north of the access track in autumn 2020. The timing of these recordings indicate that this is likely to be foraging activity, likely to be associated with grazing and prevailing weather conditions rather than the hedgerow itself.

10.8.593 The effect of the severance of the hedgerow in this location by a narrow, low speed limit estate road is not considered to be significant given that these bats currently feed alongside a track which is accessed by vehicles throughout a 24 hour period. These bats are considered to be highly likely to cross this feature and continue to forage in this area despite this severance. The foraging resource in this area is expected to be directly related to the presence of livestock and this is expected to decrease in this locale and adapt to the changes in the grazing regime toward other areas of the site. There is considerable alternative foraging resource across the site that will be retained throughout the development.

10.8.594 The areas north of the access track will be enhanced to provide a mosaic of wet features including ecologically designed SuDS that will increase the diversity and abundance of prey species in this area.

10.8.595 The grassland on site is of very low value to foraging bats and therefore the loss of this habitat is considered to have a negligible negative effect.

10.8.596 The measures described to control lighting during construction in the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. As such, whilst the Sensitivity of the bat assemblage is considered to be Moderate (reflecting the absence of roosts present or supported by the habitats present on site and considering the status/rarity of the respective species foraging on site), the Magnitude of change would be Low and therefore a minor negative but **Not**

Significant Likely Construction Effect will occur to the bat assemblage during construction associated with the OPA Phase 1.

Construction Wider OPA and Link Road

10.8.597 Similar construction effects will be evident within the residential elements of the wider OPA. Specific design principles will be required to fully mitigate the potential severance and road collision effects of the link road construction at key habitat severance locations. These are described in Table 10.7 of this chapter. Measures to protect the habitats during construction, particularly riparian habitats, woodland and hedgerow are also relevant to bats.

10.8.598 The destruction of roosts on site will be delivered under European Protected Species mitigation licences ensuring that appropriate and timely mitigation is provided to permit this action to be delivered in a legally compliant manner and to avoid any effects on the favourable conservation status of the species affected.

10.8.599 As such, whilst the Sensitivity of the bat assemblage in the wider OPA is considered to be High (reflecting the roosts present and/or supported by the habitats present on site and considering the status/rarity of the respective species), the Magnitude of change would be Low and therefore a minor negative but **Not Significant Likely Construction Effect** will occur to the bat assemblage during construction associated with the OPA Phase 1.

Occupation OPA Phase 1

10.8.600 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.601 These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on the bat assemblage associated with Phase 1.

10.8.602 This receptor is of high sensitivity and the magnitude of change is considered to be Very Low resulting in a **Minor Non-Significant effect.**

Occupation Wider OPA and Link Road

10.8.603 A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development.

10.8.604 Measures implemented during construction and design to minimise severance and road collision mortality rates will minimise the occupation phase effects and the potential effect of an increase in cat predation will be addressed using the specific measures are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that generates no likely significant effects on the bat assemblage associated with the wider OPA development.

10.8.605 This receptor is of high sensitivity and the magnitude of change is considered to be Low resulting in a **Minor Non-Significant effect.**

Great Crested Newt

Baseline Conditions

10.8.606 Comprehensive great crested newt surveys have been conducted over a number of years at ponds associated with the One Horton Heath site and within 500m, and of related terrestrial habitats for this species. The surveys have confirmed the presence of two populations of great crested newt. One is a medium sized population and associated with ponds currently located off-site and using part of the north western area of the OHH site land. The second is a low sized population using a single poor condition pond associated with Chalcroft Farm in the centre south of the OHH site land. These are considered to be part of the same meta-population based on proximity between the breeding ponds and an absence of clear barriers to dispersion between ponds.

10.8.607 The northern population is considered to be of medium importance from a quantitative perspective, and of minor qualitative importance as there are no breeding habitats on site. It has a moderate functional importance as there is probably some dispersal to/from nearby populations and moderate contextual importance with a population size class typical of the local area. The southern population is considered to be of minor importance from a quantitative perspective, and of moderate qualitative importance as there are is a breeding habitat on site but that habitats are common in the area. It has a moderate functional importance as there is probably some dispersal to/from nearby populations and minor contextual importance with a population size class lower than in the surrounding area.

10.8.608 Habitat condition at a site level is generally considered to be in a poor and no better than sub-optimal condition because of the dominance of grazed and compacted improved grassland and arable cropped land. The site currently has a reasonable network of hedgerows and in paces associated ditches. Barriers to wider migration exist in certain locations through the presence of flowing water (although some watercourses are impounded allowing movement across them) and urban development including roads with kerbs. Woodland belts associated with parts of the site and its boundaries also provide optimal terrestrial habitats for foraging, resting and potentially overwintering if frost free features are present. The pond at Chalcroft Farm used by the southern population is in poor condition and is relatively isolated due to its location in the centre of an actively used yard. The ponds used by the northern population are located off-site, although Eastleigh Borough Council is creating six new ponds in land it owns immediately to the north west of the OHH boundary. There are defunct ponds in Quobleigh Woods within the territory of the metapopulation suffering from siltation, near complete shading and poor water quality. Other suitable terrestrial habitats existing in the adjacent wider landscape particularly to the west and north east.

Potential Effects and Their Significance

10.8.609 The potential effects associated with the Development on great crested newt could occur in the following ways:

- Construction
    - Direct loss of great crested newt resting, overwintering and breeding habitat and risk of injury / killing
    - Direct loss of key foraging habitat
    - Severance of key habitat connecting breeding and foraging/resting/overwintering habitat
    - Pollution of breeding ponds and connecting ditches
- Operation
    - Road collision mortality
    - Entrapment in road and drainage infrastructure

- Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat)

- Increased predation from growth in resident cat population

10.8.610 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase

10.8.611 The OPA Phase 1 residential development will result in the loss of approximately 3.2ha of very low suitability terrestrial habitat within 250m of the single breeding pond at Chalcroft Farm and 14.5 ha of very low suitability habits within 250-500m, therefore also having the potential to injure/kill any great crested newt within this terrestrial habitat.

10.8.612 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.

10.8.613 No effects are predicted to any breeding ponds.

10.8.614 A suitable exclusion fence will be installed around the perimeter of those areas within 500m of the pond falling within the OPA Phase 1 land. Pitfall traps will be installed every 10m along the internal side of the fence along with artificial refugia. These will be operated for a minimum of 30 days until no further captures are recorded when hand searches and destructive searched will be carried out. Great crested newt captured from this location will be translocated to a suitable receptor habitat, away from the effects of the development. Habitats in this receptor area will be enhanced (see Table 10.11) to ensure a full range of functional habitats are present and in optimal condition. The target habitat will be woodland with the presence of suitable breeding ponds, resting areas, suitable overwintering habitat and excellent opportunities for foraging and dispersal. The receptor habitat will be located within Quobleigh Woods, in the control of Eastleigh Borough Council, and is associated with the wider metapopulation therefore allowing ongoing breeding success. The habitat enhancement works will also include the restoration of two ponds within Quobleigh Woods, These mitigation works will be defined in full and delivered under a Natural England EPS great crested newt licence, and an associated

multi-plot great crested newt masterplan, ensuring OHH site wide habitat enhancement and connectivity, robust management, monitoring and legal compliance will be achieved. Semi-permanent exclusion fencing will also be installed along the boundary of the nearby development plots to avoid potential double-capture/handling of great crested newt.

10.8.615 The measures set out in Table 10.11 will ensure the enhancement of great crested newt habitat, which will be further provided through the wider measures to deliver biodiversity net gain. These include a network of ponds and SuDS basins together with new grassland, woodland, hedgerows and ditches, and features to ensure safe newt passage under/across roads, enabling an enhanced opportunity for connectivity and metapopulation growth across the OPA Phase 1 and Wider OPA land.

10.8.616 It is considered reasonable, therefore, to conclude that any construction phase effects on great crested newt from the OPA Phase 1 will be addressed through the inherent and additional mitigation/enhancement measures, suitable robust and licensed mitigation measures with overall enhancement of retained habitats that will benefit the local metapopulation. As such, whilst the Sensitivity of great crested newt is considered to be Medium (reflecting both the size and character of the southern population), the Magnitude of change would be Low and therefore a positive but Not Significant Likely Construction Effect will occur to the great crested newt during construction associated with the OPA Phase 1.

Construction Wider OPA1 and Link Road

10.8.617 The Wider OPA and Link Road construction will result in the loss of approximately 3.2ha of very low suitability terrestrial habitat within 250m of the single breeding pond at Chalcroft Farm and 14.5 ha of very low suitability habits within 250-500m, therefore also having the potential to injure/kill any great crested newt within this terrestrial habitat.

10.8.618 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.

10.8.619 The poor quality pond associated with Chalcroft Farm will be retained and restored, but the population associated with this pond will be captured and translocated to receptor habitat in Quobleigh Woods, together with the two waterbodies restored under the Phase 1 OPA. This will be achieved through a combination of conventional terrestrial trapping, associated with a small population (see below) and ring fencing and seasonal capture of great crested newt within the pond. Once the phase of construction by the pond has been completed the ring fence will

be removed. The Mitigation and enhancement set out in Table 10.11 will include the creation of wider connecting ponds and other connecting habitats (including integration with highways) promoting the wider dispersal of great crested newt south, from the enhanced northern habitat areas, including connectivity to Chalcroft Pond.

10.8.620 No effects are predicted to any other breeding ponds.

10.8.621 A suitable exclusion fence will be installed around the perimeter of those areas within 500m of the ponds falling within the Wider OPA and Link Road. Pitfall traps will be installed every 10m along the internal side of the fence along with artificial refugia. These will be operated for a minimum of 30 days until no further captures are recorded when hand searches and destructive searched will be carried out. Great crested newt captured from this location will be translocated to a suitable receptor habitat, away from the effects of the development. Habitats in this receptor area will be enhanced (see Table 10.11) to ensure a full range of functional habitats are present and in optimal condition. The target habitat will be woodland with the presence of suitable breeding ponds, resting areas, suitable overwintering habitat and excellent opportunities for foraging and dispersal. The receptor habitat will be located within Quobleigh Woods, in the control of Eastleigh Borough Council, and is associated with the wider metapopulation therefore allowing ongoing breeding success. The habitat enhancement works will also include the restoration of two ponds within Quobleigh Woods, These mitigation works will be defined in full and delivered under a Natural England EPS great crested newt licence, and an associated multi-plot great crested newt masterplan, ensuring OHH site wide habitat enhancement and connectivity, robust management, monitoring and legal compliance will be achieved. Semi-permanent exclusion fencing will also be installed along the boundary of the nearby development plots to avoid potential double-capture/handling of great crested newt.

10.8.622 The measures set out in Table 10.11 will ensure the enhancement of great crested newt habitat, which will be further provided through the wider measures to deliver biodiversity net gain. These include a network of ponds and SuDS basins together with new grassland, woodland, hedgerows and ditches, and features to ensure safe newt passage under/across roads, enabling an enhanced opportunity for connectivity and metapopulation growth across the Wider OPA land.

10.8.623 It is considered reasonable, therefore, to conclude that any construction phase effects on great crested newt from the Wider OPA and Link Road will be addressed through the inherent and additional mitigation/enhancement measures, suitable robust and licensed mitigation measures with overall enhancement of retained habitats that will benefit the local

metapopulation. As such, whilst the Sensitivity of great crested newt is considered to be Medium (reflecting both the size and character of the southern population), the Magnitude of change would be Low and therefore a positive but Not Significant Likely Construction Effect will occur to the great crested newt during construction associated with the Wider OPA and Link Road.

Occupation OPA Phase

10.8.624 A sensitive lighting scheme designed to avoid lighting of suitable retained habitats will be delivered to avoid effects on breeding ponds and optimal terrestrial habitats.

10.8.625 Homeowner information packs will be provided, alongside educational/information boards to provide guidance on how pets, such as cats will predate on wildlife, including amphibians and to encourage responsible decision making when choosing and owning these pets.

10.8.626 Habitat Management and monitoring will be implemented in accordance with both the future NE EPS licence requirements as well as ongoing biodiversity commitments under the project planning conditions and legal agreements.

Occupation Wider OPA1 and Link Road

10.8.627 A sensitive lighting scheme designed to avoid lighting of suitable retained habitats will be delivered to avoid effects on breeding ponds and optimal terrestrial habitats.

10.8.628 Homeowner information packs will be provided, alongside educational/information boards to provide guidance on how pets, such as cats will predate on wildlife, including amphibians and to encourage responsible decision making when choosing and owning these pets.

10.8.629 Habitat Management and monitoring will be implemented in accordance with both the future NE EPS licence requirements as well as ongoing biodiversity commitments under the project planning conditions and legal agreements.

Dormouse

Baseline Conditions

10.8.630 Comprehensive otter surveys have been conducted in 2018 and 2020 covering the woodland and significant hedgerow habitats across the One Horton Heath site to assess the

importance of the site for dormice. Survey methodologies and detailed results are described in detail in appendix 10.7 Dormouse.

10.8.631 Two nests and one live dormouse were found during the last survey visit in November 2020 within the central woodland corridor. No other signs of dormouse presence have been recorded on site.

10.8.632 Given the large volume of survey effort employed both historically and during the most recent surveys, this data does not indicate the presence of a significant population of dormouse on site. Nonetheless, the sensitivity of this receptor is assessed and Medium given that this is a European Protected Species (EPS) and therefore required a NE mitigation licence.

Potential Effects and Their Significance

10.8.633 The potential effects associated with the Development has on dormice could occur in the following ways:

- The extent and distribution of the natural habitats upon which species rely;
- The structure and function of habitats;
- Increase in mortality due to road collision
- The supporting processes on which the habitats and species rely (for example, maintenance of current hydrological conditions); and
- The distribution of those species within the site.

10.8.634 Consideration of how the Proposed Development proposals could affect dormice and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.635 No evidence of dormouse has been recorded within the ZOI of Phase 1 despite surveys of the area and adjacent woodland habitat. Two hedgerows are due to be removed during this phase, however the absence of dormouse in this area and the presence of suitable alternative connective habitat around the boundary of this phase to retain potential landscape permeability for this species.

10.8.636 The sensitivity of this receptor is high, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on dormice.**

Construction Wider OPA and Link Road

10.8.637 The construction of the link road requires the severance of the central woodland and the removal of highly suitable habitat on the vicinity of dormouse records. This will result in a small area of habitat loss and the severance of highly suitable habitat from further highly suitable habitat along the western site boundary.

10.8.638 The central woodland corridor lead into the existing Horton Heath development to the east and is therefore effectively limited in its functionality as a connective corridor across the wider landscape and functions as a habitat spur form the main riparian corridor along the western site boundary.

10.8.639 An additional severance location over the Quobleigh stream has the potential to sever connective habitat for this species between the wider high value Quobleigh woodland and the riparian corridor connecting the River Itchen to the north west and the railway corridor to the south. There are no records of dormouse in Quobleigh wood. However, given the very high suitability of this habitat for this species and the likely abundance of natural alternative nesting features to the artificial nest tubes used to survey for this species, there is a constraint on this survey that can make this survey method less effective. Quobleigh wood also has good connectivity to the central woodland via the western riparian woodland corridor and Quobleigh wood is therefore considered as dormouse habitat.

10.8.640 The construction of the link road will therefore require and EPS mitigation licence for this species.

10.8.641 It is considered reasonable, therefore, to conclude that any construction phase effects on dormice from the wider OPA and link road will be addressed through the inherent and additional mitigation/enhancement measures, suitable robust and licensed mitigation measures with overall enhancement of retained habitats that will benefit the local metapopulation. As such, whilst the Sensitivity of dormice is considered to be High the Magnitude of change would be Low and therefore a negative but **Not Significant Likely Construction Effect** will occur to the great crested newt during construction of the wider OPA and link road.

Occupation OPA Phase 1

10.8.642 No evidence of dormouse has been recorded within the ZOI of Phase 1 despite surveys of the area and adjacent woodland habitat. Access is restricted to the adjacent offsite woodland, preventing any recreational impacts on the high suitability habitats in close proximity to this phase.

10.8.643 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the protection of Chalcroft Business Park SINC will also protect the suitable habitat adjacent to this phase.

10.8.644 The sensitivity of this receptor is high, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on dormice.**

Occupation Wider OPA and Link Road

10.8.645 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the protection of wildlife from recreation and predation effects will also be applicable to dormice.

10.8.646 The sensitivity of this receptor is high, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on dormice.**

Otter

Baseline Conditions

10.8.647 Comprehensive otter surveys have been conducted in 2018 and 2020 covering the riparian habitats across the One Horton Heath site to assess the importance of the site for otter. Survey methodologies and detailed results are described in detail in appendix 10.6 Otter and Water Vole.

10.8.648 There are no desk study records of Otter within the site boundary. There are however five historical records of Otter within the last ten years approximately 1.8km north west of the Site near Bishopstoke along riparian habitats linked to the site. Previous surveys conducted by Ecologica Associates Ltd in 2014 found only one set of footprints in the northwest corner of the

site. Repeat surveys done in 2015 found no evidence of otter. Otter surveys conducted by Johns Associated Ltd in 2018 and 2020 found no signs of otter.

10.8.649 The value of the site for otter is considered to be limited to the potential use of the site as connective habitat within the wider landscape between the catchments of the Itchen and Hamble rivers. Nonetheless, this function is considered important and should be maintained throughout the development.

10.8.650 This receptor is therefore considered to be of high sensitivity.

Potential Effects and Their Significance

10.8.651 The potential effects associated with the Development has on otter could occur in the following ways:

- Construction
- Direct loss of landscape connectivity
- Pollution of tributary of River Itchen
- Operation
- Road collision mortality

10.8.652 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.653 The riparian corridor in the north of this phase is considered to be connective habitat for otter and is a minor tributary of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons.

10.8.654 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.655 Construction measures in this area are extremely limited in this phase and the likelihood of and effect is considered to be very low.

10.8.656 The sensitivity of this receptor is high and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on otters.**

Construction Wider OPA and Link Road

10.8.657 The riparian corridors across the site are considered to be connective habitat for otter and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons.

10.8.658 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.659 Construction measures in this area are extremely limited in this phase and the likelihood of and effect is considered to be very low.

10.8.660 The sensitivity of this receptor is high, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on otters.**

Occupation OPA Phase 1

10.8.661 Enhancement and extension of riparian and grassland corridor containing a number of ecologically designed SuDS to the north of the Chalcroft track will retain the landscape connectivity along this key connective corridor. This area will be unlit.

10.8.662 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.663 The sensitivity of this receptor is high, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on otters.**

Occupation Wider OPA and Link Road

10.8.664 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.665 The sensitivity of this receptor is high, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on otters.**

Water Vole

Baseline Conditions

10.8.666 Comprehensive water vole surveys have been conducted in 2018 and 2020 covering the riparian habitats across the One Horton Heath site to assess the importance of the site for this species. Survey methodologies and detailed results are described in detail in appendix 10.6 Otter and Water Vole.

10.8.667 Data was provided by Hampshire Biodiversity Information Centre. There is one desk study record of water vole within the Site footprint in the last 10 years. There are also a number of other records approximately 1.8km north west of the Site near Bishopstoke.

10.8.668 The data shows that there no population of water voles on site.

10.8.669 Previous surveys undertaken by Ecologica Associates Ltd in 2014 recorded a number of signs of water vole. The majority of sightings were on a watercourse on western boundary and a stream running across the site further north. A repeat survey was done in 2015 and found no signs of water vole. There was also one recorded sighting of water vole on 21/04/2018 along the northern watercourse (See **Error! Reference source not found.**).

10.8.670 Water vole surveys conducted by Johns Associated Ltd in 2018 and 2020 found no signs of water vole and this species is therefore considered to be absent from the site. A notable sparsity of high quality habitat was evident, with potentially suitable areas in the south west of the site subject to poaching and intensive grazing.

10.8.671 The value of the site for water vole is considered to be limited to the potential use of the site as connective habitat within the wider landscape between the catchments of the Itchen

and Hamble rivers. Nonetheless, this function is considered important and should be maintained throughout the development.

10.8.672 This receptor is therefore considered to be of low sensitivity.

Potential Effects and Their Significance

10.8.673 The potential effects associated with the Development has on water vole could occur in the following ways:

- The extent and distribution of the natural habitats upon which species rely;
- The structure and function of habitats, primarily for dispersal;
- Increase in mortality due to road collision
- Alteration of behaviour due to artificial lighting
- The supporting processes on which the habitats and species rely (for example, maintenance of current hydrological conditions); and
- The distribution of those species within the site.

10.8.674 Consideration of how the Proposed Development proposals could affect water vole and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.675 The riparian corridor in the north of this phase is considered to be connective habitat for water vole and is a minor tributary of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons.

10.8.676 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to water vole in the wider river catchment during construction.

10.8.677 Construction measures in this area are extremely limited in this phase and the likelihood of and effect is considered to be very low.

10.8.678 The sensitivity of this receptor is low, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on water vole.**

Construction Wider OPA and Link Road

10.8.679 The riparian corridors across the site are considered to be long distance connective habitat for water vole and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons.

10.8.680 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.681 Construction measures in this area are extremely limited in this phase and the likelihood of and effect is considered to be very low.

10.8.682 The sensitivity of this receptor is low and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on water vole.**

Occupation OPA Phase 1

10.8.683 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.684 The sensitivity of this receptor is medium, and the magnitude of this change is considered to be negligible given that this species is absent from the site and there is**,** therefore**, no likely significant effect on water vole.**

Occupation Wider OPA and Link Road

10.8.685 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.

10.8.686 The sensitivity of this receptor is medium, and the magnitude of this change is considered to be negligible given that this species is absent from the site and there is**,** therefore**, no likely significant effect on water vole.**

Reptiles

Baseline Conditions

Wider OPA Area

10.8.687 Comprehensive reptile surveys have been conducted over a number of years covering the most suitable habitats across the One Horton Heath site to assess the importance of the site for reptiles. The survey design adopted a targeted approach whereby the habitats of highest suitability were sampled. Survey methodologies and detailed results are described in detail in appendix 10.10 Reptiles.

10.8.688 The surveys recorded the following:

- Slow worm – Good Population (5 adults peak count - Quobleigh Wood boundary)
- Grass snake – Low Populations (single juvenile recorded in 2020 – Quobleigh Wood boundary
- Common lizard- Low Population (single record during 2020 surveys – eastern end of central woodland belt)

10.8.689 The suitability of habitats across the site is locally restricted and patchy with reptile presence largely restricted to the boundaries of the site, particularly in areas adjacent to woodland or domestic gardens.

10.8.690 The hedgerow, marshy grassland, woodland, riparian and scrub habitats present on site are suitable to support this species.

OPA Phase 1 Area

10.8.691 Historic surveys in 2014 show a single common lizard recorded within the southern boundary of this area. Update surveys in 2020 along the northern boundary of this phase did not record any reptiles. In addition, sensitive vegetation clearance works conducted under an Ecological Clerk of Works immediately adjacent to this phase did not encounter any reptiles despite clearing 200m of suitable habitat. The population of reptiles in this phase is therefore considered to be limited to the southern site boundary only.

10.8.692 The proposed retention and enhancement of the habitat buffer between the site and the adjacent Chalcroft Distribution Park SINC. This majority of this phase will result in the loss of suboptimal habitats for this species with the loss of suitable habitat

Potential Effects and Their Significance

10.8.693 The potential effects associated with the Development on these of receptors could occur in the following ways:

- Construction
- Direct loss of reptile resting, overwintering and breeding habitat and risk of injury / killing
- Direct loss of key foraging habitat
- Severance of key habitat connecting breeding and foraging/resting/overwintering habitat
- Operation
- Road collision mortality
- Entrapment in road and drainage infrastructure
- Increased predation from growth in resident cat population

10.8.694 Consideration of how the Proposed Development could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.695 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable

measures to avoid these effects will be successfully implemented. The measures as described for GCN also afford protection to reptiles during construction.

10.8.696 The sensitivity of this receptor is low, and the magnitude of this change is considered to be very low and there is, therefore, **no likely significant effect on reptiles.**

Construction Wider OPA and Link Road

10.8.697 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for GCN also afford protection to reptiles during construction.

10.8.698 The sensitivity of this receptor is low and the magnitude of this change is considered to be very low and there is, therefore, **no likely significant effect on reptiles.**

Occupation OPA Phase 1

10.8.699 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for GCN also afford protection to reptiles during occupation. The sensitivity of this receptor is low and the magnitude of this change is considered to be very low and there is, therefore, **no likely significant effect on reptiles.**

Occupation Wider OPA and Link Road

10.8.700 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for GCN also afford protection to reptiles during occupation. The sensitivity of this receptor is low and the magnitude of this change is considered to be very low and there is, therefore, **no likely significant effect on reptiles.**

Badger

Baseline Conditions

10.8.701 Comprehensive badger surveys have been conducted over a number of years covering the One Horton Heath site and within 30m to assess the presence of setts and field signs of foraging activity. Survey methodologies and detailed results are described in detail in appendix 10.9.

10.8.702 The surveys have confirmed the absence of any significant setts or activity levels to indicate the presence of core habitat. The site is therefore not considered to provide an important function for this species.

10.8.703 Two partially active setts have been identified on site during the most recent surveys, located in areas that are not expected to be directly affected by the development.

10.8.704 The habitats present on site are suitable to support this species and the survey results are below the expectation of activity levels typically associated with these habitats. Given the extent of retained high value habitats and propensity for this species to occupy urban fringe habitats, the potential exists to incorporate measures into this scheme to the benefit of this species.

10.8.705 This receptor is therefore assessed as **low value.**

Potential Effects and Their Significance

10.8.706 The potential effects associated with the Development on badgers could occur in the following ways:

- Construction
- Direct disturbance and/or loss of setts
- Direct loss of key foraging habitat
- Severance of key habitat connecting resting places to key foraging habitats
- Operation
- Road collision mortality
- Increased lighting levels associated with new link road, estate roads and additional external

and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat)

- Increased disturbance through direct or indirect interactions with dogs

10.8.707 Consideration of how the Proposed Development could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.708 No evidence of the use of the OPA Phase 1 area has been recorded.

10.8.709 The construction of the link road will potentially sever connective habitats and could constrain the capacity of the area to support this species. However, the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented. The sensitivity of this receptor is low and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on badgers.**

Construction Wider OPA and Link Road

10.8.710 The construction of the wider OPA areas will result in the loss of approximately 70ha of suitable foraging habitat. However, site does not currently support a badger population.

10.8.711 The potential for direct or indirect impacts on setts (either on site or within 30m of construction areas or haul routes) will be avoided through the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented. The sensitivity of this receptor is low, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on badgers.**

Occupation OPA Phase 1

10.8.712 No evidence of the use of the OPA Phase 1 area has been recorded. The sensitivity of this receptor is low and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on badgers.**

Occupation Wider OPA and Link Road

10.8.713 The increase in the likelihood of road collision mortality is not considered to be significant due to the very low levels of badger activity recorded on site. The incorporated mitigation measures to ensure safe passage across the link road will further reduce this likelihood.

10.8.714 Increased encounters between badgers, their resting places and humans and dogs is not considered to affect the current low level of use of the site by this species and absence of permanent resting places.

10.8.715 The future colonisation of the site by badgers will be limited in areas in close proximity to designated dog exercise areas by their capacity to tolerate this disturbance. Capacity will be provided on site to support any future colonisations within areas of high quality habitat, into which public access will be restricted.

10.8.716 The sensitivity of this receptor is low, and the magnitude of this change is considered to be very low and there is, therefore, **no likely significant effect** on badgers.

Breeding Birds

Baseline Conditions

10.8.717 Comprehensive breeding bird and barn owl surveys have been conducted over a number of years covering the One Horton Heath site. Survey methodologies and detailed results are described in detail in appendix 10.8 Birds.

10.8.718 A breeding pair of barn owl are present, successfully nesting in the nest box south of Chalcroft Farm in 2020. Evidence of roosting was also observed in the stables building at the far southern extent of the Chalcroft Farm complex. The site is considered to support one home range for these birds.

10.8.719 No other birds listed under Schedule 1 of the Wildlife and Countryside Act (as amended) were recorded.

10.8.720 25 species were recorded on site in 2020, comprised predominantly of common and more generalist species, typical of the interface between urban and agricultural habitats.

10.8.721 Passerine species of note are:

- Species of Principal Importance in England under s41 of the Natural Environment and Rural Communities (NERC) Act (2006):
- Skylark (also Hampshire BAP Priority Species)
- One singing male was observed in the areas both north and south of the Chalcroft farm track. A possible pair was observed in this area during the second survey visit but these were absent during the third visit and are unlikely to have bred in this area in 2020.
- Retained areas of grassland habitat are suitable for this species and the site will continue to have the capacity to support low numbers of skylark. In addition, the sensitive management of these areas will result in an increased quality of foraging resource.
- House Sparrow
- Seven house sparrow nests were recorded in 2020 clustered around Chalcroft Farm and the unoccupied Fir Tree Farm. Additional activity was observed associated with the gardens and properties immediately adjacent to the site on the eastern boundary.
- These nest sites will be lost as part of the demolition of existing buildings. Suitable nesting opportunities for this species will be incorporated into retained habitats and also into buildings constructed within the scheme. This will increase the capacity of the site to support this species.
- Hampshire Biodiversity Action Plan Priority Species
- Song Thrush
- Three singing males were recorded on site with one confirmed nest identified in a hedgerow just north of Quobleigh stream containing 4 chicks.
- Retained areas of hedgerow and woodland habitats are suitable for this species and the site will continue to have the capacity to support a low density of song thrush. Whilst outside of the control of this application, domestic gardens are likely to provide a diverse foraging and nesting resource as is typical of urban areas where this species is commonly found. The enhancement of the diversity and quality of retained habitats will also benefit this species.
- Linnet

- One singing male was observed on two occasions singing from the hedgerow immediately to the north of the Chalcroft Farm track. A subsequent record of a pair with two juveniles in this area could indicate breeding but a direct link between these records, and therefore breeding on site, is uncertain. The habitats in this area are considered suitable nesting habitat for this species.

- This hedgerow is due to be retained, albeit subject to an increase in disturbance form the adjacent development. The retained habitats across the site have the potential to support several breeding pairs and, as such, the site will continue to have the capacity to support an increased population of this species. The enhancement of the diversity and quality of retained habitats, particularly hedgerows and associated grassland habitats further from the development areas will also benefit this species.

- BOCC Red list Species

- Starling

- Activity was dispersed over the site with multiple records of foraging and singing adults. Four nests were confirmed (including 2 within holes in telegraph poles and 2 in buildings) with a number of foraging sorties observed with adult birds returning to nests within the adjacent Horton Heath residential areas.

- Additional observations in late summer/autumn recorded small post breeding flocks of adults and juvenile birds with the largest group comprising 20 birds. No large murmurations or aggregations of this species have been recorded on site through the suite of 2018-2020 surveys delivered on site for multiple species however previous winter surveys conducted in 2014/15 observed post breeding groups of up to 20-30 birds

- Mistle Thrush

- A pair of mistle thrush were observed in the large dead oak tree in the south west of the site, flying into the Chalcroft distribution Park woodland on two separate visits in April and June. This pair is assumed to be breeding within this woodland.

Potential Effects and Their Significance

10.8.722 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

- Construction
- Loss of foraging and nesting habitat
- Direct impacts on active nests
- Occupation
- Increase in cat predation
- Road Collision Mortality (specifically Barn Owl)

Construction OPA Phase 1

Passerine species

10.8.723 The birds recorded breeding within Phase1 are common and ubiquitous species.

10.8.724 The potential for direct or indirect impacts on active bird nests (will be avoided through the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented.

10.8.725 The sensitivity of this receptor is very low, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on breeding (passerine) birds.**

Barn Owl

10.8.726 The grassland habitat is improved and heavily grazed and is of very low foraging value to barn owls due to its limited capacity to support field voles. A wide swathe of ecological buffer and green infrastructure corridor will provide enhanced foraging habitat and serve to retain connectivity to foraging areas that may lie beyond the site to the south east.

10.8.727 The construction area is over 150m from the existing nest site separated by mature hedgerows and, as such poses no potential for disturbance of the existing nest site.

10.8.728 The sensitivity of this receptor is medium, and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on barn owl.**

Construction Wider OPA and Link Road

Passerine Species

10.8.729 The birds recorded breeding within on site are generally adaptable common and ubiquitous species. The loss of the habitats within the development footprint are largely of low value to breeding passerines and the retained and enhanced habitats on site will accommodate all of species present at similar densities, albeit with an altered distribution. There will be a temporary reduction in habitats (e.g. hedgerow) on site as there will be a period between the loss and the maturation of the newly created hedgerows. This is not expected to be of significant detriment to the species present as the habitats retained on site are considered adequate to accommodate these species at a higher density in the interim with the population capable of rapid colonisation of new habitats with the result being an increase in available, high quality habitat in the long term.

10.8.730 The potential for direct or indirect impacts on active bird nests (will be avoided through the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented.

10.8.731 The sensitivity of this receptor is very low and the magnitude of this change is considered to be very low and there is**,** therefore**, no likely significant effect on breeding (passerine) birds.**

Barn Owl

10.8.732 The vast majority of grassland habitat to be lost is improved and heavily grazed and of very low foraging value to barn owls due to its limited capacity to support field voles.

10.8.733 The link road is likely to be categorised as a “Modern A Road” class according to the Barn Owl Trust[87]

[87] Barn Owls and Major Roads: Results and Recommendations from a 15 year research project (Barn Owl Trust, 2004)

10.8.734 Whilst a modern A road, the link road will be designed to accommodate measures described within this report to reduce the road collision mortality rate including:

- Sections where the road is situated on an embankment present the highest risk followed by sections at existing ground levels. In these areas, the creation of obstacles (natural or artificial with a preference for natural) which force birds to fly higher across roads will be incorporated into the scheme.
- Areas where the road is situated in a cutting present a lower risk and will not require additional planting, although this will be considered as part of the wider road landscaping scheme.
- Verges south of the link road will be maintained in a short, thatchless condition to reduce the potential for field vole.

10.8.735 The existing nest location will be moved in a phased process whereby an identical box will be erected in the far south west of the site in winter 2020 (approx. 600m from the nearest link road section) with the existing box retained until the winter prior to the operational phase of the road (estimated 2022 – relocation in winter 2021). At which point the occupied box will be relocated (outside of breeding season) to a tree within 100m of the new nest box. This will recreate the current associated adult and nest roost configuration between the nest box and the roost in Chalcroft Farm. This relocation will seek to reduce collision risk and to reduce the potential for disturbance effects form the residential areas.

10.8.736 The marshy grassland areas in this vicinity of the nest box will be enhanced and managed to increase the population of field voles to provide an increased foraging resource.

Occupation OPA Phase 1

10.8.737 Homeowner information packs will be provided, alongside educational/information boards to provide guidance on the valued species on site and how disturbance and pets, such as cats and dogs will disturb/predate on wildlife to encourage responsible decision making when choosing and taking responsibility for the management of these pets.

Occupation Wider OPA and Link Road

10.8.738 Homeowner information packs will be provided, alongside educational/information boards to provide guidance on the valued species on site and how disturbance and pets, such as cats and dogs will disturb/predate on wildlife to encourage responsible decision making when choosing and taking responsibility for the management of these pets.

Invertebrates

Baseline Conditions

10.8.739 The Site offers habitats suitable for a range of invertebrate species. The grassland has limited floristic diversity and therefore offers limited suitability to invertebrates, whereas the hedgerows riparian corridors, woodland and marshy grassland offer better-quality habitat for this group. In addition, the dung from the grazing cattle will provide foraging opportunities for some invertebrate species which in turn will act as prey for animals foraging across the Site.

10.8.740 Overall, the Site is considered likely to support an invertebrate assemblage comprising predominantly common and widespread species, (owing to the grazed habitat that is dominant), although more floristically diverse and complex habitats (such as the riparian corridors) may support legally protected and/ or notable species.

Potential Effects and Their Significance

10.8.741 The potential effects associated with the Development has on this type of receptor could occur in the following ways:

- The extent and distribution of the natural habitats upon which species rely;
- The structure and function of habitats;
- Increase in mortality due to road collision
- Alteration of behaviour and predation risk due to artificial lighting
- The supporting processes on which the habitats and species rely (for example, maintenance of current hydrological conditions); and
- The distribution of those species within the site.

10.8.742 Consideration of how the Proposed Development proposals could affect this receptor and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.743 The habitats present within phase 1 are of very low suitability for rarer invertebrates.

10.8.744 It is therefore considered that the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the protection of designated sites and valuable habitats on and adjacent to the site are also relevant to invertebrates.

10.8.745 The sensitivity of this receptor is low, and the magnitude of this change is considered to be negligible given that this species is absent from the site and there is**,** therefore**, no likely significant effect on invertebrates.**

Construction Wider OPA and Link Road

10.8.746 The avoidance measures employed during the design of the development have largely. avoided habitats with suitability for rarer invertebrates. These are primarily considered to be woodland, riparian habitats, ponds, hedgerows and marshy grassland. Some small extents of these habitats are to be lost where this has been unavoidable, however, the proportion lost is very small and very unlikely to affect invertebrate populations present on site.

10.8.747 This assessment has been supported by the Ecological Steering group and has resulted in the recommendation that no invertebrate surveys were required.

10.8.748 It is therefore considered that the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the protection of designated sites and valuable habitats on and adjacent to the site are also relevant to invertebrates.

Occupation OPA Phase 1

10.8.749 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the protection of designated sites and valuable habitats on and adjacent to the site are also relevant to invertebrates. The sensitivity of this receptor is low, and the magnitude of this change is considered to be negligible given that this species is absent from the site and there is**,** therefore**, no likely significant effect on invertebrates.**

Occupation Wider OPA and Link Road

10.8.750 The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the protection of designated sites and valuable habitats on and adjacent to the site are also relevant to invertebrates. The sensitivity of this receptor is low, and the magnitude of this change is considered to be negligible given that this species is absent from the site and there is**,** therefore**, no likely significant effect on invertebrates.**

Fish

Baseline Conditions

10.8.751 The walkover visual inspection of in-channel habitats concluded that the watercourses associated with the survey area and the One Horton Heath Site support a range of features that are promoting or limiting in terms of fish habitat. In particular, the following features were recorded:

- Effects of low flow were obvious and are unlikely to be unique to 2020.
- A number of the watercourses were dry and do not support habitat for fish during these conditions.
- Barriers to fish migration exist with no notable obstructions to fish passage recorded in survey cross sections out of 100. No riffles were recorded. This significantly restricts the suitability for a wide range of species recorded in the near vicinity.
- The lack of physical diversity is highly likely to reduce macro-invertebrate and fish prey diversity restricting the viability of self-sustaining fish populations for a range of species.
- The watercourses receive extensive agricultural runoff and inputs (likely to contain silts, nutrients, and other chemicals), alongside the discharge from the southern boundary business park, roads and urban development (also likely to contain a range of contaminants). This is likely to limit the presence of fish species sensitive to these conditions.
- The flow is dominated by smooth glides or no perceptible flow, indicative of the lower flow conditions observed. Higher flows do pass through these watercourses although these would not support a broad fish population throughout the year when flows are limited, depths low

and conditions unfavorable.

- The channels are dominated by trees, hedgerows and/or woodland with only reaches two 500m long survey reaches not being covered by woody vegetation.
- There is a paucity of in-channel vegetation and where this exists, it is dominated by marginal emergent species restricting the opportunities for fish spawning and food for a range of species.

10.8.752 Based on the surveys conducted in 2020, it is clear that the watercourses associated with One Horton Heath and in a generally poor condition with limited habitat diversity. This arises from a range of influencing factors including:

- Low flows/dry channels dominated by largely terrestrial vegetation;
- Contamination from agricultural inputs (silts, nutrients, chemicals), urban and road runoff (a range of potential contaminants);
- A lack of management of the dominant woodland and hedgerow/scrub cover;
- Barriers to fish migration and the presence of artificial channel, structures and features;
- Modification to channel form and connectivity (in the south)
- Disturbance from cattle poaching.

10.8.753 At the time of surveying, the only potentially viable fish habitat is associated with the southern boundary watercourse, the lower parts of the western boundary watercourse and in the upper parts of the Fairoak Stream, noting these would also be separated by barriers to migration.

10.8.754 Based on a comparison between the features recorded, fish habitat requirements for the species recorded in the local area, and in particular the constraints and opportunities present, it is considered unlikely that: stone loach, bullhead, pike, perch, Atlantic salmon, brown/sea trout, chub or grayling would be present, or if present, the absence of one of more critical features or presence of a key constraint will make it highly unlikely a sustainable population is currently present. The watercourses do provide better opportunities for minnow, brook lamprey, gudgeon, and European eel, although even for these species, constraints are also present.

Potential Effects and Their Significance

10.8.755 The potential effects associated with the Development has on this type of receptor could occur in the following ways:

10.8.756 The extent and distribution of the natural habitats upon which the species depend;

10.8.757 The structure and function (including typical species) of habitats upon which the species depend;

10.8.758 The structure and function of the habitats of species for which the site was designated;

10.8.759 The supporting processes on which the habitats and species rely (for example, maintenance of current hydrological conditions); and

10.8.760 The distribution of those species within the site.

10.8.761 Consideration of how the Proposed Development proposals could affect this habitat type and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.762 There is no fish habitat associated with the OPA Phase 1 area but it drains to the western watercourse, a Main River that is likely to support a restricted fish population on/adjacent to the site due to poor habitat conditions.

10.8.763 The site preparation and construction activities associated with OPA Phase 1 will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ordinary watercourse associated with this Phase, which also drains to the west into the western watercourse. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter these watercourses draining the site and be encountered by fish.

10.8.764 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including

paints, solvents, plastics etc could be transported through soil and through water into the watercourses.

10.8.765 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.766 The adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success, maintaining flow conditions for fish in the onsite watercourses and downstream.

10.8.767 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the watercourses from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.768 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and fish habitat. Soil and sediment

originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the watercourses from the site (noting that all receiving watercourses and on site fish habitat are dominated by silt and clay bed substrate (apart from those which are dry).

10.8.769 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permeant vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.770 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of fish habitat or the local fish population. As such, whilst the Sensitivity of the on site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a **Not Significant Likely Construction Effect** will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from sediment or other associated pollution during construction associated with the OPA Phase 1.

10.8.771 With the inclusion of the mitigation set out in Chapter 12 of this ES it is considered reasonable to conclude that any changes from construction phase noise or vibration would not affect the conservation status of habitat/species receptors or the integrity of fish habitat or the local fish population. As such, whilst the Sensitivity of the on site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous monitoring and management intervention measures set out in Chapter 12, a **Not Significant Likely Construction Effect** will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from noise or vibration during construction associated with the OPA Phase 1.

10.8.772 Improvements in habitat quality, diversity and structure to the Ordinary Watercourse will be implemented as part of a comprehensive mitigation and enhancement plan, resulting in

its value/sensitivity increasing from low to medium. If there is sufficient water flow, this may become accessible to fish but is will not result in a Likely Significant Effect. Enhancements to the wider watercourses will be implemented through the Wider OPA.

Construction Wider OPA and Link Road

10.8.773 Fish habitat associated with the Wider OPA is limited to the lower western watercourse, a Main River and the upper parts of the Fairoak Stream that is likely to support a restricted fish population on/adjacent to the site due to poor habitat conditions including obstacles to fish passage.

10.8.774 The site preparation and construction activities associated with the wider OPA and Link Road will result in the phased removal of vegetation and exposure and movement of soils, including temporary storage as stock piles, prior to their re-use and revegetation. During this process there is the potential for surface runoff to erode and transport sediment along lower lying flow paths, some of which could be propagated by vehicle tracks, and sediment laden water could enter the retained ordinary watercourse associated with this Phase, which also drains to the west into the western watercourse. In this manner, sediment (and any associated nutrients and contaminants associated with it) may enter these watercourses draining the site and be encountered by fish.

10.8.775 In a similar manner, accidental chemical or waste pollution from construction activities (e.g. leaking vehicle fuel tank, spillages or other accidental releases of contaminants including paints, solvents, plastics etc could be transported through soil and through water into the watercourses.

10.8.776 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving watercourses, including the Itchen.

10.8.777 The adopted mitigation set out in Table 10.7 in Section 7 of this Chapter of the ES clearly identifies that a robust set of pollution and erosion prevention measures will be prescribed in a Construction Environmental Management Plan, that will adopt all best practice procedures, taking into account site and delivery phase specific conditions (including local

geology and soil typology, topography and environmental pathways). These measures will be implemented in a phase and multi-phase specific manner to ensure complete and consistent management of on and off-site environmental quality. A monitoring and intervention programme will also ensure the efficacy of the CEMP systems and that the quality of any surface runoff entering on site watercourses and that of the combined downstream flow, remains high and consistent. This reflects expected and tried and tested construction phase pollution management procedures and is considered to offer a high level of success, maintaining flow conditions for fish in the onsite watercourses and downstream.

10.8.778 Additional mitigation is set out in Table 10.11 in Section 10.7 of the ES that provides further reassurance of the measures to be implemented to minimise any change in water quality in the watercourses from construction phase effects. These include the protection of all watercourses with a habitat and green infrastructure buffer of between 10 and 50 metres. This will provide a rough surface to help force soil deposition (which would be naturally vegetated) should construction phase attenuation and sedimentation basins be overwhelmed. Formal SUDS basins will also be constructed early in the development phases providing additional attenuation and sediment management during construction, prior to post-construction maintenance, completion and creation of supporting habitats.

10.8.779 The development will also result in the phased cessation of agricultural activities, that includes cattle grazing and arable fields, with substantial areas of bare ground and eroding soil that can feed sediment into the receiving watercourses and fish habitat. Soil and sediment originating from these land uses would cease during each phase of construction and as such there will be a natural reduction in baseline sediment input to the watercourses from the site (noting that all receiving watercourses and on site fish habitat are dominated by silt and clay bed substrate (apart from those which are dry).

10.8.780 During the course of the construction phase impermeable and vegetated surfaces (including habitats and amenity areas) will be provided at the earliest opportunity to ensure that areas of bare soil are minimised in extent and duration. The development of permeant vegetation will aid the gradual cessation of net sediment transport from the specific development phase and the site, with hard surfaces being managed through the new drainage system that will include sediment forebays and other infrastructure, and wetland habitat creation, specifically designed to trap and retain sediment.

10.8.781 With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction

phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of fish habitat and the fish population. As such, whilst the Sensitivity of the on site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a **Not Significant Likely Construction Effect** will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from sediment or other associated pollution during construction associated with the wider OPA.

10.8.782 With the inclusion of the mitigation set out in Chapter 12 of this ES it is considered reasonable to conclude that any changes from construction phase noise or vibration would not affect the conservation status of habitat/species receptors or the integrity of fish habitat or the local fish population. As such, whilst the Sensitivity of the on site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous monitoring and management intervention measures set out in Chapter 12, a **Not Significant Likely Construction Effect** will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from noise or vibration during construction associated with the Wider OPA.

10.8.783 Improvements in habitat quality, diversity and structure to the western boundary watercourse and Fairoak Stream will be implemented as part of a comprehensive mitigation and enhancement plan, resulting in its value/sensitivity increasing from medium to high and a **positive Significant Likely Effect to fish**. If there is sufficient water flow, the enhanced Ordinary watercourses may become accessible to fish but this will not result in a Likely Significant Effect.

Occupation OPA Phase 1

10.8.784 The developed OPA Phase 1 will result in a change from the agricultural land use to maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1 and the Link Road. Soil erosion from these areas is considered to be negligible.

10.8.785 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1.

10.8.786 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.787 Specifications in The SuDS Manual[88] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details). With regards to potential criticism of SuDS in treating fine sediment, the OHH water specialists consider it is not appropriate to assess the performance of the proposed SuDS scheme at OHH against other SuDS schemes that have been designed and built in recent years.

10.8.788 Until very recently, surface water drainage systems that were being offered for adoption by sewerage undertakers were required to be designed in accordance with Sewers for Adoption (SfA). SfA required the system being offered for adoption to comprise a continuous pipe system from inlet to outfall. This led to SuDS features being moved 'offline' such that the treatment processes associated with them were bypassed in the most polluting events. Southern Water implemented this by requiring all SuDS and above ground storage features to have no hydraulic link back in to the system being offered for adoption. The effect of this was that attenuation storage for rainfall events up to the 1 in 30 year return period had to be located within the underground system being offered for adoption.

10.8.789 The issue was exacerbated by SfA's requirement for surface water pipe systems to be ‘self-cleansing’. These requirements forced designers to produce surface water drainage systems that transported sediment through the drainage system to the outfall to avoid siltation of underground assets. With OFWAT's approval of the Code for Adoption in October 2019, and its implementation in April 2020, designers now have much more flexibility to utilise the treatment processes within SuDS features.

[88] https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

10.8.790 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.791 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the most sensitive on site watercourse (the western watercourse Main River) has a Medium level of sensitivity, the Magnitude of change will be Very Low and therefore **No Significant occupation likely effect** will occur to fish as a result of sediment (or other associated contaminant) emissions. No significant effects are predicted for downstream watercourses.

10.8.792 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving fish habitat. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.793 Public access to watercourses associated with the woodlands will be prevented and all other areas will be limited to access on adjacent paths.

Occupation Wider OPA and Link Road

10.8.794 The developed Wider OPA and Link Road will result in a change from the agricultural land use to maturing mixed use development that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as areas of Green Infrastructure associated with OPA Phase 1 and the Link Road. Soil erosion from these areas into fish habitat is considered to be negligible.

10.8.795 The Additional Mitigation set out in Table 10.11 identifies a range of measures to avoid and minimise the emissions of sediment (and other associated contaminants) as well as nutrients from the operational/occupational stages of the OPA Phase 1.

10.8.796 Sediment generated from the OPA Phase 1 will enter the formal SUDS which is designed to attenuate and retain sediment (including fine particles) and treat and remove nutrients including nitrates and phosphates. The SuDS basins will include sediment forebays, permanently wet and vegetated over deepened wetland habitats, and marginal vegetation in contact with the water, transitioning to emergent and terrestrial habitats.

10.8.797 Specifications in The SuDS Manual[89] prepared for professional SUDS design by CIRIA will be used as the basis for this (please refer to Chapter 11 for full details). With regards to potential criticism of SuDS in treating fine sediment, the OHH water specialists consider it is not appropriate to assess the performance of the proposed SuDS scheme at OHH against other SuDS schemes that have been designed and built in recent years.

10.8.798 Until very recently, surface water drainage systems that were being offered for adoption by sewerage undertakers were required to be designed in accordance with Sewers for Adoption (SfA). SfA required the system being offered for adoption to comprise a continuous pipe system from inlet to outfall. This led to SuDS features being moved 'offline' such that the treatment processes associated with them were bypassed in the most polluting events. Southern Water

[89] https://www.ciria.org/ItemDetail?iProductCode=C753&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

implemented this by requiring all SuDS and above ground storage features to have no hydraulic link back in to the system being offered for adoption. The effect of this was that attenuation storage for rainfall events up to the 1 in 30 year return period had to be located within the underground system being offered for adoption.

10.8.799 The issue was exacerbated by SfA's requirement for surface water pipe systems to be 'self-cleansing'. These requirements forced designers to produce surface water drainage systems that transported sediment through the drainage system to the outfall to avoid siltation of underground assets. With OFWAT's approval of the Code for Adoption in October 2019, and its implementation in April 2020, designers now have much more flexibility to utilise the treatment processes within SuDS features.

10.8.800 The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.801 Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the most sensitive on site watercourse (the western watercourse Main River) has a Medium level of sensitivity, the Magnitude of change will be Very Low and therefore **No Significant occupation likely effect** will occur to fish as a result of sediment (or other associated contaminant) emissions. No significant effects are predicted for downstream watercourses.

10.8.802 The detailed design of the drainage system and site-wide water management plan will ensue that there is no net change in discharge volume from the site, even when taking into account attenuation within ponds, lagoons, or other features. The Flood Risk Assessment for

the development proposals (see Chapter 11 of this ES) requires and demonstrates the maintenance of the greenfield runoff rate, factoring in changes attributed to climate change. As a result, there is no anticipated reduction or increase in runoff volume or rate from the site or within the receiving fish habitat. Please refer to Chapter 11 of this ES for full details on these measures.

10.8.803 Public access to watercourses associated with the woodlands will be prevented and all other areas will be limited to access on adjacent paths.

Invasive Species

Baseline Conditions

10.8.804 The distribution of invasive species on site is described in detail in Appendix 10.2 and summarised below.

10.8.805 Japanese Knotweed (Fallopia japonica) has been identified in two areas (adjacent to Chalcroft Farm pond and in the centre of the central woodland belt). These areas are not currently accessible to the public and are also not located within the anticipated construction areas.

10.8.806 Himalayan balsam (Impatiens glandulifera) is present in large areas of the lower reaches of Quobleigh wood, both on and off site, and is present throughout the Quobleigh stream corridor. This area is within the construction area of the northern link road crossing. A small additional area was identified on the southern boundary of the woodland where it meets the main hedgerow connecting Quobleigh wood to Fir Tree farm.

10.8.807 Patches of rhododendron (Rhododendron ponticum) have also been identified within Quobleigh wood on the site boundary north of the stream. This is outside the construction areas.

10.8.808 Japanese Rose (Rosa rugosa) has also been identified in localised patches within the hedgerows in the vicinity of Fir Tree farm.

Potential Effects and Their Significance

10.8.809 The potential effects associated with the Development has on this type of habitat could occur in the following ways:

10.8.810 The extent and distribution of invasive species that can compromise the structure and function (including typical species) of natural habitats;

10.8.811 Consideration of how the Proposed Development proposals could cause this receptor and therefore cause a negative effect on its ecological status is set out below, separated into construction and operational effects.

Construction OPA Phase 1

10.8.812 No invasive species are present within the working area of this phase and therefore there is no risk of spreading invasive species.

10.8.813 There is a risk that additional species will be transported to site in materials or machinery. Specific biosecurity measures will be described in a CEMP to mitigate for the risk of transfer of invasive species.

10.8.814 The sensitivity of receptor habitats on site are very low and the magnitude of this change is considered to be very low and there is, therefore, no likely significant effect on habitats due to the introduction of invasive species.

Construction Wider OPA and Link Road

10.8.815 There is a significant risk of spreading Himalayan balsam during works to construct the Quobleigh stream link road crossing. This could result in the spread of seed into the downstream tributaries and into the River Itchen SSSI. However, measures outlined in the CEMP and a separate invasive species strategy document will ensure that this plant is not caused to spread during works.

10.8.816 There is a risk that additional species will be transported to site in materials or machinery. Specific biosecurity measures will be described an implemented through a CEMP to mitigate for the risk of transfer of invasive species and through the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented.

10.8.817 The sensitivity of receptor habitats that could be subject to the spread of invasive species (particularly the dispersal of Himalayan balsam into watercourses) are high but, with effective management and monitoring, the magnitude of this change is considered to be low

and there is, therefore, no likely significant effect on habitats or designated sites due to the introduction of invasive species.

Occupation OPA Phase 1

10.8.818 There is an inherent risk that additional species will be transported to site as domestic garden plants/pets and subsequently caused to spread into habitats adjacent to the development areas. This is outside the influence of this development to control; however, information will be provided to homeowners regarding common, known invasive plant and animal species that they should avoid.

10.8.819 Specific biosecurity measures will be described in a LEMP to minimise the risk of transfer of invasive species during routine habitat management, particularly the management of SuDs features and riparian habitats.

10.8.820 The sensitivity of the vulnerable receptors on site are considered to be low (although downstream receptors including the River Itchen are high) but the magnitude of this change (taking into account the best practice measures being implemented) is considered to be low and there is, therefore, no likely significant effect on habitats or designated sites due to the introduction of invasive species.

Occupation Wider OPA and Link Road

10.8.821 There is an inherent risk that additional species will be transported to site as domestic garden plants/pets and subsequently caused to spread into habitats adjacent to the development areas. This is outside the influence of this development to control; however, information will be provided to homeowners regarding common, known invasive plant and animal species that they should avoid.

10.8.822 Specific biosecurity measures will be described in a LEMP to minimise the risk of transfer of invasive species during routine habitat management, particularly the management of SuDs features and riparian habitats.

10.8.823 It is envisaged that the development will control invasive species on site through the delivery of an invasive species strategy.

10.8.824 The sensitivity of the vulnerable receptors on site are considered to be low (although downstream receptors including the River Itchen are high) but the magnitude of this change (taking into account the best practice measures being implemented) is considered to be low

and there is, therefore, **no likely significant effect on habitats or designated sites due to the introduction of invasive species.**

10.9 CUMULATIVE EFFECTS

10.9.1 This Section considers the likely cumulative impacts from the Proposed Development in combination with other schemes already submitted for consideration by the Local Planning Authority on those ecological receptors (and/or other legally protected species) considered in this Ecology Chapter.

10.9.2 This section considers cumulative impacts from other schemes alongside the OPA Phase 1 and Link Road and Wider OPA proposals.

10.9.3 Table 10.20 details the committed schemes identified and agreed with Eastleigh Borough Council. The schemes taken forward for further consideration are highlighted in bold text and grey shaded cells.

Table 10.20: Cumulative Impacts – Committed Schemes

Site Address	Application Reference	Description	Approximate Distance from Site Boundary (km)	LPA
One Horton Heath Utilities Enabling Works – Underground cabling	N/A	N/A	0	EBC
Allington Lane, Burnetts Lane and Bubb Lane access	O/14/75735 and O/16/79354	N/A	0	EBC
Chalcroft Business Park, Burnetts Lane, West End	F/18/83945	10,541m^2	0.025 (Adjacent)	EBC
Land off Botley Road, West End, Southampton	O/15/76418 F/19/85439	100 units plus 30 units	1.5	EBC
Land at Hedge End North, Winchester Road, Botley, Southampton (Land north west of Boorley Green)	O/15/75953 RM/17/81628	680 units	1.5	EBC
Land to North and East of Boorley Green, Winchester Road, Botley, Southampton SO32 2UA	O/12/71514 F/19/86233	704 units	1.7	EBC

Site Address	Application Reference	Description	Approximate Distance from Site Boundary (km)	LPA
Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh SO50 7EA	O/15/77190	242 units	1.7	EBC
Land west of Woodhouse Lane	O/18/83634	605 units	2	EBC
Land South of Maddoxford Lane, Boorley Green, Botley, Southampton, SO32 2DB,	F/19/84937	86 units	2.4	EBC
Land to the south of Maddoxford Lane and west of Westfield, Boorley Green, Botley, SO32 2DB	F/19/85178	104 units	2.5	EBC
Southampton International Airport, Mitchell Way, Eastleigh,	F/19/86707	Runway extension	2.7	EBC
The Mount Hospital, Church Road, Bishopstoke	O/12/71007 F/13/73226 F/14/75061 F/17/80513	53 units	2.8	EBC
Land to the North and East of Winchester Street, Botley	O/18/83698	375 units	2.8	EBC
Land at Woodhouse Lane and to the North and East of Botley Village, Eastleigh	CS/17/81226	Construction of a bypass for Botley, providing a connection from Station Hill (A334/A3051 junction) to Woodhouse Lane	3.3	HCC
Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, SO50 9DG	F/19/85332	2,686sqm	3.4	EBC
Land off St Johns Road, South of Foord Road, Hedge End, Southampton SO30 4DG	F/15/76804	109 units	4	EBC
Serenity, Heath House Lane, Hedge End, Southampton, SO30 0LE	F/19/86829	107	4	EBC

Site Address	Application Reference	Description	Approximate Distance from Site Boundary (km)	LPA
Land west of Waylands Place and north of Peewit Hill Close, Hedge End, SO31 1DJ	F/17/80651	106 units	4.2	EBC
Land at Park Farm/North Stoneham Park Stoneham Lane, Eastleigh, SO50 9HS	F/19/86946	15,731sqm	4.3	EBC
Land south of Chestnut Avenue north Stoneham Park, Chestnut Avenue, Stoneham Lane, Eastleigh	O/15/76023 F/17/81167 F/17/81165 F/19/87086	868 units (outstanding) plus 18 units, 39 units and 65 units	4.5	EBC
Land South of Bursledon Road, Bursledon, Southampton	O/15/77121 F/18/82322	178 (outstanding)	5	EBC

Construction phase – Phase 1 OPA and Wider OPA

10.9.4 Taking into account the conclusions that no significant effects are predicted in Chapter 7 (Air Quality), Chapter 11 (Hydrology), Chapter 12 (Noise and Vibration) and Chapter 14 (Landscape and Visual), together with the adopted and additional ecological mitigation and enhancement set out in Chapter 10: Ecology (Tables 10.7 and 10.11 of that Chapter), and the associated monitoring, management and (if necessary intervention) set out in Table 10:25 of Chapter 10: Ecology, the detailed assessment of effects in isolation has concluded that there will only be a 'negligible', 'very low' or 'low' magnitude of change predicted for all ecological effects. Consequently, no significant construction related effects are predicted for any of the ecological receptors being considered either in isolation, in combination or as inter-related effects.

10.9.5 Consequently, it is considered reasonable, and in accordance with guidance provided by PINS, that 'no significant inter-project related construction effects on ecology can therefore occur.

Operational phase – Phase 1 OPA and Wider OPA

10.9.6 Taking into account the conclusions that no significant effects are predicted in Chapter 7 (Air Quality), Chapter 11 (Hydrology), Chapter 12 (Noise and Vibration) and Chapter 14 (Landscape

and Visual), together with the adopted and additional ecological mitigation and enhancement set out in Chapter 10: Ecology (Tables 10.7 and 10.11 of that Chapter), and the associated monitoring, management and (if necessary intervention) set out in Table 10:25 of Chapter 10: Ecology, the detailed assessment of effects in isolation has concluded that there will only be a 'negligible', 'very low' or 'low' magnitude of change predicted for all ecological effects. Consequently, no significant construction related effects are predicted for any of the ecological receptors being considered either in isolation, in combination or as inter-related effects. Consequently, it is considered reasonable, and in accordance with guidance provided by PINS, that 'no significant inter-project related operational effects on ecology can therefore occur.

10.10 IMPACT OF CLIMATE CHANGE

10.10.1 Greenhouse gas (GHG) emissions contribute to climate change, which could affect the designated features of national and local sites, habitats and species considered in this Chapter. For example, climate change may lead to grassland management changes resulting in the loss of foraging habitat for bats and/ or badgers. Climate change may also lead to, for example, changes in the distribution of bats due to other areas in the UK and abroad becoming more suitable for the species, leading to a decline in local populations.

10.10.2 The Climate Change Adaptation Manual[90] supports practical and pragmatic decision making and guides reasonable judgement on the potential effects of climate change on the key habitats associated with the Site. The habitats that characterise the Site, for example, improved grassland and hedgerows, are of low relative vulnerability to climate change.

10.10.3 Climate change and its implications for ecology has been incorporated into the design of the inherent ecological design mitigation and enhancement habitats to reduce the risk of impact on legally protected and other species. Selection measures that are based on habitats that are known to be more resilient to climate change and provide extended ecological functionality for a range of species across the Site will be selected. These inherent design mitigation measures are listed in Table 10.7, with additional mitigation, compensation and enhancement measures given in Table 10.11 also relevant. Specific measures that have been included in these Tables that will help to mitigate the effects of climate change at the Site include the restoration and

[90] Natural England & Royal Society for the Protection of Birds (RSPB), 2015. Climate Change Adaptation Manual: Evidence to support nature conservation in a changing climate.

management of Priority Habitats, that generally have a low sensitivity to key climate change effects, and will provide enhanced and long terms suitability for the wide range of biodiversity associated with the One Horton Heath site and adjacent connected habitats.

10.10.4 This has largely been achieved through the retention, enhancement and creation of additional areas of replacement habitat that are considered to have a low level of sensitivity to climate change (subject to appropriate management). These measures are associated with the provision of trees, hedgerow and scrub, the creation of a new pond, provision of new bat roosts, amphibian/ reptile hibernacula and bird nesting habitat, and improvement in grassland species diversity. A Landscape and Ecological Management Plan will be produced to guide appropriate long-term care of these new and existing habitats.

10.10.5 It is considered that these measures also reduce the impact of climate change on ecology at the Site through the strengthening of habitat connectivity and ecological networks within and adjacent to the Site, and the allowance for climate change in drainage systems (i.e. the incorporation of SUDS into the Site proposals).

10.11 ASSESSMENT SUMMARY

Table 10.21: Ecology Assessment Summary – OPA Phase 1 (Construction Effects)

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects – OPA Phase 1								
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate – could be significant	Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from the bank edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of	Very Low	No Likely Significant Effect
	Change in nutrients	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular	Low	No Likely Significant Effect		Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	affecting water quality		nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest.			these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details. Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net zero nutrient and sediment emission measures described in above.		
	Modification of hydrological regime	V High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665	Low	Moderate – could be significant		Negligible	No Likely Significant Effect
Solent Maritime SAC (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Very Low	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest.	Low	Moderate – could be significant		Very Low	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of hydrological regime	V High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665	Low	Moderate – could be significant		Negligible	No Likely Significant Effect
Solent SPA (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Negligible	No Likely Significant Effect
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with potential effects on	Low	Moderate – could be significant		Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			eutrophication levels and associated features of interest.					
Solent and Southampton Water RAMSAR (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Negligible	No Likely Significant Effect
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with potential effects on eutrophication levels and associated features of interest.	Low	Moderate – could be significant		Negligible	No Likely Significant Effect
New Forest SPA (and other constituent designated sites)	No likely significant effects						Negligible	No Likely Significant Effect
New Forest SAC (and other constituent designated sites)	No likely significant effects						Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Emer Bog SAC (and other constituent designated sites)	No likely significant effects						Negligible	No Likely Significant Effect
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)	Design measures have been included within the SuDS scheme (see Chapter 11 of this ES) to avoid changes to the hydrological regime, water quality or soil levels that would negatively affect trees and shrubs. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.	Negligible	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect
Round Copse Site of Importance for Nature	Pollution	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	Production of a detailed Construction Environmental Management Plan	Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Conservation (SINC)			Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.			(CEMP) (see table 10.7 for detailed description of required components) A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: • No excavation (except SuDS, respecting RPAs) • No construction related activities or activities likely to have negative effect on habitat • Biodiversity Enhancement permitted • No additional lighting >0.5lux The 15m ecological buffer will be demarcated with a significant species rich hedgerow, fence earth bank and ditch features to prevent public access into these areas. The ecological buffer will be designed to effectively extend the existing habitats within the SINC woodland and to provide a transitional habitat and structure, replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the		
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			characteristics and quality entering the SINC			following restricted uses and constraints: • Footpaths • Cycleways • SuDS • Biodiversity enhancement permitted • Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux. It is envisaged that ecological enhancement measures will be delivered at the earliest available opportunity. Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs. A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement. A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat creation measures and to inform a responsive system of remedial works to ensure that the condition of retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC;		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						therefore, the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.		
Treeline Break Site of Importance for Nature Conservation (SINC)	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)	Design measures have been included within the SuDS scheme (see Chapter 11 of this ES) to avoid changes to the hydrological regime, water quality or soil levels that would negatively affect trees and shrubs. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.	Negligible	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) (measured from the bank edge of water limit when watercourse is full). Watercourse severance has been minimised through the development. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Negligible	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the habitat through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the watercourse and associated features of interest.	Low	Moderate (could be significant)		Low	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect
	Pollution	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See also measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Negligible	No Likely Significant Effect
Marshy Grassland – see bats, birds, amphibians and reptiles as well – Priority Habitat	Habitat Change	High	Construction activities will result in an unavoidable loss of 0.24ha of poor quality areas of marshy grassland	Low	Moderate (could be significant)	The retained habitat areas will be significantly enhanced and managed in perpetuity to increase species diversity through improvements to the hydrological and grazing regimes to increase the value of these habitats. Additional wetland habitat will also be	Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						provided in the form of ponds and wetland habitats to compliment these retained habitat areas.		
	Direct damage	High	Deposition of dust arising from construction activities. Damage to retained habitats through accidental access with machinery. Discharge of soil/sediment from construction activities into the feature from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	Areas of this habitat will be immediately adjacent to areas of significant construction works. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Negligible	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the feature and associated features of interest.	Low	Moderate (could be significant)		Negligible	Significant positive likely effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature					
Hedgerows	Habitat Change	Medium	Construction activities will result in an unavoidable loss of 0.5 km of hedgerows.	Medium	Moderate (could be significant)	Phase 1 will result in the loss of ~0.5km of hedgerow, the retention of ~0.7km and the creation of ~1km. This will ultimately deliver a net increase of ~0.5km (a gain of ~50%) of native species rich hedgerow. Retained and newly planted hedgerows will be protected by a 5m ecological buffer comprising a grassland habitat to compliment the hedgerow habitat. This will be managed to maximise the ecological benefit. Retained hedgerows will not be subject to artificial light levels in excess of 0.5 lux increase on baseline. A wide range of additional ecological mitigation and enhancement measures will provide additional ecological functionality of habitats in the wider local area and these measures will be implemented as part of the Proposed Development. These are summarised in Section 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES. Consequently, only a low magnitude of change is predicted that	Very Low	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						generates no likely significant effects on ecology.		
	Direct Damage	High	Deposition of dust arising from construction activities. Damage to retained habitats through accidental access with machinery. Discharge of soil/sediment from construction activities into the feature from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created on a minimum of a like for like basis. Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas. Areas of this habitat will be immediately adjacent to areas of significant construction works. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Negligible	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Pollution	High	Deposition of dust arising from construction activities. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)		V Low	No likely significant effect
Broadleaved Semi-Natural Woodland (off site)	Direct damage	High	Direct impact through plant movement in RPAs or accidental physical damage during construction of SuDS.	Low	Moderate (could be significant)	Measures described for Round Copse SINC, are also applicable to this habitat. Measures described in 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES are considered adequate to mitigate for construction phase effects.	Low	No likely significant effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime through modifications to soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction supply of water or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality supplying the feature.	Low	Moderate (could be significant)		Low	Likely positive minor non-significant effect
	Habitat Severance	Medium	Severance of key habitat connecting roost and feeding/breeding areas etc. Artificial lighting of habitat features during construction. Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat)	Low	Moderate (could be significant)		Low	Negligible Non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Bats	Direct loss/degradation of key foraging habitat	Medium	Reduction in available food source/diversity/abundance of foraging resource including through severance and lighting effects.	Low	Minor Non-significant likely effect	The effect of the severance of the hedgerow in this location by a narrow, low speed limit estate road is not considered to be significant given that these bats currently feed alongside a track which is accessed by vehicles throughout a 24 hour period. These bats are considered to be highly likely to cross this feature and continue to forage in this area despite this severance. The foraging resource in this area is expected to be directly related to the presence of livestock and this is expected to decrease in this locale and adapt to the changes in the grazing regime toward other areas of the site. There is considerable alternative foraging resource across the site that will be retained throughout the development. The areas north of the access track will be enhanced to provide a mosaic of wet features including ecologically designed SuDS that will increase the diversity and abundance of prey species in this area. The grassland on site is of very low value to foraging bats and therefore the loss of this habitat is considered to have a negligible negative effect. The boundary features will be protected and new woodland and hedgerow planting along the south western boundary will ensure landscape permeability. The measures described to control lighting during construction in the inherent and additional measures (all based on robust and tried and tested	Very Low	Negligible Non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. As such, whilst the Sensitivity of the bat assemblage is considered to be medium (reflecting the absence of roosts present or supported by the habitats present on site and considering the status/rarity of the respective species foraging on site), the Magnitude of change would be Low and therefore a minor negative but Not Significant Likely Construction Effect will occur to the bat assemblage during construction associated with the OPA Phase 1.		
	Pollution	High	Accidental pollution on site construction activities (e.g. hydrocarbons, herbicides, paints, solvents and other materials used) and discharge into habitats used including exposure to substances with chronic or acute consequential effects.	High	Major (significant)	The grassland on site is of very low value to foraging bats and therefore the loss of this habitat is considered to have a negligible negative effect. Additional habitat creation and enhancement measures described above for woodland (including woodland extensions), hedgerows, marshy grassland, ponds, watercourses and water quality will all enhance the foraging provision on site within the retained habitats. The measures described to control lighting during construction in the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. As such, whilst the	Low	Minor Non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						Sensitivity of the bat assemblage is considered to be mediume (reflecting the absence of roosts present or supported by the habitats present on site and considering the status/rarity of the respective species foraging on site), the Magnitude of change would be Low and therefore a minor negative but Not Significant Likely Construction Effect will occur to the bat assemblage during construction associated with the OPA Phase 1.		
Great Crested Newt	Destruction of habitat features	High	Impacts on terrestrial habitat within 500m of a breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, marshy grassland, woodlands, watercourses and mature trees) and adjacent habitats.	High	Major (significant)	Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been largely avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with	Low	Minor Non-significant likely effect
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	High	Major (significant)		Low	Minor Non-significant likely effect
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat within 250m of breeding pond and associate traffic movements.	High	Major (significant)		Low	Minor Non-significant likely effect
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	High	Major (significant)		Low	Minor Non-significant likely effect
	Habitat Severance	High	Habitat fragmentation due to habitat loss and disturbance	Low	Moderate (could be significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat within 500m to two restored and two created and optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation. The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan. See A to N		
Otter	Killing/injury	High	Constriction operations in/adjacent to suitable habitat within 30m of riparian habitats and associate traffic movements.	Low	Moderate (could be significant)	The riparian corridors within the northern area of the site are considered to be connective habitat for otter and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.	Very low	No likely significant effect
	Habitat Severance	Low	Habitat fragmentation due to habitat loss and disturbance	Low	Minor (not significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Water Vole	Killing/injury	Low	Constriction operations in/adjacent to suitable habitat within 30m of riparian habitats and associate traffic movements.	Low	Negligible Not Significant	The riparian corridors within the northern area of the site are considered to be connective habitat for otter and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to water vole in the wider river catchment during construction.	Very low	No likely significant effect
	Pollution	Low	Accidental pollution on site construction activities (e.g. hydrocarbons, herbicides, paints, solvents and other materials used) and discharge into habitats used including exposure to substances with chronic or acute consequential effects.	Low	Negligible Not Significant		Low	Minor Non-significant
Reptiles	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for marshy grassland, hedgerows and great crested newts are also relevant to reptiles.	Very Low	Minor Non-significant
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat and associate traffic movements.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in	Low	Moderate (Could be significant)		Very Low	Minor Non-significant

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			foraging resource can also occur as a result of habitat severance.					
	Damage/ destruction of setts	Low	Construction within close proximity of sett location (distance dependent on magnitude of vibration) causing collapse of tunnels	Very Low	Negligible (not significant)		Very Low	Negligible (not significant)
Badger	Entrapment	Low	Open, steep sided excavations during construction can entrap animals.	Very Low	Negligible (not significant)	Very limited badger activity observed on site over a 2 year monitoring period. No active setts recorded in 2020. Works areas within 30m of suitable sett construction habitat will be subject to a pre-works inspection The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for marshy grassland, woodland, hedgerows, ponds and great crested newts are also relevant to reptiles.	Very Low	Negligible (not significant)
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
Breeding Birds						Provision of new habitat will continue to support a similar species assemblage and population size. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Damage/ destruction of active nests	High	Removal of habitat within close proximity of nest location, or of connected structures (i.e. buildings or branches) causing collapse of supporting vegetation.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Direct loss/degradation of key foraging habitat (barn owl)	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	Low	Moderate (Could be significant)	Works areas within 5m of suitable nest construction habitat will be subject to a pre-works inspection should work occur in the period March-September (inclusive). The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Negligible likely non-significant effect
	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The grassland habitat is improved and heavily grazed and is of very low foraging value to barn owls due to its limited capacity to support field voles. A wide swathe of ecological buffer and green infrastructure corridor will provide enhanced foraging habitat and serve to retain connectivity to foraging areas that may lie beyond the site to the south east. The construction area is over 150m from the existing nest site separated by mature hedgerows and, as such poses no potential for disturbance of the existing nest site.	Very Low	No likely significant effect
Fish (on-site) (see also watercourses)	Modification of onsite hydrological regime affecting habitats.	Medium	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Positive non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature					
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest.	Low	Minor (not significant)	With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of fish habitat and the fish population. As such, whilst the Sensitivity of the on-site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a Not Significant Likely Construction Effect will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from sediment or other associated pollution during construction associated with the OPA Phase 1.	Very Low	Positive non-significant likely effect

Table 10.22: Ecology Assessment Summary – OPA Phase 1 (Occupation Effects)

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Occupation / Operational Effects – OPA Phase 1								
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.			ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system.	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			watercourses and associated features of interest.			Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent Maritime SAC (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses and transport into the Solent introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the Solent influencing a possible reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and transport into the Solent.			and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent SPA (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on site	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						provision against SANG criteria has been completed. Please refer to Chapter 14 for full details. The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys. However, residents of One Horton Heath will wish to also visit the New Forest SPA. Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites. With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered reasonable to conclude that		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore No Significant Likely Occupational/Operational Effect will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the Wider OPA. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						ensure that suitable measures to avoid these effects will be successfully implemented.		
Solent and Southampton Water Ramsar (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and thereby the Solent associated features of interest.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect
New Forest SPA (and other constituent	Disturbance/ degradation of designated features as	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
designated sites)	a result of increased recreation		breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.					
New Forest SAC (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in	Low	Moderate (Could be significant)		Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is limited to the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.	Low	Negligible (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details.	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						to avoid these effects will be successfully implemented.		
Round Copse, West End Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)		Will Not Occur	No likely significant effect
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of	Low	Negligible (not significant)	None	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			increased recreational pressure is negligible.					
Treeline Break Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Negligible (not significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will Not Occur	No likely significant effect
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure	Low	Negligible (not significant)		Will Not Occur	No likely significant effect
Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in	Low	Moderate (Could be significant)		Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Minor (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details.	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						to avoid these effects will be successfully implemented.		
Marshy Grassland	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	See measures included for watercourses	Will Not Occur	No likely significant effect
Hedgerows	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods)	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.			set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
Bats	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	Minor Non-significant likely effect
	Indirect degradation of foraging resource	High	Artificial lighting can attract flying nocturnal invertebrates (particularly moths) drawing them a way form unlit area into lit areas, thereby reducing the availability of prey for light sensitive species (such as brown long-eared bats)	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	Minor Non-significant likely effect
	Increase in predation risk	Low	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						to avoid these effects will be successfully implemented.		
Great Crested Newt	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
	Entrapment	High	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
Otter	Pollution	Medium	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
Water Vole	Pollution	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
Reptiles	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Entrapment	High	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Badger	Increase in road collision mortality	Low	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Breeding Birds	Increase in road collision mortality (all species but particularly barn owl)	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Moderate (Could be significant)	Road speeds within Phase 1 will be under 20 Mph through a residential scheme, therefore no increase in road traffic mortality is expected.	Very Low	No likely significant effect
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						to avoid these effects will be successfully implemented.		
Invertebrates	Alteration of behaviour	Medium	Artificial light can alter the behaviour of nocturnal invertebrates, thereby affecting population viability and breeding.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Fish (on site)	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures for watercourses	Very Low	No likely significant effect
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses	Low	Moderate (Could be significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			with potential effects on eutrophication levels and associated features of interest.					
	Changes in flow regime	High	Change in riverine flow associated with modified drainage and effects on fish and associated habitat features from a change in flow regime.	Low	Moderate (Could be significant)		Very Low	No likely significant effect
Invasive Species	Spread of invasive species into habitat present (in particular tributaries of the River Itchen)	High	Degradation of affected natural habitats through reduction in diversity and dominance of non-native species that do not provide foraging resource for native invertebrate/animal species.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

Table 10.23: Ecology Assessment Summary – Wider OPA (Construction Effects)

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects - Wider OPA and Link Road								
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate – could be significant	Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from the bank edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of	Very low	No Likely Significant Effect
	Change in nutrients	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular	Low	Moderate – could be significant		Will not occur	Significant positive likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	affecting water quality		nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest.			these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details. Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net zero nutrient and sediment emission measures described in above.		
	Modification of hydrological regime	V High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect
Solent Maritime SAC (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest.	Low	Moderate – could be significant		Will not occur	Significant positive likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of hydrological regime	V High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect
Solent SPA (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			Solent with potential effects on eutrophication levels and associated features of interest.					
Solent and Southampton Water RAMSAR (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with potential effects on eutrophication levels and associated features of interest.	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect
New Forest SPA (and other constituent designated sites)	No likely significant effects						Will not occur	No Likely Significant Effect
New Forest SAC (and other constituent designated sites)	No likely significant effects						Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Emer Bog SAC (and other constituent designated sites)	No likely significant effects						Will not occur	No Likely Significant Effect
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Works are sufficiently distant from this SINC with limited pathways such that direct construction phase effects are unlikely.	Low	Moderate (could be significant)	Production of a detailed Construction Environmental Management Plan (CEMP) (see table 10.7 for detailed description of required components) A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: • No excavation (except SuDS, respecting RPAs) • No construction related activities or activities likely to have negative effect on habitat • Biodiversity Enhancement permitted • No additional lighting >0.5lux The 15m ecological buffer will be demarcated with a significant species rich hedgerow, fence earth bank and ditch features to prevent public access into these areas. The ecological buffer will be designed to effectively extend the existing	Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						habitats within the SINC woodland and to provide a transitional habitat and structure, replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the following restricted uses and constraints: • Footpaths • Cycleways • SuDS • Biodiversity enhancement permitted • Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux. It is envisaged that ecological enhancement measures will be delivered at the earliest available opportunity. Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs. A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement. A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						creation measures and to inform a responsive system of remedial works to ensure that the condition of retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC; therefore, the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.		
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)	Design measures have been included within the SuDS scheme (see Chapter 11 of this ES) to avoid changes to the hydrological regime, water quality or soil levels that would negatively affect trees and shrubs. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and	Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			characteristics and quality entering the SINC			zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.		
Round Copse Site of Importance for Nature Conservation (SINC)	Pollution	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Heart's Copse Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality		Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.					
	Modification of onsite hydrological regime affecting habitats.		Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Treeline Break Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Field West of Treeline Break (Long Field) Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			eutrophication levels in the SINC and associated features of interest.					
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Quobleigh Pond and Woods Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	affecting water quality		nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.					
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Fair Oak School Meadow Site of Importance for Nature Conservation (SINC) / Wyvern Technical College Meadow Site of Importance for Nature Conservation (SINC)	Pollution	High	Deposition of dust arising from construction activities. Specific buffer prescriptions have been agreed for the protection of existing watercourses.	Very Low	Minor Non-significant	Production of a detailed Construction Environmental Management Plan (CEMP) (see table 10.7 for detailed description of required components)	Will not occur	No Likely Significant Effect
Watercourses (other than those listed or associated	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological	Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
with designated sites listed above) – Priority Habitat	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the habitat through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the watercourse and associated features of interest.	Low	Moderate (could be significant)	improvements) (measured from the bank edge of water limit when watercourse is full). Watercourse severance has been minimised through the development. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	Significant positive likely effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect
Ponds – see bats, birds, amphibians and reptiles as well– Priority Habitat	Habitat Change	High	The poor condition pond at Chalcroft Farm will be protected and restored through the development. The pond in Quobleigh wood will be unaffected by construction and enhanced. A net increase in ponds will be delivered by the proposals including a network of new wildlife ponds along the western boundary of the site to facilitate recolonisation of the southwest of the site by great crested newts and extend the range and population size of the Quobleigh metapopulation	Low	Moderate (could be significant)	All ponds will be subject to high quality conservation management delivered in perpetuity under a detailed LEMP.	Low	Non-Significant positive likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See also measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Parkland	Habitat Change	High	The area of parkland on site will be extended though planting by 0.5 ha (50%)	Low	Moderate (could be significant)		Low	Non-Significant positive likely effect
	Pollution	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See also measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Marshy Grassland – see bats, birds, amphibians and reptiles as well – Priority Habitat	Habitat Change	High	Construction activities will result in an unavoidable loss of 0.24ha of poor quality areas of marshy grassland	Low	Moderate (could be significant)	The retained habitat areas will be significantly enhanced and managed in perpetuity to increase species diversity through improvements to the hydrological and grazing regimes to increase the value of these habitats. Additional wetland habitat will also be provided in the form of ponds and wetland habitats to compliment these retained habitat areas.	Low	No Likely Significant Effect
	Direct damage	High	Deposition of dust arising from construction activities. Damage to retained habitats through accidental access with machinery. Discharge of soil/sediment from construction activities into the feature from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	Areas of this habitat will be immediately adjacent to areas of significant construction works. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very low	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on	Low	Moderate (could be significant)		Very low	Non-Significant positive likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			eutrophication levels in the feature and associated features of interest.					
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Very low	Non-Significant positive likely effect
Hedgerows	Habitat Change	High	Construction activities will result in an unavoidable loss of 1.17km of hedgerows.	Medium	Major (could be significant)	6.24km of new native, species rich hedgerow (with trees) will be created. These hedgerows will be protected by a minimum 5m buffer from the development and not subject to lighting levels >0.5 lux. These will be managed in perpetuity for the benefit of wildlife under a comprehensive LEMP. The OPA net position shows: •Loss of 1.17 km of hedgerow (9.3% of baseline) •Retention of 9.21km of hedgerow (73 % of baseline) •Creation of 6.24 km of new species rich hedgerows This results in a post construction figure of 15.45 km resulting a total species rich hedgerow net gain of 22.8%.	Low	Non-Significant positive likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						•Enhancement of 2.2km of retained hedgerow from species poor to species rich hedgerows, with standard trees where appropriate. This is in addition to the 22.8% gain in extent.		
	Direct Damage	High	Deposition of dust arising from construction activities. Damage to retained habitats through accidental access with machinery. Discharge of soil/sediment from construction activities into the feature from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Moderate	Moderate (could be significant)	Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created on a minimum of a like for like basis. Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas. Areas of this habitat will be immediately adjacent to areas of significant construction works. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the feature and associated features of interest.	Low	Moderate (could be significant)		Will not occur	Significant positive likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Broadleaved Semi-Natural Woodland	Habitat Change	High	The construction of the link road and local road sections will result in the unavoidable loss of 0.8ha (12.3%) of semi-natural broadleaved woodland on site, at either end of the central woodland belt.	Medium	Major (significant)	Measures described in 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES are considered adequate to mitigate for construction phase effects. Measures described for the adjacent woodland SINC sites (Quobleigh Pond and Woods, Round Copse, Treeline Break and Chalcroft Business Park), are also applicable to this habitat. The development will result in the creation of 5.6ha of semi-natural broadleaved woodland in areas designed to effectively extend the existing mature woodland and designated SINC sites. This results in a total of 11.3 ha of woodland across the site post construction, a net increase in this priority habitat of 164%. The location of these areas of new habitat will complement the	Very Low	No Likely Significant Effect
	Pollution	High	Deposition of dust arising from construction activities. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)		Very Low	No likely significant effect
	Direct damage	High	Direct impact through plant movement in RPAs or accidental physical damage.	Low	Moderate (could be significant)		Low	No likely significant effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime through modifications to soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction supply of water or change in flood regime resulting in an increase on volume/rate	Low	Moderate (could be significant)		Low	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			and transport of sediment/erosion etc and change in flow characteristics and quality supplying the feature.			existing habitats and will be more likely to succeed on an accelerated timescale due to the presence of a mature donor habitat immediately adjacent to these locations. The existing areas of woodland on site will be enhanced through sensitive planting to promote greater species diversity in both species and structure of the woodlands by implementing a planting and management scheme to enhance herb, scrub and canopy layers and to account for the predicted loss of ash trees within the woodlands to Ash Dieback.		
Bats	Removal of habitat features	High	Impacts on bat roosts and supporting habitats (including buildings, hedgerows, woodlands, watercourses and mature trees) and adjacent habitats.	High	Major (significant)	A number of low status roosts for common bats species are present within the buildings on site, the majority of which are to be demolished. These will be compensated for through the provision of roost type/species appropriate bat boxes and “natural” roost features created on retained trees in appropriate locations (i.e. in close proximity to existing flight lines, adjacent to high value habitat, relatively undisturbed and unlit areas). A maternity roost for brown long-eared bats will be directly affected by the demolition. A mitigation roost will be constructed in the vicinity of Hearts Copse following the criteria for this roost type as described in the bat mitigation guidelines and delivered under licence. Substantial tree and shrub planting will reinforce the connection this location to existing	Very Low	No Likely Significant Effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						flight lines and maternity roost locations within Hearts Copse. The removal of mature trees has been minimised through careful masterplan layout. Where trees containing potential roost features are retained, these will be protected by the buffer specifications as described for hedgerows (O & P) and woodland (G) in section 10.7. Where trees with potential roost features are required to be removed, a precautionary principle will be applied that assume the presence of the most likely roost type for the feature. This is considered appropriate as tree roosts are dynamic and can be readily occupied/abandoned by a variety of species at any given time, making firm assessment of the roost types present particularly challenging. Mitigation and licensing requirements will therefore be informed by subsequent inspections prior to any impacts on these features. A suite of species and habitat specific monitoring regimes will be implemented to provide feedback on the efficacy of mitigation and habitat creation measures for specific receptor species in accordance with legislative and policy requirements. This monitoring will inform a responsive system of remedial measures to ensure that the intended function of these measures is realised and maintained in perpetuity. See A to N and T to X above.		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Habitat Severance	High	Severance of key habitat connecting roost and feeding/breeding areas etc. Artificial lighting of habitat features during construction. Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat)	High	Major (significant)	Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. •Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation •Minimising the width of the road crossing •Clear span design •Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. •A minimum height of 3m under bridge crossings. •Sensitive design of any lighting that may be required in these areas. •Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses.	Very Low	Minor Non-significant likely effect
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource including through severance and lighting effects.	High	Major (significant)	The loss of foraging habitat across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (see G, H, I, O & P). Additional habitat creation and enhancement measures described	Very Low	Minor Non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						above for woodland (including woodland extensions), hedgerows, marshy grassland, ponds, watercourses and water quality will all enhance the foraging provision on site within the retained habitats.		
Great Crested Newt	Pollution	High	Accidental pollution on site construction activities (e.g. hydrocarbons, herbicides, paints, solvents and other materials used) and discharge into habitats used including exposure to substances with chronic or acute consequential effects.	High	Major (significant)	Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been largely avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated	Very Low	Minor Non-significant likely effect
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, marshy grassland, woodlands, watercourses and mature trees) and adjacent habitats.	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat within 250m of breeding pond and associate traffic movements.	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	High	Major (significant)		Very Low	Minor Non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat within 500m to two restored and two created and optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation.		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk.		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan. See A to N		
Otter	Habitat Severance	High	Habitat fragmentation due to habitat loss and disturbance	Low	Moderate (could be significant)	The riparian corridors across the site are considered to be connective habitat for otter and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction. The design principles describe above for bats will also allow otter to move freely along the riparian corridor under	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						the link road and therefore reduce collision risk.		
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat within 30m of riparian habitats and associate traffic movements.	Low	Moderate (could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction and maintain connectivity.	Very low	No likely significant effect
Water Vole	Habitat Severance	Low	Habitat fragmentation due to habitat loss and disturbance	Low	Negligible (not significant)	The riparian corridors across the site are considered to be connective habitat for water vole and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to water vole in the wider river catchment during construction. The design principles describe above for bats will also allow water vole to move freely along the riparian corridor under the link road and therefore reduce collision risk and maintain connectivity.	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Killing/injury	Low	Constriction operations in/adjacent to suitable habitat within 30m of riparian habitats and associate traffic movements.	Low	Moderate (could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.	Will Not Occur	No likely significant effect
Dormouse	Disturbance	High	Construction activity and noise in proximity to nest sites.	High	Major (significant)	See A- N and T above Ongoing annual dormouse tube monitoring to inform licencing requirements for each phase of the project. Avoidance of hedgerow severance within 150m of confirmed records (currently only within woodland north of solar farm). No lighting associated with road crossings of woodland habitat Installation of suitable aerial structure (e.g. Peoples Trust for Endangered Species, 2019[91]) across roads severing woodland, in combination with suitable planting to strengthen vegetated corridors Provision of deciduous woodland adjacent to key retained woodland corridor to ensure no net loss of	Very Low	Minor Non-significant likely effect
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including hedgerows, woodlands, and mature trees) and adjacent habitats connected to central woodland within territorial range.	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat and associate traffic movements.	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Direct loss/degradation of key	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or	High	Major (significant)		Very Low	Minor Non-significant likely effect

91 https://ptes.org/wp-content/uploads/2019/09/White-Hughes-2019-dormouse-bridge.pdf

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	foraging habitat		pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.			habitat and to maximise availability of food plants throughout the active part of the year. Provision of 150 dormouse nest boxes within retained woodland corridors to maximise and extend suitable nesting habitats. Annual nest box monitoring to be carried out. Sensitive woodland management to restore and maximise opportunities for dormouse (e.g. Forestry Commission 2019[92] and the Hampshire Dormouse Group[93])		
Reptiles	Pollution	High	Accidental pollution on site construction activities (e.g. hydrocarbons, herbicides, paints, solvents and other materials used) and discharge into habitats used including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for marshy grassland, woodland, hedgerows, ponds and great crested newts are also relevant to reptiles.	Very Low	Minor Non-significant
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats	Low	Moderate (Could be significant)		Very Low	Minor Non-significant

92 Forestry Commission. 2019. A Protocol fo Undertaking Woodland Management in England Where Dormice Are Present. Protocol Version 4.

93 https://hampshiredormousegroup.co.uk/resources/woodland-habitat-management/

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			Artificial lighting of habitat features during construction					
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat and associate traffic movements.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
Badger	Damage/ destruction of setts	Low	Construction within close proximity of sett location (distance dependent on magnitude of vibration) causing collapse of tunnels	Very Low	Negligible (not significant)	Very limited badger activity observed on site over a 2 year monitoring period. No active setts recorded in 2020. Works areas within 30m of suitable sett construction habitat will be subject to a pre-works inspection The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for marshy grassland, woodland, hedgerows, ponds and great crested newts are also relevant to reptiles.	Very Low	Negligible (not significant)
	Entrapment	Low	Open, steep sided excavations during construction can entrap animals.	Very Low	Negligible (not significant)		Very Low	Negligible (not significant)
Breeding Birds	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Moderate (Could be significant)	Provision of new habitat will continue to support a similar species assemblage and population size. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to	Very Low	Minor Non-significant

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						avoid these effects will be successfully implemented.		
	Disturbance (Barn Owl only)	High	Construction activity and noise in proximity to nest sites.	Moderate	Major (significant)	Work that risk disturbance to barn owl will avoid the key breeding/nesting period (March-August). The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant
	Damage/ destruction of active nests	High	Removal of habitat within close proximity of nest location, or of connected structures (i.e. buildings or branches) causing collapse of supporting vegetation.	Low	Moderate (Could be significant)	Works areas within 5m of suitable nest construction habitat will be subject to a pre-works inspection should work occur in the period March-September (inclusive). The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant
	Direct loss/degradation of key foraging habitat (barn owl)	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	Moderate	Major (significant)	The existing nest location will be moved in a phased process whereby an identical box will be erected in the far south west of the site in winter 2020 (approx. 600m from the nearest link road section) with the existing box retained until the winter prior to the operational phase of the road (estimated 2022 – relocation in winter 2021). At which point the occupied box will be relocated (outside of breeding season) to a tree within 100m of the new nest box. This will recreate the	Very Low	Minor Non-significant

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						current associated adult and nest roost configuration between the nest box and the roost in Chalcroft Farm. This relocation will seek to reduce collision risk and to reduce the potential for disturbance effects form the residential areas. The marshy grassland areas in this vicinity of the nest box will be enhanced and managed to increase the population of field voles to provide an increased foraging resource.		
Invertebrates	Destruction of habitat features	Medium	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Fish (on-site) (see also watercourses)	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Modification of onsite hydrological	Medium	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil	Low	Minor (not significant)	With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES	Very Low	Positive non-

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	regime affecting habitats.		drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature			it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of fish habitat and the fish population. As such, whilst the Sensitivity of the on site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a Not Significant Likely Construction Effect will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from sediment or other associated pollution during construction associated with the OPA Phase 1.		significant likely effect
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest.	Low	Minor (not significant)		Very Low	Positive non-significant likely effect
Invasive Species	Spread of invasive species into habitat present (in particular tributaries of the River Itchen)	High	Degradation of affected natural habitats through reduction in diversity and dominance of non-native species that do not provide foraging resource for native invertebrate/animal species.	Low	Moderate (Could be significant)	There is a significant risk of spreading Himalayan balsam during works to construct the Quobleigh stream link road crossing. This could result in the spread of seed into the downstream tributaries and into the River Itchen SSSI. However, measures outlined in the CEMP and a separate invasive species strategy document will ensure that this plant is not caused to spread during works. There is a risk that additional species will be transported to site in materials	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						or machinery. Specific biosecurity measures will be described an implemented through a CEMP to mitigate for the risk of transfer of invasive species and through the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented. The sensitivity of receptor habitats that could be subject to the spread of invasive species (particularly the dispersal of Himalayan balsam into watercourses) are high but, with effective management and monitoring, the magnitude of this change is considered to be low and there is, therefore, no likely significant effect on habitats or designated sites due to the introduction of invasive species.		

Table 10.24: Ecology Assessment Summary – Wider OPA (Operational Effects)

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Occupation / Operational Effects – Wider OPA and Link Road								
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes,	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.			management intervention to ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			watercourses and associated features of interest.			into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent Maritime SAC (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses and transport into the Solent introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the Solent influencing a possible reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and transport into the Solent.			surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent SPA (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						comparison of the on site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details. The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys. However, residents of One Horton Heath will wish to also visit the New Forest SPA. Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites. With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore No Significant Likely Occupational/Operational Effect will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the Wider OPA. The inherent and additional measures (all based on robust and tried and tested methods)		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11	Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Solent and Southampton Water Ramsar (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Very Low	No likely significant effect
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and thereby the Solent associated features of interest.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect
New Forest SPA (and other	Disturbance/ degradation of designated features as	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
constituent designated sites)	a result of increased recreation		species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.					
New Forest SAC (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Very Low	No likely significant effect
Emers Bog SAC (and other constituent designated sites)	No likely significant effect						Will Not Occur	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is limited to the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.	Low	Negligible (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Round Copse, West End Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in	Low	Moderate (Could be significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.					
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure is negligible.	Low	Negligible (not significant)	None	Very Low	No likely significant effect
Hearts Copse, West End, Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or	Low	Moderate (Could be significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.					
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure is negligible.	Low	Negligible (not significant)		Very Low	No likely significant effect
Treeline Break Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Negligible (not significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very Low	No likely significant effect
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure	Low	Negligible (not significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Quobleigh Pond and Woods Site of Importance for Nature Conservation (SINC)	Disturbance/degradation of habitat features as a result of increased recreation	High	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas from the PRoW in the centre of this site.	Low	Moderate (Could be significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Fair Oak School Meadow Site of Importance for Nature Conservation (SINC)	Disturbance of designated features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Moderate (Could be significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Wyvern Technical College Meadow Site of Importance for Nature Conservation (SINC)	Disturbance of designated features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Moderate (Could be significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11		

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)		Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Minor (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Ponds – see bats, birds, amphibians and reptiles as well– Priority Habitat	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods)	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Parkland	Increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas including potential vandalism.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Marshy Grassland	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	See measures included for watercourses	Very Low	No likely significant effect
Hedgerows	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Broadleaved Semi-Natural Woodland	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Bats	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats	High	Major (significant)	Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. •Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation •Minimising the width of the road crossing •Clear span design •Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to	Very Low	Minor Non-significant likely effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						minimise road collision mortality. •A minimum height of 3m under bridge crossings. •Sensitive design of any lighting that may be required in these areas. •Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Indirect degradation of foraging resource	High	Artificial lighting can attract flying nocturnal invertebrates (particularly moths) drawing them a way form unlit area into lit areas, thereby reducing the availability of prey for light sensitive species (such as brown long-eared bats)	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant likely effect
	Increase in predation risk	Low	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Great Crested Newt	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Increase in predation risk	Low	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Entrapment	Low	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Otter	Pollution	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Water Vole	Pollution	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
Reptiles	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Entrapment	High	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Badger	Increase in road collision mortality	Low	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Breeding Birds	Increase in road collision mortality (all species but particularly barn owl)	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Moderate (Could be significant)	The link road is likely to be categorised as a “Modern A Road” class according to the Barn Owl Trust Whilst a modern A road, the link road will be designed to accommodate measures described within this report to reduce the road collision mortality rate including: •Sections where the road is situated on an embankment present the highest risk followed by sections at existing	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						ground levels. In these areas, the creation of obstacles (natural or artificial with a preference for natural) which force birds to fly higher across roads will be incorporated into the scheme. •Areas where the road is situated in a cutting present a lower risk and will not require additional planting, although this will be considered as part of the wider road landscaping scheme. •Verges south of the link road will be maintained in a short, thatchless condition to reduce the potential for field vole.		
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Invertebrates	Alteration of behaviour	Medium	Artificial light can alter the behaviour of nocturnal invertebrates, thereby affecting population viability and breeding.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Negligible	No likely significant effect
Fish (on site)	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and	Low	Moderate (Could be significant)	See measures for watercourses	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.					
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest.	Low	Moderate (Could be significant)		Very Low	No likely significant effect
	Changes in flow regime	High	Change in riverine flow associated with modified drainage and effects on fish and associated habitat features from a change in flow regime.	Low	Moderate (Could be significant)		Very Low	No likely significant effect
Invasive Species	Spread of invasive species into habitat present (in particular tributaries of the River Itchen)	Low	Degradation of affected natural habitats through reduction in diversity and dominance of non-native species that do not provide foraging resource for native invertebrate/animal species.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Very Low	No likely significant effect

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						to avoid these effects will be successfully implemented.		

Table 10.25: Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
	e.g. Developer/Contractor/Council	e.g. Planning Condition S.106	How will the implementation of the mitigation measure be monitored?	e.g. construction phase or specific trigger
INHERENT DESIGN MITIGATION MEASURE				
Production of a detailed Construction Environmental Management Plan (CEMP)	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	CEMP management responsibilities, duties, monitoring, reporting, improvement plan Communications and complaints reporting system	Pre-construction
Watercourses protected by 10m ecological buffer (excluding SuDS)	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP.	Pre-construction (design)
Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created in accordance with the prescriptions detailed in the DEFRA Biodiversity metric 2.0. Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process. and LEMP Delivered through CEMP	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
Woodland and tree removal and severance has been minimised through the design process. Retained existing woodlands will be enhanced through the introduction of a high quality Woodland Management Plan, discussed later in the ES Chapter.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
				habitat to minimise interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
Areas of important marshy grassland have been excluded from the development area and will be enhanced by the project. These areas will be subject to high quality conservation management discussed later in the ES Chapter.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP	Preconstruction avoidance through design. LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP
ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT				
OPERATION – ALL PHASES Discharge of foul water (sewage) to Peel Common Waste Water Treatment Works and not into the River Itchen. Suitable treatment at Peel Common Wastewater Treatment Works within consented limits. Comprehensive SuDS infrastructure including features such as interceptors, permeable paving, rain gardens, swales, vegetated SuDS ponds, sediment forebays. Successful treatment of nitrates and phosphates using robust methodology. Purchase of Defra/NE/ EBC nutrient credits if necessary, to demonstrate overall net zero nutrient emissions from the development, monitoring regime to demonstrate no emissions and feedback mechanism to enable effective management intervention if necessary. This approach has been designed with the express requirement that the development is nutrient neutral and does not result in any increase in nitrate, phosphate or sediment runoff into the receiving watercourses, the River Itchen and the Solent systems. Please refer to Chapter 11 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	Construction: Suitable temporary measures to be implemented during construction as required to avoid construction related effects (see CEMP) Operation: SuDS to be delivered in advance of each phase to ensure that no negative effects on water quality.
CONSTRUCTION AND OPERATION – ALL PHASES Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from the bank	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed	Construction: Suitable temporary measures to be implemented during construction as required to avoid construction related effects (see CEMP) Operation:

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses.			for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	SuDS to be delivered in advance of each phase to ensure that no negative effects on water quality.
CONSTRUCTION AND OPERATION – ALL PHASES Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net zero nutrient and sediment emission measures described in above.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
OPERATION – ALL PHASES Potable water abstraction and balancing River Itchen flows is comprehensively dealt through strategic measures being implemented by Southern Water e.g. Review of Consent process and Water Resource Management Plan. Please refer to Chapter 11 of this ES and Environment Agency Position Statement for full details.	Southern Water – beyond remit of the OHH Project	Southern Water Abstraction Consent	Catchment wide strategy beyond the remit of the development	N/A
CONSTRUCTION – ALL PHASES Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance. See also Chapter 11.	Phased throughout development in accordance with strategy agreed pre-construction
OPERATION – ALL PHASES Provision of an extensive network of footpaths and play/sports facilities within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km (optional shorter 2.5km) SANG route, that includes at least 2.5km of this within semi-natural settings that offer a greater element of open space provision provided by more distant open	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of recreational provision that is utilised widely by residents See Chapter 14	Delivered on a phased basis in accordance with strategy agreed pre-construction See Chapter 14

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
greenspace, including at least 2.5km of route that allows informal access and dog walking. Please refer to Chapter 14 of this ES.				
OPERATION – ALL PHASES Subject to final negotiations between EBC and with Natural England in relation to the extent on-site features prevent recreational impacts, if required, an appropriate financial contribution will be paid into the Solent Aware SPD fund, to effectively prevent associated disturbance effects that could result in likely significant effects on the features of interest (bird assemblage and supporting habitats). Please refer to Chapter 14 of this ES.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of compliant measures to ensure that there is no significant effect on Solent SPA	Delivered on a phased basis in accordance with strategy agreed pre-construction.
CONSTRUCTION AND OPERATION – ALL PHASES A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux The 15m ecological buffer will be demarcated with a significant species rich hedgerow and ditch features to prevent public access into these areas. The ecological buffer will be planted to echo the existing habitats within the SINC woodland and to provide a transitional habitat and structure, replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the following restricted uses and constraints: Footpaths Cycleways SuDS Biodiversity enhancement permitted Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP.	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats. LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP
CONSTRUCTION AND OPERATION – ALL PHASES Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No effects on retained trees	Pre-construction strategy agreed.

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION – ALL PHASES A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of all relevant measures as set out in this chapter	LEMP agreed pre-construction
CONSTRUCTION AND OPERATION – ALL PHASES A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat creation measures and to inform a responsive system of remedial works to ensure that the condition of retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of relevant measures as set out in this chapter	Habitat Monitoring Strategy agreed pre-construction
OPERATION – ALL PHASES An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of recreational provision that is utilised widely by residents See Chapter 14	Delivered on a phased basis in accordance with strategy agreed pre-construction See Chapter 14
OPERATION – ALL PHASES The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of on-site open space strategy and homeowner information packs See Chapter 14	Pre-occupation See Chapter 14
CONSTRUCTION AND OPERATION – ALL PHASES A 15m ecological buffer subject to the specifications as described in G will be implemented between the link road and the woodland to protect the habitat and to ensure that root protection areas are respected.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No effects on retained trees	LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP
OPERATION – ALL PHASES Acoustic fencing will be installed to minimise operational phase noise	Eastleigh Borough Council or agents thereof under the	Planning Condition	Measures designed to avoid disturbance to	Strategy agreed prior to construction within CEMP.

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
disturbance from the link road on sensitive habitats (and associated species receptors e.g. breeding birds). Please refer to Chapter 12 of this ES for full details.	control of Eastleigh Borough Council		wildlife where required. Please refer to Chapter 12 of this ES for full details.	Please refer to Chapter 12 of this ES for full details.
OPERATION – ALL PHASES Additional (2.2ha) of grassland recreational areas that will provide suitable alternative areas for recreation. CONSTRUCTION AND OPERATION – ALL PHASES The new woodland extension to the west of the existing woodland will provide high value habitat for a broad range of receptors including GCN, bats, birds, invertebrates and reptiles.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of on-site open space strategy and homeowner information packs See Chapter 14	Pre-occupation See Chapter 14
CONSTRUCTION AND OPERATION – ALL PHASES Flight pond will be restored and enhanced for invertebrates, fish, amphibian, reptiles, birds and mammals.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pond enhanced to good condition (GCN HSI category)	In accordance with GCN Masterplan Strategy.
CONSTRUCTION AND OPERATION – ALL PHASES Hedgerows with mature trees at regular intervals (SINC or non SINC) will have a 15m buffer (measured from tree stems) Hedgerows without mature trees or only occasional trees (SINC or non SINC) will have a minimum 5m ecological buffer (plus RPA around any mature trees to be retained) measured from the centre line of the hedgerow. These buffers will be subject to the following constraints: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux All hedgerows will be managed for biodiversity in accordance with a long-term management plan, including new planting to infill gaps in hedgerows and ongoing high quality management. See A to N	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Retained hedgerows protected as per the measures agreed within CEMP and LEMP.	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION AND OPERATION – ALL PHASES Where the removal or severance of woodland is unavoidable, compensatory native species rich planting will occur in accordance with the prescriptions detailed in the DEFRA Biodiversity metric 2.0. New areas of woodland and woodland extension are also included in the proposals. Woodland management and monitoring will be implemented from the start	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process. and LEMP	Preconstruction avoidance through design. Habitat creation to be completed as to minimise the interval between loss

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
of the project delivery process if not before to maximise habitat value, structure and longevity, including the control of non-native invasive species.			Delivered through CEMP	and maturation of new habitats. Protection measures delivered during construction by CEMP
CONSTRUCTION– ALL PHASES Roost Loss A number of low status roosts for common bats species are present within the buildings on site, the majority of which are to be demolished. These will be compensated for through the provision of roost type/species appropriate bat boxes and “natural” roost features created on retained trees in appropriate locations (i.e. in close proximity to existing flight lines, adjacent to high value habitat, relatively undisturbed and unlit areas). A maternity roost for brown long-eared bats will be directly affected by the demolition. A mitigation roost will be constructed in the vicinity of Hearts Copse following the criteria for this roost type as described in the bat mitigation guidelines and delivered under an EPS licence. Substantial tree and shrub planting will reinforce the connection this location to existing flight lines and maternity roost locations within Hearts Copse. The removal of mature trees has been minimised through careful masterplan layout. Where trees containing potential roost features are retained, these will be protected by the buffer specifications as described for hedgerows (O & P) and woodland (G). Where trees with potential roost features are required to be removed, a precautionary principle will be applied that assume the presence of the most likely roost type for the feature. This is considered appropriate as tree roosts are dynamic and can be readily occupied/abandoned by a variety of species at any given time, making firm assessment of the roost types present particularly challenging. Mitigation and licensing requirements will therefore be informed by subsequent inspections prior to any impacts on these features.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition and EPS mitigation licence as required.	Delivered in accordance with EPS Mitigation licences as appropriate, including post construction monitoring.	Bat Mitigation Strategy Approved pre-construction. EPS licence secured as required. Preconstruction avoidance through design. Habitat creation to be completed as to minimise the interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
CONSTRUCTION AND OPERATION – ALL PHASES Bat Habitat Severance/Road Collision Mitigation Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Bat Mitigation Strategy to be approved pre-construction No impact observed on commuting bats. Minimal road casualties observed	

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Minimising the width of the road crossing Clear span design Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. A minimum height of 3m under bridge crossings. Sensitive design of any lighting that may be required in these areas. Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses.				
CONSTRUCTION AND OPERATION – ALL PHASES Bat Loss/degradation of foraging habitat Mitigation The loss of foraging habitat across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (see G, H, I, O & P). OPERATION – ALL PHASES Bat Lighting Mitigation (also for other nocturnal species). Specific design measures have been included as a key design principle to keep additional lighting to a minimum across the site. Where lux levels must exceed 0.5 lux on any valuable retained or created habitat, a further detailed assessment of the lighting design to include wavelength, directionality and duration/timing of lighting will be conducted to inform lighting design for each phase of development to ensure no deleterious effect on affected habitats. OPERATION – ALL PHASES Bats and cat predation (also relevant to other fauna). Home owner packs will provided to identify the effects of cat predation on biodiversity and to encourage homeowners to not own cats, or if they do to take a responsible approach including keeping cats in at night, use of bells etc.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Bat Mitigation Strategy to be approved pre-construction	
CONSTRUCTION AND OPERATION – ALL PHASES Bat mitigation efficacy. A suite of species and habitat specific monitoring regimes will be implemented to provide feedback on the efficacy of mitigation and habitat creation measures for specific receptor species in accordance with legislative and policy requirements. This monitoring will inform a responsive	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition and/or EPS Mitigation licences as required	Bat Mitigation Strategy to be approved pre-construction	

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
system of remedial measures to ensure that the intended function of these measures is realised and maintained in perpetuity.				
CONSTRUCTION Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat within 500m to two restored and two created and optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Successful delivery of EPS mitigation licence measures to maintain favourable conservation status of GCN population on site.	GCN Strategy Approved pre-construction. EPS licence secured as required.

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation. The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan.				
CONSTRUCTIONAND OPERATION – ALL PHASES Watercourse road crossing points locations to be designed as single span to facilitate continuation of hydrological regime and landscape permeability for terrestrial mammals including otter. Mammal crossings will be included where provision for mammal access cannot be incorporated along the stream at water level.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of landscape connectivity for nocturnal mammals along watercourses	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTIONAND OPERATION – ALL PHASES Watercourse restoration using best practice measures (e.g. as defined by the UK River Restoration Centre) to increase physical habitat diversity, reconnect to the floodplain, increase light levels to the channel and riparian corridor and maximise species diversity, controlling non-native species.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of watercourse enhancement measures.	Watercourse Enhancement Strategy agreed prior to construction with enhancements delivered during construction at

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
				appropriate timings through development lifespan.
CONSTRUCTIONAND OPERATION – ALL PHASES Water vole has not been recorded during 2018-2020, although historic records are present. Further surveys will be conducted on a precautionary basis to ensure no effects and legal compliance. Measures outlined in A – O will be relevant to habitat that could be used by this species. Measures set out in FF and GG are also relevant and will avoid effects on water vole should they be recorded in the area in the future.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of landscape connectivity for nocturnal mammals along watercourses	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION – ALL PHASES Precautionary surveys will continue to ensure any new setts or re-activated setts are taken into account in the construction programme. Should it be necessary Natural England badger licences will be sought to ensure legal compliance in terms of disturbance of any setts and any requirements for exclusions/sett closure/provision of artificial setts. Deep excavations will be covered at night or suitable mammal ladders/earth maps will be provided to allow large mammals including badger to exit excavations.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction inspections completed, and actions taken to ensure no effects on badger setts.	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION – ALL PHASES Habitats requiring works during the nesting season (March-September inclusive) will be subject to a pre-works nesting bird check with measures implemented to protect any active nests likely to be affected by the works. Please refer to Chapter 12 for full details on measures to minimise construction disturbance through noise and vibration. CONSTRUCTION Where areas of suitable nesting habitat for valued bird species is lost, suitable alternative nesting habitat will be provided on site through a network of bird boxes, features incorporated to buildings, new tree and shrub planting and enhanced grassland, woodland, wetlands. CONSTRUCTION AND OPERATION – ALL PHASES Measures to minimise the risk of disturbance to birds during nesting will be implemented as defined elsewhere above in A to O, including both on site and off sites notably SSSI, SPA and SAC habitats. Please refer to Chapter 12 for full details on measures to minimise construction and occupation disturbance through noise and vibration.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction surveys inspections and actions taken to ensure no effects on badger setts.	
CONSTRUCTION– ALL PHASES The existing barn owl nest box will be relocated into the area in the vicinity of Hearts Copse (>600m from link road) to reduce road collision risk associated with the link road. Delivery of	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction surveys inspections as required and actions taken to ensure site	Barn Owl Strategy agreed prior to construction.

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
significant screening of link road as it proceeds northwards from Chalcroft Farm to avoid road traffic mortality. Enhancement of grassland habitats and hedgerow buffers for small mammals will provide additional foraging resource for barn owl to compensate for the loss of low value foraging habitats.			continues to safely support breeding barn owl without acting as a population sink.	
CONSTRUCTION AND OPERATION – ALL PHASES The loss of high value invertebrate habitats across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (See A to O and T to X).	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net loss of high value invertebrate habitats. Delivery of sensitive lighting plan	Habitat protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION Ongoing annual dormouse tube monitoring to inform licencing requirements for each phase of the project. CONSTRUCTION Avoidance of hedgerow severance within 150m of confirmed records (currently only within woodland north of solar farm). OPERATION No lighting associated with road crossings of woodland copses CONSTRUCTION AND OPERATION Installation of suitable aerial structure (e.g. Peoples Trust for Endangered Species, 2019[94]) across roads severing woodland, in combination with suitable planting to strengthen vegetated corridors OPERATION Provision of replacement woodland adjacent to key retained woodland corridor to ensure no net loss of habitat and to maximise availability of food plants throughout the active part of the year. CONSTRUCTION AND OPERATION Provision of 150 dormouse nest boxes within retained woodland corridors to maximise and extend suitable nesting habitats. Annual nest box monitoring to be carried out.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of the favourable conservation status of dormouse on site.	Dormouse Strategy approved pre-construction. EPS licence secured as required.

94 https://ptes.org/wp-content/uploads/2019/09/White-Hughes-2019-dormouse-bridge.pdf

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION Sensitive woodland management to restore and maximise opportunities for dormouse (e.g. Forestry Commission 2019[95] and the Hampshire Dormouse Group[96]) OPERATION Provision of suitable advice in homeowner packs and on information boards regarding dormouse and responsible enjoyment of the countryside. NB access is limited to key habitats suitable for dormouse.				
CONSTRUCTION AND OPERATION – ALL PHASES An invasive species management plan will be implemented to control the existing populations of Japanese Knotweed, Himalayan Balsam, Variegated Yellow Archangel, Rhododendron, Mink and other non-native species, present on site.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No spread of invasive species. Measures implemented to control invasive species on site.	Invasive Species Strategy approved pre-construction. Protection measures delivered during construction by CEMP LEMP agreed prior to construction

95 Forestry Commission. 2019. A Protocol fo Undertaking Woodland Management in England Where Dormice Are Present. Protocol Version 4.

96 https://hampshiredormousegroup.co.uk/resources/woodland-habitat-management/

CHAPTER 11: HYDROLOGY

11.1 INTRODUCTION

11.1.1 This chapter of the ES has been produced by PFA Consulting Ltd to assess the Proposed Development in relation to the effects it would have upon Hydrology.

11.1.2 This chapter contains an assessment of the likely significant effects that the Proposed Development would have on the water environment and, where necessary, identifies mitigation measures in accordance with relevant legislation, planning policies, guidance, and statutory requirements in respect of flood risk, surface water drainage and surface water quality. This assessment is supported by:

- A detailed Flood Risk Assessment (FRA) and Drainage Strategy for the Wider OPA produced by PFA Consulting Ltd contained in Appendix 11.1 in Volume 2 of this ES;
- A detailed FRA and Drainage Strategy for OPA Phase 1 produced by Odyssey contained in Appendix 11.2 in Volume 2 of this ES;
- A detailed Nitrate Neutrality Study produced by Hilson Moran contained in Appendix 11.3 in Volume 2 of this ES;
- A Nitrate Neutrality Study – First Residential Parcel produced by Hilson Moran contained in Appendix 11.4 in Volume 2 of this ES; and
- A Water Quality Outline Monitoring and Management Plan produced by Johns Associates contained in Appendix 11.5 of Volume 2 of the ES.

11.2 ASSESSMENT CRITERIA & METHODOLOGY

11.2.1 This section of the chapter references previous assessments undertaken in relation to the Wider OPA Site; the Screening Opinion issued by Eastleigh Borough Council; the legislation, policy, published standards, guidance and best practice relevant to the assessment; and the method by which the baseline has been established.

Previous Assessment

11.2.2 A 'Water Environment' ES Chapter was produced for West Horton Heath in December 2014 and an addendum to that Chapter was produced in October 2016 for North West Horton Heath. These assessments concluded that all construction effects could be successfully

mitigated and that, after mitigation, the residual effects of the operation phase would range from Moderate Adverse to Moderate Beneficial.

11.2.3 This ES Chapter is produced independently of the previous studies.

Scoping Opinion

11.2.4 An EIA Scoping Opinion was issued by Eastleigh Borough Council on 12 August 2020. Comments relevant to this chapter are summarised below:

- The assessment of flood risk should demonstrate how flood risk will be managed now and over the lifetime of the proposed development, ensuring that the latest climate change guidance is taken into account, that a sequential approach to the site layout should be taken and that the assessment is in line with national planning policy and guidance.

- The surface water drainage strategy should include information on water management across the site before, during, post-construction and for the longer term operation once development is completed and the site occupied/in use. The water management strategy should maintain existing sub catchments and ensure adequate space is provided in the masterplan for robust and effective Sustainable Drainage (SuDS) systems within connected blue-green infrastructure, in order to ensure that sensitive wetlands and receiving waters are protected.

- The term ‘water management strategy’ should be used in the ES and subsequent application documents rather than ‘surface water drainage strategy’ to ensure all hydrological sources and receptors (especially hydro-ecology) are covered for the lifetime of the site.

- The assessment must feed into and link to the biodiversity section, and both should include the nearby designated-site wetland habitats and water dependent ecological features in the list of receptors.

- Appropriate and effective ongoing monitoring (before, during, post construction and over the operational lifetime of the site) of hydrological impacts on sensitive receptors, and of the effectiveness of SuDS in reducing flood risk and protecting water quality of the sensitive receiving waters, must be incorporated in any water management (sustainable drainage) strategy and the ES should include further information in this respect.

11.2.5 These comments have been addressed in the production of the FRA which contains a water management (sustainable drainage) strategy and in the assessment below. Furthermore, the scheme has been developed iteratively to ensure effects on sensitive ecological (biodiversity) and hydrological receptors have been appropriately mitigated and that the site layout incorporates coherent blue-green infrastructure. Design mitigation and additional mitigation measures (including monitoring) are discussed in the sections below.

Legislative Context

11.2.6 This section summarises those pieces of legislation that are directly relevant to surface water drainage, surface water quality and flood risk which have been acknowledged in the preparation of this ES chapter. Please note that this is not exhaustive and focuses on the key pieces of legislation. The sustainable use and management of water resources is the key driver behind all legislation detailed below.

International and European Legislation

Water Framework Directive (2000/60/EC)

11.2.7 The Water Framework Directive (WFD) aims for a more integrated approach to water management. It sets the target for all waters, both surface and groundwater, to achieve 'Good' status by 2027. Good status refers to ecological and chemical status for surface waters and both chemical and quantitative status for groundwaters.

National Legislation

Flood and Water Management Act 2010

11.2.8 The Act was established to provide better, more comprehensive management of flood risk. The Act creates Lead Local Flood Authorities (LLFA) at the Unitary Authority and County Council level. The LLFA is responsible for managing the risk of all 'local floods'. In this instance the LLFA is Hampshire County Council.

Water Resources Act 1991

11.2.9 The Act sets out the regulatory controls and restrictions that provide protection to the water environment through controls on abstraction, impounding and discharges as well as identifying water quality and drought provisions.

11.2.10 It ensures that any works that potentially impact a 'Main River' need to be consented by the Environment Agency.

Land Drainage Act 1991

11.2.11 The Act places the responsibility for the maintenance of ordinary watercourses on the riparian landowners.

11.2.12 The amended Act ensures that any channel works cannot be undertaken without prior authorisation from the LLFA or (where relevant) the Internal Drainage Board.

Salmon and Freshwater Fisheries Act 1975

11.2.13 The Act makes it an offence for polluting activity that can cause the waters to be poisonous or injurious to fish or the spawning grounds, spawn or food of fish and contains other provisions to protect migration routes.

Planning Policy and Guidance

11.2.14 This section summarises the national and local policies and guidance relevant to surface water drainage and flood risk.

National Planning Policy

11.2.15 Paragraphs 155 – 165 in the National Planning Policy Framework (NPPF) set out the national planning policy in relation to planning and flood risk and is supported by the 'Flood Risk and Coastal Change Planning Practice Guidance'.

11.2.16 Both the NPPF and its Guidance highlight the need to avoid inappropriate development in areas at risk of flooding and the need to make development safe from flooding without increasing flood risk elsewhere.

11.2.17 The Planning Practice Guidance references the Government's 'Non-statutory Technical standards for sustainable drainage systems'[1] which relate to the design, construction, operation and maintenance of sustainable drainage systems and have been published as guidance. It contains standards for peak flow and volume control and management of flood risk within the development.

[1] Department for Environment, Food and Rural Affairs (March 2015) 'Non-statutory technical standards for sustainable drainage systems'

Local Planning Policy

Current Planning Policy

11.2.18 The Eastleigh Borough Council Local Plan review (2001 – 2011) contains saved policies relevant to this assessment:

- Policy 41.ES – Development affecting water courses.
- Policy 42.ES – Development in a catchment of a water course.
- Policy 43.ES – Areas at risk of flooding.
- Policy 45.ES – Sustainable Drainage.

Emerging Planning Policy

11.2.19 The Eastleigh Borough Local Plan 2016 – 2036 was submitted in October 2018 for public examination. The following policies in the submitted Local Plan are relevant to this assessment:

- Policy DM3 – Adaptation to climate change.
- Policy DM5 – Managing flood risk.
- Policy DM6 – Sustainable surface water management and watercourse management.
- Policy DM10 – Water and Waste Water.
- Policy DM11 – Nature conservation.

Guidance / Best Practice

Strategic Flood Risk Assessment (SFRA)

11.2.20 The Strategic Flood Risk Assessment[2] (SFRA) was produced for the Partnership for Urban South Hampshire (PUSH) in December 2007. The SFRA provides an overview of flood risk from all sources including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources. The SFRA also includes guidance specific to

[2] Atkins (2007) Partnership for Urban South Hampshire Strategic Flood Risk Assessment Final Report

Eastleigh Borough. This includes a qualitative assessment of the likely effects of new development and guidance on the preparation of site specific Flood Risk Assessments, including the use of Sustainable Drainage Systems (SuDS).

11.2.21 A SFRA 2016 Update[3] was produced to inform emerging Local Plans and other policy documents within the PUSH area. This included taking account of updates to national planning policy and guidance since the publication of the 2007 SFRA.

The SuDS Manual

11.2.22 The SuDS Manual[4] provides best practice information on the design, construction, operation and maintenance of Sustainable Drainage Systems (SuDS). It promotes the use of a SuDS 'management train', which seeks to address the quality and quantity of runoff at all stages of a drainage system.

Hampshire County Council Guidance

11.2.23 Hampshire County Council is in the process of publishing a series of Technical Guidance (TG) Notes. TG8-1 to TG8-6 will outline the standards for drainage but have yet to be published.

11.2.24 Hampshire County Council in its role as the LLFA has also published an information leaflet for developers covering the principles and application and SuDS. The information provides guidance on sources of further information and how to obtain pre-application advice. In January 2020 Hampshire County Council published a Surface Water Checklist for developers.

Baseline Data Collection

11.2.25 The following sources of information have been reviewed, to establish the baseline and future conditions:

- Site Parameter Plans;
- Ordnance Survey 1:25,000 scale Maps;
- Topographical Survey;
- Environment Agency website and online mapping;

[3] Eastern Solent Coastal Partnership (2016) Partnership for Urban South Hampshire Strategic Flood Risk Assessment (SFRA) Update - 2016

[4] CIRIA (2015) 'The SuDS Manual' CIRIA C753

- Environment Agency Modelled Flood Levels;
- Ground Investigation Report[5], including soakage testing;
- Soil Site Report[6];
- Cranfield Soil and AgriFood Institute (CSAI) Soilscapes dataset;
- British Geological Survey© (2020) NERC online mapping;
- Southern Water Asset Mapping;
- Partnership for Urban Hampshire Strategic Flood Risk Assessment (SFRA), 2007;
- Partnership for Urban Hampshire SFRA 2016 Update, 2016; and
- A site walkover was undertaken in July 2018 to inform the FRA and Drainage Strategy for the Wider OPA and in February 2020 to inform the Nitrate Neutrality Study;

Assessment Methodology

11.2.26 A general assessment methodology is presented in Chapter 5. How this methodology is applied to the Hydrology subject area is set out in the section below.

Flood Risk Assessment and Drainage Strategy

11.2.27 The assessment draws upon a more detailed Flood Risk Assessment (FRA) for the Wider OPA contained in Appendix 11.1 in Volume 2 of this ES.

11.2.28 The Wider OPA FRA assesses the flood risk to and from the Site from all sources including:

- Fluvial (flooding from watercourses);
- Pluvial (direct rainfall and surface water flooding);
- Groundwater;

[5] Hydrock (2019) Horton Heath, Hampshire Ground Investigation Report. Document reference: HHD-HYD-XX-XX-RP-GE-0002

[6] National Soil Resources Institute (2018) Soils Site Report for location 448946E, 116881N, 2km x 2km, National Soil Resources Institute, Cranfield University.

- Overwhelmed Sewers and Drainage Systems; and
- Artificial Sources.

11.2.29 The Wider OPA FRA demonstrates how flood risk will be managed now and over the Proposed Development's lifetime, taking climate change into account, and with regard to the vulnerability of its users.

11.2.30 A Water Management Strategy (including the application of SuDS) for the Wider OPA is contained within the Wider OPA FRA along with information on the future operation and maintenance of the proposed on-site drainage systems.

11.2.31 The FRA and Drainage Strategy for OPA Phase 1 contained in Appendix 11.2 in Volume 2 of this ES provides the necessary details for the SuDS in OPA Phase 1 to deliver the concepts set out in the Wider OPA FRA and Drainage Strategy.

Receptor Sensitivity

11.2.32 Generic receptor sensitivity has been classified in Chapter 5 on a scale ranging from 'Negligible' to 'Very High'.

11.2.33 In terms of hydrology, flood risk and surface water quality the receptor sensitivity will be assessed as shown in Table 11.1 below. These categories are derived from legislative controls, designated status, number of individual receptors, characteristics (such as rarity or condition of the receptor) and the ability of the receptor to tolerate and adjust to change.

Table 11.1: Receptor Sensitivity

Sensitivity	Description
Very High	• Local Residents (persons and property) • National or Internationally Designated Areas e.g. Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site, or National Nature Reserve. • Nationally or Internationally protected species. • Functional Floodplain or flood storage area (Flood Zone 3b).
High	• Watercourse, waterbody or wetland with 'High' quality. • Areas with a 'High' probability of flooding (Flood Zone 3a).
Medium	• Non statutory sites of regional or local importance e.g. Local Nature Reserve (LNR) or Site of Importance for Nature Conservation (SINC). • Areas with a 'Medium' probability of flooding (Flood Zone 2). • Watercourse, waterbody or wetland with 'Good' quality.
Low	• Watercourse, waterbody or wetland with 'Moderate' quality. • Areas benefiting (protected) from flood defences.
Very Low	• Areas with a 'Low' probability of flooding (Flood Zone 1). • Unclassified Ordinary Watercourses.
Negligible	• Watercourse, waterbody or wetland with 'Poor' or 'Bad' quality or a Heavily Modified Waterbody (including drainage ditches).

Magnitude of Change

11.2.34 The criteria to assess the magnitude of the effects are set out in Table 11.2 and are derived from the spatial scale, permanence and severity of the effects.

Table 11.2: Magnitude of Change

Sensitivity	Description
Very High	Long term, permanent and severe changes to the hydrology (flood risk, flow characteristics of watercourses, and habitat quality) or water quality. • Increase/decrease in whole catchment risk of flooding. • Large loss/addition of floodplain storage. • Severe permanent deterioration/improvement of water quality, habitat quality or flow characteristics of a watercourse at a regional scale.
High	Long term, permanent or severe changes to the hydrology (flow characteristics of watercourses, and habitat quality) or surface water quality or flood risk. • Increase/decrease in sub-catchment risk of flooding. • Loss/addition of floodplain storage. • Significant permanent deterioration/improvement of water quality, habitat quality or flow characteristics of a watercourse at a local to regional scale.
Medium	Material short to medium term local changes to hydrology or surface water quality or flood risk. • Increase/decrease in flood risk affecting the Site and its immediate vicinity. • Minor loss/addition of floodplain storage. • Moderate changes to the habitat quality or flow characteristics of a watercourse. • Severe temporary reduction or moderate local scale improvement in the quality of surface water resources.
Low	Measurable but immaterial changes to hydrology or surface water quality or flood risk. • Increase/decrease in flood risk to the Site. • Minor changes to habitat quality or flow characteristics of a watercourse. • Minor local scale reduction (reversible with time) or improvement in the quality of surface water.
Very Low	Measurable, immaterial and temporary changes to hydrology or surface water quality or flood risk. • Temporary minor increase/decrease in flood risk to the Site. • Temporary and minor changes to habitat quality or flow characteristics of a watercourse. • Minor, temporary and local scale reduction (reversible with time) or improvement in the quality of surface water.
Negligible	No appreciable effect on hydrology or surface water quality or flood risk.

Effect Significance

11.2.35 The significance of effects is determined by combining the predicted magnitude of change with the assigned sensitivity of the receptor and can be classified as ‘Substantial’, ‘Major’, ‘Moderate’, ‘Minor’, ‘Neutral’ and described as ‘Adverse’ or ‘Beneficial’ in accordance with Table 5.2 in Chapter 5 of this ES.

11.2.36 All effects classified ‘Moderate’ or above require additional assessment regarding their significance in EIA terms. ‘Minor’ and ‘Neutral’ effects are considered to not be significant in EIA terms.

11.2.37 Effects can also be described as direct, indirect, reversible, irreversible, cumulative, temporary, and permanent.

Geographical Scope

11.2.38 The geographical scope of this assessment will focus on the Wider OPA Site (including the OPA Phase 1 Site), watercourses flowing within and along the boundary of the Wider OPA Site and OPA Phase 1 Site, watercourses that may affect the Wider OPA Site and OPA Phase 1 Site (i.e. an off-site watercourse with an associated floodplain or overland flow path that affects the Wider OPA Site or OPA Phase 1 Site) and watercourses downstream of the Wider OPA Site and OPA Phase 1 Site in the context of the interlinked wider hydrological system associated with the River Itchen catchment draining into Southampton Water and the Solent.

Temporal Scope

11.2.39 The temporal scope will cover the construction and occupation phases of the OPA Phase 1 and the Wider OPA. This will include an assessment of the baseline environment, assessment of the construction phase during the timeframe envisaged for construction, and an assessment of the occupation phase both in the medium and longer term, taking the potential effects of climate change into account.

Assumptions & Limitations

11.2.40 The assessment of the significance of the effects of the Proposed Development on the water environment is based upon the assumption that the baseline data is appropriate and that any mitigation measures proposed will be delivered during the detailed design of the scheme and maintained throughout their lifetime to ensure their effectiveness.

11.3 CONSULTATION

11.3.1 The FRA and Water Management Strategy has been produced in consultation with the Lead Local Flood Authority (LLFA), the Environment Agency and Southern Water.

11.3.2 A pre application meeting with Hampshire County Council in its role as the LLFA was completed in January 2020. There was broad agreement of the surface water drainage strategy consisting of Strategic SuDS features and upstream Source Control. It was agreed that the Strategic SuDS features would incorporate a series of treatment processes, i.e. sediment forebays, micropools, low flow channels, wetland planting areas and swales for outfalls where possible with flow rates for the 1 in 100 year + 40% rainfall event being restricted to Q_{BAR}/Q_{MED} of the natural catchment as closely as possible. The upstream Source

Control and green infrastructure measures are be covered by text within the FRA to inform later detailed designs. The submission would be supported by Micro Drainage Source Control modelling outputs for the Strategic SuDS features.

11.3.3 As part of the Environmental Statement Scoping exercise, the emerging Water Management / SuDS Strategy was presented to the Environment Agency and to Eastleigh Borough Council at an online meeting in March 2020.

11.3.4 The Environment Agency was consulted via email in May 2020 and the flood risk data was provided by the Environment Agency in June 2020. This included modelled flood levels for the on-site watercourses and details of flood defences and historic flood events. An additional enquiry was raised with the Environment Agency relating to flood levels downstream of the Quobleigh Pond and in the vicinity of Moon River. This additional information was provided by the Environment Agency in July 2020.

11.3.5 High level strategic meetings were held with Southern Water in July and August 2018 and topics covered included greywater reuse on the site and on-site wastewater treatment. These processes have subsequently been discounted and an adoptable on-site sewer network with a pumped connection to the public foul sewerage network is now proposed to manage waste water from the proposed development on the Site. Discussions regarding the point of connection to the public sewer network are ongoing with Southern Water. The delivery of a S98 sewer requisition is separate to the planning process.

11.4 BASELINE ENVIRONMENT

11.4.1 This section describes the Site in the context of the hydrological (surface water) environment; and sets the baseline conditions which the potential effects of the Proposed Development can be assessed against.

OPA Phase 1

Hydrological Context

Watercourses

11.4.2 A number of drainage features and watercourses are present within the OPA Phase 1 Site. An ordinary watercourse bisects the northern area of the OPA Phase 1 Site and flows from

southeast (adjacent to Burnetts Lane) to west (running north of Charlcroft Farm, and south of the Solar Farm and eventually into an unnamed 'Main River' to the north west of the OPA Phase 1 Site). The OPA Phase 1 Site falls within the wider catchment of the River Itchen. No other water bodies are identified in the OPA Phase 1 Site.

Catchment Hydrological Characteristics

11.4.3 The Soils Site Report classifies the soils by their HOST (Hydrology of Soil Type) Class. The western area of the OPA Phase 1 Site falls into HOST Class 25 which is defined as "*Slowly permeable, seasonally waterlogged soils over impermeable clay substrates with no storage capacity*". The Cranfield Soil and AgriFood Institute (CSAI) Soilscapes dataset map indicates that soils in the area are classified as 'impeded drainage' which refers to tight, compact deep subsoil that impedes downward water movement which after heavy rainfall the subsoil becomes waterlogged, particularly during the winter. HOST Class 25 soils have a Standard Percentage Runoff (SPR) of 49.6%.

11.4.4 The eastern area of the OPA Phase 1 Site falls into HOST Class 3, which is defined as "*Free draining permeable soils on soft sandstone substrates with relatively high permeability and high storage capacity*". The Cranfield Soil and AgriFood Institute (CSAI) Soilscapes dataset map indicates that soils in the area are classified as 'freely draining' which refers to soils which absorb rainfall readily and allow it to drain through to underlying layers. HOST Class 3 soils have a SPR of 14.5%.

11.4.5 The OPA Phase 1 Site therefore has variable underlying soils and has a variable response to rainfall.

Surface Water Drainage

11.4.6 The OPA Phase 1 Site currently comprises largely undeveloped greenfield land. In its undeveloped state the surface water runoff from the OPA Phase 1 Site drains into the on-site watercourses by overland and subsurface flow. The existing access track which connects to Chalcroft Farm drains into the adjacent drainage ditches and the ordinary watercourse described above by overland flow.

11.4.7 No public surface water sewers are identified on the OPA Phase 1 Site.

Historic Pollution Incidences

11.4.8 The Environment Agency maintains a register of pollution incidents. Inspection of the data reproduced in the Ground Investigation Report shows that there are no historic pollution incidences on the OPA Phase 1 Site.

Discharge Consents / Permits

11.4.9 No active Environmental Permits (formerly known as Discharge Consents) are identified on the OPA Phase 1 Site.

Abstraction Licence

11.4.10 No active Abstraction Licences are identified on the OPA Phase 1 Site.

Flood Risk

11.4.11 A detailed FRA for the OPA Phase 1 Site has been produced to support this assessment and is contained in Appendix 11.2 in Volume 2 of this ES and is summarised below.

Flood Source: Watercourses and Surface Water

11.4.12 The OPA Phase 1 Site is predominately at Very Low risk of flooding from watercourses (located entirely in Flood Zone 1) and from surface water runoff or localised accumulations of surface water as a consequence of an intense rainfall event.

11.4.13 Areas of elevated surface water flood risk (Low, Medium and High) are associated with the low lying areas adjacent to the existing access track, hedgerow and ditches which bisects the OPA Phase 1 Site and around the on-site watercourses.

Flood Source: Groundwater

11.4.14 The OPA Phase 1 Site is predominately underlain by Wittering Formation (Sand, Silt and Clay) bedrock with a small area of Earnley Sand Formation (Sand, Silt and Clay) in the southeast corner of the Site. Alluvium (Clay, Silt, Sand and Gravel) superficial deposits are associated with the areas underlying on-site watercourses.

11.4.15 The underlying Bedrock and Superficial deposits are classified as a Secondary A aquifers which are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

11.4.16 It is considered that groundwater could be shallow on the site and shallowest in proximity to the on-site watercourses. If groundwater were to emerge it would follow a similar route to surface water flooding discussed in the section above and collect at low lying areas of the OPA Phase 1 Site adjacent to watercourses.

11.4.17 The majority of the OPA Phase 1 Site is at Low risk of flooding from groundwater with areas of elevated risk associated with the low lying areas in proximity to on-site watercourses.

Flood Source: Overwhelmed Sewers

11.4.18 No public sewers are identified on the OPA Phase 1 Site. There are no known instances of flooding from overwhelmed sewers affecting the OPA Phase 1 Site. The risk of flooding from overwhelmed sewers is therefore assessed as Low.

Flood Source: Artificial

11.4.19 The GOV.UK Flood risk from reservoirs map indicates the OPA Phase 1 Site is unaffected by flooding from any reservoirs and no significant waterbodies are identified which are considered to pose a risk. The risk of artificial flood hazards affecting the OPA Phase 1 Site is considered to be Very Low.

Historic Flood Risk

11.4.20 No historic flood risks have been identified on the OPA Phase 1 Site.

Environmental and Surface Water Quality

On-site Watercourses, Waterbodies and Wetland Areas

11.4.21 No watercourses, waterbodies or wetland areas within the OPA Phase 1 Site are designated for its nature conservation value or assessed by the Environment Agency against WFD quality targets.

Off-site Watercourses, Waterbodies and Wetland Areas

11.4.22 The OPA Phase 1 Site is located within the catchment of the River Itchen. The River Itchen corridor is designated as a Special Area of Conservation (SAC) and as a Site of Special Scientific Interest (SSSI). The boundary of the designated site is approximately 2.1km downstream of the OPA Phase 1 Site.

11.4.23 The unnamed Main River to the northwest runs through Field West of Treeline Break SINC and Treeline Break SINC.

11.4.24 There are a number of other designated sites downstream of the OPA Phase 1 Site which depend on the water environment. These are summarised in Table 11.4 below.

Table 11.4: Environmental Designations

Environmental Designation	Area(s) affected
Ramsar Sites	Downstream reaches of the River Itchen and Southampton Water
Local Nature Reserves (LNR)	Areas adjacent to River Itchen and Southampton Water downstream of the Site.
Sites of Special Scientific Interest (SSSIs)	Following River Itchen corridor and adjacent to Southampton Water.
Special Areas of Conservation (SACs)	Following River Itchen corridor and adjacent to Southampton Water (Solent Maritime SAC).
Special Protection Areas (SPAs)	River Itchen through Southampton and areas adjacent to Southampton Water
Nitrate Vulnerable Zones 2017 – Eutrophic Water	The Wider OPA Site and the wider River Itchen catchment.

11.4.25 The designated sites downstream of the OPA Phase 1 Site are sensitive to land use change across their catchment with specific sensitivities to fine sediment and nutrient enrichment (with a particular focus on Nitrogen levels).

Foul Water

11.4.26 The OPA Phase 1 Site is undeveloped and not served by any public sewers. The OPA Phase 1 Site lies in the catchment of the Chickenhall Wastewater Treatment Works (WwTW) which is located 2.6km to the north west of the OPA Phase 1 Site and discharges to the River Itchen.

The Wider OPA

Hydrological Context

Watercourses

11.4.27 A number of drainage features and watercourses are present within the Wider OPA Site. The watercourses within the Wider OPA Site are tributaries of the River Itchen which is located approximately 1.5km to the west of the Wider OPA Site's boundary.

11.4.28 The watercourse on the western boundary of the Wider OPA Site is classified as a 'Main River' and flows from south to north under Allington Lane and into the River Itchen to the south of Chickenhall Lane Wastewater Treatment Works (WwTW). All other on-site watercourses discharge into this unnamed 'Main River'.

11.4.29 An ordinary watercourse is present on the Wider OPA Site's southern boundary to the north of Chalcroft Business Park and drains from southeast to north. A second ordinary watercourse bisects the southern area of the Wider OPA Site and flows from southeast (adjacent to Burnetts Lane) to west (running north of Charlcroft Farm, and south of the Solar Farm). A third ordinary watercourse bisects the central area of the Wider OPA Site and flows from east (in the vicinity of Horton Heath) to west (to the north of the Solar Farm). A number of smaller ditches drain into the on-site watercourses and are adjacent to existing highways which cross the Wider OPA Site located within hedgerows.

11.4.30 A second 'Main River' bisects the north western area of the Wider OPA Site and flows from north east to west to the north of Firtree Farm. This watercourse is known locally as the Fair Oak Stream.

11.4.31 A number of ponds are also present on the Wider OPA Site and in its immediate vicinity. A pond is present within the Chalcroft Farm site and another is present adjacent to the Fair Oak Stream in an area of woodland to the north of Firtree Farm. Quobleigh Pond is located to the north of the Wider OPA Site on the Fair Oak Stream and an unnamed pond is present to the west of the site to the west of the unnamed 'Main River' and south of Allington Lane. These waterbodies are supplemented by a number of ephemeral pools associated with the small watercourses on the Wider OPA Site.

11.4.32 The natural catchments of the on-site watercourses are defined by the Wider OPA Site's topography.

Catchment Hydrological Characteristics

11.4.33 The Soils Site Report classifies the soils by their HOST (Hydrology of Soil Type) Class. The majority of the Wider OPA Site falls into HOST Class 25 which is defined as "*Slowly permeable, seasonally waterlogged soils over impermeable clay substrates with no storage capacity*" which is classified as 'impeded drainage' with a Standard Percentage Runoff (SPR) of 49.6%[7].

11.4.34 A small area in the south-east of the Wider OPA Site falls into HOST Class 3, which is defined as "*Free draining permeable soils on soft sandstone substrates with relatively high permeability and high storage capacity*" which is classified as 'freely draining' with a SPR of 14.5%.

[7] Institute of Hydrology (1995) Report No. 126 Hydrology of soil types: a hydrologically-based classification of the soils of the United Kingdom.

11.4.35 The majority of the Wider OPA Site is therefore in an area with a high standard percentage runoff and would respond rapidly to rainfall.

Surface Water Drainage

11.4.36 The Wider OPA Site currently comprises largely undeveloped greenfield land. In its undeveloped state the surface water runoff from the Wider OPA Site drains into the on-site watercourses by overland and subsurface flow.

11.4.37 It is likely that the small amount of existing development on the Wider OPA Site drains into on-site watercourses through direct piped connections or via overland flow.

11.4.38 No public surface water sewers are identified on the Wider OPA Site.

Historic Pollution Incidences

11.4.39 Inspection of the Environment Agency register of pollution incidents reproduced in the Ground Investigation Report shows that there are no historic pollution incidences on the site. However, there are records on the Wider OPA Site's southern boundary likely associated with activities on the Chalcroft Business Park. These included a 'Minor (Category 3)' incident in 2002 associated with Oils and Fuel and a 'Significant (Category 2)' incident in 2002 associated with Diesel. Other pollution incidences recorded are remote from the Site and are unlikely to have affected the water environment on the Wider OPA Site.

Discharge Consents / Permits

11.4.40 The Environment Agency maintains a public register of Environmental Permits (formerly known as Discharge Consents).

11.4.41 Two Environment Permits are present on the Chalcroft Business Park associated with the discharge of treated sewage effluent. One active Environmental Permit is located on the eastern boundary of the Wider OPA Site related to the Burnetts Lane sewage pumping station operated by Southern Water which has an outfall into the ordinary watercourse which runs to the north of the Solar Farm.

Abstraction Licence

11.4.42 The Environment Agency maintains a register of Abstraction Licences. Inspection of the data reproduced in the Ground Investigation Report shows that there are no active Abstraction Licences on the Wider OPA Site. The nearest surface water abstraction is located 0.25km to the west of the site associated with the unnamed 'Main River' for use as Spray Irrigation by Allington Manor Farm. Other abstraction licences are present downstream of the Wider OPA Site.

Flood Risk

11.4.43 A detailed FRA for the Wider OPA has been produced to support this assessment and is contained in Appendix 11.1 in Volume 2 of this ES.

11.4.44 The FRA assesses the flood hazards on the Wider OPA Site from all sources - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources. The FRA is summarised below.

Flood Source: Watercourses and Surface Water

11.4.45 The Wider OPA Site is predominately at Very Low risk of flooding from watercourses and from surface water runoff or localised accumulations of surface water as a consequence of an intense rainfall event.

11.4.46 Areas of elevated watercourse and surface water flood risk (Low, Medium and High) are associated with the routes and low lying areas around the on-site watercourses.

11.4.47 Areas of Flood Zones 2 and 3 are present along the unnamed Main River which forms the Wider OPA Site's western boundary and Fair Oak Stream which bisects the northern area. The remainder of the Wider OPA Site is defined as Flood Zone 1.

11.4.48 Areas of High, Medium and Low surface water flood risk are restricted to the naturally defined channels of the on-site watercourses and a small number of isolated low lying areas within the Wider OPA Site, including the western extent of Fir Tree Lane. The remainder of the Wider OPA Site is at Very Low risk of surface water flooding.

Flood Source: Groundwater

11.4.49 Groundwater flooding is most likely to occur in low-lying areas underlain by water-bearing permeable rocks such as sands, gravels, limestone and chalk. Groundwater flooding occurs as a result of water rising from the underlying rocks or from water flowing from abnormal springs. This tends to occur after long periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. In low-lying areas the water table is usually at shallower depths, so during very wet periods, all the additional groundwater flowing towards these areas can cause the water table to rise to the surface causing groundwater flooding.

11.4.50 The Wider OPA Site is predominately underlain by Wittering Formation (Sand, Silt and Clay) bedrock with a small area of Earnley Sand Formation (Sand, Silt and Clay) in the southeast corner of the Wider OPA Site. Alluvium (Clay, Silt, Sand and Gravel) superficial deposits are associated with the areas underlying on-site watercourses.

11.4.51 The underlying Bedrock and Superficial deposits are classified as a Secondary A aquifers which are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

11.4.52 With respect to Groundwater the Ground Investigation Report states "*Groundwater is anticipated to be shallow within Alluvium and River Deposits in the vicinity of the streams within the site. Groundwater within the Wittering Formation is anticipated to be a similar elevation to the streams or forming a hydraulic gradient to the groundwater levels in the superficial deposits*". As part of the investigatory work which supported the Ground Investigation Report, 10 Boreholes were drilled across the Wider OPA Site and groundwater levels recorded during post-fieldwork monitoring in the winter months. Groundwater levels varied between 0.9m below ground level (m bgl) and 3.04m bgl. It is considered that groundwater could be shallow on the site and shallowest in proximity to the on-site watercourses.

11.4.53 If groundwater were to emerge it would follow a similar route to surface water flooding discussed in the section above and collect at low lying areas of the Wider OPA Site adjacent to watercourses.

11.4.54 The majority of the Wider OPA Site is at Low risk of flooding from groundwater with areas of elevated risk associated with the low lying areas in proximity to on-site watercourses.

Flood Source: Overwhelmed Sewers

11.4.55 No public sewers are identified on the Wider OPA Site. There are no known instances of flooding from overwhelmed sewers affecting the Wider OPA Site. The risk of flooding from overwhelmed sewers is therefore assessed as Low.

Flood Source: Artificial

11.4.56 The GOV.UK Flood risk from reservoirs map indicates the Wider OPA Site is unaffected by flooding from any reservoirs.

11.4.57 No significant waterbodies are identified upstream of the Wider OPA Site which are considered to pose a risk to the Wider OPA Site.

11.4.58 The risk of artificial flood hazards affecting the Wider OPA Site is considered to be Very Low.

Historic Flood Risk

11.4.59 The Wider OPA Site and the vicinity have been subject to historic flood events. This includes Allington Lane and Fir Tree Lane which both suffer from frequent silting and damage to the existing ditches and regular routine maintenance is required.

11.4.60 The Moon River development at the confluence of the unnamed Main River and the Fair Oak Stream has also suffered historic flooding.

Environmental and Surface Water Quality

On-site Watercourses, Waterbodies and Wetland Areas

11.4.61 Only one on-site watercourse, waterbody or wetland area is designated for its nature conservation value. The Fair Oak Stream which bisects the northern area of the site falls within a Site of Importance for Nature Conservation (SINC) (Quobleigh Pond and Woods SINC, Fair Oak School Meadow SINC, Wyvern Technical College Meadow SINC and Ponds and Meadow adjacent to Wyvern Technical College SINC). A SINC is a Local Wildlife Site. However, the Fair Oak Stream (and on-site ordinary watercourses) are not assessed by the Environment Agency against Water Framework Directive (WFD) water quality targets.

11.4.62 The unnamed Main River on the Wider OPA Site's western boundary is assessed by the Environment Agency against WFD quality targets. The area where the data is applicable is across the length of the Lower Itchen and its tributaries from Winchester in the north to Swaythling in the south. The overall status in 2019 was assessed as Moderate. The latest monitoring data is summarised in Table 11.3 below.

Table 11.3: River Quality (based on Environment Agency data)[8]

Classification Item	2019
Overall Water Body	Moderate
Ecological	Good
• Biological quality elements	Good
○ Macrophytes and Phytobenthos Combined	Good
○ Fish	High
○ Invertebrates	High
• Hydromorphological Supporting Elements	Supports Good
○ Hydrological Regime	Does Not Support Good
• Physico-chemical quality elements	High
○ Acid Neutralising Capacity	High
○ Ammonia (Phys-Chem)	High
○ Biochemical Oxygen Demand (BOD)	High
○ Dissolved oxygen	High
○ pH	High
○ Phosphate	High
○ Temperature	High
• Specific pollutants	High
Chemical	Fail
• Priority substances	Good
• Other Pollutants	Good
• Priority hazardous substances	Fail
○ Polybrominated diphenyl ethers (PBDE)	Fail
○ Benzo(g-h-i)perylene	Fail
○ Mercury and Its Compounds	Fail
○ Other Priority hazardous substances	Good

11.4.63 The reasons for not achieving 'Good' status and the reasons for deterioration in the River Itchen are listed as 'Physical modification' and 'Suspect data' affecting the Hydrological Regime Element.

11.4.64 The unnamed Main River on the Wider OPA Site's western boundary runs through Field West of Treeline Break SINC and Treeline Break SINC.

[8] Environment Agency (2020) Catchment Data Explorer

Off-site Watercourses, Waterbodies and Wetland Areas

11.4.65 The Wider OPA Site is located within the catchment of the River Itchen. The River Itchen corridor is designated as a SAC and as a SSSI. The boundary of the designated site is approximately 0.9km downstream of the Wider OPA Site.

11.4.66 The River Itchen SAC covers 304 Ha of river from New and Old Alresford at the head of the catchment to the tidal reaches in Swaythling (Southampton). The designated features include *'Rivers with floating vegetation often dominated by water-crowfoot'* (*Ranunculion* and *Batrachion* vegetation) and populations of Southern Damselfly, Freshwater Crayfish, Brook Lamprey, Atlantic Salmon, Bullhead, and Otter. The habitat notification (Code H3260) comprises the watercourse channel, its banks and part of the riparian zone in additional to parts of the floodplain.

11.4.67 Regarding the baseline quality of the River Itchen SAC and the pressures it faces the Natural England document[9] states *'The Itchen faces numerous pressures from water abstraction and flow diversions, discharges, agricultural runoff, channel modifications, fisheries management and human impacts associated with the urbanisation alongside much of the river`s valley.'.*

11.4.68 Natural England's document[10] recognises that the ''*Rivers with floating vegetation often dominated by water-crowfoot'* qualifying habitat *'has been adversely affected by nutrient enrichment, mainly from sewage inputs and agriculture, and where agriculture has caused serious siltation. It is also vulnerable to artificial reductions in river flows and to unsympathetic channel engineering works.'*

11.4.69 The River Itchen SSSI covers approximately 42km length of river from New and Old Alresford at the head of the catchment to the tidal reaches in Swaythling (Southampton). This SSSI is notified for classic chalk stream and river, fen meadow, flood pasture and swamp habitats, particularly formations of in-channel vegetation dominated by Water Crowfoot, riparian vegetation communities (including wet woodlands) and side channels, runnels and ditches associated with the main river and former water meadows. This SSSI is also notified for significant populations of the nationally-rare Southern Damselfly and assemblages of nationally-rare and scarce freshwater and riparian invertebrates, including the White-clawed

[9] Natural England (2014) Site Improvement Plan – River Itchen

[10] Natural England (2019) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features River Itchen Special Area of Conservation (SAC) Site Code: UK0012599

Crayfish. This SSSI is notified for Otter, Water Vole, freshwater fishes including Bullhead, Brook Lamprey and Atlantic Salmon, and the assemblage of breeding birds.

11.4.70 Chalk rivers are predominately groundwater fed ecosystems which typically have high water quality, relatively constant temperatures and high dissolved oxygen levels. The river and its surrounding waterways maintain high groundwater levels creating a diverse fen, swamp and meadow habitat in the low lying floodplain adjacent to the river.

11.4.71 Pressures facing the lowland reaches of the River Itchen include nutrient enrichment which can cause a shift in plant communities away from traditional chalk stream species. The River Itchen is a recreation game fishery with fishing for Atlantic Salmon occurring along its lower reaches. Atlantic salmon stock levels are identified as under pressure due to poor in-gravel egg survival caused by high levels of silt input to the river. The River Itchen SSSI Notification document states *'The majority of extra silt originates from cultivated land and point sources such as fish farms, sewage treatment works and cress farm discharges. In recent years substantial effort has been made to restore the river channel for Atlantic salmon by gravel reinstatement, cleaning and channel modifications.'*

11.4.72 The length of the River Itchen designated as an SSSI downstream of the Wider OPA Site is approximately 5km. The SSSI is divided into different management units. The management units downstream of the Site which are directly reliant on the quality of the water environment are Unit 100 'Main Habitat - Fen, Marsh and Swamp – Lowland' and Unit 108 'Main Habitat – Rivers and Steams'. Unit 100 condition is assessed as 'Unfavourable – Recovering' in 2013 and Unit 108 condition is assessed as 'Unfavourable - No change' in 2015.

11.4.73 Areas of the Solent foreshore are classified as the Solent Maritime SAC which is designated for its estuarine and Atlantic salt meadows habitat and Smooth Cord-grass vegetation. The Solent is being affected by high levels of Nitrogen and Phosphorus causing eutrophication and algal blooms resulting in changes to dissolved oxygen concentrations and smoothing of habitat ultimately causing the degradation of the designated sites. The sources of the nutrient input come from agricultural activity and treated wastewater discharges in the upstream watercourse catchments.

11.4.74 Natural England's document[11] states '*For the Solent Maritime SAC the condition assessments completed considered the SAC features across the site as a whole and found the condition of these features - estuary, mudflat & sandflats, sandbanks – to be unfavourable. The*

[11] Natural England (2020) Advice On Achieving Nutrient Neutrality For New Development In The Solent Region' (version 5 – June 2020)

unfavourable assessment is based on a number of attributes failing, including the nutrient water quality attribute. Other attributes were also found to be failing, such as, for seagrasses, their extent, distribution, rhizome structure and reproduction as well as biomass, and for the intertidal mud and sand features their infaunal quality. These failures are considered to be in part due to impacts from elevated nutrients.'

11.4.75 Natural England recognise that '*There is evidence that inputs of both phosphorus and nitrogen influence eutrophication of the water environment. However, the principal nutrient that tends to drive eutrophication in the marine environment is nitrogen and this is supported by modelling and evidence*.'

11.4.76 There are a number of other designated sites downstream of the Wider OPA Site which depend on the water environment. These are summarised in Table 11.4 above.

11.4.77 To summarise, the designated sites downstream of the Wider OPA Site are sensitive to land use change across their catchment with specific sensitivities to fine sediment and nutrient enrichment (with a particular focus on Nitrogen levels).

Foul Water

11.4.78 The Wider OPA Site is not served by any public sewers. It is assumed that all foul sewage generated by pre-existing dwellings and farmsteads is currently treated on-site by septic tanks and drainage fields, discharging leachate ultimately to local watercourses or groundwaters.

11.4.79 The Site lies in the catchment of the Chickenhall Wastewater Treatment Works (WwTW) which is located 1.7km to the west of the Site and discharges to the River Itchen.

11.4.80 In relation to the capacity of public foul water network and treatment capacity the Partnership for Urban South Hampshire (PUSH) Integrated Water Management Study[12] was published in 2018 to support Eastleigh Borough Council's 'Eastleigh Local Plan'. It states '*The growth areas in the Eastligh Borough Council area are predicted to drain to either the Chickenhall Eastleigh, Peel Common or Portswood WwTW. The water quality assessments indicated that there are no significant constraints to prevent future housing growth related to Chickenhall Eastleigh or Portswood WWTWs, although they will require upgrades to their sewer networks. Although overall no significant impact or deterioration is predicted due to future housing growth, the Peel Common WwTW may require improvements by 2025 to increase capacity in*

[12] Amec Foster Wheeler (2018) Partnership for Urban South Hampshire – Integrated Water Management Study

the WwTW, which will be subject to review in 2022. Sewer capacity upgrades are also likely to be required at this WwTW. The catchment has nitrate problems and catchment level nitrate measures are required now.'

11.4.81 The Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036[13] states in relation to Peel Common *'The possible need for an improved N discharge limit will also be reviewed in 2022.'*

11.4.82 The Wider OPA Site lies within a catchment which drains to Southern Water's WwTW. Southern Water have a statutory duty to provide sewerage conveyance and treatment infrastructure for new development and to provide additional capacity as and when required. It is Southern Water's responsibility to comply with its Environmental Permits at WwTW and their wider environmental obligations.

Future Baseline

11.4.83 For the purposes of this assessment, it is considered that the future baseline is the same as the existing baseline with respect to watercourses and surface water drainage.

11.4.84 In respect to flood hazards climate change will increase peak rainfall intensities and peak river flows. The effect of climate change on flood hazards is considered as part of the FRA. The predominant flooding mechanism across the site would remain watercourses and drainage ditches overtopping causing inundation of low lying areas adjacent to watercourse flows and shallow overland flows where topography concentrates surface water runoff when the effects of climate change are taken into account.

11.4.85 The future baseline for the surface water quality of on-site and off-site watercourses is difficult to predict due to the complexities surrounding the sources and pathways of pollution and catchment land use as a driver for water quality change. Implementation of the WFD seeks to prevent deterioration of the surface water status.

11.4.86 Natural England advocate new larger developments (in excess of 200-300 houses) within the watercourse catchments draining to the Solent achieve 'Nutrient Neutrality'. Through application of the Natural England methodology the new development does not add to existing nutrient burdens and that *'demonstrating nutrient neutrality is, in our view, able to provide sufficient and reasonable certainty that the development does not adversely affect the*

[13] Urban Edge Environmental Consulting Ltd (2019) The Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036 HRA Reort for the Submission Plan

integrity, by means of impacts from nutrients, on the relevant internationally designated sites.'.[14].

11.4.87 As such for the purposes of this assessment it is considered that the future baseline is the same as the existing baseline with respect to surface water quality and that the condition of designated sites will not deteriorate.

Summary of Receptors

11.4.88 A summary of the sensitivity of the receptors identified as part of the baseline conditions relevant to the assessment of the effect of the Proposed Development on the water environment (hydrology, flood risk and surface water quality) is set out below:

- Local Residents (persons and property) downstream of the Site – Very High
- Protected aquatic habitat and species in River Itchen SSSI and SAC – Very High
- Protected marine habitat and species in Solent Maritime SAC – Very High
- Floodplain associated with the unnamed Main River on western boundary - Very High to Medium
- Floodplain associated with Fair Oak Stream on bisecting northern areas of the site - Very High to Medium
- Protected aquatic habitat and species in adjacent SINCs (Quobleigh Pond and Woods SINC, Fair Oak School Meadow SINC, Wyvern Technical College Meadow SINC and Ponds and Meadow adjacent to Wyvern Technical College SINC) – Medium
- Surface water and environmental quality of the unnamed Main River on western boundary - Medium
- Drainage function of on-site ordinary watercourses / drainage ditches – Very Low to Negligible
- Surface water quality of on-site ordinary watercourses / drainage ditches – Very Low to Negligible

[14] Natural England (2020) Advice On Achieving Nutrient Neutrality For New Development In The Solent Region – Version 5

11.5 INHERENT DESIGN MITIGATION

11.5.1 The inherent design of OPA Phase 1 and the Wider OPA and construction management measures secured with a CEMP mitigate a range of effects associated with the delivery of the scheme. The mitigation measures are set out below design out the main effects of the both the OPA Phase 1 and Wider OPA. Where inherent design mitigation is specific to OPA Phase 1, this is highlighted below.

OPA Phase 1

Construction Mitigation

11.5.2 Management measures at the construction phase will be delivered through a Construction Environmental Management Plan (CEMP) to control runoff and pollution related risks associated with the construction processes taking place on the OPA Phase 1 Site.

11.5.3 It is the Principal Contractor's responsibility to coordinate the construction of the scheme and implement the CEMP which must adhere to the principles set out below.

Flood Risk in Construction

11.5.4 Strategic SuDS features will be constructed in the first phase of construction and flow controls should be installed upon completion of the SuDS feature and outfall arrangements.

11.5.5 Sewers will be installed in phases during construction to ensure that runoff can be intercepted by the surface water drainage scheme and any temporary construction drainage (piped or temporary ditches) will be routed through the SuDS features to minimise uncontrolled overland flows.

11.5.6 Works within or around watercourses associated with watercourse crossing should as far as practicable only occur during periods of dry weather or when water levels are low.

11.5.7 Any topsoil stockpiles should not be located close to retained trees, ditches, watercourses, SuDS features, flood risk areas and existing and future excavations. If topsoil is planned to be stockpiled for more than six months the surface of the stockpiles should be seeded with a grass/clover mix to minimise soil erosion.

Pollution Prevention

11.5.8 Proper supervision of construction activities at all stages of the project using appropriately experienced and qualified staff and supervisors with defined environmental responsibilities

and strict adherence to Health and Safety Regulations, Codes of Practice, and consent Conditions as stipulated by the Environment Agency.

11.5.9 Contractors will employ best construction site management practice, good housekeeping and adopt pollution prevention principles and measures set out in CIRIA C532 and CIRIA C692.

11.5.10 Waste storage (with segregated waste streams) and concrete washout areas will be designated to minimise the risk of pollution in areas prone to contamination.

11.5.11 Additional precautions will be taken in any areas where there is increased risk of hydrocarbon/chemical spillage and hazardous substance stores. Any relevant fuels, lubricants or chemicals will be stored in accordance with the pollution prevention principles with an impermeable base and suitable bunding to prevent discharge in the event of spillage and leakage, and the design and location will be in accordance with the Environment Agency's requirements. Drip trays will be utilised under mobile plant.

11.5.12 Effective contingency plans will be put in place to manage the risk associated with accidents and/or unforeseen circumstances. For example, contamination response procedures (including training on the use and location of spill kits) will be disseminated to the construction personnel. A suitable stock of oil booms, absorbent materials, drain covers and geotextile fencing will be kept on-site. An emergency response plan could be developed based on the Stop-Contain-Notify principal in consultation with the Environment Agency. The plan would include the need for staff training in emergency procedures and the provision of appropriate emergency response equipment.

11.5.13 The site will be adequately secured with hoarding and security staff to counteract vandalism, theft and breakage thereby minimising the risk of a pollution incident occurring by this means.

11.5.14 The on-site watercourses will be inspected regularly to check for any unforeseen discharges from the development site (changes in colour, transparency, oil sheen or foam build up, or increased siltation). If any deterioration in the quality of the on-site watercourses is identified this should be reported to the construction site manager and construction site management techniques reviewed and adjusted accordingly.

11.5.15 Site welfare facilities will be provided for construction staff and foul waste tankered from the site prior to the construction of a foul water drainage network and connection into the public sewer network.

11.5.16 The contractor will provide additional street cleaning facilities as necessary to keep supporting highways clear of mud and prevent sediment contaminating surface runoff. Wheel cleaning

facilities, appropriate stockpiling of topsoil, suitable timing of earthwork and earthmoving operations, and dust suppression measures will be used to prevent migration of sediment and other potentially polluting substances.

Silt Management

11.5.17 Dewatering of excavations may be required during construction of the scheme. Any water pumped out of excavations should be discharged via a SuDS feature (detention basin) with flow control in place. This ensures that runoff from the construction site is managed and discharged from the surface water drainage scheme at a controlled rate to minimise effect on downstream receptors. If water is heavily laden with silt, it should be pumped via a settlement tank or lagoon or other silt management techniques (e.g. Silt Busters / Silt Bags) prior to discharge to the SuDS system (detention basin). This is to ensure silt mobilised as a result of construction activities is captured at source to minimise discharge to on-site watercourses.

11.5.18 Silt fences should be erected along the boundary of watercourses to minimise silt laden runoff entering the on-site watercourses and the use of sedimats (or similar approved product) may be necessary.

11.5.19 Where active construction will not take place for more than 60 working days areas should be stabilised by temporary seeding and/or mulching or by other suitable means.

Delivery of Construction Mitigation

11.5.20 Details of environmental monitoring protocols and method statements incorporating the above measures will be outlined in a CEMP which can be subject to a planning condition.

<u>Flood Risk Design Mitigation</u>

11.5.21 The FRA contained in Appendix 11.2 sets out flood mitigation measures for OPA Phase 1 Site.

Sequential Approach to Site Layout

11.5.22 OPA Phase 1 Site is located entirely within Flood Zone 1 and the layout has been devised to provide at least a 10m buffer from on-site watercourses to built development (except for outfalls from SuDS systems, ecological improvements and watercourse crossings).

Watercourse Crossings

11.5.23 Culverting of ordinary watercourses is required to facilitate site access into future development parcels and will require Land Drainage Consent from Hampshire County Council. Through the

detailed design of watercourse crossings and the application process for Land Drainage Consent disruption to the watercourse's flow, morphology and habitat will be minimised.

Surface Water Flood Risk

11.5.24 Localised areas of surface water flood risk are present on the site as a result of topography concentrating runoff into an overland flow route or runoff accumulating in localised low spots. Where these areas are within development parcels the surface water flood risk is a result of rainfall falling on the development area. As such the provision of a surface water drainage system (as described below) will intercept and manage this rainfall and remove the flood risk as a constraint from development area.

Surface Water Runoff Mitigation

11.5.25 The OPA Phase 1 FRA contains a water management strategy involving the implementation of SuDS to manage the disposal of surface water runoff from the Proposed Development.

11.5.26 Surface water runoff from the Proposed Development will be intercepted by on-site drainage systems designed to contain the runoff from storms up to the 1 in 100 year return period, including an appropriate allowance for climate change.

11.5.27 The water management strategy comprises two elements. Strategic SuDS are embedded in the green infrastructure across the site and Source Control will be delivered within the development parcels.

11.5.28 Due to the ground conditions, the use of infiltration SuDS measures has been discounted. This is set out in the attached FRA and the drainage hierarchy has been followed.

Strategic SuDS

11.5.29 Strategic SuDS features are proposed within the green infrastructure on the site. The Strategic SuDS Features will comprise detention basins (incorporating low flow channels, micro pools, wetland areas and sediment forebays) to detain and treat the runoff.

11.5.30 Runoff will be temporarily stored within the Strategic SuDS Features before being discharged at greenfield runoff rates into on-site watercourses to mimic the natural drainage sub catchments on the site.

11.5.31 The Strategic SuDS create wetland habitat on the Site and contribute to the treatment of surface water runoff by encouraging settlement of particles, biodegradation and photolytic breakdown of pollutants and biological uptake of nutrients.

Source Control SuDS

11.5.32 Upstream Source Control in the form of areas of pervious pavement on private drives and shared parking and swales to collect runoff from localised areas creates a SuDS Management Train across the OPA Phase 1 Site. These measures ensure surface water runoff is managed as close to its source as possible.

Surface Water Quality Mitigation

SuDS and Water Quality

11.5.33 The enhanced risk of pollution as a result of the Proposed Development can be mitigated by an adequately designed surface water drainage system. All road areas and other areas that drain to gullies should pass through deep trapped gullies. All larger parking areas (>800m^2 and/or >50 parking spaces) should drain via pervious paving or pass through a separator before discharging into the downstream drainage system.

11.5.34 Sedimentation, deposition and filtration, UV action, and biological uptake by the vegetation within the Strategic SuDS and upstream Source Control features will contribute to the pollution removal capability of the surface water drainage system.

Landscape Management

11.5.35 Effects on surface water quality from the application of fertiliser, pesticides or herbicides in the landscaped areas will be mitigated by adopted good management practice such as the provision of untreated buffer strips, and not applying chemicals before periods of heavy rain. These measures will be set out in an appropriate Landscape Management Plan which will be secured by an appropriate condition.

Foul Water Drainage Strategy

11.5.36 Impacts from foul water drainage will be dealt with through connection of the site to the downstream Southern Water public foul water sewerage system. Due to site's topography, foul water flows arising from the Proposed Development will be collected in foul sewers and directed to an on-site foul water pumping station. The pumping station will pump the foul sewage to the public sewer network via a rising main. The preferred point of connection is to the public sewerage system to the south east of the development which drains to the Peel Common Wastewater Treatment Works (WwTW) which is operated by Southern Water and discharges into the Solent. The Environmental Permit for Peel Common WwTW includes provision for Total Nitrates.

Nutrient Neutrality

11.5.37 A detailed Nitrate Neutrality Study has been produced by Hilson Moran and is attached as Appendix 11.3 in Volume 2 of this ES. A Nitrate Neutrality Study – First Residential Parcel has been produced by Hilson Moran which focuses on OPA Phase 1 and is attached as Appendix 11.4 in Volume 2 of this ES.

11.5.38 Although OPA Phase 1 does not achieve nitrate neutrality in isolation, it will contribute to the betterment attained by the Wider OPA as a whole which is discussed in more detail in the sections below. The management of nutrient loadings from OPA Phase 1 is achieved through the cessation of agriculture, connection of foul flows to Peel Common WwTW, and treating nutrients in development runoff by means of a network of SUDS feature OPA Phase 1.

The Wider OPA

Construction Mitigation

11.5.39 The same measures as set out in the OPA Phase 1 section above must be adhered to and implemented by the Principal Contractor as part of the CEMP for the Wider OPA. Additional construction management measures are set out below which are specific for the Wider OPA.

Flood Risk in Construction

11.5.40 The surface water drainage scheme is designed to be delivered in a phased manner to ensure sufficient attenuation volume is available throughout the construction of the Proposed Development. Any SuDS features will be constructed at the commencement of the phase it serves and flow controls should be installed upon completion of the SuDS feature and outfall arrangements.

11.5.41 Construction activities close to the on-site watercourses should whenever practicalable be a minimum of 10m away from watercourses/ditches. Exceptions to this are where watercourse crossings are required for site access roads (including the Link Road).

11.5.42 The Principal Contractor will sign up to the Environment Agency's flood warnings for flooding from Main Rivers. Plans will be put in place to ensure any construction activities in flood risk areas will cease when a flood warning or alert is issued by the Environment Agency.

11.5.43 All construction compounds and material and plant storage areas should be located outside areas susceptible to flooding.

Pollution Prevention

11.5.44 Contractors will employ best construction site management practice, good housekeeping and adopt pollution prevention principles and measures set out in CIRIA C532 and CIRIA C692 as per OPA Phase 1.

Silt Management

11.5.45 Silt Management measures as per OPA Phase 1 should be implemented for the construction period of the Wider OPA.

Delivery of Construction Mitigation

11.5.46 Details of environmental monitoring protocols and method statements incorporating the above measures will be outlined in a CEMP which can be subject to a planning condition.

11.5.47 Works on or near a Main River (including temporary works) may require an Environmental Permit for flood risk activities from the Environment Agency. Any relevant works must comply with the permit conditions

Flood Risk Design Mitigation

11.5.48 The FRA contained in Appendix 11.1 sets out flood mitigation measures for the Wider OPA site.

Sequential Approach to Site Layout

11.5.49 With respect to the risk of flooding from watercourses, the site layout has taken a sequential risk based approach to direct development to the areas at the lowest risk of flooding. Built development (residential, school and mixed use area) are restricted to areas of Flood Zone 1. Only the Link Road, which connects Allington Lane to the north with Burnetts Lane to the south, crosses areas of Flood Zones 2 and 3 associated with the Main Rivers on the site.

11.5.50 The layout has been devised to provide at least a 10m buffer from on-site watercourses to built development (except for outfalls from SuDS systems, ecological improvements and watercourse crossings).The 10m buffer allows for easy maintenance of the watercourses and minimises disturbance to the habitat in the watercourse corridors.

Minimum Finished Floor Levels

11.5.51 Minimum ground floor levels for all built development on the site would be set at least 600mm above the 1 in 100 year annual probability flood level in any year (including an allowance for climate change) or at least 300mm above existing ground level (whichever is higher). In addition, all residential development would be set at least 10m away from a Main River. These

measures ensure the proposed dwellings will be appropriately safe and the residual flood risk is appropriately managed.

Watercourse Crossings

11.5.52 Any works crossing a Main River will be designed to ensure flood risk does not increase downstream. Any works, including embankments, which encroach on the 1 in 100 year, including an allowance for climate change, flood outline will be subject to level-for-level floodplain compensation and volume-for-volume compensation. These works are subject to detailed design and can be secured with an appropriate condition to avoid displacing flood waters. Opportunities for flood risk betterment should be explored during the detailed design of flood compensation schemes.

11.5.53 Crossings of the Main Rivers will be set with a soffit level above the 1 in 100 year flood level, including an allowance for climate change. It is recommended that Main River crossings are designed to be single span structures (bridge or pre cast structures with natural bed and no artificial invert) where possible. Due to the small size of the ditches it may also be appropriate to consider closed culverts at the detailed design stage for any ditch crossings. Culverts should be designed with natural beds and sufficient freeboard to accommodate design flood events.

11.5.54 Culverting or crossing of a Main River will require an Environmental Permit for flood risk activities from the Environment Agency. Culverting of ordinary watercourses to facilitate site access will require Land Drainage Consent from Hampshire County Council. Through the application process for Land Drainage Consent or Environmental Permit, and a properly designed outfall and culvert, disruption to the watercourse's flow, morphology and habitat will be minimised.

Surface Water Flood Risk

11.5.55 As per OPA Phase 1 the provision of a surface water drainage system (as described below) will intercept and manage this rainfall and removes surface water flood risk as a constraint from development area.

<u>Surface Water Runoff Mitigation</u>

11.5.56 The Wider OPA FRA contains a comprehensive water management strategy for the site involving the implementation of SuDS to manage the disposal of surface water runoff from the Proposed Development.

11.5.57 Surface water runoff from the Proposed Development will be intercepted by on-site drainage systems designed to contain the runoff from storms up to the 1 in 100 year return period, including an appropriate allowance for climate change. The aims of this will be to ensure that the Proposed Development would be appropriately safe for its lifetime taking account of the vulnerability of its users, the Proposed Development would not increase flood risk elsewhere, and would reduce flood risk overall. Pollution control measures are incorporated to mitigate any impacts on the downstream environment.

11.5.58 The water management strategy comprises two elements. Strategic SuDS are embedded in the green infrastructure across the site and Source Control will be delivered within the development parcels.

11.5.59 Due to ground conditions the use of infiltration SuDS measures has been discounted. This is set out in the attached FRA and the drainage hierarchy has been followed.

Strategic SuDS

11.5.60 Strategic SuDS features are proposed within the green infrastructure on the site. The Strategic SuDS Features will comprise a combination of swales, detention basins (incorporating low flow channels, micro pools, wetland areas and sediment forebays) to detain and treat the runoff.

11.5.61 Runoff will be temporarily stored within the Strategic SuDS Features before being discharged at greenfield runoff rates (Q_{BAR} / Q_{MED}) into on-site watercourses. Discharging runoff at greenfield values reduces peak runoff rates from the Site during extreme storm events and contributes to reducing flood risk downstream while maintaining baseflows to the receiving watercourses.

11.5.62 The Strategic SuDS features have been placed to ensure that the outfalls mimic the natural drainage sub catchments on the site. Through breaking the site into sub catchments, the Strategic SuDS can be delivered in a phased manner as development phases move forward.

11.5.63 The detailed design of the Strategic SuDS features will be delivered as part of future reserved matter applications for the site. The design of these features can be secured by way of a planning condition.

11.5.64 The Strategic SuDS features will be designed to incorporate specific design features to maximise their ability to enhance quality of runoff, deliver biodiversity net gain and their general amenity value. These design features include:

- The Strategic SuDS will be ‘online’ and receive runoff during all storm events.

- Low flow channels will be incorporated into the SuDS features to create wetter areas of habitat and encourage drier areas across other parts of the basin creating a diverse mosaic of habitats within the feature. Low flow channels will be locally widened to create wetland areas in the base.

- Micro pools will create areas of standing water at the outlet of the Strategic SuDS to prevent the resuspension of fine sediment.

- Sediment forebays will be provided at the inlet to promote sedimentation and allow fine sediments (which also contains nutirents) to collect in an area for periodic removal.

- Planting throughout the Strategic SuDS features will enhance the rate of evapotranspiration, provide interception and increase rates sedimentation. Biological uptake of nutrients from vegetation growth will also contribute to the surface water quality enhancement of the Strategic SuDS features.

11.5.65 Outfall routes connecting Strategic SuDS to the on-site watercourses (downstream of the flow control) should utilise swales where possible. This measure increases the entrapment of sediments within the grass and minimises the risk of erosion around the outfall.

11.5.66 Pollution treatment through the SuDS Management Train is primarily by gravitational settling of particulate pollutants. Other mechanisms of pollution removal include filtration through the vegetation on the detention basin base together with biodegradation and photolytic breakdown of any hydrocarbons during the drying processes between runoff events. Nutrients will also be absorbed through biological activity of the plants within the detention basin.

11.5.67 The strategic SuDS are located outside of flood risk areas associated with watercourses so as not to increase flood risk elsewhere.

11.5.68 The Strategic SuDS create wetland habitat on the Site.

Source Control SuDS

11.5.69 Upstream Source Control will be provided in the development parcels to create a SuDS Management Train across the development site and ensure surface water runoff is managed as close to its source as possible.

11.5.70 The design of these features require detailed information on layouts and site levels. As such these measures will be delivered as part of future reserved matters applications.

11.5.71 Source Control features include areas of pervious pavement on private drives and shared parking, use of bioretention areas / rain gardens to collect runoff from localised areas, use of swales to convey runoff above ground. The use of green roofs and rainwater harvesting / reuse systems for public / commercial buildings should be considered where appropriate. Water butts shall be provided in residual gardens for rainwater reuse (e.g. domestic irrigation).

11.5.72 The use of multiple SuDS features across the development site gives the SuDS Management train resilience as it does not rely on one or two features to deliver its aims of enhancing water quality, biodiversity, amenity value and flood risk.

Surface Water Drainage

11.5.73 The Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036[15] advocates three forms of naturalised filtration to ensure surface water quality is treated before discharge in the absence of infiltration drainage. Through the use of upstream Source Control, Strategic SuDS and an outfall swale it is considered that this design criterion is achieved.

11.5.74 The on-site drainage systems will be designed in accordance with the relevant national standards and guidance including the SuDS Manual (C753), Building Regulations Part H, BS EN 752:2017, Design and Construction Guidance for foul and surface water sewers, together with Environment Agency documents such as Rainfall Runoff Management for Developments and DEFRA's Non-Statutory Technical Standards for Sustainable Drainage Systems.

11.5.75 Events in excess of the design standard of the drainage system (also known as exceedance events) will be managed to minimise the residual risk and these measures are outlined in the FRA. The detailed design of the Proposed Development will set site levels such that exceedance flow routes are directed towards Strategic SuDS features and on-site watercourses and away from existing and proposed properties.

11.5.76 The water management strategy contained in the FRA includes an outline management and maintenance strategy to reduce the risk of blockages or system failures. The maintenance strategy will include details of sediment removal frequencies from Strategic SuDS features.

11.5.77 The requirement for Strategic SuDS features to be lined with clay, butyl or geomembrane liner to minimise the ingress of groundwater will be assessed at the detailed design stage.

Surface Water Quality Mitigation

[15] Urban Edge Environmental Consulting Ltd (2019) The Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036 HRA Report for the Submission Plan

SuDS and Water Quality

11.5.78 The enhanced risk of pollution as a result of the Proposed Development can be mitigated by an adequately designed surface water drainage system. Pollution control measures incorporated into the surface water drainage design include the use of deep trapped gullies and separator systems (if required for larger parking areas). All road areas and other areas that drain to gullies should pass through deep trapped gullies. All larger parking areas (>800m^2 and/or >50 parking spaces) should drain via pervious paving or pass through a separator, which meets the requirements of BS EN 858 'Separator systems for light liquids (e.g. oil and petrol)', before discharging into the downstream drainage system. No "high risk" elements of development (i.e. petrol filling stations, lorry parking areas or industrial yard areas) are proposed which would require greater pollution control measures.

11.5.79 Sedimentation, deposition and filtration, UV action, and biological uptake by the vegetation within the Strategic SuDS and upstream Source Control features will contribute to the pollution removal capability of the surface water drainage system.

11.5.80 The proposed SuDS features will intercept and contribute to the reduction of urban diffuse phosphate and nitrite loads which could drain into the River Itchen. For example, the SuDS features will intercept silt and runoff from the Site which could be enriched with nutrients as a result of detergent use from washing of cars, or the application of fertilisers by homeowners or in areas of public open space.

11.5.81 The Wider OPA FRA contains an assessment of surface water quality using the simple index approach as advocated by the CIRIA SuDS Manual 2015. This shows total pollution mitigation index (for each contaminant type) equals or exceeds the pollution hazard index (for each contaminant type) and that SuDS components deliver adequate surface water quality treatment.

Landscape Management

11.5.82 Effects on surface water quality from the application of fertiliser, pesticides or herbicides in the landscaped areas will be mitigated by adopted good management practice and secured by an appropriate condition for a Landscape Management Plan.

Foul Water Drainage Strategy

11.5.83 Impacts from foul water drainage will be dealt with through connection of the site to the downstream Southern Water public foul water sewer system. Due to site topography foul water flows arising from the Proposed Development will be collected in foul sewers and directed to on-site foul water pumping stations. The pumping stations will pump the foul

sewage to the public sewer network via a rising main. The preferred point of connection is to the public sewerage system to the south east of the development which drains to the Peel Common Wastewater Treatment Works (WwTW) which is operated by Southern Water and discharges into the Solent.

11.5.84 The Peel Common WwTW is subject to an Environmental Permit which controls the quality of its discharge to the receiving watercourse / waterbody. The Environmental Permit for Peel Common WwTW includes provision for Total Nitrates.

11.5.85 Southern Water has a statutory duty to provide sewerage conveyance and treatment infrastructure for new development and to provide additional capacity as and when required. It is Southern Water's responsibility to comply with its Environmental Permits at WwTW and their wider environmental obligations.

11.5.86 The details of the connection to the Peel Common WwTW will be agreed with Southern Water as part of a detailed S106 / S98 application. Any off-site works delivered by Southern Water will be designed to current standards and would mitigate the effect of additional foul water flows on sewer flood risk.

11.5.87 Through discharging treated foul water effluent into a different watercourse catchment (and into the Solent) the effect of the development on nutrient levels in the River Itchen is mitigated. Southern Water has an obligation to treat and mitigate the nutrient loadings from the development before it is discharged into the Solent.

Nutrient Neutrality

11.5.88 In the PUSH region Natural England advises development should calculate a nutrient budget and achieve nutrient neutrality. The achievement of nutrient neutrality is a means of ensuring that development does not add to existing nutrient burdens in the designated sites. The Proposed Development will be Nitrate Neutral. A detailed Nitrate Neutrality Study has been produced by Hilson Moran and is attached as Appendix 11.3 in Volume 2 of this ES.

11.5.89 The focus of this study has been Nitrogen inputs as this is the primary driver of Eutrophication in the Solent. The existing Nitrogen load from the site's agricultural and existing residential development on the Site has been calculated and on-site and off-site mitigation measures identified.

11.5.90 Mitigation measures built into the scheme include the cessation of agricultural practices that generate high nutrient loads and conversion to built development and inclusion of wetland areas of the site as part of the Strategic SuDS features.

11.5.91 Through the cessation of agricultural activities on the Wider OPA Site, connection to Peel Common WwTW and removal of nitrogen from runoff using SuDS Management Train the Wider OPA Site would result in a net decrease in Nitrogen discharged to the local environment of c.1,839.6 kg TN/yr and total mass of Nitrogen discharged to sensitive European Designated Sites (both the River Itchen and Solent) would be reduced.

11.5.92 Excess organic and inorganic Phosphate can contribute to eutrophication of receiving waters and it generally more of a problem for freshwaters rather than marine or estuarine habitats where nitrate is typically the limiting nutrient. The main source of Phosphate from new developments will be from foul sewerage. The Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036[16] states that in both academic modelling work and scientific observation that *'country actions to reduce agricultural diffuse eutrophication are having much more success at reducing P than in reducing N. This suggests a focus of action on reducing N source losses from farming to address nitrogen enrichment in the Solent sites will coincidentally deliver a high degree of agricultural diffuse P reduction on the River Itchen SAC.'*. It also identifies that at the bottom of the River Itchen agricultural diffuse and the Wastewater treatment works are the dominant sources of Phosphate. By connecting foul water discharges to Peel Common WwTW, achieving Nitrate Neutrality and deploying a water management strategy incorporating SUDS the need for detailed analysis of Phosphate is not required as part of this assessment as it is covered by measures to mitigate Nitrates.

11.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

11.6.1 This section provides a summary of the predicted likely effects arising as a result of the construction and operation of the Proposed Development but taking into account the design mitigation measures set out above.

OPA Phase 1

Construction Impacts and Effects

Surface Water Drainage and Flood Risk

11.6.2 The construction of the Proposed Development has the potential to locally affect flood hazards on the OPA Phase 1 Site. During the construction phase there will be the potential for on-going disruption to the OPA Phase 1 Site's drainage regime prior to the completion of the surface water drainage system. There is a potential risk of ponding on the OPA Phase 1 Site

[16] Urban Edge Environmental Consulting Ltd (2019) The Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016-2036 HRA Report for the Submission Plan

as a result of the runoff from the increased impermeable area draining from the OPA Phase 1 Site; the disruption of existing overland surface water and flood flow routes; and potential soil compaction as a result of construction activities. It is anticipated that overland flow routes will be unaffected and will continue to flow towards the low points on the OPA Phase 1 Site and the on-site watercourses.

11.6.3 During the construction phase, earth will be exposed on the OPA Phase 1 Site and construction materials will be stored on the OPA Phase 1 Site. There is potential for silt to be washed off into the watercourses after periods of rainfall. Siltation of on-site watercourses could reduce channel capacity and increase blockage risk. There is also the potential for construction materials to be washed into the on-site watercourses which could reduce channel capacity and increase blockage risk.

11.6.4 Excavation will be required to construct below ground services, foundations and SuDS features. The excavations across the OPA Phase 1 Site have the potential to intercept shallow groundwater. To facilitate construction, excavations may have to be dewatered and water pumped onto a designated area of the Site or into an on-site watercourse. Dewatering of excavations has the potential to temporarily increase the base flow of the on-site watercourses.

11.6.5 Potential effects of a changed surface and ground water hydrological regime, such as changed quantities and flow direction, may result in impacts on existing wetland areas which may receive less or more water as a result of the development if not mitigated.

11.6.6 Through the implementation of construction management measures set out in a CEMP and phased delivery of the Strategic SuDS the magnitude of change on flood risk and surface water drainage on the OPA Phase 1 Site and downstream is Very Low to Negligible. The overall effect significance taking into account design mitigation and the CEMP is **Neutral** to **Moderate Adverse** and effects would be temporary for the duration of the construction period.

Surface Water and Environmental Quality

11.6.7 There are a number of substances which could adversely affect surface water quality on the OPA Phase 1 Site and in the downstream environment as a result of construction activities. Potentially polluting construction activities include excavation and groundworks; vehicle operation; machine and plant washing; erosion from temporary vehicle routes and exposed earth; incorrect storage of substances; and accidental spillages. Vandalism of plant and material storage could also be a pollution risk if substances are discharged or if leakage occurs as a result of damage. Polluting substances could include:

- Fine sediment (e.g. silts and clays);
- Cementitous materials;
- Oil, fuels and chemicals, including lubricants, coolants and hydraulic fluids; and
- Other general wastes including wood, plastics, sewerage and construction aggregate.

11.6.8 These substances may contaminate the underlying groundwater or downstream watercourses via surface runoff, especially after periods of rainfall.

11.6.9 Construction activities may encounter shallow groundwater within the underlying superficial deposits. The excavations will need to be dewatered to a nearby watercourse to facilitate construction works. These waters are likely to contain suspended sediments which can cause siltation, increase turbidity and affect dissolved oxygen levels and habitat quality in the downstream watercourses.

11.6.10 Release of sediments and silt to surface waters from stock piled material and excavations can reduce channel capacity and cause the deterioration of water and habitat quality. Siltation of the river bed can smother and infill coarse gravels, which can affect fish spawning success and the establishment of submerged plants, as well as having an impact on the invertebrates living in and on the riverbed. This could occur along the entire works area as well as at construction compounds;

11.6.11 The significance of the contaminate effects is dependent on the pollution event, the nature of the pollutant, and antecedent conditions. The implementation of measures set out in the CEMP will reduce the effect of a pollution event occurring.

11.6.12 The impact magnitude of the effect of potentially polluting construction activities on the OPA Phase 1 Site taking account the measures in the CEMP is assessed as Low to Negligible. The principles set out above to be incorporated into a CEMP reduce the risk of a pollution event occurring. However, the risk of a pollution event can never be eliminated. The effect significance is therefore assessed as **Neutral** to **Moderate Adverse** and effects would be temporary for the duration of the construction period.

Occupation Impacts and Effects

Surface Water Drainage and Flood Risk

11.6.13 At the occupation stage the key effects on flood hazards and surface water drainage will be as follows:

- Increased surface water runoff due to the creation of hard standing and buildings on-site leading to a potential increase in the rate and volume of surface water runoff discharged to the receiving watercourse and disruption to the natural drainage regime;
- Reduced infiltration to underlying strata due to the increase in hard standing on-site; and
- Effects on local topography creating or disrupting overland flows paths increasing on-site and off-site flood risk.

11.6.14 The implementation of the water management strategy as described above will mitigate these key effects to ensure the risk of flooding on-site and off-site does not increase.

11.6.15 The provision of a water management strategy, involving the implementation of SuDS with a controlled discharge at greenfield Q_{BAR} / Q_{MED} values reduces peak runoff rates from the OPA Phase 1 Site during extreme storm events will reduce the impact magnitude of the effects identified above to Negligible to Low Beneficial.

11.6.16 The effect significance of the operation of OPA Phase 1 on flood risk on-site and off-site is assessed as **Neutral** to **Moderate Beneficial**. The benefits to off-site flood risk will be permanent.

Surface Water and Environmental Quality

11.6.17 Following the completion of OPA Phase 1 there is potential for polluting substances from the ongoing use to have a detrimental effect on the surface water quality of the surface water runoff and consequently the receiving water bodies. These substances include:

- Hydrocarbons from increased vehicular movement, leakages and cleaning of vehicles;
- Heavy metals, primarily Zinc, Iron, Lead, Cadmium and Copper originating from fuel combustion emissions and wear down of brakes and tyres;
- Sediment introduced to the Site from vehicle movement;
- Sediment mobilised by activities by residents (e.g. washing cars, gardening);
- Spillages and leakages associated with on-site facilities (employment / commercial);
- De-icer and gritting material during periods of cold weather;
- Fertiliser and herbicides from management of landscape areas; and

- Foul sewage generated by occupants.

11.6.18 The delivery of Strategic SuDS features creates wetland habitat on the OPA Phase 1 Site.

11.6.19 The phased cessation of agriculture and conversion permanent stable surfaces as the scheme develops changes the nutrient budget of the OPA Phase 1 Site. The OPA Phase 1 Site is currently in agricultural use (arable and pastoral) which typically is a diffuse source of nutrients as a result of fertiliser application, soil losses and any animal wastes entering watercourses or groundwaters. These diffuse sources could contribute to the phosphate and nitrite loadings in the downstream designated sites. Nutrient enrichment of receiving waters can shift algal and plant communities having a knock on and detrimental effect across on BOD and populations causing wider ecosystem to change. The cessation of agricultural activities on the OPA Phase 1 Site will have a positive effect on offsetting the proposed development's nutrient load. Nitrite loading from the discharge from the Peel Common WwTW is controlled by the efficiency of the wastewater treatment process which is managed by Southern Water. The treated effluent discharge from the WwTW is controlled by the requirements of an Environmental Permit which is regulated by the Environment Agency. This is assessed in more detail in the Nitrate Neutrality Study.

11.6.20 The provision of a water management strategy, involving the implementation of Strategic and Source Control SuDS to intercept contaminated runoff and provide a degree of pollution treatment, will reduce the impact magnitude of the effect identified above to between Very Low to Negligible. The effect significance of the operation of the OPA Phase 1 on downstream surface water quality is assessed as **Moderate Adverse** to **Neutral**. This effect is considered permanent. The risk of a pollution event can never be eliminated but due to the low risk nature of the proposed land use the risk of pollution is Low.

11.6.21 The cessation of agricultural activities, connection of foul water to a Peel Common WwTW and application of a SuDS Management Train to on-site surface water management reduces the effect of the OPA Phase 1 on nutrient loadings to Very Low. The effect significance of the operation of OPA Phase 1 on downstream nutrient loadings and in the designated sites is assessed as **Moderate**. This effect is considered temporary and the significance of the effect would reduce to **Neutral** to **Moderate Beneficial** when permanent 'Nitrate Neutrality' and net reduction is achieved as part of the Wider OPA.

The Wider OPA

Construction Impacts and Effects

Surface Water Drainage and Flood Risk

11.6.22 The effect of the construction of the Wider OPA is the same as the construction of OPA Phase 1 and would affect the same receptors. These effects are set out above. Due to the greater scale of the Wider OPA the duration of the construction period is longer and therefore potential for effects to occur is over a longer period.

11.6.23 Through the implementation of construction management measures set out in a CEMP and phased delivery of the Strategic SuDS the magnitude of change on flood risk and surface water drainage on the Wider OPA and downstream is Very Low to Negligible. The overall effect significance taking into account design mitigation and the CEMP is **Neutral** to **Moderate Adverse** and effects would be temporary for the duration of the construction period.

Surface Water and Environmental Quality

11.6.24 The effect of the construction of the Wider OPA is the same as the construction of OPA Phase 1 and would affect the same receptors. These effects are set out above. Due to the greater scale of the Wider OPA the duration of the construction period is longer and therefore potential for effects to occur is over a longer period.

11.6.25 The impact magnitude of the effect of potentially polluting construction activities taking account the measures in the CEMP on the Wider OPA Site and downstream is assessed as Low to Negligible. The principles set out above to be incorporated into a CEMP reduce the risk of a pollution event occurring. However, the risk of a pollution event can never be eliminated. The effect significance is therefore assessed as **Neutral** to **Moderate Adverse** and effects would be temporary for the duration of the construction period.

Occupation Impacts and Effects

Surface Water Drainage and Flood Risk

11.6.26 The provision of a water management strategy, involving the implementation of SuDS with a controlled discharge at greenfield Q_{BAR} / Q_{MED} values reduces peak runoff rates from the Wider OPA Site. The positive magnitude of the effects increases to between Negligible to Medium Beneficial due to the greater volume of attenuation storage and flow control delivered on the Wider OPA Site.

11.6.27 The effect significance of the operation of the Wider OPA on flood risk on-site and off-site is assessed as **Neutral** to **Major Beneficial**. The benefits to off-site flood risk will be permanent.

Surface Water and Environmental Quality

11.6.28 The effect of the operation of the Wider OPA on environmental and surface water quality and nutrient loadings is the same as the operation of OPA Phase 1 and affect the same receptors.

These effects are set out above. Due to the greater scale of the Wider OPA the magnitude for the effect is greater.

11.6.29 The provision of a water management strategy, involving the implementation of Strategic and Source Control SuDS to intercept contaminated runoff and provide a degree of pollution treatment will reduce the impact magnitude of the effect identified above to between Very Low to Negligible. The effect significance of the operation of the Wider OPA on downstream surface water quality is assessed as **Moderate Adverse** to **Neutral**. This effect is considered permanent. The risk of a pollution event can never be eliminated but due to the low risk nature of the proposed land use the risk of pollution is Low.

11.6.30 The cessation of agricultural activities, connection of foul water to a Peel Common WwTW and application of a SuDS Management Train to on-site surface water management reduces the effect of the Wider OPA on nutrient loadings to between Negligible and Medium Beneficial. The effect significance of the operation of the Proposed Development on downstream nutrient loadings and in the designated sites is assessed as **Neutral** to **Major Beneficial**. This effect is considered permanent.

11.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

11.7.1 It is considered that the majority of the effects of the Proposed Development on the water environment would be mitigated to an acceptable level based on design mitigation measures set out within the Flood Risk Assessment (including water management drainage strategy) and that the potential for construction related effects can be appropriately dealt with via a CEMP. Details of mitigation measures to deliver a nutrient neutral development are set out in the Nitrate Neutrality Study.

11.7.2 Due to the sensitivity of the downstream designated sites to deterioration in surface water quality, primarily from fine sediment and excess nutrients, additional mitigation measures are proposed to ensure confidence and give certainty that the mitigation measures are achieving the desired outcomes, and that the effects are reduced to an acceptable level.

OPA Phase 1

Construction Measures

Surface Water Quality Monitoring

11.7.3 Surface water quality monitoring of the on-site watercourses is necessary pre development (to establish a baseline) and during construction and operation of the development to assess and

confirm the effectiveness of the proposed mitigation measures at capturing fine sediment and reducing nutrient levels.

11.7.4 A Water Quality Outline Monitoring and Management Plan produced by Johns Associates is contained in Appendix 11.5 of Volume 2 of the ES. This plan will be implemented during the construction of OPA Phase 1 and through to the completion of the Wider OPA.

11.7.5 A monitoring programme will be established whereby regular sampling of the watercourses (at 10 locations), and at discharge points from the Strategic SuDS features (an additional 17 locations) is undertaken to ensure that there is no adverse impact on the quality of any surface water discharging into on-site watercourses. The water quality monitoring regime will be agreed with Eastleigh Borough Council, the Environment Agency and Natural England.

11.7.6 The monitoring regime will consist of weekly monitoring at all sample locations using a hand held multiparameter water quality meter to measure dissolved oxygen, oxidation reduction potential, temperature, pH, electrical conductivity, turbidity, total dissolved solids, ammonium nitrogen, nitrate nitrogen, chloride, atmospheric pressure, and flow.

11.7.7 Spring and autumn Macroinvertebrate surveys are proposed at the watercourse sampling locations to identify the composition of the Macroinvertebrate community to enable the calculation of different quality indices for biodiversity, overall water quality, flow conditions, acidification, siltation, morphology, salinity and the community conservation importance.

11.7.8 In addition, suspended solids will be sampled using an automatic sampler and sent for laboratory analysis, and water samples will be obtained from watercourse sampling locations for laboratory analysis to quantify total nitrogen levels.

11.7.9 The intensity and duration of the monitoring will vary depending on the phase of the development. The monitoring regime is set out in the Water Quality Outline Monitoring and Management Plan.

11.7.10 The organisation responsible for maintaining the POS and Strategic SuDS will produce an annual maintenance report summarising the maintenance activities completed by the maintenance contractor and the results of the surface water quality monitoring. The ongoing maintenance and monitoring regime will be agreed with Eastleigh Borough Council, the Environment Agency and Natural England.

11.7.11 If, or when, the SuDS scheme has been fully adopted by the Southern Water which has a statutory responsibility for the maintenance and monitoring of adopted drainage systems the scheme may need to be revised.

11.7.12 There is an opportunity for adaptive management to ensure that, if an issue is identified, targeted adaptive mitigation measures can be put in place. Adaptive mitigation measures include:

- Enhanced management including increased sediment / vegetation removal frequencies;
- Enhanced planting of Strategic SuDS features to increase sediment entrapment or nutrient uptake;
- Retrofit Source Control in problem areas;
- Retrofit hydrodynamic vortex separators in problem areas; and
- Education / enforcement if pollution is as a result of unconsented activities on the Site.

11.7.13 The CEMP will include monitoring of on-site watercourses to establish sediment loadings being discharged downstream. A management plan will be put in place to ensure that silt management techniques are working effectively and include alternative working methods.

11.7.14 The water quality monitoring, management plan and CEMP can be secured by way of a planning condition.

11.7.15 The delivery of OPA Phase 1 will test the effectiveness of construction management mitigation measures and through implementation of the monitor-manage feedback loop these measures can be refined for future phases of the Wider OPA.

Occupation Measures

11.7.16 The delivery of OPA Phase 1 will test the effectiveness of the design mitigation measures and through implementation of monitor-manage feedback loop these can be taken forward into future phases of the Wider OPA.

The Wider OPA

Construction Measures

Surface Water Quality Monitoring

11.7.17 The monitoring and management plan is a means of assessing and confirming the effectiveness of mitigation measures to downstream surface water quality and is necessary to be taken forward throughout the delivery of the Wider OPA due to the sensitivity of downstream designated sites.

11.7.18 The monitoring and management measures described above would be applied as part of the Wider OPA as set out in the Water Quality Outline Monitoring and Management Plan produced by Johns Associates contained in Appendix 11.5 of Volume 2 of the ES.

Occupation Measures

11.7.19 An ongoing water quality monitoring and management plan is proposed to monitor the effectiveness of the SuDS system at removing fine sediment and nutrients from surface water runoff as the Wider OPA is delivered. Through implementation of the monitor-manage feedback loop, management measures can be refined to mitigate the effect of the Wider OPA.

11.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

11.8.1 This section assesses the residual environmental effects after taking into account the proposed design mitigation and additional mitigation outlined above.

OPA Phase 1

Construction Effects

Surface Water Drainage and Flood Risk

11.8.2 Taking into account the measures outlined above which will be incorporated into a CEMP and supported by monitoring and adaptive management the impact magnitude of the effect of the construction of OPA Phase 1 on surface water drainage regime and the resultant flood risk implications in the receiving water bodies is assessed as is Very Low to Negligible. The effect significance is therefore assessed as **Neutral** to **Moderate Adverse**. The effects of the disruption to the surface water drainage regime are considered to be temporary, and reversible with time as OPA Phase 1 is built out and permanent mitigation measures are fully implemented. It is concluded the effects of construction activities on flood risk and drainage are mitigated to an acceptable level and the effects are not deemed significant.

Surface Water and Environmental Quality

11.8.3 Taking into account the measures outlined above which will be incorporated into a CEMP and supported by monitoring and adaptive management the impact magnitude of the effect of the construction of OPA Phase 1 on downstream surface water quality is assessed as Low to Negligible. The measures set in the CEMP and enhanced monitoring reduce the risk of pollution occurring to a low as possible. However, the risk of a pollution event can never be eliminated. The effect significance is therefore assessed as **Neutral** to **Moderate Adverse**. It is concluded the temporary effects of construction activities on downstream surface water quality are mitigated to an acceptable level and the effects are not deemed significant.

Occupation Effects

Surface Water Drainage and Flood Risk

11.8.4 The provision of a water management strategy, involving the implementation of SuDS incorporating attenuation and flow controls and Source Control measures will reduce the impact magnitude of OPA Phase 1 on flood risk and drainage to between Negligible to Low Beneficial. The effect significance of the operation of OPA Phase 1 on flood risk on-site and off-site is assessed as **Neutral** to **Moderate Beneficial**. The benefits to off-site flood risk will be permanent.

Surface Water and Environmental Quality

11.8.5 The provision of a water management strategy, involving the implementation of Strategic and Source Control SuDS to intercept contaminated runoff and provide a degree of pollution treatment supported by monitoring and targeted adaptive management will reduce the impact magnitude of the effect of OPA Phase 1 on downstream surface water quality to between Very Low to Negligible. The risk of a pollution event can never be eliminated but due to the low risk nature of the proposed land use the risk of pollution is Low. The effect significance of the operation of OPA Phase 1 on downstream surface water quality is assessed as **Moderate Adverse** to **Neutral**. It is concluded the permanent effects of the operation of the development on downstream surface water quality are mitigated to an acceptable level and the effects are not deemed significant.

11.8.6 The cessation of agricultural activities, connection of foul water to a Peel Common WwTW and application of a SuDS Management Train to on-site surface water management reduces the effect of the OPA Phase 1 on nutrient loadings to Very Low. The effect significance of the operation of OPA Phase 1 on downstream nutrient loadings and in the designated sites is assessed as **Moderate**. This effect is considered temporary and the significance of the effect would reduce to **Neutral** to **Moderate Beneficial** when permanent 'Nitrate Neutrality' and net reduction is achieved as part of the Wider OPA.

The Wider OPA

Construction Effects

Surface Water Drainage and Flood Risk

11.8.7 Taking into account the measures outlined above which will be incorporated into a CEMP and supported by monitoring and adaptive management the impact magnitude of the effect of the construction of the Wider OPA on surface water drainage regime and the resultant flood risk

implications in the receiving water bodies is assessed as is Very Low to Negligible. The effect significance is therefore assessed as **Neutral** to **Moderate Adverse**. The effects of the disruption to the surface water drainage regime are considered to be temporary, and reversible with time as Wider OPA is built out and permanent mitigation measures are fully implemented. It is concluded the effects of construction activities on flood risk and drainage are mitigated to an acceptable level and the effects are not deemed significant.

Surface Water and Environmental Quality

11.8.8 Taking into account the measures outlined above which will be incorporated into a CEMP and supported by monitoring and adaptive management the impact magnitude of the effect of the construction of the Wider OPA on downstream surface water quality is assessed as Low to Negligible. The measures set in the CEMP and enhanced monitoring reduce the risk of pollution occurring to a low as possible. However, the risk of a pollution event can never be eliminated. The effect significance is therefore assessed as **Neutral** to **Moderate Adverse**. It is concluded the temporary effects of construction activities on downstream surface water quality are mitigated to an acceptable level and the effects are not deemed significant.

Occupation Effects

Surface Water Drainage and Flood Risk

11.8.9 The provision of a water management strategy, involving the implementation of SuDS incorporating attenuation and flow controls and Source Control measures will reduce the impact magnitude of Wider OPA on flood risk and drainage to between Negligible to Medium Beneficial. The effect significance of the operation of Wider OPA on flood risk on-site and off-site is assessed as **Neutral** to **Major Beneficial**. The benefits to off-site flood risk will be permanent.

Surface Water and Environmental Quality

11.8.10 The provision of a water management strategy, involving the implementation of Strategic and Source Control SuDS to intercept contaminated runoff and provide a degree of pollution treatment supported by monitoring and targeted adaptive management will reduce the impact magnitude of the effect of Wider OPA on downstream surface water quality to between Very Low to Negligible. The risk of a pollution event can never be eliminated but due to the low risk nature of the proposed land use the risk of pollution is Low. The effect significance of the operation of Wider OPA on downstream surface water quality is assessed as **Moderate Adverse** to **Neutral**. It is concluded the permanent effects of the operation of the development on downstream surface water quality are mitigated to an acceptable level and the effects are not deemed significant.

11.8.11 The cessation of agricultural activities, connection of foul water to a Peel Common WwTW and application of a SuDS Management Train to on-site surface water management reduces the effect of the Wider OPA on nutrient loadings to between Negligible and Medium Beneficial. The effect significance of the operation of the Proposed Development on downstream nutrient loadings and in the designated sites is assessed as **Neutral** to **Major Beneficial**. This effect is considered permanent.

11.9 CUMULATIVE EFFECTS

11.9.1 Cumulative and in-combination effects can result from a combination of impacts, which on their own may not be significant but when combined with others, could generate significant effects.

11.9.2 In-combination effects arise where effects from one environmental element bring about changes in another environmental element. With respect to surface water drainage and flooding a change in the hydrology and downstream surface water quality as a result of the Proposed Development can effect aquatic habitats and therefore have wider ecological implications.

11.9.3 It is necessary to assess the effects of the development taking into account the potential cumulative and in-combination effects as a result of other developments in the vicinity of the Site. Due to the nature of the potential effect of development on hydrology and flood risk it is considered that a cumulative or in-combination effect can only occur if the other development sites (and therefore their effects) are within the same surface water drainage catchment or wider river catchment of the Site. The effects of development on surface water drainage and flood risk are limited to within the same surface water or river catchment and cross catchment effects are rare.

11.9.4 On this basis it is possible to scope out development sites situated outside of the natural drainage catchment of the Site and the development sites which fall outside of the River Itchen catchments. Sites not assessed further include:

- Land off Botley Road, West End, Southampton
- Land at Hedge End North, Winchester Road, Botley, Southampton (Land north west of Boorley Green)
- Land to North and East of Boorley Green, Winchester Road, Botley, Southampton SO32 2UA

- Land west of Woodhouse Lane
- Land South of Maddoxford Lane, Boorley Green, Botley, Southampton, SO32 2DB,
- Land to the south of Maddoxford Lane and west of Westfield, Boorley Green, Botley, SO32 2DB
- Land to the North and East of Winchester Street, Botley
- Land at Woodhouse Lane and to the North and East of Botley Village, Eastleigh
- Land off St Johns Road, South of Foord Road, Hedge End, Southampton SO30 4DG
- Serenity, Heath House Lane, Hedge End, Southampton, SO30 0LE
- Land west of Waylands Place and north of Peewit Hill Close, Hedge End, SO31 1DJ
- Land at Park Farm/North Stoneham Park Stoneham Lane, Eastleigh, SO50 9HS
- Land south of Chestnut Avenue north Stoneham Park, Chestnut Avenue, Stoneham Lane, Eastleigh
- Land South of Bursledon Road, Bursledon, Southampton

11.9.5 Sites which require further assessment include:

- One Horton Heath Utilities Enabling Works – Underground cabling
- Allington Lane, Burnetts Lane and Bubb Lane access
- Chalcroft Business Park, Burnetts Lane, West End
- Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh SO50 7EA
- Southampton International Airport, Mitchell Way, Eastleigh,
- The Mount Hospital, Church Road, Bishopstoke
- Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, SO50 9DG

11.9.6 It is considered the effect of other developments and mitigation measures will not change the sensitivity, importance or value of receptors. The cumulative assessment will therefore focus on the effects of the other developments on affecting the magnitude or severity of the effect.

The effects of the Proposed Development identified in the section above are considered to occur regardless of the presence of the other development sites.

Design of Cumulative Assessment Sites

11.9.7 The basis of the assessment for cumulative and in-combination effects is that the other developments will deliver mitigation measures to address their effects on hydrology and flood risk. Government Planning Policy ensures that the significance of the residual effects of new development on surface water drainage and flood risk is minimised following the construction of suitably designed surface water drainage systems, application of SuDS and pollution prevention principles. Thus, the cumulative effects of several developments in an area should have 'Neutral' effect on surface water drainage and flood risk, provided government planning policy, industry best practice and Environment Agency Guidance are complied with.

11.9.8 In order to assess the cumulative and in-combination effects of the other developments their drainage strategies for the above developments are summarised in Table 11.5 below.

Table 11.5: Summary of Other Sites Drainage and Flood Risk Management Strategy

Development Site	Summary of Drainage and Flood Risk Management Strategy
One Horton Heath Utilities Enabling Works – Underground cabling	Works are related to the diversion of electricity cables and water mains which cross the Site. Works are underground which will have negligible flood risk implications. No drainage proposed.
Allington Lane, Burnetts Lane and Bubb Lane access	The Site access was consented under application references O/14/75735 and O/16/79354. The site access from Bubb Lane and Burnetts Lane. The road is drained via deep trapped gullies, detention basins and attenuation tanks with runoff restricted to greenfield runoff rates (Q_{MED}) up to and including the 100 year critical storm. The Bubb Lane drainage system connects into an existing highway drainage system. The Burnetts Lane drainage system drains onto watercourses on-site in the vicinity of Phase 1. No significant flood risk constraints are identified in this access work. The Allington Lane site access is drained drained via deep trapped gullies and a detention basin with runoff restricted to greenfield runoff rates (Q_{MED}) up to and including the 100 year critical storm. The drainage system drains into an existing ditch adjacent to Allington lane. No significant flood risk constraints are identified in this access work. No foul water drainage is proposed as part of the site access work. No significant flood risks constraints were identified.
Chalcroft Business Park, Burnetts Lane, West End	Chalcroft Business Park is located on the site's southern boundary. The redevelopment proposals drain via a combination of infiltration drainage (where ground conditions allow) and attenuation drainage. Infiltration drainage is in the form of porous pavement. Attenuation drainage utilises the sub base of the porous pavement for storage with a discharge to the watercourse which forms the boundary with the Site or a below ground

	attenuation tank which connects into the existing drainage network. Both situations discharge at greenfield runoff rates (Q_{BAR}). It is proposed that the foul water will discharge to the public sewer system proposed as part of the Proposed Development. As an interim solution an on-site package treatment plant is proposed to manage the domestic drainage and an effluent storage tank to receive trade effluent. No significant flood risks constraints were identified on the redevelopment area. To mitigate surface water flooding it is proposed to lower hardstanding yards and open spaces 0.5m lower than nearby buildings.
Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh SO50 7EA	Surface water drainage consists of a series of SuDS attenuation basins and attenuation tanks which discharge at greenfield rates (Q_{BAR}) into an on-site watercourse which falls within the Fair Oak Stream catchment. The SuDS attenuation basins are enhanced with bio-retention areas and sediment forebays designed to provide the required level of treatment. A vortex separator is provided prior to discharging to an existing drainage ditch. Foul water discharges into the public sewer network on Mortimers Lane. No significant flood risks constraints were identified.
Southampton International Airport, Mitchell Way, Eastleigh,	Surface water drainage is via geocellular storage combined with an infiltration drainage field and permeable paving. A bypass interceptor and penstock valve are contained in the below ground drainage system consistent with the wider airport drainage system. No foul water drainage is proposed as part of the runway or car park extension. No significant flood risks constraints were identified.
The Mount Hospital, Church Road, Bishopstoke	Surface water will be disposed of by means of infiltration utilising porous pavement and areas of geocellular storage. Existing drainage system will be utilised with discharge to the River Itchen albeit serving a smaller area. Rainwater harvesting systems will be designed for toilet flushing and irrigation based on 5% development roof area. It is proposed that the foul water will discharge to the public sewer system which is within the Chickenhall WwTW catchment. This appears to be via an indirect connection to an existing private sewer on the site. No significant flood risks constraints were identified.
Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, SO50 9DG	Surface water will be disposed of by means of infiltration and would utilise permeable paving and shallow geocellular soakaways. It is proposed that the foul water will discharge to the public sewer system within Leigh Road. No significant flood risks constraints were identified.

Cumulative Effects from Construction

11.9.9 It is assumed that during the construction phase for other development sites best practice construction site management with adequate contingency planning, and following the

principles of pollution prevention which will be formalised and incorporated into a CEMP. The CEMP will be implemented and adhered to during the construction of these schemes. These measures will reduce the risk of a pollution event occurring and reduce the disruption of surface water drainage regime and the resultant flood risk implications in the receiving water bodies.

11.9.10 The cumulative effect significance of construction activities on flood risk, drainage and surface water quality is therefore assessed as **Neutral** to **Moderate Adverse**. The risk of an accidental pollution incident can never be completely removed and would be temporary and reversible in time.

Cumulative Effects from Operation

11.9.11 The cumulative impact of operation of the development and nearby development sites on flood risk, drainage and surface water quality receptors is assessed in Table 11.6 below.

Table 11.6: Cumulative impact of operation of the development and other development sites

Development Site	Summary of Cumulative Operation Effects
One Horton Heath Utilities Enabling Works – Underground cabling	Once operational the utilities infrastructure will have a negligible effect on the water environment with very limited opportunity for flood risk and drainage effects to interact between the two schemes. The cumulative effect is therefore **Neutral**.
Allington Lane, Burnetts Lane and Bubb Lane access	Surface Water Drainage - The proposed water management strategy is consistent with the attenuation based drainage strategy for the site accesses. Taking into account the attenuation storage and flow control on both schemes the significance of the cumulative effect is assessed at **Neutral** to **Major Beneficial**. Foul Water Drainage – No foul water drainage proposed therefore **Neutral** cumulative effect. Flood Risk – No flood hazards are considered to interact and cumulative effect is **Neutral**
Chalcroft Business Park, Burnetts Lane, West End	Surface Water Drainage - The proposed water management strategy is consistent with the attenuation based drainage strategy for the redevelopment of the Chalcroft Busniess Park. Taking into account the attenuation storage and flow control on both schemes the significance of the cumulative effect is assessed at **Neutral** to **Major Beneficial**. Foul Water Drainage – The reliance on a private package treatment plant will result in a Very Low magnitude of change on nutrient loadings to the downstream watercourse. The proposed Development relies on a connection into the public sewer network in the adjacent catchment. Consequentially the cumulative effect is **Neutral**. Flood Risk – No flood hazards are considered to interact and cumulative effect is **Neutral**
Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh SO50 7EA	The Pembers Hill Farm site is located upstream of the Proposed Development. Surface Water Drainage - Taking into account the attenuation storage and flow control on both schemes the significance of the cumulative effect is assessed at **Neutral** to

	Major Beneficial. Foul Water Drainage - Foul sewerage from the Pembers Hill Farm development likely drains to the Chickenhall WwTW and could increase nutrient load on the receiving River Itchen. The proposed Development relies on a connection into the public sewer network in the adjacent catchment. Consequentially the cumulative effect is **Neutral**. Flood Risk – Site is remote from the Proposed Development and no flood hazards are considered to interact and cumulative effect is **Neutral**.
Southampton International Airport, Mitchell Way, Eastleigh,	Surface Water Drainage – Southampton Airport scheme drains via infiltration devices and is remote form the Proposed Development and therefore cumulative effect is **Neutral**. Foul Water Drainage - No foul water drainage proposed therefore **Neutral** cumulative effect. Flood Risk – Site is remote from the Proposed Development and Flood no flood hazards are considered to interact and cumulative effect is **Neutral**.
The Mount Hospital, Church Road, Bishopstoke	Surface Water Drainage – The Mount Hospital scheme drains predominately via infiltration drainage and maintains an existing positive outflow to the River Itchen at greenfield rates and is remote from the site. The cumulative effect is **Neutral**. Foul Water Drainage - Foul sewerage from the Mount Hospital development drains to the Chickenhall WwTW and could increase nutrient load on the receiving River Itchen. The proposed Development relies on a connection into the public sewer network in the adjacent catchment. Consequentially the cumulative effect is **Neutral**. Flood Risk – Site is remote from the Proposed Development and Flood no flood hazards are considered to interact and cumulative effect is **Neutral**.
Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, SO50 9DG	Surface Water Drainage – The Eastleigh Police Station redevelopment drains via infiltration devices and is remote form the Proposed Development and therefore cumulative effect is **Neutral**. Foul Water Drainage - Foul sewerage from the Eastleigh Police Station redevelopment drains to the Chickenhall WwTW and could increase nutrient load on the receiving River Itchen. The proposed Development relies on a connection into the public sewer network in the adjacent catchment. Consequentially the cumulative effect is **Neutral**. Flood Risk – Site is remote from the Proposed Development and Flood no flood hazards are considered to interact and cumulative effect is **Neutral**.

11.9.12 The proposed mitigation measures set out in the section above relating to the Proposed Development will complement the other developments' mitigation measures, minimising the cumulative effects of various schemes across the wider watercourse catchment.

11.9.13 With mitigation measures in place (as set out in the section above) the overall significance of the cumulative and in-combination effect of other development and the proposed development

on surface water drainage, flood risk and environmental quality of on-site watercourses should be **Neutral**.

11.10 IMPACT OF CLIMATE CHANGE

11.10.1 The mitigation measures set out in this assessment and supporting FRA have considered the effects of climate change and the residual environmental effects set out above are considered to be representative of the residual environmental effect of the Proposed Development on the water environment taking into account climate change.

Effect of Climate Change on Flood Risk

11.10.2 The allowances for climate change on peak river flow and peak rainfall intensities are in accordance with the Environment Agency's guidance entitled 'Flood risk assessments: climate change allowances'.

11.10.3 The Flood Risk Assessment includes an assessment of climate change on flood hazards on the Site. The proposed built development is designed to be located in Very Low areas of flood risk from watercourses taking into account the effects of climate change.

11.10.4 The water management system has been designed to take into account the effects of climate change on peak rainfall intensities.

11.10.5 The flood risk and drainage mitigation measures set out in this report and supporting FRA take into account the effects of climate change and are designed to continue to function throughout the lifetime of the development.

Effect of Climate Change on Water Quality

11.10.6 The effect of climate change on designated sites downstream is likely to be complex and manifest in multiple ways generally increasing pressures across the whole catchment. It is likely to reduce the designated sites resilience to change and will likely could become increasing sensitive over time. For example, increasing water temperatures will result in reduction in dissolved oxygen levels which can have detrimental effects throughout the aquatic ecosystem.

11.10.7 For the purposes of this assessment the designated sites are already classified as Very High sensitivity. The effects of climate change are very unlikely to have a beneficial effect on downstream designated sites.

11.10.8 To ensure the quality of designated sites downstream of the Site do not deteriorate additional mitigation is proposed in the section above. The mitigation measures proposed are considered to be resilient to the effects of climate change and are designed to continue to function throughout the lifetime of the development.

11.11 ASSESSMENT SUMMARY

11.11.1 Table 11.7 below summarises the impacts and effects, mitigation and residual effects of the Proposed Development on flood risk, surface water drainage and surface water quality.

11.11.2 Table 11.8 below summarises the proposed additional mitigation and how it is to controlled, implemented and verified.

Table 11.7: Hydrology Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
OPA PHASE 1							
CONSTRUCTION EFFECTS							
Flood risk to downstream persons and property A CEMP containing site management measures and through the phasing of the delivery of the surface water drainage and flood mitigation measures will minimise effect on site drainage.	Very High	Temporary	Negligible to Very Low Adverse	Neutral to Moderate Adverse	-	Negligible to Very Low Adverse	Neutral to Moderate Adverse
Surface Water Quality Adoption of best practice construction site management with adequate contingency planning, following the principles of pollution prevention will be formalised and incorporated into a CEMP to reduce the risk of a pollution event occurring from potentially polluting construction activities.	Medium to Very High	Temporary	Negligible to Low Adverse	Neutral to Moderate Adverse	Surface water quality monitoring and management plan	Negligible to Low Adverse	Neutral to Moderate Adverse
OPERATION EFFECTS							
Flood risk to downstream persons	Very High	Permanent	Negligible to Low Beneficial	Neutral to Moderate	-	Negligible to Low Beneficial	Neutral to Moderate

and property Provision of a surface water drainage system based on SuDS principles to attenuate and release runoff at controlled rate and sequentially designed site layout				Beneficial			Beneficial
Surface Water Quality Surface water drainage system based on SuDS principles to intercept and provide pollution treatment	Medium to Very High	Permanent	Negligible to Low Adverse	Neutral to Moderate Adverse	Surface water quality monitoring and management plan	Negligible to Very Low Adverse	Neutral to Moderate Adverse
Nutrients Connection to public sewer draining to Peel Common WwTW and delivering on-site and off-site nutrient mitigation.	Very High	Temporary	Very Low	Moderate Adverse	Deliver 'Nutrient Neutrality' and net reduction as part of Wider OPA	Negligible to Medium Beneficial	Neutral to Major Beneficial
WIDER OPA							
CONSTRUCTION EFFECTS							
Flood risk to downstream persons and property A CEMP containing site management measures and through the phasing of the delivery of the surface water drainage and flood mitigation measures will minimise effect on site drainage.	Very High	Temporary	Negligible to Very Low Adverse	Neutral to Moderate Adverse	-	Negligible to Very Low Adverse	Neutral to Moderate Adverse

Surface Water Quality Adoption of best practice construction site management with adequate contingency planning, following the principles of pollution prevention will be formalised and incorporated into a CEMP to reduce the risk of a pollution event occurring from potentially polluting construction activities.	Medium to Very High	Temporary	Negligible to Low Adverse	Neutral to Moderate Adverse	Surface water quality monitoring and management plan	Negligible to Low Adverse	Neutral to Moderate Adverse
OPERATION EFFECTS							
Flood risk to downstream persons and property Provision of a surface water drainage system based on SuDS principles to attenuate and release runoff at controlled rate and sequentially designed site layout	Very High	Permanent	Negligible to Medium Beneficial	Neutral to Major Beneficial	-	Negligible to Medium Beneficial	Neutral to Major Beneficial
Surface Water Quality Surface water drainage system based on SuDS principles to intercept and provide pollution treatment	Medium to Very High	Permanent	Negligible to Low Adverse	Neutral to Moderate Adverse	Surface water quality monitoring and management plan	Negligible to Very Low Adverse	Neutral to Moderate Adverse
Nutrients Connection to public sewer draining to Peel Common WwTW and	Very High	Permanent	Negligible to Medium Beneficial	Neutral to Major Beneficial	-	Negligible to Medium Beneficial	Neutral to Major Beneficial

delivering on-site and off-site nutrient mitigation.							
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
Flood risk to downstream persons and property	Effect of multiple schemes on runoff rates and resultant flood risk.				All schemes incorporate appropriate mitigation measures consisting of attenuation SuDS and flow control or infiltration drainage.		Neutral
Surface Water Quality	Effect of multiple schemes on downstream surface water and environmental quality primarily from fine sediment and nutrients.				Implementing a CEMP and delivering nitrite neutral development and discharging foul water to Peel Common WwTW.		Neutral
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**
Increase peak river flow and peak rainfall intensities	The design of flood risk and drainage mitigation measures take into account the effects of climate change and are designed to continue to function throughout the lifetime of the development.				Sequential site layout design + SuDS		Negligible
Surface water quality in designated sites	The effect of climate change on water quality and overall resilience of an aquatic ecosystem is complex is very likely to become increasing sensitive over time. The mitigation measures proposed are considered to be resilient to the effects of climate change and are designed to continue to function throughout the lifetime of the development.				SuDS + surface water quality monitoring and management		Negligible

Table 11.8: Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
OPA Phase 1				
CEMP	Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase
SuDS	Developer/Principal Contractor	Planning Condition	Surface water quality monitoring and management feedback loop	Lifetime of development / Phased delivery
Appropriately designed watercourse crossings	Developer/Principal Contractor	Planning Condition / Land Drainage Consent	Compliance with Land Drainage Consent	Construction Phase
Surface water quality monitoring	Developer/Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase through to Operation
Connection to Peel Common WwTW	Developer	Planning Condition / S106 / S98	Compliance with Planning Condition on Foul Water Drainage Strategy	Lifetime of development / Phased delivery
Wider OPA				
CEMP	Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase
SuDS	Developer/Principal Contractor	Planning Condition	Surface water quality monitoring and management feedback loop	Lifetime of development / Phased delivery
Appropriately designed watercourse crossings	Developer/Principal Contractor	Planning Condition / Environmental Permit /Land Drainage Consent	Compliance with Environmental Permit /Land Drainage Consent	Construction Phase
Surface water quality monitoring	Developer/Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase through to Operation
Connection to Peel Common WwTW	Developer	Planning Condition / S106 / S98	Compliance with Planning Condition on Foul Water Drainage Strategy	Lifetime of development / Phased delivery

CHAPTER 12: NOISE AND VIBRATION

12.1 INTRODUCTION

12.1.1 This chapter of the ES has been produced by Hydrock to assess the potential noise and vibration impacts associated with the Proposed Development. In particular it considers:

- The potential effects of noise and vibration during the construction phase of the Proposed Development on Existing Sensitive Receptors;
- The potential effect of changes to the existing noise environment associated with the Proposed Development when operational, at Existing Sensitive Receptors;
- The potential effect of existing noise sources at Proposed Sensitive Receptors within the Proposed Development; and,
- The potential effect of proposed noise and vibration sources within the Proposed Development, at Existing and Proposed Noise Sensitive Receptors.

12.1.2 In accordance with current policy and guidance, this chapter describes the following:

- The methods used to assess potential noise and vibration impacts and effects;
- Current baseline conditions at, and in the vicinity of, the Proposed Development;
- Potential impacts and effects arising from noise and vibration sources;
- Details of mitigation measures required to prevent, reduce, or offset potential impacts; and,
- Residual impacts and effects. upon the existing and future sensitive receivers that are likely to arise from the construction and occupational phases of the Proposed Development,

12.1.3 The Proposed Development comprises the Wider OPA, together with OPA Phase 1, which effectively represents Phase 1 of the overall Wider OPA Site. This Chapter addresses noise and vibration impacts and effects associated with the Wider OPA Site and OPA Phase 1 in parallel, in order to support discrete planning applications, respectively.

12.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessments

12.2.1 Hydrock undertook noise and vibration impact assessments associated with the construction and operational phases of the nearby Link Roads between Burnetts Lane and Bubb Lane, and at Allington Lane which facilitate site access in to the southern and north western parts of the Wider OPA Site.

12.2.2 The assessment was carried out in order to partially discharge Condition 32 attached to the extant planning permission for a residential development of up to 950 dwellings and associated infrastructure and facilities (ref: X/19/86475), within the Wider OPA Site. The assessment comprised A noise assessment report was submitted (dated 02/12/19), following which the condition was discharged on the 5th March 2020 (ref: DC/19/87026).

Scoping Opinion

12.2.1 An EIA Scoping Report was submitted to Eastleigh Borough Council on 20 April 2020. A summary of the noise and vibration assessment methodology outlined within the scoping report is as follows:

- Assessment of potential noise and vibration effects associated with the construction phase of the development, undertaken in accordance with BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014;
- Assessment of potential noise effects associated with development-generated road traffic, in accordance with CRTN and the DRMB;
- Assessment of potential effects associated with proposed ancillary equipment associated with the proposed Development will be set in accordance with BS4142:2014 + A1:2019. In particular, with reference to proposed employment and education land uses; and,
- Assessment of potential noise effects at proposed sensitive areas within the Proposed Development during the operational Phase of the Development (future scenario).

12.2.2 The formal Scoping Opinion was issued by Eastleigh Borough Council (EBC)on 12th August 2020, and has been considered during this assessment. While the Scoping Opinion agrees in principle with the above proposed methodology, additional comments regarding noise and vibration were included as follows:

12.2.3 The Scoping Opinion states:

'Road receptors may be more distant than the nominal distances indicated in the report for assessments, due to traffic movement patterns brought about by the traffic growth resulting from such a large development itself, and also due to the improved road infrastructure with the creation of the link road and a through route from Bubb Lane to Allington Lane and onward to Eastleigh Town Centre. This last point is important when considering the scope of the air pollution and noise studies as there is a potential for resulting changes and increases in traffic to impact these in locations where air pollution and noise are already very elevated and exceed national guideline values. In particular, air pollution in the Eastleigh Air Quality Management Area and noise in the Noise Important Areas, (as defined under the European noise directive, END), which exist in Eastleigh town on the A335, Southampton Road, Leigh Road and Twyford Roads, but also on quieter roads were relative changes are large.'

12.2.4 In order to address this paragraph, noise impacts associated with development generated road traffic are considered in the vicinity of Eastleigh Town Centre, including some of the links referenced. In addition, other pertinent areas located a considerable distance from the Proposed Development are considered, including road links towards the West End and Chartwell Green.

'Similarly, there are uncertainties in the likely timescale over which the development will be constructed and become operational, this will affect the validity of some of the assumptions underpinning both air pollution and noise impact assessments, and the detail of how these have been considered in the various future scenarios which will be used to assess the scale of impacts should be included in the ES.'

12.2.5 In order to provide a robust assessment, and account for uncertainties within the methodology with respect to the timescale over which the Wider OPA will be constructed and occupied, it is assumed that the Wider OPA Ste is fully occupied during the predicted 'opening year'.

'It is understood from the information in the Scoping Report regarding noise that piling may be required for the proposed development. Fish are particularly sensitive to vibration that may arise as a result of piling or other noisy percussive activities during construction within or close to watercourses. This and other habitats should be included as a potential significant effect to be

assessed in the ES. Following discussion at the 1HH Ecology Working Group further information on the impacts from sediments and on salmon spawning specifically is needed…

Consideration needs to be given not only to the human impact of noise, but also the impacts on sensitive ecological receptors such as the River Itchen including, but not limited to, the impact on the migration of fish.'

12.2.6 Consideration of potential noise and vibration impacts and effects on migratory fish, and other significant ecological receptor locations, have been considered. This includes, Chalcroft Tolls Ecology Area, Quobleigh Ecological Area and Central Stream Corridor, as highlighted on the 'OHH Sensitive Ecology Areas – Noise' figure (Figure x.x), provided by Johns Associates, the Ecologist for this project.

'Vibration is scoped in for the construction phase and the operational phase due to through traffic and heavy traffic utilising the new link road and travelling through to Allington Lane / Eastleigh road and on to Eastleigh Town. Vibration impacts from Chalcroft Business Park HGVs is a known local issue.'

12.2.7 Potential vibration impacts and effects associated with the construction and operational phase is considered in this assessment as appropriate, in accordance with current guidance and available information. In particular, some commentary on HGVs and vibration is included, with respect to Existing Sensitive Receptors.

'It is important that adequate representation of existing background noise and vibration levels is demonstrated, which needs to take account of other noise sources including transport networks and the Chalcroft Business Park. Periods of noise monitoring should be sufficient to establish typical noise levels with a reasonable degree of certainty.'

12.2.8 Background noise levels have been established in accordance with current guidance, in particular BS4142 with respect to industrial noise sources at Chalcroft Business Park. Background vibration levels, i.e. vibration from existing sources are also considered within the assessment, however the only nearby significant vibration source is considered to be the London to Portsmouth via Basingstoke rail line, approximately 70m to the south of the Wider OPA Site.

Legislative Context

12.2.9 The key legislation relevant to the Proposed Development are:

- Control of Pollution Act, 1974 (COPA); and,
- Environmental Noise (England) Regulations[12.2], 2006

Planning Policy and Guidance

National Planning Policy

12.2.10 The following national planning policy is considered applicable:

National Planning Policy Framework, 2019,

12.2.11 The 'National Planning Policy Framework' (NPPF), February 2019, Ministry of Housing, Communities and Local Government, sets out the United Kingdom Government's planning policies for adoption in England and how they should be applied.

12.2.12 The main aims of the NPPF are set out in section 11, as stated below.

"Planning policies and decisions should: Encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains – such as developments that would enable new habitat creation or improve public access to the countryside;

recognise that some undeveloped land can perform many functions, such as for wildlife, recreation, flood risk mitigation, cooling/shading, carbon storage or food production;

give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land;

promote and support the development of under-utilised land and buildings, especially if this would help to meet identified needs for housing where land supply is constrained and available sites could be used more effectively (for example converting space above shops, and building on or above service yards, car parks, lock-ups and railway infrastructure); and

support opportunities to use the airspace above existing residential and commercial premises for new homes. In particular, they should allow upward extensions where the development would be consistent with the prevailing height and form of neighbouring properties and the overall street scene, is well designed (including complying with any local design policies and

standards), and can maintain safe access and egress for occupiers."

12.2.13 Updates to the NPPF, published in 2019, also brings into effect the 'agent of change' principle. This principle protects existing business, particularly licenced premises and venues, from unreasonable restrictions placed on them as a result of development permitted after they were established. However, in essence, any party bringing change to an area should be responsible for managing subsequent impacts.

12.2.14 The NPPF refers to guidance contained in 'Noise Policy Statement for England (NPSE), March 2010, Department for Environmental, Food and Rural Affairs' (NPSE). The NPSE is intended to apply to all forms of noise, with the exception of noise occurring in the workplace.

Noise Policy Statement for England, 2011

12.2.15 The NPSE provides advice regarding the impact of noise which should be assessed on the basis of 'adverse' and 'significant adverse' effect. However, the NPSE does not provide any specific guidance on assessment methods or threshold values at which different effects would occur. It should therefore be considered in combination with national noise guidance and standards.

12.2.16 Moreover, the NPSE advises that it is not possible to have 'a single objective noise-based measure'…that is applicable to all sources of noise in all situations. It further advises that the sound level at which an adverse effect occurs is 'likely to be different for different noise sources, for different receptors and at different times.'

Local Planning Policy

Current Planning Policy

12.2.17 Eastleigh Borough Local Plan, 2001 - 2011

Emerging Planning Policy

12.2.18 Draft Eastleigh Borough Local Plan, 2011 - 2019

Guidance/ Best Practice

12.2.19 The following international guidance is considered applicable:

- World Health Organisation (WHO) Guidelines for Community Noise, 1999,

12.2.20 The following national guidance is considered applicable:

- Planning Practice Guidance (Live Document);
- British Standards 5228:2009 + A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration (BS5228-1 and -2);
- BRE Controlling particles, vapour and noise pollution from construction sites (Part 1 to 5), 2003;
- Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7, 2011 (DMRB);
- British Standards 8233: 2014 'Sound insulation and noise reduction for buildings – Code of practice' (BS8233);
- Professional Practice Guidance: Planning and Noise, 2017 (ProPG);
- British Standard 4142:2014 + A1:2019 'Methods for rating and assessing industrial and commercial sound' (BS4142);
- British Standard 6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting' (BS6472);
- Department of Transport – Calculation of Road Traffic Noise ,1988 (CRTN);
- Institute of Estuarine and Coastal Studies (IECS) Guidance on Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance, 2009
- Measurement and Interpretation of Underwater Noise During Construction and Operation of Offshore Wind Farms, Nedwell et al, 2007;
- Institute of Environmental Management and Assessment (IEMA) – Guidelines for Environmental Noise Impact Assessment, 2014.

Baseline Data Collection

12.2.21 Noise monitoring was undertaken at, and in the vicinity of, the site over four separate survey periods, as follows:

- 2nd November 2018 to 5th November 2018;

- 14th November 2019;
- 14th October to 16th October 2020; and,
- 26th October to 27th October 2020.

12.2.22 Noise measurements were made using Class 1, integrating sound level meters. Microphones were positioned vertically on a tripod at least 1.5m above the ground and at least 3.5m from any other reflecting surfaces. Sound level meters were calibrated to a reference level of 94 dB at 1kHz both prior to, and on completion of, the noise survey. No significant drift in calibration was noted during the survey (≤ 0.5 dB).

12.2.23 All noise monitoring took place during conducive weather conditions, with wind speeds less than 5ms^{-1} and no significant precipitation.

12.2.24 For the purposes of this assessment, in accordance with current guidance, daytime hours are taken to be 0700 to 2300 hours and night-time hours to be 2300 to 0700 hours

12.2.25 Noise monitoring was undertaken at 9 Monitoring Locations (MLs) considered to be representative of the noise environment at, and in the vicinity of, the Proposed Development. Noise monitoring locations are shown on **Figure 12.1**, and summarised in **Table 12.1** below.

Table 12.1 – Monitoring Location Summary

Monitoring Location	Description	Monitoring Period
ML1	Adjacent to the northern site boundary of the Wider OPA, within Quobleigh Ecological Area. This location was selected to establish existing noise levels in the norther part of the site, with respect to Quobleigh Ecological Area, nearby existing residential receptors and proposed sensitive areas in the northern part of the Site.	1315 on 02/11/18, to 1050 on 05/11/18
ML2	To the north east of the Wider OPA Site, adjacent to Allington Lane. This location was selected in order to characterise road traffic noise from Allington Lane.	1213 to 1513 on 14/11/19
ML3	Adjacent to the eastern site boundary. This location was selected to establish existing noise levels in the eastern part of the site, with respect to nearby existing residential receptors and proposed sensitive areas in the eastern part of the Site.	1210 on 02/11/18, to 1130 on 05/11/18
ML4	To the west of the Wider OPA Site, located approximately 10m from the London to Portsmouth via Basingstoke rail line.	1400 on 26/10/20 to

	This location was selected to characterise rail noise associated with this line.	1400 on 27/10/20
ML5	In the southern part of the Wider OPA Site, in the northern part of the FRP. This location was selected to establish background noise levels at the site, with respect to potential impacts from Chalcroft Business Park.	1645 on 14/10/20 to 0845 on 16/10/20
ML6	To the south of the Wider OPA Site, adjacent to in the northern part Chalcroft Business Park. This location was selected to establish specific and background noise levels associated with industrial activity at nearby units within the Business Park.	0930 on 15/10/20 to 0815 on 16/10/20
ML7	Adjacent to the southern Wider OPA Site boundary with, Chalcroft Business Park. This location was selected to establish ambient, specific and background noise levels associated with industrial activity at nearby units within the Business Park.	1240 on 02/11/18 to 1035 on 05/11/18
ML8	Adjacent to the Wider OPA Site south eastern boundary with Burnetts Lane. This location was selected in order to characterise road traffic noise from Allington Lane.	1230 on 14/11/19 to 1530 on 14/11/19
ML9	In the southern part of the Wider OPA Site and the OPA Phase 1 Site, in the vicinity of Chalcroft Business Park and the proposed Site access off Burnetts Lane. This location was selected to establish ambient noise in the southern part of the Wider OPA Site and the OPA Phase 1 Site, together with specific and background noise levels associated with the Business Park.	1715 on 14/10/20 to 0900 on 15/10/20

12.2.26 Together with discussions undertaken with Chalcroft Business Park, observations undertaken during setup and dismantling of each ML allow an evaluation of the prevailing noise environment at the Site.

12.2.27 Monitoring undertaken at ML5, ML6 and ML9 were also supplemented with audio recordings to allow retrospective analysis of the acoustic environment, during periods which were unattended.

Assessment Methodology

Construction Phase

Noise at Residential Receptors

12.2.28 The generic construction sequence of works which are considered to be the most likely to give rise to significant noise effects can be divided into three specific activities:

- Enabling Works;
- Piling;
- Building Construction; and,
- Landscaping and External Infrastructure Works.

12.2.29 The likely significant effects of noise from construction and demolition works have been assessed in accordance with the 'ABC Method' of BS5228-1.

12.2.30 This method defines category threshold values which are determined by the time of day and existing monitored ambient noise levels in the vicinity of ESRs (rounded to the nearest 5dB). Noise likely to be generated by construction and demolition activities, known as the 'total noise level', is then compared with the 'threshold value'. If the total noise level exceeds the 'threshold value', a significant effect is deemed likely to occur.

12.2.31 **Table 12.2** summarises the significance effect threshold values at receptors, recommended by BS5228-1.

Table 12.2: Thresholds of Significant Effect at Residential Receptors in Accordance with the ABC Method of BS5228-1

Assessment Category Threshold Value Period	Threshold Value, dB		
	Category A *1	Category B *2	Category C *3
Weekday Daytime (07:00 to 19:00) and Saturdays (07:00 to 10:00)	65	70	75
*1 Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than this value. *2 Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values. *3 Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are more than this value.			

Vibration at Residential Receptors

12.2.32 Damage to buildings associated solely with groundborne vibration is uncommon, and although vibration may be noticeable, there is little evidence to suggest that cosmetic damage can occur, such as a crack in plaster, unless the magnitude of the vibration is extremely high. The most likely impact, where elevated levels of vibration do occur during the demolition and construction phases of development, is associated with perceptibility.

12.2.33 Where groundborne vibration is of a relatively continuous nature, there is a greater likelihood of structural damage occurring, compared to transient vibration; for example, that caused by transiting vehicles or piling. The only current national guidance document which provides a methodology for predicting levels of vibration from construction activities is BS5228- 2. The prediction method provided relates specifically to percussive, or vibratory, rolling and piling only.

12.2.34 Therefore, it is not possible to accurately predict levels of vibration during the Site preparation and the construction phase of development. However, vibration impacts during Site activities other than piling are uncommon. As such, to control the impact of vibration during Site preparation and construction of a development, limits relating to the perceptibility of vibration are typically set.

12.2.35 Piling is likely to be required during the construction of the Proposed Development. Therefore, a prediction of vibration associated with potential piling at nearby ESRs has been included within this assessment.

12.2.36 As stated in BS5228-2 and as generally accepted, the threshold of vibration perception for humans is typically in the Peak Particle Velocity (PPV) range of 0.14 mms-1 to 0.3mm/s, which forms the basis of the recommend maximum permitted vibration levels of 1 mms-1 PPV within occupied residential dwellings.

12.2.37 BS5228-2 also sets out the distances (based on historical field measurements) at which certain activities could give rise to a just perceptible level of vibration. These distances are presented in **Table 12.3**.

Table 12.3: Typical Distances at which Vibration May Just Be Perceptible

Construction Activity	Distance, m
Excavation	10-15
Heavy Vehicles (e.g. dump trucks)	5-10
Hydraulic Breaker	15-20
Rotary Bored Piling	20-30

Noise at Bird Habitats

12.2.38 IECS Guidance sets out a disturbance level framework based upon the typical response of waterfowl to construction noise. The report highlights that level of disturbance often varies

depending on magnitude, frequency and duration of sound, and species, age, season and previous exposure.

12.2.39 The report highlights that the disturbance level is related to both visual and aural stimuli, and that noise in isolation is not necessarily a cause for disturbance, without any visual disruption.

12.2.40 The effect on bird population is quantified based on observations of flight response and behavioural changes. Threshold noise levels provided by IECS are summarised in the table below.

Table 12.4 – Bird Response and Impact Thresholds

Noise Level, dB(A)	Level of Magnitude	Type of Noise
< 50	Low	Regular construction noise
< 70	Low	Piling noise (impulsive)
50 to 70	Medium	Regular construction noise
>70	Medium - High	Piling noise (impulsive)
>85	High	Not defined

12.2.41 No indication of response associated with regular piling noise above 70 dB, or definition of regular piling noise, is provided within IECS guidance. However, noise levels of 70 dB L_{AFmax} is considered to represent the threshold of behavioural response but not necessarily be an indication of flight responses.

Noise and Vibration at Fish Habitats and Migration Routes

12.2.42 Fish behaviour responses from exposure to underwater sound relate directly to the species-specific hearing sensitivity. Variations in anatomy and physiology fish hearing mechanisms is extensive, therefore the way in which different species detect sound can vary drastically. Figure 12.1 provides hearing threshold contours for Dab, Herring, Salmon and Trout fish species.

12.2.43 various studies have been carried out regarding the potential impact of noise and vibration on fish. However, '*Measurement and Interpretation of Underwater Noise During Construction and Operation of Offshore Wind Farms*' published in 2007 provides an assessment criteria framework based on the predicted level above the species-specific hearing threshold, dB_{ht}. Table 12.5 below provides a summary of impact thresholds and corresponding effect levels.

Table 12.5 – Fish Response and Impact Thresholds

Noise Level, dB_{ht}	Level of Magnitude	Type of Noise
0 – 50	Negligible	Low likelihood of Disturbance
50 – 75	Low	Some avoidance reaction by the majority of individuals but habituation or context may limit effect
75 – 90	Medium	Significant avoidance reaction by the majority of individuals but habituation or context may limit effect
>90	High	Strong avoidance reaction by virtually all individuals
>130	Very High	Possibility of traumatic hearing damage from single event

Operational Phase

Development-Generated Road Traffic

12.2.44 DMRB provides guidance on defining the magnitude of noise impacts associated with changes in road traffic flows, related to the Proposed Development.

12.2.45 The magnitude of effect can be determined on the basis of a change in road traffic noise level, in terms of $L_{Aeq, 18hour}$, as detailed in Table 12.6. However, it is considered that the absolute level of road traffic noise is also relevant in the determining of noise impacts.

Table 12.6 – Short-Term and Long-Term Magnitude of Change in Road Traffic Noise, according to DMRB

Level of Magnitude	Short Term Change in Noise Level $L_{10,18hour}$ dB(A)	Long Term Change in Noise Level $L_{10,18hour}$ dB(A)	Significance of Impact – as described in DMRB
High	≥ 5.0	≥ 10.0	Major
Medium	3.0-4.9	5.0-9.9	Moderate
Low	1.0-2.9	3.0-4.9	Minor
Negligible	0.1-0.9	0.1-2.9	Negligible
	0.0	0.0	No Change

Noise from Proposed Ancillary Equipment

12.2.46 Noise levels from proposed ancillary equipment associated with the Proposed Development, for example building services and fixed plant at proposed employment, commercial and education uses, would need to be controlled to ensure that it would not have an adverse effect on Proposed Sensitive Receptors (PSRs) and Existing Sensitive Receptors (ESRs), relative to the background noise level. Criteria for the assessment are set in accordance with BS 4142:2014. Using the baseline noise levels recorded at, and in the vicinity of, the Site, noise limits for ancillary equipment have been calculated to ensure the requirements are met.

Significance of Effect

Magnitude of Effect

12.2.47 Table 12.7 describes the magnitude of noise and vibration impact effects. These magnitude descriptors are based upon IEMA Guidelines for Environmental Noise Impact Assessment, and the descriptions based on the Noise Exposure Hierarchy in PPG-Noise.

Table 12.7 – Magnitude of Impact

Descriptor	Description
High	Impact resulting in a considerable change in baseline environmental conditions predicted either to cause statutory objectives to be significantly exceeded or to result in severe undesirable/desirable consequences on the receiving environment.
Medium	Impact resulting in a discernible change in baseline environmental conditions predicted either to cause statutory objectives to be marginally exceeded or to result in undesirable/desirable consequences on the receiving environment.
Low	Impact resulting in a change in baseline environmental conditions with undesirable/desirable conditions that can be tolerated.
Negligible	No discernible change in baseline environmental conditions.

Sensitivity of Receptor

12.2.48 Table 12.8 describes the sensitivity of receptors.

Table 12.8 – Sensitivity of Receptor

Descriptor	Description
High	Receptor/resource has little ability to absorb change without fundamentally altering its present character, or of international or national importance. For example, hospitals, residential care homes, and internationally and nationally designated nature conservation sites which are also known to contain noise sensitive species (i.e. noise may change breeding habits or threaten species in some other way).
Medium	Receptor/resource has moderate capacity to absorb change without significantly altering its present character. For example, residential dwellings, offices, schools, and play areas. Locally designated nature conservation sites which are also known to contain noise sensitive species (i.e. noise may change breeding habits or threaten species in some other way).
Low	Receptor/resources is tolerant of change without detriment to its character or is of low or local importance. For example, industrial estates.
Negligible	Receptor/resource is not sensitive to noise.

Significance of Effect

12.2.49 The significance of effect is determined by the interaction between magnitude of impact (Table 12.7) and sensitivity of receptor (Table 12.8). Magnitude descriptors are based upon IEMA Guidelines for Environmental Noise Impact Assessment, and the descriptions based on the Noise Exposure Hierarchy in PPG-Noise.

Table 12.9 – Significance of Effect Matrix, according to IEMA Guidelines

Magnitude of Effect	Sensitivity of Receptors

	High	Medium	Low	Negligible
High	Substantial	Major	Moderate	Minor
Medium	Major	Major	Moderate	Neutral
Low	Moderate	Moderate	Minor	Neutral
Negligible	Minor	Neutral	Neutral	Neutral

12.2.50 In terms of significant of effect (in EIA terms), the threshold between insignificant and significant lies between 'Moderate' and 'Major' as identified within Table 12.9. Moderate impacts may be noticeable and intrusive but may cause a small change in behaviour. Whereas Substantial impacts are likely to be noticeable and disruptive, and might cause a material change in behaviour or attitude.

Geographical Scope

12.2.51 The geographical scope of this assessment includes the Proposed Development and ESRs in the vicinity of the adjacent local road network. In addition, pertinent areas located a considerable distance from the Proposed Development are considered, including ESRs in the vicinity of Eastleigh Town Centre, West End and Chartwell Green.

Temporal Scope

12.2.52 This assessment considers potential impacts and effects over a 10-year period, including the following assessment years:

- Baseline 2020;
- OPA Phase 1 Opening Year 2023; and,
- Operational Future Year 2030.

Assumptions & Limitations

12.2.53 To reduce the level of uncertainty within the assessment the following steps have been taken:

- Road traffic noise at existing and proposed receptors have been predicted using SoundPlan, taking into account 1st order reflections from buildings and other large surfaces;
- All noise sources measured during the survey are considered to be typical of the surrounding noise environment;

- The noise measurement locations were selected to be representative of the noise levels at the closest point of proposed receptors;
- The distance between the source and nearest receptors has been measured from scale plans;
- Noise measurements were undertaken during suitable weather conditions; and,
- Noise measurements were made using Class 1, integrating sound level meters, which are accurate to 0.1dB.

12.3 CONSULTATION

12.3.1 Hydrock provided a noise survey and assessment methodology overview email to Eastleigh Borough Council (EBC) in August 2020 via email. The email set out a review of current guidance to be used for this assessment, together with justification for the validity of noise survey data captured in November 2018, and November 2019 in the vicinity of the site.

12.3.2 Given the majority of 2020 has been subject to Covid-19 restrictions, or associated effects on transportation, survey data collected in 2018/2019 is considered to provide a robust representation of the typical baseline conditions.

12.3.3 In response to the aforementioned email, telephone discussions were held with Stuart Wedgebury, Environmental Health Consultant at EBC, and subsequent email on the 10th December 2020. In the email it was confirmed that the noise data collected in November 2018 and November 2019 is likely to be representative of 2020 conditions.

12.3.4 In addition, the response provided a reiteration of points raised within the Scoping Opinion, and also highlighted the importance of the 'agent of change' principal to the Proposed Development, outlined within the NPPF. Stuart Wedgebury also highlighted that a review of extant permissions of individual businesses at Chalcroft Business park could be carried out, to provide additional context to the impact assessment.

12.3.5 Further information was provided by Dawn Errington, on the 16th December 2020, relating to permitted operations at Chalcroft Business Park under extant planning permission, indicating that some of the businesses have no restrictions on night-time HGV movements. It was highlighted that noise from HGV movements associated with current operations are somewhat of a sensitive issue locally, and have given rise to complaints.

12.3.6 In addition, Dawn Errington provided access to a noise impact assessment carried out in support of the planning application for the relocation of Owtons Butchers, to be located in a new industrial unit at Chalcroft Business Park (application ref: F/18/83945). The noise impact assessment concludes that no adverse impacts are predicted to occur, with appropriate mitigation measures in place, when considering proposed residential receptors at the Wider OPA Site (inclusive of the OPA Phase 1 Site) with partially open windows.

12.3.7 Consultation was carried out with representatives of Chalcroft Business Park prior to and during the 2020 noise survey, including the overall site manager and individual business operators, in order to understand typical operations. Appendix 12.1 provides a summary of information obtained pertinent to this assessment.

12.4 BASELINE ENVIRONMENT

12.4.1 Observations made at the Wider OPA Ste during the surveys allowed any significant existing noise sources which contribute the measured levels, to be identified. In addition, measurements undertaken at ML5, ML6 and ML9 included constant audio recording to allow retrospective analysis of the existing noise environment. The following noise sources were identified:

Road Traffic Noise: Noise from the adjacent road network was dominant for the majority of the daytime and night time periods, across the Wider OPA Site (at all MLs). Prevailing sources include Allington Lane, Burnetts Lane, B3354 and B3342.

Rail Noise: Noise from rail movements on the London to Portsmouth via Basingstoke rail line, was regularly audible, and occasionally dominant during the daytime and night time periods, in the south western part of the site (ML4, ML6, ML7 and ML9);

Industrial Noise: Industrial noise associated with Chalcroft Business Park was regularly audible, and occasionally dominant for short periods at ML6 during the daytime period, and was inaudible during the night-time period. HGV movements along the access road off Burnetts Lane, associated with the existing Owtons Butchers was regularly dominant at ML5 during the daytime and night-time period; and,

Other: Bird song and other wildlife noises were occasionally audible during the daytime and night time period. Noise from distant aircraft was occasionally audible.

12.4.2 Measured noise levels at each ML have been separated in to daytime (0700 to 2300 hours) and night-time (2300 to 0700 hours) categories, as appropriate.

12.4.3 Monitoring at ML1, ML3 and ML7 was undertaken between the 2nd and 5th November 2018, covering both weekday and weekend periods. Weekday and weekend daytime periods were found to be relatively similar in level over the survey period. However, the measured Sunday night-time periods were found to be comparably less than the measured Friday and Saturday night-time periods. In order to provide a robust assessment of ambient noise levels at the Wider OPA Site, Sunday night-time levels have been omitted.

12.4.4 Where possible, 16-hour daytime and 8-hour night-time periods were measured in full.

12.4.5 At ML4, daytime levels were measured between 1400 to 2300 on the 26th November and 0700 to 1400 on the 27th November 2020. The respective $L_{Aeq,\ 9hour}$ and $L_{Aeq,\ 7hour}$ levels have been logarithmically averaged to provide a representative daytime $L_{Aeq,\ 16hour}$ level.

12.4.6 At ML6, a daytime $L_{Aeq,\ 15hour}$ level was measured, between the 15th and 16th October 2020. Similarly, at ML9, a daytime $L_{Aeq,\ 8hour}$ level was measured, between the 14th and 15th October 2020. Daytime levels measured at ML6 and ML9 included peak transportation periods, therefore the arithmetic average of the measured $L_{Aeq,\ 1hour}$ values are considered to represent the typical $L_{Aeq,\ 16hour}$ daytime level at each location, in order to provide a robust assessment.

12.4.7 Measurements at ML2 and ML8 were carried out for 3 consecutive hours, during the quiet daytime period (1000 to 1700), in accordance with the shortened measurement methodology outlined within CRTN, in order to characterise noise from Allington Lane and Burnetts Lane, respectively. Daytime $L_{Aeq,\ 16hour}$ and night-time $L_{Aeq,\ 8hour}$ values have been derived from the measured $L_{A10,\ 3hour}$ using the methodologies outlined by CRTN and TRL, and presented in Table 12.10.

12.4.8 Table 12.10 presents the typical daytime and night-time values at each ML, used for the purposes of this assessment.

Table 12.10 – Average Measured Daytime and Night-time Noise Levels

Monitoring Location	Time Period	Measured Noise Level, $L_{Aeq,T}$ dB
ML1	0700 - 2300 2300 - 0700	47 37
ML2	0700 - 2300 2300 - 0700	74 65
ML3	0700 - 2300 2300 – 0700	50 42

ML4	0700 - 2300 2300 – 0700	62 54
ML5	0700 - 2300 2300 – 0700	57 56
ML6	0700 - 2300 2300 – 0700	42 35
ML7	0700 - 2300 2300 – 0700	50 41
ML8	0700 - 2300 2300 - 0700	63 55
ML9	0700 - 2300 2300 - 0700	44 36

12.4.9 The typical measured night-time L_{AFmax} noise levels measured during the survey are summarised in Table 12.11. Measured night time maxima which are not considered representative of the typical noise environment have been eliminated from this assessment.

12.4.10 Typical measured daytime L_{AFmax} noise levels at ML2 and ML8 are also presented for completeness.

Table 12.11: Summary of Typical Maximum Night-time Noise Levels

Monitoring Location	Typical Night-time L_{AFmax} dB
ML1	73
ML2	88
ML3	46
ML4	82
ML5	84
ML6	50
ML7	60
ML8	85
ML9	52

12.4.11 A summary of noise survey results is presented in Appendix 12.2.

12.5 INHERENT DESIGN MITIGATION

12.5.1 A Construction Environmental Management Plan (CEMP) will be undertaken for the Proposed Development, which will include a methodology of noise and vibration best practice and, where

required, mitigation with respect to the thresholds outlined within this assessment, as appropriate.

12.5.2 An assessment of road traffic noise associated with the proposed Bubb Lane & Burnetts Lane Link Road was carried out by Hydrock, in order to discharge Condition 32 attached to the planning permission (ref: DC/19/87026). The assessment outlined a mitigation scheme to be implemented as part of that link road. The mitigation scheme comprises a landscaped earth, in combination with a 2m acoustic a barrier, as detailed in the addendum report, dated 2nd July 2020. The link road and associated mitigation scheme has been included for all future year road traffic scenarios, as the link road is expected to become operational in 2021.

12.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

Construction Impacts and Effects

OPA Phase 1

12.6.1 The activities associated with the construction phase of the OPA Phase 1 have the potential to generate noise and vibration that propagates beyond the site boundary. Off-site impacts associated with the OPA Phase 1 are covered within the Wider OPA section.

The Wider OPA

Noise at Existing Residential Receptors

12.6.2 The activities associated with the construction phase of the Wider OPA have the potential to generate noise that propagates beyond the site boundary. In addition, noise associated with the construction phase has the potential to impact preceding phases of the development itself. For example, Phase 1 may be impacted by later construction phases when it becomes occupied prior to completion of the overall development.

12.6.3 At this stage, detailed information regarding the nature and timescales of activities likely to take place during the construction phase of the Wider OPA are not known. Activities which could give rise to significant impacts during construction include, but are not limited to, the following:

- Site preparation i.e. ground excavation, levelling of ground, trenching, trench filling, unloading and levelling of hardcore and compacting filling; and,

- Construction of the Proposed Development, including piling, construction of access roads, fabrication processes e.g. planning, sanding, routing, cutting, drilling and laying foundations.

12.6.4 The contractor undertaking the enabling and construction works has not yet been appointed, therefore, for the purposes of this assessment it is assumed that the enabling and construction works will be restricted to daytime hours (i.e. between 08:00 and 18:00 hours Monday to Friday and 08:00 to 13:00 hours on a Saturday, with no work on Sunday and Bank Holidays).

12.6.5 Based upon the measured ambient noise levels in the vicinity of the Phase 1 Site and ESRs, during the daytime period, the appropriate category value has been determined, as detailed in Table 12.12.

Table 12.12: Appropriate Category Value for Existing Sensitive Receptors

Description of Receptor	Representative Monitoring Location	Average Measured Daytime Level, dB $L_{Aeq, T}$	Rounded Daytime Level to the Nearest 5 dB(A)	Appropriate Category Value, according to BS5228-1	Significant Noise Impact Threshold,
Residential dwellings in the northern part of Phase 1	ML5	57	55	A	65
Residential dwellings in the eastern part of Phase 1	ML8	56*	55	A	65
Residential dwellings in the southern part of Phase 1	ML9	44	45	A	65
Existing residential dwellings in the vicinity of the eastern Site boundary	ML3	50	50	A	65
Existing residential dwellings in the vicinity of the northern Site boundary	ML1	47	45	A	65
Existing residential dwellings in the vicinity of the western Site boundary.	ML2	67*	65	B	70
*Denotes road traffic noise levels which have been distance corrected to 10m from the carriageway, in order to represent ambient levels in the vicinity of ESRs.					

12.6.6 Construction Phase activities have the potential to generate short-term increases in noise levels. The levels of noise received at the receptors closest to Phase 1 and the overall Proposed Development, would depend on the sound power levels of equipment used, the distance to the

properties, the presence of screening or reflective surfaces and the ability of the intervening ground to absorb propagating noise.

12.6.7 Furthermore, the nearest noise sensitive receptors to the construction activity will vary over the course of the construction period, depending on where activities are taking place within the Site. Given the potentially small distances between activities and existing residential dwellings, noise levels at the receptors may occur above the threshold values determined by BS5228, as detailed in Table 12.12, when in the immediate vicinity.

12.6.8 The noise impact of the construction phase on existing and proposed residential properties is likely to be **minor**, however there is potential for short-term **moderate** impacts when construction takes place in the immediate vicinity of sensitive receptors.

12.6.9 Therefore, it is recommended that mitigation measures be put in to place in order to avoid and/or reduce potential impacts where possible. Further, detail is provided in the Mitigation Section of this Chapter.

Vibration at Existing Residential Receptors

12.6.10 The nearest sensitive receptors to the proposed construction works would vary depending upon the part of the Development under construction. As a worst-case scenario, construction works may potentially take place at a distance less than 10m from existing residential properties and occupied dwellings within Phase 1. At this distance, it is considered possible that vibration due to the operation of construction machinery may be above the threshold of complaint. However, this would be transient only and for very limited periods during the works.

12.6.11 It is considered that piling may be required given the nature of the Proposed Development. At this time, the type(s) of piling to be used during the construction phase is not known and it is likely that the contractor responsible for undertaking construction works at the Site would decide the appropriate method of piling required.

12.6.12 BS5228-2 recognises that the most common form of vibration associated with piling is the intermittent type derived from conventional driven piling. The intensity of vibration disturbance, which may be registered at a receptor, would be a function of many factors. These are set out in BS5228-2 and include:

- Energy per blow or cycle;
- Distance between source and receptor;

- Soil structure interaction (i.e. nature of connection between soil and structure being monitored); and,

- Construction of structure and location of measuring points (e.g. soil surface, building foundation and internal structural element).

12.6.13 As the responsible contractor has not yet been appointed, detailed information regarding the above is not known. However, elements of proposed roads are considered to potentially be constructed using piling techniques.

12.6.14 Typically, modern construction methods would implement either Continuous Flight Auger (CFA) piling or rotary bored piling techniques. These methods use trawler mounted drill rigs to insert the pile in to the ground, and do not use vibratory hammers. These methods therefore don't emit high intensity transient vibration and generally emit low level constant vibration.

12.6.15 It is considered likely that either CFA or rotary bored piling methods will be used during the construction of the Development. However, a 'worst case' prediction of vibration impact, as a result of vibratory driven piles being used, has been carried out at the nearest existing residential receptor, using the methodology outlined within Annex E of BS5228-2.

12.6.16 The prediction assumes the following:

- 33% probability that predicted PPV will be exceeded. Kv = 126;

- The piling rig is located in at 50m from sensitive receptors. x=50; and,

- 'All operations' criterion is used from BS5228-2. Δ=1.3. Less impact is likely during 'start up' and 'run down' situations. More impact is likely during steady state operation.

12.6.17 The predicted worst case PPV at receptors located 50m from piling activity is 0.7 mms^{-1}. In accordance with BS5228-2, this indicates that vibration might just be perceptible at this ESR. Furthermore, this predicted level is significantly less than the guideline value for the threshold of building damage, outlined within BS7385-2.

12.6.18 The vibration level of the construction works is likely to result in an impact between **moderate** and **neutral**, at existing and proposed residential dwellings.

<u>Noise & Vibration at Ecological Receptors</u>

12.6.19 The following potentially Sensitive Ecological Areas (SEAs) have been identified to be located within 50m proposed major roads within the Proposed Development, as shown on 'OHH Sensitive Ecological Areas – Noise' drawing, provided by Johns Associates:

- Quobleigh Ecological Area; and,
- Quobleigh Central Stream Corridor; and,
- Chalcroft Tolls Ecology Area.

12.6.20 In addition, Johns Associates highlighted the presence of 3 badger sets located in and around the Quobleigh Ecological Area and stream corridor. However, badger set locations are at least 100m from any proposed major road construction areas, and impacts therefore have the potential to be **minor** on occasion, but likely to be **neutral** for the majority of the time, depending on the specific area in which construction activity occurs.

Bird Habitats

12.6.21 Bird habitats are generally considered to be of medium sensitivity, as birds have some ability to absorb/avoid short term impacts by relocating to nearby habitats. However, during particularly sensitives periods, such as breeding seasons, bird habitats are considered to be of high sensitivity.

12.6.22 Noise impact thresholds for construction noise are provided within IECS guidance, as detailed in Table 12.4. The distance between bird habitats, within the identified SEAs identified, will vary over the course of the construction period, depending on where activities are taking place within the Site.

12.6.23 IECS guidance provides general guidance that a 100m buffer zone between construction activities and bird habitats should remove the potential for noise impacts. Given the potentially small distances between construction activities and bird habitats within the SEAs, a 100m buffer zone would not be practical.

12.6.24 When construction is due to take place within close proximity to the SEAs, the appropriate threshold values should be adopted, and construction noise should be controlled to an average level of less than 70dB(A), with individual events being controlled to below 85dB(A) at nearby habitats. This would ensure no significant impacts occur, in accordance with IECS guidance.

12.6.25 The noise impact of the construction phase on bird habitats is likely to be **minor** to **neutral** for the majority of the time, however there is potential for short-term **moderate** impacts when construction takes place in the immediate vicinity of SEAs.

12.6.26 Therefore, it is recommended that mitigation measures be put in to place in order to avoid and/or reduce potential impacts where possible. Further, detail is provided in the Mitigation Section of this Chapter.

Fish Habitats

12.6.27 Quobleigh Stream has been identified as a potential habitat for migratory salmonid species. Generally, fish habitats are generally considered to be of low sensitivity, as fish have some ability to absorb/avoid impacts by relocating to nearby habitats. However, during particularly sensitives periods, such as breeding/migration seasons, the migration paths themselves are considered to be of high sensitivity.

12.6.28 When construction is due to take place within close proximity to Quobleigh Stream, the appropriate threshold values should be adopted, and construction noise and re-radiated noise from construction vibration should be controlled to an average level of less than 75$dB_{ht.}$ This would ensure no significant impacts occur, in accordance with current guidance.

12.6.29 The dB_{ht} criteria refers to the specific underwater hearing threshold of individual fish species. Guidance within '*Measurement and Interpretation of Underwater Noise During Construction and Operation of Offshore Wind Farms*' provides example hearing thresholds for Salmon and Trout salmonid species, of approximately 115 dB and 95 dB (re. 1 µPa), respectively, at their most sensitive frequency band. Any exceedance of these hearing threshold values would subsequently be defined as dB above hearing threshold, dB_{ht}.

12.6.30 Underwater sound is measured in dB with a reference pressure of 1 µPa, whereas airborne sound is measured in dB with a reference pressure of 20 µPa. Based on the change in reference pressures, the change in sound pressure level from air to underwater is +26dB i.e. underwater sound is 26dB higher than airborne sound.

12.6.31 Therefore, based on the hearing thresholds of Salmon and Trout, an airborne noise level of 89dB and 69dB, respectively, would be at the threshold of hearing for each species. Furthermore, respective airborne levels greater than 139dB and 119dB for Salmon and Trout would be required to be present at the water surface to invoke an avoidance reaction, i.e. low magnitude of impact.

12.6.32 As an example, according BS5228-1, typical noise levels from pre-cast concrete hydraulic hammer driven piling activity are 89dB at 10m, and 109dB at 1m from source. This indicates that impacts associated with airborne sound from construction activity at Quobleigh Stream are likely to result in a **neutral** effect.

12.6.33 Re-radiated noise level can be derived from a Peak Particle Velocity (PPV) vibration value. The *'Association of Noise Consultants measurement and assessment of groundborne noise and vibration, 2020'* presents a methodology for converting dB vibration velocity level in to dB re-radiated sound pressure level, shown below:

$$L_p = L_v - 27\ dB$$

Where: L_v is the RMS vibration velocity level, re. 1 x 10^{-9}, and L_p is the RMS noise level.

12.6.34 The above formula has since been updated to better suit the prediction of re-radiated noise in rooms specifically for rail applications, based on empirical measurements from London Underground Central Line. However, this assessment is not related to re-radiated rail noise level within rooms, therefore the preceding formula has been adopted, as above.

12.6.35 PPV is converted to vibration velocity level, L_v, using a reference vibration velocity level of 1×10^{-9}, with the following formula:

$$L_v = 20 \log \left(\frac{PPV \times 0.707}{1 \times 10^{-9}} \right) \text{dB}$$

12.6.36 While the above formulae are generally used for re-radiated noise within buildings, it has been adopted to form a crude prediction methodology for this assessment, in the absence of a more specific methodology.

12.6.37 Table 12.13 presents some example PPV values from construction activities at the bank of Quobleigh Stream and the corresponding predicted re-radiated underwater noise levels, including a +26dB underwater correction as outlined previously.

Table 12.13 – Predicted Re-Radiated Underwater Noise from Example PPV Values

PPV, mm/s	Re-Radiated Noise Level, dB	Low Impact Threshold, Salmon/Trout, dB ($50dB_{ht}$)	Medium Impact Threshold, Salmon/Trout, dB ($75dB_{ht}$)	High Impact Threshold, Salmon/Trout, dB ($90dB_{ht}$)
0.1	156	165/145	190/170	205/185

0.2	162			
0.5	170			
1	176			
2	182			
5	190			

12.6.38 Table 12.3 indicates that PPV value of 0.5mm/s measured at the bank of Quobleigh Stream would exceed the low impact threshold, but not exceed medium impact thresholds for Salmon and Trout. Furthermore, PPV of up to approximately 2mm/s at the Quobleigh Stream would result in a medium impact for Salmon and Trout, and not exceed the high impact threshold value.

12.6.39 It is considered that vibration levels from construction activity should not exceed 0.5mm/s PPV, where possible, and vibration of 2mm/s PPV should be prevented, at the bank of Quobleigh Stream. This would ensure potential vibration impacts, associated with re-radiated noise, are between **minor** and **moderate** at Quobleigh Stream.

12.6.40 It is recommended that mitigation measures be put in to place in order to avoid and/or reduce potential impacts where possible. Further, detail is provided in the Mitigation Section of this Chapter.

Occupation Impacts and Effects

OPA Phase 1

Development Generated Road Traffic at Existing Sensitive Receptors

12.6.41 Noise modelling has been carried out in accordance with CRTN to assess potential changes in road traffic noise at ESRs associated with the OPA Phase 1 Site. This includes nearby ESRs, together with ESRs in the vicinity of Eastleigh Town centre to the north west, and West End to the south west of the Wider OPA Site. A total of 54 ESRs have been identified as presented in Appendix 12.3, and shown on Figure 12.2 and Figure 12.3.

12.6.42 Predictions have been carried out for a future 'opening year' of 2023, including committed developments, which relates specifically to the first occupation of OPA Phase 1 Site. In order to provide a robust assessment, it is assumed that the OPA Phase 1 would be fully occupied in 2023.

12.6.43 18 Hour Annual Average Weekday Traffic (AAWT) data used for the purposes of this assessment has been provided by Paul Basham Associates, based on data submitted as part of the Site's extant planning permission for the Baseline 2020 + Committed Development, with the addition of predicted committed development traffic included within the transport assessment. A summary of traffic data used for this assessment is provided in Appendix 12.4.

12.6.44 Paul Basham Associates also provided the following information relating to the methodology in establishing traffic data:

- TEMPro Growth factors have been applied to the daily 2020 data to establish 2023, using the 'Eastleigh Ward' – as agreed for the highway assessment.
- 24-hour flows have been converted to 18-hours using the results of three nearby ATC surveys (Burnetts Lane, Allington Lane and Bishopstoke Road) to understand the percentage of vehicles in the 18 hour category, which confirmed an average of 97.3% across the three surveys.
- Committed developments considered include Pembers Hill Farm (O/15/77190), Land North West of Boorley Green (P/15/75953), Land West of Woodhouse Lane (O/18/83634) and Land North of Winchester Street (O/18/83698).

12.6.45 Predicted noise levels are based on speed limits for each road link in the absence of average speed data. Furthermore, in the absence of specific HGV percentages, 10% HGVs have been assumed on each road link to provide a robust assessment, as recommended by Paul Basham Associates.

12.6.46 A summary of noise modelling assumptions is provided in Appendix 12.5.

12.6.47 Noise impacts associated with the OPA Phase 1 at each ESR have been assessed in accordance with DMRB, by comparing the predicted road traffic noise levels for the following scenarios:

- Scenario 1: 2020 Baseline Year;
- Scenario 2: 2023 Opening year, without development (inc. committed developments); and,
- Scenario 3: 2023 Opening year, with development (inc. committed developments).

12.6.48 Predicted levels at each ESR are detailed in full in Appendix 12.6. ESRs with the most significant changes in noise levels, associated with the OPA Phase 1, have been identified and summarised in Table 12.14 below.

Table 12.14 – Summary of Predicted Road Traffic Noise Levels for Assessment Scenarios.

ESR	Floor Level	Predicted $L_{10, 18hour}$ noise level at Existing Sensitive Receptors				
		Scenario 1: 2020 Baseline	Scenario 2: 2030 Opening Year, Without Development	Scenario 3: 2030 Opening Year, With Development	Predicted Change: Scenario1 to Scenario 3 (Figure 12.4)	Predicted Change: Scenario 2 to Scenario 3 (Figure 12.5)
ESR9	GF	68	68	69	+1	+1
	F1	68	69	69	+1	0
ESR12	GF	66	66	67	+1	+1
	F1	67	68	68	+1	0
ESR26	GF	61	59	59	-2	0
	F1	62	60	60	-2	0
ESR27	GF	60	62	62	+2	0
	F1	61	63	63	+2	0
ESR44	GF	63	59	59	-4	0
	F1	65	61	61	-4	0

12.6.49 The predicted changes in noise levels attributed to development generated road traffic from the OPA Phase 1 Site have been assessed in accordance with the DMRB magnitude criteria set out in Table 12.6, together with sensitivity criteria set out in Table 12.8. Existing residential dwellings and healthcare receptors are considered to be of medium sensitivity as described.

12.6.50 When assessing the cumulative change in noise levels i.e. comparing 'baseline 2020' conditions to the '2023 opening year, with development', the highest increase in noise level is predicted to be approximately 2dB, at ESR27, an existing residence off Burnetts Lane. When considered over the 3-year period between assessment scenarios, this is considered to represent a minor impact in the short-term, in accordance with the significance criteria set-out in this Chapter. This indicates that **moderate** effects would occur at this ESR.

12.6.51 All other cumulative short-term impacts are predicted to be lower than found at ESR27, and therefore comprise negligible impacts, and **neutral** effects. With the exception of ESR44, where a reduction in development-generated road traffic noise levels is predicted, resulting in a **moderate beneficial** effect

12.6.52 The cumulative change in noise levels between 2020 baseline and 2023 opening year for the OPA Phase 1, with development, scenarios are presented on Figure 12.5.

12.6.53 When assessing the Proposed Development in isolation i.e. comparing '2023 opening year, without development' conditions to the '2023 opening year, with development', the highest increase in noise level is predicted to be approximately 1dB, as shown in Table 12.14. This indicates that the change in noise level at ESRs, associated with the OPA Phase 1 Site will be less than, or equal to 1dB, which is at the threshold between low and negligible impact, in the short-term, in accordance with DMRB.

12.6.54 This indicates that **moderate** to **neutral** effects are predicted to occur at ESRs, in attributed to the OPA Phase 1 Site only.

12.6.55 The change in noise levels between 2023 opening year, without development and with development scenarios are presented on Figure 12.6.

12.6.56 No specific mitigation is required with regards to development-generated road traffic noise.

Noise Levels at Proposed Residential Dwellings

12.6.57 Free field and façade noise levels have been predicted at the OPA Phase 1 Site based on the site Site Layout Plans, Building Heights and Plot Type drawings provided by Clague Architects (dated: November 2020).

12.6.58 In order to provide an appropriate assessment of future operational conditions, road traffic noise associated with the 2030 operational year, with the Wider OPA and committed developments has been considered.

Outdoor Living Areas

12.6.59 Plans indicate that proposed gardens will include 2m high garden wall/fencing along the boundaries of gardens located closest to Burnetts Road and the proposed north-south link road. Proposed garden wall/fencing has been incorporated in to noise level predictions, and is assumed to have a surface density of at least 10kg/m^2 , with no perforations.

12.6.60 Figure 12.7 illustrates predicted daytime external noise levels across the OPA Phase 1 Site. This figure includes a 55dB limit line, which corresponds to the recommended requirements for outdoor living areas, in accordance with BS8233 and who guidance.

12.6.61 Figure 12.7 indicates that noise levels in proposed gardens achieve 55dB $L_{Aeqq,\ T}$ within proposed gardens across the Proposed Development. Furthermore, the majority of gardens achieve the 'desirable' level of 50dB $L_{Aeq,\ T}$ outlined by BS8233.

12.6.62 With the inclusion of 2m high garden fences, forming part of the proposals for the OPA Phase 1 Site, noise levels in proposed gardens result in **neutral** effects. Therefore, no additional mitigation is required.

Internal Noise Levels in Proposed Dwellings

12.6.63 Façade noise levels at each plot within the OPA Phase 1 have been predicted. The highest façade levels, predicted at each floor of each building, are presented in the following figures:

- Figure 12.8 illustrates predicted average daytime facade noise levels and corresponding noise exposure category values across the OPA Phase 1 Site, $L_{Aeq,\ 16h}$.
- Figure 12.9 illustrates predicted average night-time facade noise levels and corresponding noise exposure category values across the OPA Phase 1 Site, $L_{Aeq,\ 8h}$.
- Figure 12.10 illustrates predicted maximum night-time facade noise levels and corresponding noise exposure category values across the OPA Phase 1 Site, L_{AFmax}.

12.6.64 Depending on the predicted noise levels, and subsequent magnitude of impact at each proposed facade, facades are categorised in to noise exposure categories, outlined in Table 12.15, as reflected in the above figures.

Table 12.15: Façade Noise Exposure Categories

Façade Noise Exposure Category	Description
High	Acoustically enhanced glazing and ventilation configurations
Moderate	Standard glazing and ventilation configurations
Low	No specific mitigation requirements

12.6.65 The category value for each façade has been determined based on detailed noise break-in calculations for each house type, habitable room type, and measured octave band noise levels associated with the surrounding local road network. Measured octave band levels of nearby roads have been proportionately scaled to be representative the predicted levels in the 2030 future year scenario, as appropriate.

12.6.66 Without the inclusion of any specific mitigation, dwellings with facades subjected to the moderate and high noise exposure categories would be subjected to **major** to **substantial** effects, respectively.

12.6.67 Specific details on glazing and ventilation requirements are provided in the Mitigation section of this Chapter.

Noise Associated with Chalcroft Business Park

12.6.68 Consultation with businesses at Chalcroft Business Park was carried out in order to identify typical operations and noise sources with the potential to impact the Proposed Development. In summary, existing businesses comprise a mixture of warehousing and logistics uses, in addition

12.6.69 Noise levels were measured at ML9, to the south west of the OPA Phase 1 Site, closest to Chalcroft Business Park. No industrial type noise was observed to be audible during the daytime or night-time period at this location.

12.6.70 Therefore, in accordance with BS4142, no specific assessment is required at the OPA Phase 1 site.

Noise from Proposed Ancillary Equipment

12.6.71 The OPA Phase 1 does not include any industrial/commercial uses, however there is potential that some fixed plant/ancillary equipment would be required in order to service apartment buildings. The details of which would be developed during technical design stages.

12.6.72 At this stage, detailed information relating to proposed fixed plant and/or building services associated with the OPA Phase 1 is unavailable. Therefore, guideline noise limits have been formulated based on the existing background noise environment, in accordance with current guidance.

12.6.73 Atmospheric noise emissions limits have been determined for any proposed fixed building services plant (with the exception of emergency plant i.e. back-up generators).

12.6.74 Where possible, noise associated with the ancillary equipment at the OPA Phase 1 Site should be controlled to the levels outlined in Table 12.16 when assessed in accordance with BS4142 at the nearest noise sensitive receptor. The recommended limits correspond to noise levels which are 5dB below the average background noise levels.

Table 12.16 – Atmospheric Plant Noise Emission Limits

Monitoring Location	Time Period	Measured Background Noise Level, L_{A90}, dB	Recommended Noise Level Limit, L_{A90} dB
Proposed sensitive receptors in the OPA Phase 1 Site. ML9	0700 - 2300 2300 – 0700	38 31	33 26

12.6.75 The above recommended noise limits are intended to provide conservative a guideline at this stage, in the absence of detailed information. A full assessment is likely to be required once detailed information becomes available, in accordance with BS4142.

12.6.76 The responsibility to achieve the above would fall to those undertaking the building works. Proposals should be reviewed by Hydrock during technical design.

12.6.77 As detailed information relating to fixed plant is unknown, Hydrock highlight that provisions for the selection of low noise equipment, silencers, enclosures, screens and other acoustic attenuation measures should be made where necessary.

The Wider OPA

Development Generated Road Traffic at Existing Sensitive Receptors

12.6.78 Noise modelling has been carried out in accordance with CRTN to assess potential changes in road traffic noise, associated with The Wider OPA, at ESRs. This includes ESRs in the vicinity of the Wider OPA Site, together with ESRs in the vicinity of Eastleigh Town centre to the north west, and West End to the south west of the Wider OPA Site. A total of 54 ESRs have been identified as presented in Appendix 12.3, and shown on Figure 12.2 and Figure 12.3.

12.6.79 Predictions have been carried out for a future ‘operational year’ of 2030, including committed developments. In order to provide a robust assessment, it is assumed that The Wider OPA would be fully occupied in 2030.

12.6.80 18 Hour Annual Average Weekday Traffic (AAWT) data used for the purposes of this assessment has been provided by Paul Basham Associates, based on data submitted as part of the Site's extant planning permission for the Baseline 2020 + Committed Development, with the addition of predicted committed development traffic included within the transport assessment. A summary of traffic data used for this assessment is provided in Appendix 12.4.

12.6.81 Paul Basham Associates also provided the following information relating to the methodology in establishing traffic data:

- TEMPro Growth factors have been applied to the daily 2020 data to establish 2030, using the 'Eastleigh Ward' – as agreed for the highway assessment.
- 24-hour flows have been converted to 18-hours using the results of three nearby ATC surveys (Burnetts Lane, Allington Lane and Bishopstoke Road) to understand the percentage of vehicles in the 18 hour category, which confirmed an average of 97.3% across the three surveys.
- Committed developments considered include Pembers Hill Farm (O/15/77190), Land North West of Boorley Green (P/15/75953), Land West of Woodhouse Lane (O/18/83634) and Land North of Winchester Street (O/18/83698).

12.6.82 Predicted noise levels are based on speed limits for each road link in the absence of average speed data. Furthermore, in the absence of specific HGV percentages, 10% HGVs have been assumed on each road link to provide a robust assessment, as recommended by Paul Basham Associates.

12.6.83 A summary of noise modelling assumptions is provided in Appendix 12.5.

12.6.84 Noise impacts at each ESR have been assessed in accordance with DMRB, by comparing the predicted road traffic noise levels for the following scenarios:

- Scenario 1: 2020 Baseline Year;
- Scenario 4: 2030 Opening year, without development (inc. committed developments); and,
- Scenario 5: 2030 Opening year, with development (inc. committed developments).

12.6.85 Predicted levels for each ESR are detailed in full in Appendix 12.6. ESRs with the most significant changes in noise levels have been identified and summarised in Table 12.17 below.

Table 12.17 – Summary of Predicted Road Traffic Noise Levels for Assessment Scenarios.

ESR	Floor Level	Predicted $L_{10, 18hour}$ noise level at Existing Sensitive Receptors				
		Scenario 1: 2020 Baseline	Scenario 2: 2030 Opening Year, Without Development	Scenario 3: 2030 Opening Year, With Development	Predicted Change: Scenario1 to Scenario 3 (Figure 12.4)	Predicted Change: Scenario 2 to Scenario 3 (Figure 12.5)
ESR9	GF	68	69	69	+1	0
	F1	68	69	70	+2	+1
ESR17	GF	73	74	74	+1	0
	F1	72	73	74	+2	+1
ESR18	GF	66	66	68	+2	+2
	F1	66	67	68	+2	+1
ESR27	GF	60	62	62	+2	0
	F1	61	63	64	+3	+1
ESR41	GF	62	63	66	+4	+3
	F1	63	64	67	+4	+3
ESR43	GF	69	69	70	+1	+1
	F1	69	70	71	+2	+1
ESR44	GF	63	60	60	-3	0
	F1	65	61	62	-3	+1
ESR45	GF	63	60	60	+1	+1
	F1	65	61	62	+2	+1
ESR46	GF	60	60	61	+2	+1
	F1	61	62	63	+1	+1

12.6.86 The predicted changes in noise levels associated with the Wider OPA development-generated road traffic have been assessed in accordance with the DMRB magnitude criteria set out in Table 12.6, together with sensitivity criteria set out in Table 12.8. Existing residential dwellings and healthcare receptors are considered to be of medium sensitivity as described.

12.6.87 When assessing the cumulative change in noise levels i.e. comparing 'baseline 2020' conditions to the '2030 opening year, with development', the highest increase in noise level is predicted to be approximately 4dB, at ESR41, an existing residence off Fir Tree Lane. When considered over the 10-year period between assessment scenarios, this is considered to represent a low impact in the long-term, and therefore a **minor** effect, in accordance with the significance criteria set-out in this Chapter.

12.6.88 All other cumulative impacts are predicted to be lower than found at ESR41, and are therefore considered to have a **neutral** effect. With the exception of ESR44, where a reduction in overall road traffic noise is predicted, resulting in a **moderate beneficial** effect.

12.6.89 The cumulative change in noise levels between 2020 baseline and 2030 opening year, with development, scenarios are presented on Figure 12.11.

12.6.90 When assessing the Wider OPA Site in isolation i.e. comparing '2030 opening year, without development' conditions to the '2030 opening year, with development', the highest increase in noise level is predicted to be approximately 3dB, at ESR41. This indicates that the change in noise level at ESR41, associated with Wider OPA development-generated road traffic will be less than, or equal to 3dB, which represents a low impact in the-long term, in accordance with DMRB.

12.6.91 This assessment assumes the Proposed Development is fully occupied in the 2030 'opening year' scenario, in order to provide a robust assessment and additional margin of safety. Therefore, when assessing impacts associated with the Wider OPA in isolation, the resultant effects are predicted to be **minor** to **neutral**.

12.6.92 The change in noise levels between 2030 opening year, without development and with development scenarios are presented on Figure 12.12.

12.6.93 No specific mitigation is required with regards to development-generated road traffic noise from the Wider OPA.

Noise at Proposed Sensitive Areas

12.6.94 Noise modelling has been carried out to determine the predicted future ambient noise levels at proposed sensitive areas of the Wider OPA Site. Predicted ambient noise levels in the 2030 opening year, with the development are presented in the following figures:

- Figure 12.13 – Daytime Noise Levels, $L_{Aeq,\ 16hour}$ dB;
- Figure 12.9 – Night-time Noise Levels, $L_{Aeq,\ 8hour}$ dB; and,
- Figure 12.10 – Night-time Maximum Noise Levels dB, L_{AFmax}.

12.6.95 The Proposed Parameter Plan (Ref. CMP 01) shows the general location of proposed sensitive areas across the Proposed Development. For the purposes of this assessment, Proposed

Sensitive Receptor (PSR) locations have been selected, based on the Parameter Plan, with respect to existing and proposed noise sources.

12.6.96 PSRs are considered to be representative of proposed sensitive areas likely to be affected by noise. Daytime noise levels are calculated at ground level (1.5m height) and night-time noise levels are calculated at 1st floor height (4.5m height). Predicted noise levels at PSRs are presented in Table 12.18 below.

Table 12.18 – Predicted External Noise Levels at Proposed Sensitive Receptors

Receptor Description	Predicted Average Daytime Noise Levels, $L_{Aeq, 16hour}$ dB	Predicted Average Night-time Noise Levels, $L_{Aeq, 8hour}$ dB	Predicted Maximum Night-time Noise Levels, L_{AFmax} dB
PSR1. Proposed residential dwellings in the north western part of the Wider OPA Site, closest to the proposed site access off Allington Lane.	61	55	70
PSR2. Proposed residential dwellings in the western part of the Wider OPA Site, closest to Allington Lane.	57	51	56
PSR3. Proposed residential dwellings in the south western part of the Wider OPA Site, closest to Allington Lane and the rail line.	50	45	53
PSR4. Proposed residential dwellings in the north eastern part of the Wider OPA Site, closest to existing dwellings west of Burnetts Lane.	50	45	52
PSR5. Proposed residential dwellings in the central part of the Wider OPA Site, closest to Fir Tree Lane.	64	57	75
PSR6. Proposed residential dwellings in the central part of the Wider OPA Site, closest to the proposed central link road.	62	55	72
PSR7. Proposed residential dwellings in the south eastern part of the Wider OPA Site, closest to Burnetts Lane.	61	54	79
PSR8. Proposed residential dwellings in the southern part of the Wider OPA Site, closest to the proposed access roundabout, off Burnetts Lane.	61	55	79
PSR9. Proposed residential dwellings in the southern part of the Wider OPA Site, closest to the proposed central link road.	62	55	72

PSR10. Proposed school in the eastern part of the Wider OPA Site	50	44	54
PSR11. Proposed employment area in the central part of the Wider OPA Site, closest to Fir Tree Lane.	65	57	75
PSR11. Proposed employment area in the southern part of the Wider OPA Site, closest the proposed central link road and access roundabout.	62	56	72

12.6.97 The predicted noise levels at PSRs, as presented in Table 12.18, have been used to calculate the appropriate level of required sound attenuation to achieve internal and external guideline noise levels.

Daytime Noise Levels in External Living Areas

12.6.98 Noise levels in are assessed in external living areas of the Proposed Development in accordance with the following guideline criteria, as recommended by BS8233 and WHO guidance:

- 55dB $L_{Aeq,T}$ should be considered as the upper guideline value for external living areas; and,
- 50dB $L_{Aeq,T}$ should be considered as a 'desirable' guideline value for external living areas.

12.6.99 Table 12.19 provides a summary of predicted noise levels and attenuation required to achieve guideline values in residential gardens, in accordance with BS8233 and WHO guidance.

Table 12.19 – Predicted External Noise Levels and Attenuation Requirements for Proposed Gardens

Receptor Description	Predicted Average Daytime Noise Levels, $L_{Aeq, 16hour}$ dB	Attenuation Required to Achieve 55dB(A) in Gardens
PSR1. Proposed residential dwellings in the north western part of the Wider OPA Site, closest to the proposed site access off Allington Lane.	61	6
PSR2. Proposed residential dwellings in the western part of the site, closest to Allington Lane.	57	2

PSR3. Proposed residential dwellings in the south western part of the Wider OPA Site, closest to Allington Lane and the rail line.	50	0
PSR4. Proposed residential dwellings in the north eastern part of the Wider OPA Site, closest to existing dwellings west of Burnetts Lane.	50	0
PSR5. Proposed residential dwellings in the central part of the Wider OPA Site, closest to Fir Tree Lane.	64	9
PSR6. Proposed residential dwellings in the central part of the Wider OPA Site, closest to the proposed central link road.	62	7
PSR7. Proposed residential dwellings in the south eastern part of the Wider OPA Site, closest to Burnetts Lane.	61	6
PSR8. Proposed residential dwellings in the southern part of the Wider OPA Site, closest to the proposed access roundabout, off Burnetts Lane.	61	6
PSR9. Proposed residential dwellings in the southern part of the Wider OPA Site, closest to the proposed central link road.	62	7

12.6.100 The results presented in Table 12.19 indicate mitigation are required in order to achieve guideline noise levels in outdoor living areas located closest to the existing and proposed transport network.

12.6.101 Without the inclusion of mitigation, noise levels in proposed gardens would result in **moderate** to **major** effects. Outline details of required mitigation measures are provided in the Mitigation section of this Chapter.

Daytime Internal Noise Levels in Proposed Dwellings

12.6.102 Internal noise levels are assessed within proposed dwellings according to the following guideline criterion, as recommended by BS8233 and WHO guidance:

- 35dB $L_{Aeq,T}$ in living rooms and bedrooms, during the daytime period.

12.6.103 The predicted daytime noise levels have been used to determine the noise levels likely at the facades of the properties in the vicinity of the proposed noise sensitive parts of the proposed development, during the daytime period.

12.6.104 Before internal noise levels can be calculated 3dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed housing facades when the buildings are in place.

12.6.105 Table 12.20 provides a summary of predicted façade noise levels and attenuation required to achieve 35dB $L_{Aeq, T}$ in proposed living rooms and bedrooms, in accordance with BS8233.

Table 12.20 – Predicted Facade Noise Levels and Required Attenuation in Habitable Rooms, During the Daytime

Receptor Description	Predicted Average Daytime Noise Levels, $L_{Aeq, 16hour}$ dB	Attenuation Required to Achieve 35dB(A) Internally
PSR1. Proposed residential dwellings in the north western part of the site, closest to the proposed site access off Allington Lane.	64	29
PSR2. Proposed residential dwellings in the western part of the site, closest to Allington Lane.	60	25
PSR3. Proposed residential dwellings in the south western part of the site, closest to Allington Lane and the rail line.	53	18
PSR4. Proposed residential dwellings in the north eastern part of the site, closest to existing dwellings west of Burnetts Lane.	53	18
PSR5. Proposed residential dwellings in the central part of the site, closest to Fir Tree Lane.	67	32
PSR6. Proposed residential dwellings in the central part of the site, closest to the proposed central link road.	65	30
PSR7. Proposed residential dwellings in the south eastern part of the site, closest to Burnetts Lane.	64	29
PSR8. Proposed residential dwellings in the southern part of the site, closest to the proposed access roundabout, off Burnetts Lane.	64	29
PSR9. Proposed residential dwellings in the southern part of the site, closest to the proposed central link road.	65	30

12.6.106 The results presented in Table 12.20 indicate mitigation is required in order to achieve daytime guideline noise levels in habitable rooms located closest to the existing and proposed transport network.

12.6.107 The facades of dwellings facing into the site will be protected by the buildings themselves and/or screened by other buildings and topography. It is considered that the noise levels at these facades and therefore the level of attenuation the facades would need to attenuate to achieve 35dB $L_{Aeq,\ T}$ in the living rooms and bedrooms will be less than those detailed in Table 12.20.

12.6.108 Without the inclusion of mitigation, noise levels in proposed habitable rooms would result in **moderate** to **major** effects. Outline details of required mitigation measures are provided in the Mitigation section of this Chapter.

12.6.109 Outline details of required mitigation measures are provided in the Mitigation section of this Chapter.

Night-time Internal Noise Levels in Proposed Dwellings

12.6.110 Internal noise levels are assessed within proposed dwellings according to the following guideline criterion, as recommended by BS8233 and WHO guidance:

- 30dB $L_{Aeq,T}$ wherever possible in bedrooms, during the night-time period; and,
- Individual noise events should not normally exceed 45dB L_{AFmax} in bedrooms, during the night-time period.

12.6.111 The predicted night-time noise levels, as shown in Figure 12.7 and Figure 12.8, have been used to determine the noise levels likely at the facades of the properties in the vicinity of the proposed noise sensitive parts of the proposed development, during the daytime period.

12.6.112 Before internal noise levels can be calculated 3dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed housing facades when the buildings are in place.

12.6.113 Table 12.21 provides a summary of predicted façade noise levels and attenuation required to achieve 30dB $L_{Aeq,\ T}$ and 45dB L_{AFmax} in proposed bedrooms, in accordance with BS8233.

Table 12.21 – Predicted Facade Noise Levels and Required Attenuation in Habitable Rooms, During the Night-time

Receptor Description	Predicted Average Night-time Noise Levels, $L_{Aeq, 8hour}$ dB	Predicted Maximum Night-time Noise Levels, L_{AFmax} dB	Attenuation Required to Achieve 30dB Average and 45dB Maximum Internally
PSR1. Proposed residential dwellings in the north western part of the site, closest to the proposed site access off Allington Lane.	58	73	28
PSR2. Proposed residential dwellings in the western part of the site, closest to Allington Lane.	54	59	24
PSR3. Proposed residential dwellings in the south western part of the site, closest to Allington Lane and the rail line.	48	56	18
PSR4. Proposed residential dwellings in the north eastern part of the site, closest to existing dwellings west of Burnetts Lane.	48	55	18
PSR5. Proposed residential dwellings in the central part of the site, closest to Fir Tree Lane.	60	78	33
PSR6. Proposed residential dwellings in the central part of the site, closest to the proposed central link road.	58	75	30
PSR7. Proposed residential dwellings in the south eastern part of the site, closest to Burnetts Lane.	60	82	37
PSR8. Proposed residential dwellings in the southern part of the site, closest to the proposed access roundabout, off Burnetts Lane.	58	82	37
PSR9. Proposed residential dwellings in the southern part of the site, closest to the proposed central link road.	58	75	30

12.6.114 The results presented in Table 12.21 indicate mitigation measures are required in order to achieve night time guideline noise levels in bedrooms located closest to the existing and proposed transport network.

12.6.115 The facades of dwellings facing into the site will be protected by the buildings themselves and/or screened by other buildings and topography. It is considered that the noise levels at these facades and therefore the level of attenuation the facades would need to

attenuate to achieve 30dB $L_{Aeq, T}$ and 45dB L_{AFmax} in bedrooms will be less than those detailed in Table 12.21.

12.6.116 Without the inclusion of mitigation, noise levels in proposed bedrooms would result in **moderate** to **major** effects. Outline details of required mitigation measures are provided in the Mitigation section of this Chapter.

Noise at Proposed School

12.6.117 The Concept Master Plan (ref CMP 01) indicates that the Proposed Development will include a School, located in eastern part of the site (PSR10).

12.6.118 In accordance with the requirements of BB93, the following daytime noise levels should be achieved:

- An upper limit of 60 dB $L_{Aeq, 30\ minutes}$ at the boundary of external premises used for teaching and recreation; and,
- Indoor ambient noise limits in schools of between 30 and 40 dB $L_{Aeq, 30\ minutes}$ depending on the use of the room.

12.6.119 The predicted external daytime noise levels, as shown in Table 12.18 and on Figure 12.6, are below 50dB $L_{Aeq\ 16\text{-}hour}$. This indicates that no specific mitigation measures are required at the proposed school, to ensure the required external and internal noise levels are achieved during the daytime.

12.6.120 Without the inclusion of mitigation, noise levels in the vicinity of the proposed school would result in **minor** to **neutral** effects.

Noise at Proposed Employment

12.6.121 Internal noise levels are assessed with respect to the most sensitive areas of proposed employment uses, according to the following guideline criterion, as recommended by BS8233:

- 35 to 45dB $L_{Aeq,T}$ in staff/meeting rooms, training rooms; and,
- 35 to 40dB $L_{Aeq,T}$ in executive office.

12.6.122 The predicted daytime noise levels have been used to determine the noise levels likely at the facades of proposed employment buildings at the Site, during the daytime period.

12.6.123 Before internal noise levels can be calculated 3dB(A) must be added to the free-field levels to allow for the reflection of noise from the proposed building facades when the buildings are in place.

12.6.124 Table 12.22 provides a summary of predicted façade noise levels and attenuation required to achieve guideline internal levels within employment buildings, in accordance with BS8233.

Table 12.22 – Predicted Facade Noise Levels and Required Attenuation in Employment Buildings

Receptor Description	Predicted Average Daytime Noise Levels, $L_{Aeq, 16hour}$ dB	Attenuation Required to Achieve 35dB(A) Internally
PSR11. Proposed employment area in the central part of the site, closest to Fir Tree Lane.	65	25 - 35
PSR11. Proposed employment area in the southern part of the site, closest the proposed central link road and access roundabout.	62	22 - 32

12.6.125 The results presented in Table 12.22 indicate mitigation measures are required in order to achieve guideline noise levels in employment buildings located closest to the existing and proposed transport network.

12.6.126 The facades of employment buildings facing into the site will be protected by the buildings themselves and/or screened by other buildings and topography. It is considered that the noise levels at these facades and therefore the level of attenuation the facades would need to attenuate to achieve 35 - 45dB $L_{Aeq, T}$ in sensitive rooms will be less than those detailed in Table 12.19.

12.6.127 Without the inclusion of mitigation, noise levels in proposed employment buildings have the potential to result in **moderate** to **major** effects. Outline details of required mitigation measures are provided in the Mitigation section of this Chapter.

Noise Associated with Chalcroft Business Park

12.6.128 Consultation with businesses at Chalcroft Business Park was carried out in order to identify typical operations and noise sources with the potential to impact the Proposed Development. In summary, existing businesses comprise a mixture of warehousing and logistics uses, in addition to general offices and small businesses.

12.6.129 According to representatives of Charlcroft Business Park, no manufacturing takes place at any of the units onsite. Deliveries to the businesses are predominantly made during the daytime, with only 1 or 2 night-time deliveries that are not unloaded until the following day.

12.6.130 During the survey, a new industrial unit was under construction at Chalcroft Business Park, adjacent to Unit 15 to the east. Discussions with the Business Park management highlighted that the new Unit was to accommodate Owtons Butchers which would need to relocate as a result of the Proposed Development, currently located within the Wider OPA Site, to the north of the Business Park.

12.6.131 A full summary of information provided by existing business is provided in Appendix 12.1.

12.6.132 Observations made during the noise survey, a review of audio recordings, in combination with consultation with local businesses highlighted the following significant noise sources:

- HGV reversing in to loading area of Unit 14, including engine noise and reverse alert system. Measured at approximately 60m during the Daytime;
- Forklift manoeuvring/unloading at Unit 14 within service yard of Unit 14, Measured at approximately 60m during the daytime; and,
- Break-out noise from Unit 9 during the night-time, measured at approximately 35m.

12.6.133 For the purposes of this assessment, potential industrial noise impacts are calculated at the nearest proposed noise sensitive receptors to Chalcroft Business Park, in the southern part of the Wider OPA Site.

Identification of Specific Noise Levels

12.6.134 The specific noise level is the level of industrial noise when unaffected by noise from other sources. In order to obtain the specific noise level of each industrial source, the measured residual noise level at a given ML must be logarithmically subtracted from the measured ambient level at that same location.

12.6.135 Details of the specific noise levels associated with each industrial source is set out in Table 12.20, including measured ambient and residual noise levels, and standardised specific noise levels derived for each source.

12.6.136 HGV movements along the central spine road of Chalcroft Business Park were not observed to be dominant at the monitoring locations during the daytime and night-time period. However, break-out noise from Unit 9 was observed to be dominant intermittently throughout the night-time period at ML6, as included in Table 12.23.

Table 12.23: Summary of Specific Noise Levels Associated with Chalcroft Business Park

Description of Receptor	Ambient Level, dB(A)	Residual Level, dB(A)	Specific Level at Monitoring Location, dB(A)	Reference Distance, m	Specific Level at 1m from Source, dB(A)
HGV Reversing	54	45	53	60	89
Forklift manoeuvring/unloading	52	45	51	60	87
Break-out Noise	35	29	34	35	65

Identification of Background Noise Level

12.6.137 Noise levels measured at ML9, in the south eastern part of the Wider OPA Site, adjacent to the OPA Phase 1 Site, do not contain any noise from industrial sources. Therefore, appropriate daytime and night-time background noise levels have been established at this location, for the purposes of this assessment.

12.6.138 BS4142 recognises that there is no ‘single’ background sound level, and that it is a fluctuating parameter. An appropriate background level, which corresponds to the time period when each industrial noise source is present at the site must therefore be selected. Subsequently, an assessment of industrial noise impacts is required for the daytime and night-time periods.

12.6.139 For the purposes of this assessment, and to provide a robust assessment of potential impacts, the assessment periods are categorised as follows:

- Daytime – 1000 to 1800, based on typical working hours; and
- Night-time – 2300 to 0700, based on occasional night time HGV movements.

12.6.140 The arithmetic average of measured $L_{A90,\ 1hour}$ values during the daytime period, and $L_{A90,\ 15min}$ values during the night-time period, are considered to represent the typical background levels at the closest receptors, for the purposes of this assessment. Table 12.24 presents a summary of background levels.

Table 12.24 – Summary of Background Noise Levels

Assessment Period	Background Noise Level Range (dBA)	Typical Background Level (dBA)
Daytime	32-41	38
Night-time	27-40	31

Application of Acoustic Feature Corrections

12.6.141 The specific noise of HGV reversing at Unit 14, was found to be dominant at the monitoring location on one occasion throughout the survey period, for approximately 2 minutes. Noise comprised some engine noise and a reversing alert system, including the speech “vehicle reversing” and an accompanying ‘beep’.

12.6.142 This indicates that the specific noise from HGV reversing is intermittent and contains tonal characteristics. A +3dB penalty has been applied with respect to intermittency. The tonal component of the reverse alert system was highly perceptible above the residual environment, therefore a penalty of +6dB has been applied.

12.6.143 Noise from HGV reversing at Unit 14 was found to be dominant for a total of 2 minutes. An appropriate correction has been applied assuming a 5 minute on-time with respect to the 1-hour daytime assessment period. This equates to a correction of -11dB.

12.6.144 Forklift loading/unloading activity at Unit 14 is impulsive in nature, therefore a +6dB penalty has been applied to the specific level. In addition, loading/unloading was observed to be audible at ML6 for approximately 25 minutes during the daytime period. When considered over a 1-hour assessment period, an on-time correction of -4dB must be applied in accordance with BS4142.

12.6.145 Noise break-out from Unit 9 was intermittently dominant at ML6 during the night-time, therefore a +3dB intermittency correction must be applied to the specific level. Break-out noise was not found to have any tonal or impulsive characteristics.

12.6.146 As highlighted during discussions with representatives of Chalcroft Business park, HGV movements have the potential to take place during the night-time within Chalcroft Business Park. However, no associated noise was found to be audible at MLs during the survey.

BS4142 Comparison of Rating and Background Levels - Daytime

12.6.147 The Concept Masterplan (ref: CMP01 Rev 10), indicates that closest proposed residential areas of the Development are at least 100m from the closest potential activities at Chalcroft Business Park. The potential impact of industrial noise has been assessed at this distance in order to evaluate the worst-case impacts. Appropriate distance corrections are factored in to the assessment.

12.6.148 HGV movements on the central spine road were present during the daytime at Chalcroft Business Park, however associated noise was not observed to be dominant to the north of the Business Park during the daytime. Therefore, associated potential impacts are assessed only during the night-time period.

12.6.149 The comparison of noise rating levels corresponding to daytime background levels, for industrial noise associated with Chalcroft Business Park is shown in Table 12.25 below.

Table 12.25 – BS4142 Comparison of Daytime Rating and Background Noise Levels

Description	Noise Levels, dB(A)	
	HGV Reversing	Loading/Unloading
Specific Noise Level, at 1m	89	87
Distance Attenuation	-40	-40
Feature Correction	+9	+6
On-Time Correction	-11	-4
Rating Level	47	49
Background Level	38	38
Excess of Rating over Background	+9	+11

12.6.150 Table 12.25 indicates that noise rating levels at the closest proposed receptors to Chalcroft Business Park are significantly greater than the typical daytime background levels.

This provides an indication that 'Significant Adverse' impacts are likely to occur during these periods, in accordance with BS4142, depending on context.

BS4142 Comparison of Rating and Background Levels – Night-time

12.6.151 The Concept Masterplan (ref: CMP01 Rev 10), indicates that closest proposed residential areas of the Development are at least 100m from any existing industrial Units at Chalcroft Business Park. The potential impact of industrial noise during the night-time period has been assessed at this distance in order to evaluate the worst-case impacts. Appropriate distance corrections are factored in to the assessment.

12.6.152 The comparison of noise rating levels corresponding to night-time background levels, for industrial noise associated with Chalcroft Business Park is shown in Table 12.26 below.

Table 12.26 – BS4142 Comparison of Night-time Rating and Background Noise Levels

Description	Noise Levels, dB(A)
	Unit 9 Break-out Noise
Specific Noise Level, at 1m	65
Distance Attenuation	-40
Feature Correction	+3
Rating Level	28
Background Level	31
Excess of Rating over Background	-3

12.6.153 Table 12.26 indicates that noise rating levels at the closest proposed receptors to Chalcroft Business Park are 3dB lower than the typical night-time background levels. This provides an indication that 'Low' impacts are likely to occur during these periods, in accordance with BS4142, depending on context.

BS4142 Context Assessment

12.6.154 BS4142 states:

'The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs'

12.6.155 The first requirement of this statement has been determined within the preceding section. To determine the context in which the industrial sound occurs, three factors must be considered, these are:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sounds; and,
- The sensitivity of the receptor.

Absolute Level of Sound

12.6.156 The impact of a given difference between rating level and background level depends upon whether the residual level is high or low, in accordance with BS4142.

Daytime

12.6.157 The specific level of sound from Chalcroft Business Park at the closest proposed residential dwellings, during the daytime period, when taking in to account distance attenuation, is 49dB. The daytime residual sound level is 45dB.

12.6.158 The specific level is 6dB lower than the upper guideline level of 55dB $L_{Aeq,\ T}$ recommended by BS8233 and WHO, for outdoor living spaces. These guidance documents are health-based, and provide absolute noise level recommendations based on the onset of adverse health effects.

12.6.159 Furthermore, when considering the attenuation provided by an open window of 15dB, daytime specific noise levels would be lower than the guideline 35dB value for habitable rooms, recommended by BS8233 and WHO.

12.6.160 It is therefore considered that the exceedance of rating level over background level is less significant during the daytime, with respect to the absolute level.

Night-time

12.6.161 The specific level of sound from Chalcroft Business Park at the closest proposed residential dwellings, during the night-time period, when taking in to account distance attenuation, is 28dB. The night-time residual sound level is 34dB.

12.6.162 The specific level is 2dB lower than the guideline internal level of 30dB $L_{Aeq, T}$ recommended by BS8233 and WHO, for bedrooms. Furthermore, when considering the attenuation provided by an open window of 15dB, the night-time specific noise levels would be 16dB lower than the guideline 30dB value for bedrooms, recommended by BS8233 and WHO.

12.6.163 These guidance documents are health-based, and provide absolute noise level recommendations based on the onset of adverse health effects.

12.6.164 It is therefore considered that the exceedance of rating level over background level is less significant during the night-time, with respect to the absolute level.

Character and Level of Residual and Specific Sound

12.6.165 The impact of a given difference between rating level and background level, depends upon whether the character and level of level specific sound is similar or different, when compared to the character and level of the residual acoustic environment, in accordance with BS4142.

Daytime

12.6.166 The daytime specific level from Chalcroft Busines Park includes intermittent, impulsive and tonal characteristics, which contrasts the residual acoustic environment which comprises distant transportation noise. This contrast makes daytime specific noise more noticeable over the residual acoustic environment.

12.6.167 The daytime specific level is 49 dB at the nearest proposed dwellings, whereas the corresponding residual level is 45dB. This indicates that specific noise is 4dB higher, and dominant over the residual level, when present.

12.6.168 Due to the intermittent and transient nature of daytime specific sources, the specific level was found to be present for 30minutes during the daytime survey period. Considering a 1-hour daytime assessment period, this indicates that specific noise has the potential to exceed the residual level for 50% of the time.

12.6.169 It is therefore considered that the exceedance of rating level over background level is significant during the daytime, with respect to character and level.

Night-time

12.6.170 The night-time specific level from Chalcroft Busines Park includes intermittent characteristics, which slightly contrasts the residual acoustic environment which comprises distant transportation noise, which is sometimes intermittent during the night time period. This contrast makes the night-time specific noise slightly more noticeable over the residual acoustic environment.

12.6.171 The night-time specific level is 25 dB at the nearest proposed dwellings, whereas the corresponding residual level is 34dB. This indicates that specific noise is 9dB lower, and likely to be inaudible at the closest dwellings, when present.

12.6.172 It is therefore considered that the exceedance of rating level over background level is less significant during the night-time, with respect to character and level.

Sensitivity of Receptors

12.6.173 The proposed receptors will have moderate to high sensitivity given their residential nature. However, BS4142 states that the initial estimate of the impact needs to be modified where:

'dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal/or outdoor acoustic conditions, such as:

- *Façade insulation treatment;*
- *Ventilation and/or cooling that will reduce the need top have windows open so as to provide rapid or purge ventilation; and,*
- *Acoustic screening'*

12.6.174 Furthermore, with regards to this, PPG states:

'consideration should also be given to whether adverse internal effects can be completely removed by closing all windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary '.

12.6.175 Façade insulation, the glazing and ventilation scheme, and acoustic screening is explored in more detail in the Mitigation section of this report.

Summary of Industrial Noise Impacts

12.6.176 During the daytime, the absolute level of specific sound, at the closest proposed receptors to Chalcroft Business Park, is low. However, the character of specific noise contrasts the residual acoustic environment, making industrial type noise more noticeable. Furthermore, the level of specific noise exceeds the daytime level during the day time period, for up to 50% of the time.

12.6.177 However, the sensitivity of proposed receptors can be engineered appropriately, via a combination of façade insulation treatment, and acoustic screening to reduce industrial noise impacts within external living areas, and/or completely removed within proposed habitable rooms.

12.6.178 This indicates that, without the inclusion of mitigation, industrial noise is predicted to have a **major** effect at proposed dwellings, during the daytime.

12.6.179 Given that the absolute level of sound is low, it is considered that a 5dB exceedance of the rating level over the typical daytime background level would represent an acceptable impact, in accordance with BS4142; equivalent to the Lowest Observed Adverse Effect Level, defined by the NPSE[12.1], and be present and not intrusive in accordance with PPG[12.2].

12.6.180 This indicates that a 6dB reduction in industrial noise is required during the daytime period. Mitigation is explored in the corresponding section of this Chapter.

12.6.181 During the night-time, the absolute level of specific sound is low, and is significantly less than the residual level. The character of specific sound contrasts slightly with the residual environment; however, other contextual factors significantly reduce the potential impact.

12.6.182 This indicates that, night-time industrial noise is predicted to have a **neutral** effect at proposed dwellings. Therefore, no specific mitigation is required.

Noise Associated with Proposed Ancillary Equipment

12.6.183 The Wider OPA includes a number of non-specific employment areas which have the potential to comprise a number of commercial uses, with associated ancilliary equipment. However, at this stage, detailed information relating to proposed fixed plant and/or building

[12.1] Noise Policy Statement for England xxxx

[12.2] Planning Practice Guidance – Noise xxxx

services within the Wider OPA is unavailable. Therefore, guideline noise limits have been formulated based on the existing background noise environment, in accordance with current guidance.

12.6.184 Atmospheric noise emissions limits have been determined for any proposed fixed building services plant (with the exception of emergency plant i.e. back-up generators).

12.6.185 Where possible, noise associated with the development shall be controlled to the levels outlined in Table 12.27 when assessed in accordance with BS4142 at the nearest noise sensitive receptor. The recommended limits correspond to noise levels which are 5dB below the average background noise levels.

Table 12.27 – Atmospheric Plant Noise Emission Limits

Monitoring Location	Time Period	Measured Background Noise Level, L_{A90}, dB	Recommended Noise Level Limit, L_{A90} dB
Proposed sensitive receptors in the northern part of the Wider OPA Site. ML1	0700 - 2300 2300 - 0700	41 32	36 27
Proposed sensitive receptors in the central part of the Wider OPA Site. ML3	0700 - 2300 2300 - 0700	42 32	37 27
Proposed sensitive receptors in the southern part of the Wider OPA Site. ML9	0700 - 2300 2300 – 0700	38 31	33 26

12.6.186 The above noise limits are intended to provide conservative a guideline at this stage, in the absence of detailed information. A full assessment is likely to be required once detailed information becomes available, in accordance with BS4142.

12.6.187 The responsibility to achieve the above would fall to those undertaking the building works. Proposals should be reviewed by Hydrock during technical design.

12.6.188 As detailed information relating to fixed plant is unknown, Hydrock highlight that provisions for the selection of low noise equipment, silencers, enclosures, screens and other acoustic attenuation measures should be made where necessary.

12.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

Construction

OPA Phase 1

12.7.1 The activities associated with the construction phase of the OPA Phase 1 have the potential to generate noise and vibration that propagates beyond the site boundary. Off-site impacts associated with the OPA Phase 1 are covered within the Wider OPA section.

The Wider OPA

Noise at Existing Residential Receptors

12.7.2 In order to reduce the potential impact of noise generated by the construction phase of the proposed Development at ESRs, mitigation measures will be required. Methods of best working practice should be implemented.

12.7.3 The construction works would follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction sites, Parts 1 to 5, 2003. The following measures will be put in place to minimise noise emissions and implemented via a Construction Environmental Management Plan (CEMP):

- When works are taking place within close proximity to the sensitive receptors identified, the screening of noise sources via the erection of temporary screens will be employed;
- All machinery will be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers;
- Site staff will be made aware that they are working adjacent to a sensitive area and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios;
- As far as possible, the avoidance of two noisy operations occurring simultaneously in close proximity to the same sensitive receptor;
- Adherence to any time limits imposed on noisy works by the local authority;
- Implement set working hours during the week and at weekends;
- Ensure engines are turned off when possible; and
- Should demolition and construction activities need to be carried out during night-time hours, the local authority may include a planning condition that requests advance notice and details of any night working to provided.

Vibration at Existing Residential Receptors

12.7.4 BS5228-2 recognises that the most common form of vibration associated with piling is the intermittent type derived from conventional driven piles. Whilst it is recognised that the piling process would need to be selected on the basis of the strata to be encountered, the loads to be supported and the economics of the system, careful consideration (by the appointed developer(s)) would be given to the type of piling to be used in order to minimise the potential for vibration impacts.

12.7.5 The receptors likely to be affected by piling would vary over the course of the Proposed Development under construction. Once the precise building locations and ground conditions for each location and type(s) of piling are confirmed, vibration levels would be estimated and recommendations for control made as appropriate.

12.7.6 To keep ground borne vibration to a minimum the following measures (as referred to in BS5228-2) would be put in place:

- Substitution: Where reasonably practicable, plant and or methods of work likely to cause significant levels of vibration at the receptors identified would be replaced by less intrusive plant/methods of working; and

- Isolation of plant at source: This may prove a viable option where the plant is stationary (e.g. a compressor, generator) and located close to a receptor.

12.7.7 There are a number of measures that can be implemented, depending upon the type of piling chosen (e.g. continuous flight auger (CFA) piling produces significantly less vibration than conventional driven piling and, therefore, fewer mitigation measures would be required if CFA piling were chosen as the preferred method). Additionally, the distance between the piling rig and the receptors has a significant bearing upon the likely impact. The vibration produced by piling is transient and only occurs in any one location for a limited period of time.

12.7.8 BS5228-2 indicates that mitigation might include the use of alternative methods, removal of obstructions, provision of cut-off trenches, reduction of energy input per blow, reduction of resistance to penetration. As the construction programme and methodologies become more defined, earthworks and construction vibration would be reviewed and a more detailed strategy for control would be devised and implemented via the CEMP.

12.7.9 Vibration mitigation is therefore likely to vary depending upon the type, location and duration of any piling undertaken.

Noise & Vibration at Ecological Receptors

12.7.10 In order to reduce the potential impact of noise and vibration generated by the construction phase of the proposed Development at SEAs, mitigation measures will be required. Methods of best working practice should be implemented throughout.

Bird Habitats

12.7.11 Where a 100m buffer zone between existing bird habitats and construction activities is impractical noise should be controlled to the appropriate threshold values, outlined by IECS guidance. and construction noise should be controlled to an average level of less than 70dB(A), with individual events being controlled to below 85dB(A) at nearby habitats. This would ensure no significant impacts occur, in accordance with IECS guidance.

12.7.12 Mitigation measures will be put in place to minimise noise emissions as described paragraph 12.7.4. and implemented via a Construction Environmental Management Plan (CEMP).

Fish Habitats

12.7.13 When construction is due to take place within close proximity to Quobleigh Stream, the appropriate threshold values should be adopted, and construction noise and re-radiated noise from construction vibration should be controlled to appropriate levels, as described in Table 12.13.

12.7.14 Mitigation measures will be put in place to minimise noise and vibration emissions as described paragraph 12.7.4 and 12.7.7 respectively, and implemented via a Construction Environmental Management Plan (CEMP).

Occupation

OPA Phase 1

Development Generated Road Traffic at Existing Receptors

12.7.15 No adverse effects are predicted to occur at ESRs when the OPA Phase 1 Site becomes operational, therefore no specific mitigation is required. The assessment indicates that effects would be between **moderate** and **neutral**.

Noise Levels at Proposed Residential Dwellings

Noise Within Habitable Rooms

12.7.16 Detailed noise break-in calculations for each house type and habitable room type have been carried out in order to determine glazing and ventilation requirements for dwellings within the OPA Phase 1.

12.7.17 At this stage of the project, detailed information has not yet been developed regarding façade construction, and ventilation strategy etc. The guidance contained herein is therefore subject to development during technical design, and should not be used for tender purposes.

12.7.18 The preliminary ventilation guidance outlined below is based on the assumption that the preferred approach, would be to include trickle ventilators and constant Mechanical Extract Ventilation (MEV) (Building Regulations Approved Document F - System 3).

12.7.19 When carrying out internal noise level break-in predictions, the following assumptions have been made:

- The calculation methodology was as per the 'rigorous' methodology outlined in BS8233;
- Windows are closed, but trickle ventilators are operational i.e. open;
- A reverberation time of 0.5 seconds in habitable rooms; and
- A single trickle ventilator (circa 2,500 mm2) per habitable room where trickle ventilators are feasible.

12.7.20 A suggested minimum sound insulation performance of the non-glazed elements of the building façade is outlined in Table 12.28 below.

Table 12.28 – Suggested Non-Glazed Façade Element Sound Insulation

Description	Sound Insulation Values (R, dB) per Octave Band (Hz)							Rw + Ctr
	63	125	250	500	1000	2000	4000	
Non-Glazed Façade Element	30	39	50	60	65	65	65	55

12.7.21 Figure 12.7, Figure 12.8 and Figure 12.9 illustrate the noise exposure category values for each facade across the OPA Phase 1 Site. Table 12.29 provides a summary of required glazing and ventilation configurations for proposed habitable rooms within each noise exposure category.

Table 12.29: Façade Noise Exposure Categories

Façade Noise Exposure Category	Description
High	• 16.8mm / 16mm argon / 16.8mm laminated acoustic double-glazed unit in suitable frame; and, • Passivent Fresh 80dB (2500equiv free) through wall vent.
Moderate	• 10mm / 6 – 12 mm argon / 6mm thermal double-glazed unit in suitable frame; and, • Passivent TVALdB 800 (2500equiv free) window frame vent.
Low	• No specific glazing requirements • Open windows.

12.7.22 Octave band sound insulation values for the specific glazing and ventilation configurations included in Table 12.29, are provided in Appendix 12.8.

12.7.23 The category value for each façade has been determined based on detailed noise break-in calculations for each house type, habitable room type, and measured octave band noise levels associated with the surrounding local road network. Measured octave band levels of nearby roads have been proportionately scaled to be representative the predicted levels in the 2030 future year scenario, as appropriate.

12.7.24 Glazing and ventilation configurations provided herein are subject to development during technical design, and should not be used for tender purposes.

Noise from Proposed Ancillary Equipment

12.7.25 Noise from proposed building services etc. can be controlled via the use of standard mitigation measures, such as acoustic attenuators, enclosures and louvres with sizing and performance established during the design phase.

12.7.26 It is recommended that noise emissions associated with any ancillary equipment should be limited to the values presented in Table 12.16, in order to ensure any commercial noise does not exceed the existing average background noise level at the site.

The Wider OPA

Development Generated Road Traffic at Existing Receptors

12.7.27 No adverse effects are predicted to occur at ESRs when the Wider OPA Site becomes operational, therefore no specific mitigation is required. The assessment indicates that effects would be between **moderate** and **neutral**.

Noise at Proposed Sensitive Areas

Outdoor Living Areas

12.7.28 Proposed outdoor living areas located closest to Fir Tree Lane, Burnetts Lane and the proposed central north-south link road the adjacent road network require mitigation in order to achieve 55dB $L_{Aeq, T}$, as outlined in Table 12.19.

12.7.29 It is recommended that these properties are orientated with gardens on the screened side of dwellings from nearby roads. This would ensure that recommended noise levels are achieved within proposed garden areas.

12.7.30 Alternatively, the inclusion of 2m high close boarded fencing between gardens and the aforementioned roads, together with a standoff of 15m from the carriageway, would ensure the guideline level of 55dB $L_{Aeq, T}$ is achieved within gardens.

Habitable Rooms

12.7.31 When assessing noise levels in noise sensitive rooms, the noise attenuation provided by the overall building façade requires consideration. To mitigate noise levels, the composition of the building façade would be designed to provide the level of attenuation required.

12.7.32 As glazing is generally the building element that attenuates noise the least, the proportion of glazing in a building façade is an important consideration when assessing overall noise attenuation. In the absence of design details for the building façades, it has been assumed that the glazing to buildings would comprise about 25% of the façade area (based on a standard housing type). To calculate the overall attenuation provided by this percentage of glazing in a brick or block façades, a non-uniform partition calculation can be used.

12.7.33 The calculation combines the different degrees of attenuation of the wall element and the window element. A façade comprising a solid brick or blockwork, would attenuate noise by 50-54dB whereas standard thermal double glazing would attenuate traffic noise by 26-29dB(A).

The overall noise attenuation provided by this combination is, therefore, between 32dB(A) and 35dB(A).

12.7.34 A number of types of glazing would be able to achieve between 26 and 29dB. For example, 6/12/6 thermal double glazing would achieve approximately 26dB(A) attenuation and 10/12/4 thermal double glazing would achieve approximately 29 dB(A) attenuation.

12.7.35 The noise attenuation requirements for noise sensitive rooms during the daytime and night time are summarised in Table 12.20 and Table 12.21. The requirements show that standard thermal double glazing would ensure that internal noise levels in proposed living rooms and bedrooms during the daytime and night time period, will achieve guideline noise levels, as recommended by BS8233 and WHO guidance, with windows closed.

12.7.36 However, with windows open the attenuation provided by the facades across the Site will fall to approximately 15dB(A). This would allow the recommended internal noise limits to be exceeded in some living room and bedrooms.

12.7.37 Therefore, some form of alternative ventilation will be required to achieve the required internal daytime noise levels for proposed dwellings, closest to off-site noise sources. This includes proposed dwellings in the following areas:

- Proposed dwellings closest to, and with a direct line of sight to, the proposed north-south link road;
- Proposed dwellings closest to, and with a direct line of sight to, the Fir Tree Lane;
- Proposed dwellings closest to, and with a direct line of sight to, Burnetts Lane; and,
- Proposed dwellings closest to, and with a direct line of sight to, Allington lane.

12.7.38 Proposed ventilation should, as a minimum, comply with Building Regulations Approved Document F1 Means of Ventilation and British Standard BS5925 1991: “Code of Practice for Ventilation Principles and Designing for Natural Ventilation”.

12.7.39 Acoustic ventilation is recommended for living rooms and bedrooms only.

12.7.40 The facades of some of the properties further into the Site, without a direct line of sight to off-site noise sources, would be protected by the buildings themselves. Therefore, acoustic ventilation is unlikely to be required.

12.7.41 The requirement for acoustic ventilation can be confirmed on a plot by plot basis, during Reserved Matters.

Proposed Employment

12.7.42 The noise attenuation requirements for sensitive rooms with proposed employment buildings are provided in Table 12.22. The requirements show that standard thermal double glazing would ensure that internal noise levels in proposed living rooms and bedrooms during the daytime period achieve guideline noise levels, as recommended by BS8233 and WHO guidance, with windows closed.

12.7.43 However, with windows open the attenuation provided by the facades across the Site will fall to approximately 15dB(A). This would allow the recommended internal noise limits to be exceeded in some living room and bedrooms.

12.7.44 Therefore, some form of alternative ventilation will be required to achieve the required internal daytime noise levels for sensitive rooms within proposed employment buildings.

12.7.45 The facades of employment buildings further into the Site, without a direct line of sight to off-site noise sources, would be protected by the buildings themselves. Therefore, acoustic ventilation is unlikely to be required.

12.7.46 The requirement for acoustic ventilation can be confirmed on a plot by plot basis, during Reserved Matters.

<u>Noise Associated with Chalcroft Business Park</u>

12.7.47 The BS4142 assessment carried out at the location of the closest potential residences within the Wider OPA Site, indicates that mitigation is required with respect to noise impacts from activities at Chalcroft Business Park, during the daytime.

12.7.48 The comparison of noise rating level and typical background levels indicates a potential exceedance of 11dB during the daytime period. BS4142 states:

"A difference of around 5dB is likely to be an indication of adverse impact, depending on context"

12.7.49 Furthermore, when considering the daytime specific levels in context, the exceedance of rating level over residual acoustic environment becomes less significant, in this case. While the character of noise associated with daytime activities contrasts the residual acoustic

environment, the absolute level of sound in the vicinity of receptors is low, when compared to health based acoustic guideline levels, without the inclusion of any mitigation.

12.7.50 In this case, taking in to account the context, a 5dB exceedance of the rating level over the typical daytime background level represent the threshold of adverse impacts, in accordance with BS4142; the Lowest Observed Adverse Effect Level, defined by the NPSE, and be present and not intrusive in accordance with PPG.

12.7.51 Barrier attenuation predictions, carried out in accordance with the Maekawa 1/3 octave, using the measured specific noise level of corresponding sources, indicate that the inclusion of 2m high close boarded fence between gardens and Chalcroft Business Park, would provide 6dB reduction of industrial noise levels at receptors.

12.7.52 Alternatively, properties can be orientated with gardens on the screened side of dwellings from Chalcroft Business Park. This would provide sufficient attenuation of noise levels, reducing daytime rating levels below the existing typical background levels.

12.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

Construction

OPA Phase 1

Noise at Existing Residential Receptors

12.8.1 With the inclusion of mitigation measures, noise associated with construction of the OPA Phase 1 Site is likely result in **neutral** effects, however there is potential for short-term **moderate** effects when construction takes place in the immediate vicinity of sensitive receptors.

Vibration at Existing Residential Receptors

12.8.2 With the inclusion of mitigation measures, vibration associated with construction of the OPA Phase 1 Site is likely result in **neutral** effects.

The Wider OPA

Noise at Existing Residential Receptors

12.8.3 With the implementation of best working practices, mitigation measures and observation of noise limits outlined in this Chapter, noise associated with construction of the Wider OPA Site

is likely result in **neutral** effects, however there is potential for short-term **moderate** effects when construction takes place in the immediate vicinity of sensitive receptors.

Vibration at Existing Residential Receptors

12.8.4 With implementation of best working practices, , substitution of high risk processes, mitigation measures and observation of vibration limits outlined in this Chapter, vibration associated with construction of the OPA Phase 1 Site is likely result in **neutral** effects, however there is potential for short-term **moderate** effects when construction takes place in the immediate vicinity of sensitive receptors.

12.8.5 Should the requirement for piling be removed altogether, vibration associated with construction of the OPA Phase 1 Site is likely result in **neutral** effects.

Noise and Vibration at Ecological Receptors

12.8.6 With the implementation of best working practices, substitution of high risk processes, mitigation measures and observation of noise and vibration limits outlined in this Chapter, noise and vibration associated with construction of the Wider OPA Site is likely result in **neutral** effects, however there is potential for short-term **moderate** effects when construction takes place in the immediate vicinity of SEAs.

12.8.7 Should the requirement for piling be removed altogether, or alternatively construction take place outside of sensitive migratory periods for local bird and fish species, noise vibration associated with construction of the Wider OPA Site is likely result in **neutral** effects.

Occupation

OPA Phase 1

Development Generated Road Traffic at Existing Sensitive Receptors

12.8.8 The assessment of development generated road traffic associated with the OPA Phase 1 Site, indicates that associated noise effects will be between **moderate** and **neutral**.

Noise Levels at Proposed Residential Dwellings

12.8.9 With the inclusion of 2m high garden wall/fencing, together with the glazing and ventilation strategy outlined in the Chapter, residual effects at proposed residential dwellings will be **neutral** to **moderate**.

Noise Associated with Chalcroft Business Park

12.8.10 Noise associated with Chalcroft Business Park will have a **neutral** effect at the OPA Phase 1.

Noise from Proposed Ancillary Equipment

12.8.11 Providing noise is controlled to the recommended noise limits included in the Chapter noise from proposed ancillary equipment will have a neutral effect at the OPA Phase 1 Site.

The Wider OPA

Development Generated Road Traffic at Existing Sensitive Receptors

12.8.12 The assessment of development generated road traffic associated with the Wider OPA Site, indicates that associated noise effects will be between **moderate** and **neutral**.

Noise Levels at Proposed Residential Dwellings

12.8.13 With the inclusion of recommended mitigation measures outlined in the Chapter, residual effects at proposed residential dwellings within the Wider OPA Site will be **neutral** to **moderate**.

Noise Associated with Chalcroft Business Park

12.8.14 With the inclusion of the recommended 2m high noise barrier outlined in the Chapter, residual effects associated with noise from Chalcroft Business Park will be **moderate**, at the closest sensitive areas of the Wider OPA Site, during the daytime.

12.8.15 Night-time noise effects associated with Chalcroft Business Park are **neutral**, at the Wider OPA Site.

Noise from Proposed Ancillary Equipment

12.8.16 Providing noise is controlled to the recommended noise limits included in the Chapter noise from proposed ancillary equipment will have a **neutral** effect at the Wider OPA Site.

12.9 CUMULATIVE EFFECTS

12.9.1 Committed developments considered within this assessment include Pembers Hill Farm (O/15/77190), Land North West of Boorley Green (P/15/75953), Land West of Woodhouse Lane (O/18/83634) and Land North of Winchester Street (O/18/83698).

12.9.2 The cumulative impacts have been assessed via consideration of these committed schemes, in combination with development generated road traffic and overall predicted change in baseline conditions. Cumulative changes are considered with respect to 2023 opening year for the OPA Phase 1 site and 2030 future operational year for the Wider OPA Site.

12.9.3 Cumulative effects are predicted to be between **moderate** and **neutral**.

12.10 IMPACT OF CLIMATE CHANGE

12.10.1 Climate change is not considered likely to have a material effect on the assessment of noise and vibration reported in this chapter. Wider consideration of climate change in the context of the proposed development is addressed Chapter 3 of this EIA.

12.11 ASSESSMENT SUMMARY

Table 12.30: Noise and Vibration Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects – OPA Phase 1							
Noise at existing residential	Medium	Noise audible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Vibration at existing residential	Medium	Vibration perceptible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Construction Effects – The Wider OPA							
Noise at existing residential	Medium	Noise audible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Vibration at existing residential	Medium	Vibration perceptible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Noise at nearby bird habitats	Medium	Bird response to construction noise	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Noise and vibration at fish habitats	Medium	Fish response to construction noise and vibration	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Operation Effects – OPA Phase 1							
Development generated road traffic	Medium	Audible change in noise environment at existing receptors	Negligible	Neutral	n/a	Negligible	Neutral
Noise in proposed gardens	Medium	Noise present in gardens	Negligible	Neutral	2m high garden wall/fencing	Negligible	Neutral
Noise in proposed habitable rooms	Medium	Noise present in habitable rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Industrial noise at proposed dwellings Chalcroft Industrial Estate	Medium	Industrial noise present at proposed dwellings	Negligible	Neutral	n/a	Negligible	Neutral

Operation Effects – Wider OPA							
Development generated road traffic	Medium	Audible change in noise environment at existing receptors	Low - Negligible	Moderate - Neutral	n/a	Low - Negligible	Moderate - Neutral
Noise in proposed gardens	Medium	Noise present in gardens	Medium - Negligible	Major - Neutral	2m high garden wall/fencing in combination with 15m standoff. Alternative location of gardens on screened side of dwellings	Negligible	Neutral
Noise in proposed habitable rooms	Medium	Noise present in habitable rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Noise at proposed school	Medium	Noise present in teaching areas	Negligible	Neutral	n/a	Negligible	Neutral
Noise at proposed school	Low	Noise present in offices and meeting rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Industrial noise at proposed dwellings Chalcroft Industrial Estate	Medium	Industrial noise present at proposed dwellings	Medium - Negligible	Major - Neutral	2m high close boarded fencing	Low	Moderate

Cumulative Effects

Effect	Description	Mitigation	Significance
Change in road traffic noise 2020 to 2023	Change in road traffic noise levels as a result of the OPA Phase 1 development, in combination with committed developments and general increase in baseline environment over time.	n/a	Negligible
Change in road traffic noise 2020 to 2030	Change in road traffic noise levels as a result of the Wider OPA development, in combination with committed developments and general increase in baseline environment over time.	n/a	Low

Impact of Climate Change

Effect	Description	Mitigation	Significance
n/a			

Table 12.31: Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Construction Environmental Managements Plan	Contractor	Planning condition	CEMP submitted and approved by LPA	Construction Phase
Acoustic screening	Contractor	Planning condition	Mitigation scheme submitted and approved by LPA	Prior to start of works
Glazing and ventilation scheme	Contractor	Planning condition	Strategy be submitted and approved by LPA	Prior to start of works

CHAPTER 13: LANDSCAPE AND VISUAL

13.1 INTRODUCTION

13.1.1 This chapter of the ES has been produced by Tyler Grange Group Ltd to assess the Proposed Development in relation to the landscape and visual effects it would have upon the site and wider study area.

13.1.2 This chapter of the ES has been produced by a chartered member of the Landscape Institute (CMLI) and reviewed by a Chartered Member of the LI (CMLI) at Tyler Grange LLP. It considers the existing landscape and visual context of land to the west of Horton Heath, Eastleigh and the potential implications of the proposed development for residential development and associated services on landscape and visual receptors.

13.1.3 Due to the encompassing nature of the term 'landscape' there are some references to aspects of the environment which are considered in more detail in other Chapters. This is particularly the case with the historic elements of the landscape, where reference should also be made to Chapter 9 and the flora and fauna associated with landscape elements which are considered in Chapter 10.

13.1.4 This chapter should be read in conjunction with the following supporting Figures and ES Appendices to this chapter in ES Volume 1 and Volume 2, Appendix 13.1, respectively; and the parameter plans relating to the proposed development, which are discussed in Chapter 3 and are presented in ES Volume 1.

ES Volume 1

- Figures

Figure 13.1: Site Location Plan (11705/P01a)

Figure 13.2: Planning Context and Public Rights of Way (11705/P06a)

Figure 13.3: Published Landscape Character (11705/P08a)

Figure 13.4: Eastleigh Landscape Character (11705/P09b)

Figure 13.5: Site –Specific Character (11705/P27)

Figure 13.6: Landscape Character – Quobleigh Local Landscape Character Area (11705/P28)

Figure 13.7: Landscape Character – Chalcroft Local Landscape Character Area (11705/P29)

Figure 13.8: Topography (11705/P02a)

Figure 13.9: Zone of Theoretical Visibility (11705/P03a)

Figure 13.10: Photoviewpoint Location Plan (11705/P05c)

Figure 13.11: Summer Photoviewpoints (11705/P30)

Figure 13.12: Landscape Strategy Plan (11705/P23b)

ES Volume 2

- Appendix 13.1: LVIA Technical Report
- Appendix 13.2: LVIA Report Appendix 1 – LVIA Methodology Summary of Approach and Criteria Tables
- Appendix 13.3: LVIA Report Appendix 2 – Viewpoints A-J
- Appendix 13.4: LVIA Report Appendix 3 - Winter Photographs
- Appendix 13.5: LVIA Report Appendix 4 - Scoping Record

13.2 ASSESSMENT CRITERIA & METHODOLOGY

Previous Assessment/Background

13.2.1 Two previous landscape and visual assessments have been approved by the Council as part of Environmental Statements. These supported outline planning applications X/19/86303 and X/19/86475. Both outline applications were for strategic residential development and associated works on land within the Site boundary.

13.2.2 In both applications the landscape and visual assessments were carried out by Allen Pyke Associates (APA). The extent of the landscape and visual assessment was scoped with the Council as part of a Scoping Opinion, dated October 2014 in relation to application

X/19/86475. The previous assessments were provided in accordance with Schedule 4 of the 2011 EIA Regulations and took into consideration national policy (then 2012 NPPF) and local policy which included the emerging Eastleigh Borough Local Plan which has since been replaced and advanced under a new emerging Local Plan.

13.2.3 The methodology in both instances followed the guidance set out in 'The Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3)', published by the Landscape Institute and Institute of Environmental Management and Assessment in 2013.

13.2.4 Both study areas, potential visual receptors, and key representative viewpoints were defined and agreed in consultation with the Council. TG has reviewed the previous assessments as part of the desktop study and are aware of their conclusions. The extant permissions establish and accept the principle of development on the site.

13.2.5 Since both outline applications have been approved there have been changes to the legislative context, national and local planning policy context. In addition, the current proposals are of a different scale to those previously assessed and therefore TG have undertaken a new landscape and visual assessment based on the current comprehensive proposal in accordance with up-to-date legislation, planning policy and guidance.

13.2.6 Since both the outline applications have been approved there have been changes to the legislative context, national and local planning policy context. In addition, the current proposals are of a different scale to those previously assessed and therefore Tyler Grange have undertaken a new landscape and visual assessment based on a comprehensive proposal in accordance with up-to date legislation, planning policy and guidance.

13.2.7 It is also of note that the application site is located on land identified within the submitted version of the Eastleigh Borough Council Local Plan 2016-2036 (Track change version showing initial proposed modifications - July 2019). This identifies that the site falls within land identified in Policy HH1 for major residential development.

Scoping Opinion

13.2.8 Please refer to the Council's Scoping Opinion in ES Volume 1, Chapter 4.

Legislative Context

13.2.9 The requirement for an EIA is derived from the EC Directive no. 2011/92/EU which is transposed into UK law through the Town and Country Planning (Environmental Impact

Assessment) Regulations 2017 ('the Regulations'). This chapter will therefore be prepared in accordance with these Regulations.

13.2.10 In addition to this the assessment process within the chapter will be in accordance with the landscape and visual specific guidance provided within GLVIA3.

Planning Policy and Guidance

13.2.11 The following text summarises the planning policies relevant to landscape and visual issues and should be read in conjunction with Figure 13.2: Planning Context and Public Rights of Way (11705/P06a) found in the ES Volume 1.

National Planning Policy

National Planning Policy Framework 2019

13.2.12 At the heart of the NPPF is a presumption in favour of sustainable development. For plan making, the presumption requires plans to positively seek opportunities to meet the development needs of an area and be sufficiently flexible to adapt to rapid change. Footnote 6 accompanying the presumption identifies protected areas or assets of particular importance which includes Areas of Outstanding Natural Beauty (AONB), National Parks and areas defined as Heritage Coast.

13.2.13 The creation of high-quality buildings and places is fundamental to what the planning and development process should achieve, as stated at paragraph 124.

13.2.14 Paragraph 127 seeks to ensure that developments, among others:

- Are visually attractive as a result of good architecture, layout and appropriate and effective landscaping; and
- Are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change (such as increased densities).

13.2.15 Paragraph 170 requires planning policies and decisions to contribute to and enhance the natural and local environment by fulfilling criteria including amongst others:

- "protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); and

- Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland."

13.2.16 Paragraph 170 makes it clear that there is a hierarchy to the importance and value attributed to landscapes, and that the development plan should identify the quality of particular landscapes that are not subject to statutory protection.

13.2.17 The site is not situated within an area designated in recognition of its landscape quality or value at a statutory national level (i.e., AONB or National Park).

National Planning Practice Guidance (NPPG)

Landscape

13.2.18 The PPG makes reference to the National Planning Policy Framework, stating: "it is clear that plans should recognise the intrinsic character and beauty of the countryside, and that strategic policies should provide for the conservation and enhancement of landscapes". The PPG also goes on to state, "the cumulative impacts of development on the landscape need to be considered carefully" (Paragraph: 036 Reference ID: 8-036-20190721, Revision date: 21 J07 2019).

13.2.19 At paragraph 037, the NPPG identifies that landscape character assessments can be prepared, as well as Landscape and Sensitivity and Capacity Assessments to help assess the type and scale of development that may be accommodated without compromising landscape character. This Chapter provides a review of published landscape character assessments and capacity and sensitivity studies as they relate to the site and Study Area. (Paragraph: 037 Reference ID: 8-037-20190721, Revision date: 21 07 2019)

13.2.20 The NPPG also states that a Landscape and Visual Impact Assessment can be used to demonstrate the likely effects of a proposed development.

Green Infrastructure

13.2.21 The PPG highlights the multifaceted benefits provided through the provision of Green Infrastructure, including but not limited to: "enhanced well-being, outdoor recreation and access, enhanced biodiversity and landscapes, urban cooling, and the management of flood risk" (Paragraph: 005 Reference ID: 8-005-20190721, Revision date: 21 July 2019).

13.2.22 Moreover, the NPPG recognises how green infrastructure exists within a wider landscape context and can thus be used to reinforce and enhance local landscape character and contribute to a sense of place.

Design PPG, October 2019

13.2.23 The PPG confirms well-designed places can be achieved by taking a proactive and collaborative approach at all stages of the planning process, from policy and plan formulation through to the determination of planning applications and the post approval stage. Good design is set out in the National Design Guide as comprising of 10 characteristic including context, identity, nature and public spaces (Paragraph: 001 Reference ID: 26-001-20191001, Revision date: 01 10 2019).

13.2.24 In confirming the role of parameter plans in achieving well designed places, the guidance confirms parameter plans can include information on the proposed land use, building heights, areas of potential built development, structure of landscape and green infrastructure, access and movement and other key structuring and place-making components (Paragraph: 011 Reference ID: 26-011-20191001, revision date 01 10 2019).

Local Planning Policy

Eastleigh Borough Local Plan Review 2001-2011 (Adopted May 2006)

13.2.25 The majority of the Site is located outside of the defined settlement boundary within the countryside (Policy 1.CO) as shown on the Eastleigh Borough Local Plan Review Proposals Map for the northern part of the Borough. There are two small areas of the site in the north east and south east which are in land designated as local gaps under Policy 3.CO.

13.2.26 Policies relevant to landscape and visual issues are summarised below.

Policy 3.CO Local Gaps

13.2.27 The policy states planning permission will only be permitted for appropriate development in a local gap, if: 1. It cannot be acceptably located elsewhere; and 2. It would not diminish the gap, physically or visually.

Policy 18. CO Landscape Character

13.2.28 Development which fails to respect or has an adverse impact on the intrinsic character of the landscape, will be refused.

Policy 19.CO Locally Important Landscape Features

13.2.29 The Council will refuse development in the countryside or in urban areas if it would result in the loss of, or damage to locally important features in the landscape such as water courses, ponds and lakes. Where the Council is satisfied that the loss or reduction of a feature is fully justified, it will require appropriate replacement features to be included in the proposals.

Policy 59.BE Promoting Good Design

13.2.30 Where development is in accordance with the other policies in the plan it will be permitted provided it meets a series of criteria relating to good design. These criteria include:

1. They take full and proper account of the context of the site including the character and appearance of the locality or neighbourhood and are appropriate in mass, scale, materials, layout, density, design and siting, both in themselves and in relation to adjoining buildings, spaces and views, natural features and trees worthy of retention;

2. They provide a high standard of landscaping design and appropriate planting where required. Development should use native plants in landscape schemes to benefit biodiversity. Development adjacent to or within the urban edge must not have an adverse impact on the setting of the settlement in the surrounding countryside;

3. The have satisfactory means of access and layout for vehicles, cyclists and pedestrians including appropriate links to surrounding footpaths, cycleways and public transport services.

4. They are an appropriate use for the locality and avoid unduly interfering, disturbing or conflicting with adjoining or nearby uses, especially in terms of noise, fumes, dust, overlooking, loss of daylight, loss of outlook, vibration, or from floodlighting or security lighting.

Policy 146.OS Green Network of Public Open Space

13.2.31 Proposals that would have a detrimental impact on the green network will be refused. Contributions, where appropriate, from adjoining development proposals will be sought to enhance the environment and facilities within the green network. OS Public Open Space Provision Associated with New Development

13.2.32 The Council's requires a minimum provision of 2.85 hectares of public open space per 1,000 population. This means that where development involves a net increase of 45 residential units or more, appropriate open space provision will be sought on-site to meet the open space needs arising from the development.

Policy 148.OS Sports and Recreation Provision

13.2.33 The Council will permit appropriate proposals which address deficiencies in the quality and quantity of sport and recreation facilities in accordance with its Sport & Recreation Strategy for the Borough. Policy 149.OS Playing Fields

13.2.34 The Council will support proposals to development new facilities and the enhancement of existing playing fi eld facilities, including the provision of all-weather pitches, subject to their scale, siting and design conforming with policies for the protection of the environment.

Policy 151.OS Allotments

13.2.35 The Council will refuse proposal which include the redevelopment of allotments gardens which are identified on the Proposals Map unless the allotments that would be lost to the development are replaced prior to the commencement of the development by allotments of equivalent or better quality and quantity in suitable locations, conveniently accessible for plot holders including those who need to be relocated.

Emerging Planning Policy Eastleigh Borough Council Local Plan, (Submitted version of the Eastleigh Borough Council Local Plan 2016-2036, Track change version showing initial modifications - July 2019)

13.2.36 The submitted version of the Eastleigh Borough Council Local Plan shows the majority of the site is to be allocated for housing under Policy H11 (Land West of Horton Heath) for an area of approximately 125 hectares of land. The strategic location for development is to include approximately 1,500 dwellings, 6Ha of employment land, open space, retail and community facilities including a primary school and a new link road to Bubb Lane.

13.2.37 The small areas of the Site to the north east and south east are included within the emerging housing allocation under Policy DM24 but are also shown within the gap area identified under emerging Policy S8 for the protection of countryside gaps. However, the extent of the countryside gap in respect of the Strategic Growth Option will be determined at the Masterplanning stage. The site also contains areas of existing designated recreation, allotment and open space facility which are considered under emerging policies DM34 & DM35.

13.2.38 The emerging policies with relevance to landscape and visual matters are considered below.

Strategic Policy S1: Delivering Sustainable Development

13.2.39 To be considered sustainable new development should address a series of criteria including:

- maintain and help to grow a high-performing local economy that benefits the Borough, south Hampshire and the wider economy, without adverse impact on south Hampshire's city, town and other centres, the quality of the local environment or local transport networks;

- maintain local environmental quality, including avoiding damage to, and where possible enhancing, the existing valued urban and rural environments in the Borough and heritage assets;

- maintain, enhance, extend and connect the natural habitats within and landscape value of the Borough, extending natural habitats into new and existing development.

13.2.40 The draft policy states that when considering development proposals the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Framework.

Strategic Policy S8: Protection of Countryside Gaps

13.2.41 In order to maintain the separate identity of settlements, countryside 9 gaps have been defined and include an area between Fair Oak (including the Strategic Growth Option) and Horton Heath and an area between Hedge End and Horton Heath. as shown on the Key Diagram. The draft policy notes that the precise boundary of countryside gaps connected to the Strategic Growth Option will be determined following Masterplanning.

13.2.42 In countryside gaps, development which physically or visually diminishes the gap, or has an urbanising effect detrimental to the openness of the gap, the character of the countryside or the separate identity of the adjoining settlements will not be permitted. Proposals for development within gaps will also be assessed against other relevant policies but will be resisted where this approach is not met. Strategic Policy S10: Green Infrastructure

13.2.43 Through new development and other initiatives, the Council will seek to achieve the provision, retention and/ or enhancement of the following forms of multi-functional green infrastructure, including provision of:

i. landscape scale strategic links across the Borough boundary, to and between the Borough's settlements, the countryside, the coast, and the major areas of open space including the country parks;

ii. interlinked publicly accessible open space through new and existing development including for example formal sports facilities and informal amenity spaces and cemeteries;

iii. green infrastructure incorporated into all new development with multifunctional spaces connected by primary, secondary and tertiary green links;

iv. interconnected urban green infrastructure within the fine grain of existing and new development including green, cycle ways, paths and linkages between community facilities and open spaces to link community facilities;

v. green steppingstones such as street trees, green roofs and walls, pocket parks and urban copses;

vi. connected habitats linking the network of designated sites and existing priority habitats;

vii. incorporation of historic buildings and landscapes, including historic parks and gardens within the wider Green Infrastructure to protect their setting; and

viii. opportunities for local food growing including allotments, community orchards and farms.

Strategic Policy S13: Strategic Footpath, Cycleway and Bridleway links

13.2.44 The Council in partnership with the highway authority will seeks to create new and improve existing footpath, cycle and bridleway links throughout the borough. New developments should integrate with existing routes and wherever possible maintain, protect and enhance their function. Development that would sever, obstruct or otherwise have detrimental impact on the existing or proposed network of green routes was shown on the policies map will not be permitted.

Policy DM1: General Criteria for New Development

13.2.45 As relevant, new development should fulfil general criteria which includes amongst others:

- Not have an unacceptable impact on, and where possible should enhance:

  a. Residential amenities of both new and existing residents, the character and appearance of the urban areas, the countryside and the coast;

  b. Biodiversity and

  c. Heritage assets.

- that full and proper account of the context of the site including the character, appearance and land used of the locality or neighbourhood, and be compatible with adjoining uses and be well integrated with these in terms of mass, scale, materials,

layout, density, design and siting, both in itself and in relation to adjoining buildings, spaces and views. Where adjoining development is poor in urban design terms, new development should contribute to improving the character of the area;

- not involve the loss of or damage to trees, woodlands, hedgerows, ponds, priority habitats or other landscape features of value to the character of the area, for appearance or biodiversity unless they can be replaced with features of equivalent or enhanced value;
- include a landscape scheme covering the design and layout of external space;
- provide fully connected green infrastructure that interlaces the development and connects into the wider network; and
- provide satisfactory management arrangements for all landscape, green infrastructure and biodiversity enhancement.

Policy DM35: Provision of recreation and open space facilities with new development

13.2.46 The draft policy requires that all new residential development should contribute to the achievement of the quantitative, qualitative and accessibility standards for recreation and open space facilities in the Open Space Needs Assessment 2017. The level of provision and contribution will vary depending on the existing areas of open space located within the distance set by the accessibility standard and the size of the proposed development.

13.2.47 Contributions may take the form of the provision of land laid out for recreation and/or open space and/or funding for improvements to the quality and capacity of existing recreation and/ or open space facilities, including indoor and outdoor sports facilities. Sports and open space requirements for strategic development is set out in policy S10.

13.2.48 Development proposals should include provision for the long-term management and maintenance of any recreation or open space facilities provided. Private open space that is not available for public use will not be accepted in lieu of requirements for public open space provision or contributions.

13.2.49 Proposals should help to create and enhance multifunctional green infrastructure in accordance with Policy S10. Policy DM36: New and enhanced recreation and open space facilities.

13.2.50 The provision, extension or enhancement of public and private recreation and open space facilities or uses including those identified in draft Policy DM34 will be permitted provided that they fulfil criteria including:

- They accord with the general development criteria, biodiversity and heritage policies
- In the countryside:
- Development should not involve structures, floodlighting or activities that cause urbanisation or detract from rural character.

13.2.51 They contribute to the management of, and where possible enhance the countryside and urban open spaces. The Council may require a legal agreement to ensure that land is managed to maintain or enhance its agricultural and/or landscape value and/ or biodiversity interest.

Policy F06 Foxholes Farm, Fir Tree Lane

13.2.52 Approximately 1ha of land to the west of Horton Heath is allocated for development to deliver 45 dwellings. The emerging policy states planning permission will be granted provided that the detailed proposals comply with the development and the approved masterplan for the adjacent land west and south of Horton Heath site and addresses a series of specific requirements, including:

- The provision of pedestrian and cycle links both within the site and to connect the site with the surrounding area and development permitted on adjacent sites, including the provision of access to the adjacent public open space adjacent to the east of the site;
- The provision of a good quality landscape setting for the development (including buffer planting on the Fir Tree Lane frontage) and maintaining and reinforcing existing boundary hedgerows, compatible with planned adjoining users to the south east.

Guidance/ Best Practice Landscape Checklist for New Development, 2006

13.2.53 The Landscape Checklist is a guide to submission requirements for external development works in Hampshire and the Isle of Wight. In terms of landscape, it requires developments to have an understanding of site features, constraints and opportunities including landscape character; tranquillity, scale of development, impact/appropriateness to setting, privacy, security, enclosure, screening and local distinctiveness. It also requires interpretation of the visual impact and the safeguarding of sensitive views and settings.

13.2.54 The Checklist does require applicants to submit drawings and documents as appropriate which identify the overall design concept, soft landscape elements, contours and levels, use and functions of different areas. Where necessary detailed planting proposals should be provided which consider the points raised within the checklist alongside the details necessary to consider landscape structures and surfaces. It is also likely that a Management Plan may be required as part of an application or reserved matter.

Character Area Appraisals Bishopstoke, Fair Oak and Horton Heath SPD, January 2008

13.2.55 The Character Area Appraisal SPD appraises the urban character of Horton Heath and guidance covers small scale development within the existing urban areas of the Borough but is not applicable to comprehensive re-development, such as the application site.

13.2.56 However, it is noted that the Horton Heath has a small historic core located at the southern end of the village and has expanded incrementally to the north during the 20th century. In the last 30 years there has been significant growth to the east and west of the main spine of development.

13.2.57 The site is adjacent to Character Area BIF0HH29 which is described as inter-war development in north west Horton Heath. Buildings are typically terraced or semi-detached with open or hedgerow boundaries. In terms of guidance, the SPD seeks to maintain the predominant deep building setbacks to the east of Burnetts Lane in order to retain/reinforce the existing levels of on-plot planting and ensure that the materials applied in new development are similar or complementary to those prominent in existing development. Quality Places SPD, November 2011.

Quality Places SPD

13.2.58 The Quality Places SPD provides detailed guidance to Local Plan Policy 59.BE. Whilst the SPD mostly relates to the requirements for the design of a proposal and the Design and Access Statement, it is clear that the landscape strategy is considered an essential component to achieving successful development. For the best new public open spaces, developers are advised to follow the advice set out in the Hampshire Landscape Checklist.

13.2.59 In assessing site constraints, the SPD notes that visual impacts can include large or unattractive buildings adjacent to the site or unsightly neighbouring land uses. Mitigation could take the form of restricting different forms of development to certain part of the site or landscape screening. Whilst positive site features can include mature trees and hedgerows as visual features, green space which provides visual amenity and practical recreational value and water features which are considered positive visual elements.

13.2.60 In considering access and integrating with the existing movement network, views of landmark buildings or attractive landscapes should be exploited, and hard landscape materials should complement building materials. More than 10 parking spaces should be broken up by appropriate paving and tree planting to reduce visual impact. 3

13.2.61 Appendix A of the SPD contains a key design principle checklist which for landscape requires consideration as to whether:

- landscape plans are consistent with service, engineering and building layout plans;
- the landscape design is appropriate to the level of maintenance expected;
- In low density schemes does the landscape design help to create enclosure and continuity;

13.2.62 Whilst Appendix B considers the quality of routes and seeks for routes to be designed for aesthetic enjoyment, by giving pleasure by the variety of prospects, spaces and landscapes.

Landscape Planning Policy Conclusion

13.2.63 The following should be taken into account in the development of the scheme:

Adopted policy:

- Respond to the local context of the site and its locality through the provision of high-quality landscaping and planting (Policy 59.BE).
- Provide adequate provisions for open space and recreation (Policy 148.OS).

Emerging policy:

- Maintain, enhance and extend existing natural habitats into new developments (Policy S1).
- Enhance and reference the characteristic features and local context within new developments and extend and connect natural habitats (Policy DM1).
- Prevent the loss or damage to existing trees and other landscape features (Policy DM1).

- Provide a connected and multi-functional Green Infrastructure network which connects both internally and to the wider network of Green Infrastructure beyond the site boundaries (Policy S10).

- Incorporate interconnected green infrastructure within new development with multi-functional spaces connected by green links (Policy S10).

- Provide interconnected cycle ways and footpath routes through green corridors and connect to existing routes where possible (Policy S10 and S13).

- Provide adequate provision for recreation and open space as part of new development (Policy DM36). and

- Proposals should include recommendations identified within the Quality Places SPD (2011) and emerging SPD documentation, as necessary.

Assessment Methodology

13.2.64 For the purposes of this assessment landscape is defined by the European Landscape Convention, 2000 (ELC) [ii] as:

'An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.'

13.2.65 This definition applies to all urban, peri-urban landscapes, towns, villages and rural areas. It applies to ordinary or degraded landscapes as well as those that are considered as outstanding and / or protected.

13.2.66 In the context of this definition the appraisal process seeks to consider the landscape and visual effects in an objective and systematic manner whilst recognising the perceptual and therefore subjective response to the landscape as experienced by people, moving through, living and working in the landscape.

13.2.67 The Landscape and Visual Impact Assessment (LVIA) deals with the separate but interlinked issues of:

1. **Landscape Character:** The effects of the proposed development upon discrete character areas and/or character types comprising features possessing a particular quality or merit; and

2. **Visual Context:** The effects of the proposed development on views from visual receptors, and upon the amenity value of the views.

13.2.68 Landscape character is defined in the LI's guidance (Guidelines for Landscape and Visual Impact Assessment, LI and institute of Environmental Management and Assessment (IEMA) Third Edition 2013 (GLVIA3) as:

'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.'

13.2.69 Changes to the landscape character can arise as a result of:

1. Changes to the fabric of the landscape including either the loss of key elements or introduction of new features which alter the distinct character of the landscape; and

2. Changes which alter the way in which the landscape is perceived or appreciated.

13.2.70 Changes to view will occur where there is:

1. Alteration of the view in terms of elements present and the overall composition.

2. A change to the skyline; and / or

3. There is a change to the distribution of dominance of features.

13.2.71 Such changes may or may not have a significant effect on the visual amenity of identified visual receptors.

13.2.72 It should be noted that based on GLVIA, judgements mean in this chapter are 'proportionate' and 'appropriate' to the scale of the application (para 1.17). Judgements made are *'reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others'* (para 2.24) (Tyler Grange emphasis).

13.2.73 The assessment methodology draws upon the following guidance:

1. GLVIA3 2013; and

2. 'An approach to Landscape Character Assessment' (AALCA), published by Christine Tudor and Natural England 2014

Baseline

13.2.74 The baseline appraisal takes account of both the overall Outline Planning Application as well as the First Residential Parcel (OPA Phase 1) and where necessary reference is made to specific baseline situation associated with the OPA Phase 1.

13.2.75 The baseline appraisal process is a crucial part of any assessment and includes:

- An overview of statutory plans and other data regarding relevant designations and landscape and visual related planning polices for the area;
- An assessment of the landscape character of the site and surroundings with reference to published works and checked and verified through fieldwork. This includes the classification of the landscape into units of distinct and recognisable character and land use at a site specific level;
- Field work to determine the extent to which the site can be seen from the wider area, taking into account any significant vegetation or built form which restricts or limits the extent of visibility; and
- Identification of representative viewpoints and determining likely visual receptors.

13.2.76 In addition to the Baseline Data Collection the Assessment Methodology comprises the following tasks:

Impact Assessment

13.2.77 The assessment of landscape character and visual amenity is both a subjective and objective process. Whilst subjectivity can never be removed from the assessment process, by following a systematic and structured framework of assessment, a more robust assessment can be performed, and more rational and transparent conclusions drawn. The process utilised in this assessment includes a number of stages as described below.

13.2.78 Classification of the landscape resources in terms of sensitivity to change which will be dependent on:

1. The pattern, scale, quality and condition of the landscape or individual element/feature and the contribution the landscape resources make to landscape character;

2. The value placed on the landscape as well as individual contributors (to some degree reflecting landscape designations and the level of importance they signify); and

3. The scope for mitigation and enhancement.

13.2.79 The GLVIA 2013 states that landscape receptors need to be assessed "*firstly in terms of their sensitivity, combing judgments of their susceptibility to the type of change or development proposed and the value attached to the landscape" (para 5.39)*. Visual effects should be assessed *"in terms of both their susceptibility to change in views and visual amenity and also the value attached to particular views"* (para 6.31)

13.2.80 Those landscape resources which make a notable contribution to the character and cannot be replaced or substituted will be of high sensitivity, whilst those resources which are replaceable or contribute little to the overall character of the landscape will be of low sensitivity.

13.2.81 Classification of the representative viewpoints in terms of the sensitivity of the visual receptors will be dependent on:

1. The location and context of the viewpoint;

2. The expectations and occupation or activity of the receptors; and

3. The importance or value attached to the view experienced.

13.2.82 Those receptors which are classified as being of high sensitivity to change may include users of PRoW or nearby residents, those of low sensitivity to change may include people in their place of work or travelling through the landscape in cars, trains or other modes of transport.

13.2.83 Identification and assessment of the potential landscape and visual impacts of the development proposals and consideration of the likely magnitude of change will consider the following:

1. The magnitude of effect lies along a continuum from high, where there is a prominent and notable change to the landscape character or view to low where the change is barely perceptible;

2. Consideration of further mitigation with the aim, where possible, of avoiding or reducing significant adverse landscape or visual effects determined during the course of the assessment;

3. Enhancement of the landscape where proposals seek to improve the landscape resource and visual amenity of the development area and its wider setting over and above its baseline condition; and

4. Evaluation of landscape and visual effects following mitigation, known as residual impacts.

13.2.84 Based on the GLVIA 2013 each effect on landscape and visual receptors is assessed '*in terms of its size or scale, the geographical extent of the area influenced, and its duration and reversibility'* (para 5.48 and 6.38).

13.2.85 A summary of the criteria used in this assessment is included in ES Volume 2, Appendix 13.2.

13.2.86 The assessment process includes the consideration of both tangible and intangible aspects of the environment. For example, intangible factors such as remoteness, disturbance and tranquillity are important factors in influencing how the landscape is interpreted and experienced. As a result, the assessment touches upon aspects that are considered in more scientific terms in other chapters but are still of importance to landscape assessment. Direct and indirect effects of the development upon the landscape character and visual amenity are also identified where they occur.

13.2.87 The assessment of the nature of the effect depends on the degree to which the development:

1. Complements, respects and fits into the existing scale, landform and pattern of the landscape context and visual composition;

2. Enables enhancement, restoration or retention of the landscape character and visual amenity and delivers policy aspirations; and

3. Affects strategic and important views in addition to the visual context of receptors.

13.2.88 For the purposes of this chapter, the term 'impact' refers to the causation of change (or action taken) and 'effects' are the results of the changes on the landscape and visual context (or change resulting from such action).

Significance Criteria

13.2.89 Best practice guidelines stipulate that the significance of any landscape and visual related effect should be evaluated, both during construction and following completion of the development.

13.2.90 The significance of any landscape and visual effect is a function of the sensitivity of the affected landscape resources (nature of receptor) and visual receptors against the magnitude of change that they would experience (nature of effect). The definition of significance based on the GLVIA 2013 is outlined below.

13.2.91 Significance is "*a measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic*" (GLVIA 2013, page 158). Elsewhere the guidelines state that significance can only be defined in relation to "*each development and its specific location*" (para 5.54 and 6.42). Para 6.42 adds that *"it is up to each assessment to determine the approach and if necessary to adopt a consistent approach across all the EIA topic areas*."

13.2.92 The criteria used for determining significance are outlined below and are consistent with this EIA. The nature of the effect can be classified as adverse or beneficial. However, there may be instances where the impact results in an effect which is neither adverse nor beneficial. These effects are considered to be neutral in nature.

1. Substantial beneficial
2. Moderate beneficial
3. Minor beneficial
4. Neutral/negligible
5. Minor adverse
6. Moderate adverse
7. Substantial adverse

13.2.93 The following terms explain the criteria in more detail:

- Substantial – considerable effects (by extent, duration or magnitude) of more than local significance or breaching identified standards or policy
- Moderate – limited effects which may be considered significant
- Minor – slight, very short or highly localised effects

13.2.94 It should be noted that since the commencement of this project the GLVIA 2013 guidance stipulates that assessments should distinguish between what are considered to be significant

and not significant effects. For the purposes of the assessment contained within this ES Chapter, in the context of this development significant effects are those assessed as being with either moderate or substantial effects.

Geographical Scope

13.2.95 The study area has been identified on all figures relating to this Chapter. This study area was also sent to the Eastleigh Borough Council Landscape Officer when viewpoint confirmation was sought (ES Volume 2, Appendix 13.4). The study area for both the landscape character and visual amenity extends to 2km from approximately the centre of the site.

Assumptions & Limitations

13.2.96 The assessment of potential landscape and visual effects contained within this chapter is based upon the Phase 1 OPA Detailed Proposals and the Wider OPA parameter plans that are submitted to support the planning applications.

13.2.97 The assessment of visual effects is informed by a set of publicly accessible representative views that have been included in consultation and agreement with the Council. The assessment has not been informed by, nor does it contain views from private properties or private land.

13.2.98 When considering operational impacts following the completion of the construction phase effects will be assessed at Year 1 before mitigation planting is fully mature. During the early period effects are likely to be at their greatest, however the effects will gradually reduce as planting matures. The LVIA considers worst-case effects which are likely to occur at Year 1, and also at Year 15 once the vegetation has matured. These effects are considered to be permanent.

13.3 CONSULTATION

13.3.1 As part of the scoping process TG has scoped the approach, the study area, potential visual receptors and key representative viewpoints with the Council. Initial viewpoints were chosen following the production of a ZTV (Zone of Theoretical Visibility, appended as ES Volume 1, Figure 13.9 to this chapter), aerial mapping and a review of previous landscape and visual assessments for the Site. The Council's Urban/Landscape Design Senior Specialist, Alice Harwood, reviewed the initial scope and provided additional viewpoints for consideration.

13.3.2 Following receipt of these comments, TG amended the proposed photoviewpoint locations and undertook an initial Site visit in November 2018, this amended plan is appended within ES Volume 2, Appendix 13.4. Subsequent to this, another visit was undertaken in March 2019 to refine the photoviewpoints and confirm the final viewpoints and likely receptors. The final viewpoint plan is illustrated on ES Volume 1, Figure 13.10. Subsequent visits were also undertaken in November 2019 and May and August 2020. Further updated photography was obtained in winter 2020 (included in ES Volume 2, Appendix 13.3).

13.3.3 TG have continued to liaise with the wider consultant team to ensure the landscape and visual chapter provides a robust assessment and gives consideration to the Green Infrastructure and Masterplanning principles considered for the Site.

13.4 BASELINE ENVIRONMENT

13.4.1 The full site and scheme descriptions for the applications are laid out within ES Volume 1, Chapters 2 & 3. A summary of the proposals are as follows:

13.4.2 The development proposals comprise two planning applications: Full Planning application for OPA Phase 1

13.4.3 Erection of 393 residential units with public open space, hard and soft landscape works, internal roads, footway/cycleways, associated parking spaces, substation, SuDS and associated infrastructure (This application is subject to Environmental Impact Assessment)

Outline Application for the Wider OPA

13.4.4 For the purposes of EIA, the proposed development for the Wider OPA comprises the comprehensive development of the site, delivering up to 2,500 No. Residential Dwellings, local employment, local retail, leisure, employment and community facilities, primary school, formal and informal publicly accessible open space, including formal sports facilities, landscaping, green infrastructure and sustainable drainage systems.

13.4.5 Outline: phased mixed-use development comprising: up to 2,500 residential units in total; a primary Local Centre (and supporting secondary local centres) comprising mixed-use residential/retail/leisure/community/employment/day nursery/food establishment uses; office, commercial and industrial uses; a Primary School; public open space including formal sports facilities and informal provisions; relocation of solar panels; key infrastructure and utilities provision including new roads, footpaths and cyclepaths and improvements to the existing road junction at Fir Tree Lane/Burnetts Lane; and ecological, landscape, site preparation and

demolition works (All Matters Reserved Except Access). This application is subject to Environmental Impact Assessment.

13.4.6 The maximum parameters of the Wider OPA for the purposes of the EIA assessment are:

- Circa 2,500 dwellings comprising a mix of market and affordable housing (Use Classes C2 and C3);
- A Mixed-Use centre of 3.1 Ha comprising residential, retail, leisure, community, employment facilities (Use Classes C2/C3, E, F.1, F.2 and Sui Generis);
- 3.3 Ha of employment land (Use Classes E(g)(i) and (iii), B2 and B8);
- A 3 FE primary school and early years education facilities (Use Class F1);
- Formal and informal publicly accessible open space, formal areas of play, youth provision and associated facilities, formal sports facilities, allotments and amenity space, including, landscaping, green infrastructure and sustainable drainage systems.
- The utilisation of existing and provision of new and/ or amended highway access points along Allington Lane, Fir Tree Lane, Burnetts Lane and Bubb Lane.
- Any wider land outside the site boundary needed for development specific infrastructure.

13.4.7 Primary vehicular access to the Wider OPA is to be achieved through the utilisation of the accesses onto Allington Lane, Burnetts Lane and Bubb Lane consented under planning permissions X/19/86303 and X/19/86475 and via Burnetts Lane with improvements to the existing junction with Fir Tree Lane.

Open Space Provision

13.4.8 The Wider OPA will deliver 48.15 hectares (ha) of informal open space and 2.75Ha ha of formal open space.

13.4.9 The implementation of the proposals would introduce built form to the fields located to the west of Horton Heath. This would constitute a change to the existing baseline of the site however it would not be an incongruent change due to its location on the edge of the Horton Heath settlement, the consented link road and other extant permissions.

13.4.10 The proposals would therefore form an extension to an existing and recognisable characteristic within the landscape and development will not be a new feature within the

landscape. The built form of the proposals will be incorporated within a retained and enhanced green infrastructure network. The siting of built form within the site will be considered to minimise the landscape and visual impact of the proposal. The existing footpath network will be accommodated within the proposals and additional recreational routes created throughout the scheme. Open space and sports provision are also included across the site and utilise Green Infrastructure for recreational purposes.

Landscape Character

13.4.11 This section considers the existing landscape character and features of the Site and its environs and should be read in conjunction with Figure 13.5 Landscape Character - National and County, Figure 13.6 Landscape Character – Eastleigh LCA and Figure 13.7 Quobleigh LLCA and Figure 13.8 Chalcroft LLCA. These plans depict the local landscape character context as part of Tyler Grange LLP's appraisal process. This is based on desktop and field studies and published character assessments.

13.4.12 At a national and countywide scale the area considered is reflected in Figure 13.5, whilst Figure 13.6 illustrates the Landscape Character Assessment published by Eastleigh Borough Council. The site context plan (Figure 13.7) represents the sites character and context at a local scale, this is the most relevant form of landscape character appraisal as it is site specific. This site level context was used for the assessment of the landscape resource. These layers of assessment are discussed in turn below.

National Character

13.4.13 The Countryside Agency's Character Map of England identifies broad National Character Areas (NCA) for the whole of England. The site lies within the profile of *NCA 128: South Hampshire Lowlands*.

13.4.14 Those key characteristics identified for the NCA that are representative of the wider landscape context of the site have been extracted and are listed below:

- *Low-lying, undulating plain abutting the chalk downs to the north and the coastal plain and Southampton Water to the south. An underlying geology of open marine, estuarine and freshwater Tertiary gravels. Soils over much of the area are heavy and clayey with localised pockets of more freely draining soils on higher land.*

- *Fast-flowing chalk rivers in wide, open valleys with watermeadows and riparian vegetation that provide valuable wildlife habitats for species such as breeding and overwintering birds, otter, water vole…*

- *Well-wooded farmed landscape…*
- *Mixed agricultural landscape dominated by pasture with small pockets of horticulture and arable.*
- *An intimate and enclosed field pattern with many small and irregular fields generally bounded by mixed-species hedgerows or woodland.*
- *In parts, a very urban NCA dominated by the city and port of Southampton… The more rural hinterland is characterised by small, loosely clustered or dispersed settlements, intermixed with isolated farmsteads.*
- *Fragmented by major transport links…*

13.4.15 For the purpose of assessing the effects of development this character area is of limited use as the classification covers a wide area and cannot be applied to specific sites.

13.4.16 Although the characteristics identified above are generally typical of the landscape within which the site is situated, the level of detail is not sufficient to provide an appreciation of site-specific issues which need to be taken into account in the development process.

County and District Character

13.4.17 At a county level Hampshire County Council has prepared the *'Hampshire County Integrated Character Assessment'* (Draft March 2010). The landscape associated with the site is classified as being in Landscape Character Area (LCA) 2e – Forest of Bere West. The key characteristics of this LCA are listed below, those in bold are relevant to the site:

- ***A low-lying landscape with shallow undulations, predominantly south sloping.***
- *Varied geology with permanently saturated heavy clays in the central and southern parts and locally higher sandy outcrops which are more undulating resulting in agriculturally poor soils – conversely rich alluvial especially around tributaries of the Hamble are very high grade.*
- *Locally popular accessible woodland areas.*
- ***Permanent pasture, plantation woodland*** *and small holdings with secluded, heavily wooded, often ancient origin but replanted, away from the major towns.*

- *This area is strongly associated with the Royal Forest of Bere, a hunting reserve that retains wooded and to a lesser extent, open commons, assart, field and woodland patterns.*

- ***Hedgerows often low but with individual spreading mature oaks, sometimes of ancient origin or lines of oak with no 'understorey' hedge and occasionally isolated field specimens,***

- ***Extensive 20th Century development, including urban expansion and infilling of common-edge settlements.***

- ***Historically, mixed settlement pattern of very low density, tending towards nucleation along streams and around heath scattered throughout the area.***

- ***Rich biodiversity, including woodland, heathland, grassland and wetland sites.***

13.4.18 The broader LCA is then broken down into smaller more defined Landscape Character Types (LCT), the site is located across two LCT. The south and central areas of the site are located within LCT *Lowland Mosaic Open*, this constitutes the majority of the site. The site area north of Firtree Lane is located within the *Lowland Mosaic Small Scale* LCT. The key identifying characteristics of these LCT are listed below, those in bold are relevant to the site:

Lowland Mosaic Open LCT (south and central site areas):

- **Low lying, relatively flat on clay and alluvial soils and perhaps lighter and richer soils than medium scale and heath associated lowland mosaic landscapes.**

- **Close proximity to streams.**

- **Nearly all farmed land – no remnant open land/common.**

- Little intensive exploitation pre-Saxon period.

- Intensively farmed landscapes post disafforestation resulting in high density dispersed settlement of hamlets and farmsteads particularly in the Loddon valley and lower part of the Test.

- **Often found close to settlement** – particularly market towns like Romsey and Petersfield.

- Their open nature is attributable to relatively large fields and boundary loss and very low woodland cover and few undulations.
- Relatively little biodiversity interest apart from neutral grassland, remaining woodland and hedges.
- **Mid 19th century – medium density dispersed settlement pattern.**

Lowland Mosaic Small Scale LCT (north of Firtree Lane):

- ***Low lying silty clay, but not sandy soils, that are seasonally wet and waterlogged in parts but also with better drained areas.***
- ***The soils support predominantly permanent pasture land use.***
- *Less marginal farmed areas than the lowland mosaic medium scale and lowland mosaic heath associated types.*
- ***Often small enclosures, small areas of woodland and undulating topography which produces the sense of a small-scale landscape.***
- ***Associated mostly with small chalk fed streams*** *apart from where they border the New Forest perambulation where they are more acidic.*
- *Generally, high to very high density of dispersed small farmsteads and hamlets and associated with nucleated spring line settlements in the south and north Hampshire lowlands.*
- ***Small semi natural and ancient woodland copses and hedges of varying character.***
- ***Frequently a high density of public rights of way and winding lanes.***
- ***Varying periods and types of enclosure but generally small scale*** *but has some of the earliest enclosures out of all the lowland mosaic types – perhaps indicating less marginal and richer soils.*
- *Particular association with hamlets and villages of medieval and Saxon origin often associated with wood and wood clearance.*

Eastleigh Borough Council 'Landscape Character Assessment for Eastleigh Borough (December 2011)

13.4.19 The county wide assessment highlighted is refined further to a district level. Eastleigh Borough Council has produced the *'Landscape Character Assessment for Eastleigh Borough'* (December 2011). This provides the most site relevant published landscape character assessment available. Within this document the site is identified within *LCA 9: Horton Heath Undulating Farmland*. The key characteristics of this LCA are listed below and are entirely consistent with the characteristics of the site:

- *Undulating landform with frequent ridges.*
- *Medium size fields usually with good hedges and hedgerow trees rather than woodlands.*
- *Intrusive urban edges in some areas.*
- *Unmanaged or inappropriately managed agricultural land.*

13.4.20 In addition to these characteristics the assessment provides the following information on landscape and visual sensitivity considerations:

- *Landscape Character Sensitivity – The area is predominantly undulating farmland with strong hedgerows and small blocks of scattered woodland. It is relatively large, complex and rural in character.*
- *Visual Sensitivity – Tree belts and hedgerow trees are notable features. However, the area is largely open, with rural views normally ending at wooded horizons.*

13.4.21 The key sensitivity issues identified within the assessment and of relevance to the site are as follows:

- *The visual intrusion of existing settlement edges at Bishopstoke, Fair Oak and Horton Heath and Hedge End.*
- *The erosion of the rural character of Allington Lane through poor quality land management and poor screening of development.*
- *Future development and land management changes within the area increasing intervisibility between settlements.*

13.4.22 To the west of the site, and adjacent to the Horton Heath LCA, the following distinctive LCAs are also identified. Their key characteristics are identified as follows:

LCA 2: Upper Itchen Valley

- Flat uninterrupted pasture of floodplain with absence of tree cover;
- Contrast between open pasture and wooded and urbanised valley sides
- Natural and man-made water courses criss crossing the valley floor
- Fragmented wetland habitats
- The parkland associated with The Mount Hospital
- The open floodplain and recreation grounds separate the two settlements of Eastleigh and Bishopstoke

LCA 3: Lower Itchen Valley

- Pasture and meadow of flood meadows
- Tree cover from ditch sides, tree-belts and small copses
- Physical and auditory presence of M27, railway and airport
- Limited access to the centre of the area
- Distant wooded horizons
- Sense of isolation
- High nature conservation interest

LCA 10: Oaklands Woodland and Parkland

- Undulating landform contrasting with the character areas to the west
- Woodland cover of conifers and deciduous trees
- Strong woodland character in western part of character area
- Sense of enclosure and restricted views

- Attractive parkland character to eastern part

LCA 8: Knowle Hill Farmland and Woodland

- Enclosed undulating valley landform and ridge
- Varied pattern of field sizes and cultivation
- Clusters of buildings and small fields along lanes
- Views across valley to wooded horizons north and east
- Urban influence in the western edge

LCA 11: M27 Corridor

- Presence of motorway
- Proximity of urban edge and large areas of significant woodlands
- High ground to the west of the motorway, undulating to the north and east
- Small pasture fields often with unmanaged hedges
- Pockets of relatively quiet rural areas shielded by woodland and landform

13.4.23 The site does not share characteristics with the adjacent published characteristics of the LCA's and given the scale of the LCA's and their proximity of the site the LCA's have been scoped out of the assessment and are not taken forward within the assessment.

Site Specific Landscape Character

13.4.24 Whilst the published assessments described above identify the main characteristics and features that help to define the character of the wider LCA 9 – Horton Heath Undulating Farmland of the Landscape Character Assessment for Eastleigh Borough (December 2011), they do not identify the distinct areas within these at a local level that have their own character and features and are not specific to the site itself and its landscape context. This includes factors relating to both the physical and experiential components of the landscape such as views and use for recreation.

13.4.25 In order to provide a greater understanding of the site and its relationship with the wider urban edge context to the east, as well as the wider agricultural land, the topography, local road

networks and recreational routes and the influence of existing vegetation and landscape features, Tyler Grange have undertaken a site-specific landscape appraisal.

13.4.26 This has assessed the site and identified two distinct Site-Specific Landscape Character Area (LLCAs) within the site which fall within the wider LCA9 Horton Heath Undulating Farmland Landscape Character Assessment. These are identified on ES Volume 1, Figures 13.5, 13.6 and 13.7: Site Specific Character and are:

- Quobleigh LLCA; and
- Chalcroft LLCA.

13.4.27 The assessment has also identified features within each of the LLCA's which will help to define their character and which may be affected by the proposed development.

13.4.28 These LLCAs and site features have been taken forwards into the assessment as Landscape Receptors.

Quobleigh Local Landscape Character Area

13.4.29 The Quobleigh Local Landscape Character Area (LLCA) as identified on ES Volume 1, Figure 13.6 comprises a series of irregular shaped fields bound by mature deciduous tree belts. These fields are predominantly used for pasture although some are used for hay production. A full description of the landscape character area is set out in the ES Volume 2, Appendix 13.1 LVIA Technical Report.

13.4.30 The characteristics identified within the LLCA generally reflect those identified as relevant key characteristics of LCA 9 – Horton Heath Undulating Farmland of the Landscape Character Assessment for Eastleigh Borough (December 2011).

Key Characteristics

13.4.31 The key characteristics of the LLCA are as follows:

- Irregular shaped fi elds with local undulations and gentle variation in topography.
- Settled edge and urban edge characteristics with residential development located along the eastern edge of the site overlooking the eastern field parcels.
- Mature deciduous tree belts of Quobleigh Woods located along the northern boundary of the site providing a well treed and vegetated backdrop.

- Mature deciduous tree planting flanking field boundaries providing a well wooded character and landscape framework.
- Narrow lane of Fir Tree Lane with tree and hedgerow planting around the historic core of Fir Tree Farm.
- Defunct and gappy hedgerows present within the north eastern field parcels.
- Scattered residential properties located along Fir Tree Lane.
- Developed and construction characteristics associated with the consented roundabout scheme off Allington Lane.
- Watercourse and Quobleigh ponds providing variations in character in the northern part of the site; and
- Limits in visibility and contained localised character to field parcels sitting within a well wooded landscape.

Landscape Value

13.4.32 The LLCA site does not fall within a locally designated landscape. Quobleigh LLCA – Assessment of Landscape Value, in ES Volume 2, Appendix 13.1 provides a summary of the contribution that the key characteristics of the Quobleigh LLCA make to the value of the local landscape. These include perceptual aspects, as well as the condition / quality of the landscape and how representative it is of the character of the area as recognised in the published landscape character assessment.

Susceptibility

13.4.33 The landscape within the Quobleigh LLCA is characterised by an established framework of landscape features, with recognisable tree belts forming boundaries to field parcels. The landscape contains a network of locally important recreational routes for the residents of Horton Heath, and Fair Oaks as well as important ecological habitats of Quobleigh Woods to the north and the watercourse corridor forming the southern edge of the LLCA to the north of the solar farm.

13.4.34 The LLCA has a **Medium Susceptibility** to change associated with residential development within the area, and although the landscape exhibits some recognisable landscape structure and characteristic features it is influenced by detracting man-made features.

13.4.35 The presence of established mature tree belts provides a certain amount of enclosure with the development located adjacent to the existing residential edge and the principle of development established through the consented schemes and link road.

Landscape Sensitivity

13.4.36 The Quobleigh LLCA is valued for its localised recreational routes and existing network of footpaths, its ecological features and established habitats and established tree belts and vegetated boundaries which provide a strong landscape framework and network of green infrastructure. The Grade II listed Fir Tree Farm is located to the north of Fir Tree Lane on the western part of this area.

13.4.37 Combined with the Medium Susceptibility to change associated with development within the LLCA, it is assessed as being of a **Medium Landscape Sensitivity** to residential development given the scale of the proposed scheme.

13.4.38 4.52 However, given the physical and visual containment provided by the presence of strong boundary planting both at the site boundaries and internally, and the location and proximity of the site in relation to the existing residential edge, there is the potential, through careful landscape mitigation to assimilate the scheme into the landscape and use key landscape features to inform its development.

Chalcroft Local Landscape Character Area (LLCA)

13.4.39 The Chalcroft LLCA comprises a series of irregular agricultural fields. The majority of these are bound by hedgerows and hedgerow trees. Small woodlands and copses are also present within or on the boundary of the site. A full description of the landscape character area is set out in the ES Volume 2, Appendix 13.1.

13.4.40 The characteristics of the local area associated with the site generally reflect those previously highlighted as relevant key characteristics of LCA 9 – Horton Heath Undulating Farmland of the Landscape Character Assessment for Eastleigh Borough (December 2011).

13.4.41 Key Characteristics

- Low-lying area of medium-large rectilinear fields managed for arable agriculture, pasture and horse grazing / paddocks.
- Fields defined by hedgerows, many of which are gappy and defunct;
- Hedgerow lined track to Chalcroft Farm and hedgerow lined Public Rights of Way;

- Mature Ancient Woodland forming vegetated backdrop to the southern part of the LLCA;
- Presence of built form and residential development forming the urban edge to the eastern boundary of the site;
- Historic and developed character to Chalcroft Farm complex;
- Open views across arable landuse;
- Watercourse with riparian characteristics; and
- Narrow lanes.

Landscape Value Landscape Designations

13.4.42 The LLCA does not fall within any designated landscapes. The ES Volume 2, Appendix 13.1 provides a summary of the contribution that the key characteristics of LLCA make to the value of the local landscape. These include perceptual aspects, as well as the condition / quality of the landscape and how representative it is of the character of the area as recognised in published landscape character assessments.

13.4.43 The LLCA has a **Medium Susceptibility** to change associated with residential development within the area. This reflects the settled context along Burnetts Lane and enclosed nature of the boundaries to the LLCA by the presence of mature tree planting. There are opportunities for the proposed development to preserve the character and features of the LLCA, as well as provide improvements to connectivity with adjacent areas for recreation. There are also opportunities to preserve the character of the watercourse corridor adjacent to Chalcroft track.

Landscape Sensitivity

13.4.44 As established in the LVIA the southern part of the Chalcroft LLCA is valued for its ecological qualities associated with the Ancient Woodland located along the southern boundary. The network of Public Rights of Way are also valued as localised routes linking Horton Heath and Burnetts Lane to Allington Lane and the wider landscape to the west.

13.4.45 The landscape within the LLCA is degraded in places, with defunct gappy hedgerows which are poorly managed and arable fi elds devoid of landscape features. The LLCA is as a result more open in characteristics, with longer views across the landscape. Combined with the Medium Susceptibility to change associated with development within the LLCA, it is assessed as being of a **Medium Landscape Sensitivity** to residential development. There is the potential to provide additional mitigation to assimilate the development into the landscape.

Landscape Receptors

13.4.46 The landscape receptors that are to be taken forward into the assessment of effects are set out on the table below. These include the Published Landscape Character Area (Horton Heath Undulating Farmland) including the key features and sensitivities that have been identified through the baseline studies.

13.4.47 The LLCAs are considered to be appropriate to use within the assessment and the approach has been agreed with the Landscape Officer at Eastleigh Borough Council.

13.4.48 For the purposes of the assessment, all Landscape Receptors will be assessed for both Scenario 1 and Scenario 2:

Scenario 1: Baseline situation and OPA Phase 1

- Baseline/Future Baseline + OPA Phase 1 with the Link Road delivered concurrently and completed by occupation of 100 units of OPA Phase 1.

Scenario 2: Baseline situation and Wider OPA

- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered) (The assessment of the Wider OPA assumes that the baseline situation includes the OPA Phase 1 and Link Road). Landscape within the Study Area.

Table 13.1 Landscape Receptors Summary

Landscape Receptor (Outline Application)	Key Features and Sensitivities	Landscape Value	Landscape Susceptibility	Overall Landscape Sensitivity
Horton Heath Undulating Farmland LCA	1. Predominantly agricultural landscape 2. Intrusive urban edges 3. Vegetated field boundaries	Low Contribution and not a designated landscape	Medium	***Low***
Quobleigh LLCA	1. Blocks of Woodland	Local Value Low/Medium	Medium	***Low***

Landscape Receptor (Outline Application)	Key Features and Sensitivities	Landscape Value	Landscape Susceptibility	Overall Landscape Sensitivity
	2. Green Backdrop 3. Fir Tree Farm and Fir Tree Lane 4. Residential edge of Horton Heath 5. Recreational routes and PRoW 6. Mature landscape setting	Contribution to Features and Function		
Chalcroft LLCA	1. Recreational routes and PRoW 2. Residential edge of Horton Heath and residents off Burnetts Lane 3. Ancient Woodland 4. Hedgerow planting 5. Chalcroft Farm	Low / Medium Contribution to Features and Function	Medium	*Low*

Landscape Receptor (Outline Application)	Key Features and Sensitivities	Landscape Value	Landscape Susceptibility	Overall Landscape Sensitivity
	6. Blocks of woodland at site boundaries to the west and south			

13.4.49 The assessment of landscape effects will also provide a summary of how the proposed development may affect the landscape character within the Study Area as a whole. This will draw upon the assessment of the LLCAs and landscape receptors and consider how the development may affect the function of the landscape in relation to the settlement pattern, green infrastructure and accessibility to recreational routes.

13.4.50 This will also take into account the provision of green infrastructure and recreation / amenity facilities within the proposals, as well as accessibility and connectivity with the wider area.

13.4.51 The LLCAs are considered to be appropriate to use within the assessment and the approach has been agreed with the Landscape Officer at Eastleigh Borough Council.

Landscape within the Study Area

13.4.52 The assessment of landscape effects will also provide a summary of how the proposed development may affect the landscape character within the Study Area as a whole. This will draw upon the assessment of the LLCAs and landscape receptors and consider how the development may affect the function of the landscape in relation to the settlement pattern, green infrastructure and accessibility to recreational routes.

13.4.53 This will also take into account the provision of green infrastructure and recreation / amenity facilities within the proposals, as well as accessibility and connectivity with the wider area.

Visual Amenity

13.4.54 This section identifies the potential extent of visibility of the proposed development, the visual context within which the site is seen and experienced and those groups of people (visual receptors) whom you have the potential to experience changes to their views and visual amenity resulting from development of the site.

13.4.55 In order to establish the degree of any change that may arise from future development and the extent to which this may affect those people identified, it is necessary to understand the availability, context and composition of views within the Study Area. As part of this process, the sensitivity of those people whose views and visual amenity may be affected is also established. This is determined through assessing both the value placed upon views and the susceptibility of those groups of people to the changes associated with the proposals.

13.4.56 As set-out in GLVIA, (paragraph 6.37), the value attached to particular views can be recognised through planning designation and in relation to heritage assets, as well as through appearance on maps and in guidebooks.

13.4.57 The susceptibility of visual receptors to change is defi ned by GLVIA as: “The occupation or activity of people experiencing the view at particular locations; and the extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at certain locations”(paragraph 6.32).

13.4.58 Further details regarding indicators of value and susceptibility are set out in the Methodology and Criteria Tables at ES Volume 2, Appendix 13.2.

Representative Photoviewpoints

13.4.59 A range of Photoviewpoints have been identified to inform the LVIA and to illustrate the visual context. These viewpoints include those from a range of orientations and distances and have

been chosen to be representative of those groups of people (visual receptors) who may have views of the proposed development.

13.4.60 Photoviewpoints have been scoped with Eastleigh Borough Council, and in addition to the photoviewpoints taken forward for the assessment a series of photoviewpoints are also included at the request of Eastleigh Borough Council to identify viewpoints where the site is not visible (Photoviewpoints A-J, found in ES Volume 2, Appendix 13.3).

13.4.61 A total of 26 representative viewpoints have been chosen from locations surrounding the site to provide an understanding of the baseline conditions and inform an assessment of the effects of the development (see Photoviewpoints 1-26). Photographs were taken from selected viewpoints with a digital camera with an equivalent 50mm focal length lens at eye level (approximately 1600mm above ground).

13.4.62 At the request of Eastleigh Borough Council winter photography has also been completed and is included within ES Volume 2, Appendix 13.4

13.4.63 The photoviewpoints are contained within this section, alongside a full description of the nature and composition of views, elements within them and an assessment of the sensitivity of the represented receptors to visual change (value and susceptibility). Reference is made to these viewpoints when describing the extents of visibility, composition of views and to identify visual receptors.

13.4.64 Whilst the views are chosen to be representative of the area, they cannot provide continuous coverage of all potential locations within the vicinity of the development. Often, views will occur as a sequence within the surrounding environment, with the most significant views assessed further within this report.

13.4.65 Likewise, where transient or fleeting views are possible, these will also be assessed as part of the report.

Extent of Visibility

13.4.66 The potential extents of visibility of the proposed development have been tested based upon the building height parameters of the proposed development and based on proposed building heights of 15 metre ridge heights. OD. A Zone of Theoretical Visibility (ZTV) has been generated which provides a first sieve analysis based on the findings of topographical mapping (ES Volume 1, Figure 13.8: Topography). Additional allowance has been made for the potential effects of the proposed three landmark features, included in the scheme.

13.4.67 The GIS software generated ZTV illustrates the extent to which development would be potentially visible within a 5km radius to a 1.6m high receptor and is illustrated on ES Volume 1, Figure 13.9: Zone of Theoretical Visibility. The calculation is based on Ordnance Survey Terrain 5 data only and does not take into account of built form or vegetation present within the landscape.

13.4.68 The extent from which the site is visible has been ascertained through fieldwork to determine the influence of vegetation and built form on the extent and composition of views.

13.4.69 The extent of visibility of the site is described below Reference is made to the topography plan, ZTV and representative Photoviewpoints where applicable.

13.4.70 The scope of the visual study and Photoviewpoint locations have also been agreed with the Landscape Officer at Eastleigh Borough Council. As requested by Eastleigh Borough Council, a number of additional viewpoints were requested to be considered for the application.

13.4.71 Having been assessed, it is determined that views of the site cannot be seen from these locations, and these selected views (Views A-J) have been scoped out of the assessment although are included for reference within ES Volume 2, Appendix 13.2.

13.4.72 Views are discussed and analysed in detail within the ES Volume 2, Appendix 13.4. Distant views of the site are not possible due to the presence of existing vegetation in the wider landscape and the presence of built form found at Horton Heath, Fair Oak and Hedge End. Views of the site are obscured with mature tree planting forming a key feature and characteristic across the landscape. The greatest visibility of the site is within local views up to 500m from the site. The only exception to this is the potential effect of proposed landmark features and following field work recreational receptors on ProW B743, B744, B746 and B780, have been included in the assessment, as those most likely to be affected by these features.

Visual Receptors

13.4.73 Having identified the extent of visibility, the composition of views and representative photoviewpoints, those groups of people (visual receptors) who may have the potential to have their views and visual amenity affected by the proposed development have been identified.

13.4.74 Details of the visual receptors, representative views and an assessment of the sensitivity of these to the proposed development is set out on Tables 13.2 and 13.3, below, with details of each receptor, the value attached to the view, the susceptibility and overall sensitivity to

change. The table also identifies those receptors which will be taken forward into the assessment.

13.4.75 Further details on each receptor are discussed in the ES Volume 2, Appendix 13.1 and illustrated on the representative Photoviewpoints. A justification is also provided for those receptors being scoped out of the assessment and those which are to be taken forward into the assessment.

13.4.76 Receptors will be assessed against the two scenarios as follows:

Scenario 1: Baseline situation and OPA Phase 1

- Baseline/Future Baseline + OPA Phase 1 with the Link Road delivered concurrently and completed by occupation of 100 units of OPA Phase 1.

Table 13.2 Scenario 1: Baseline situation and OPA Phase 1

Scenario 1: Baseline situation and OPA Phase 1

Visual Receptor	Representative Photoviewpoint	Visual Sensitivity			To be taken forward into assessment
		Value	Susceptibility	*Overall Sensitivity*	
Recreational Receptor					
PRoW F 1	Photoviewpoints 10 and 20	High	Medium/High	***High***	
PRoW F 2	Photoviewpoints 18 and 19	High	Medium	***High***	
PRoW F 3	Photoviewpoint 9, 11, 16 and 18	High	Medium	***High***	
PRoW WE 4	Photoviewpoints 12 and 13	High	Low/Medium	***Low/Medium***	
PRoW F5, F7 and F9	-	Medium	Low/Medium	***Low/Medium***	
PRoW F8	Photoviewpoint 21	High	Medium	***Medium***	
PRoW F10 and F11	Photoviewpoint 22 and 23	High	Medium	***Medium***	
PRoW B743, B744 and B780	Photoviewpoint 6 and 7	High	Medium	***Medium***	
Residential receptors/properties					
Residents overlooking the eastern edge of the site	Photoviewpoint 15	High	High	***High***	
Residents on Allington Lane	-	High	Medium	***Medium***	
Residents on Fir Tree Lane	Photoviewpoint 21, 24, 25 and 26	High	High	***High***	
Residents on Blind Lane	Photoviewpoint 15	High	Medium	***Medium***	
Workers and Visitors to Chalcroft Farm	-	Medium	Low/Medium	***Low Medium***	
Chalcroft Business Centre	Photoviewpoint 14	Medium	Medium	***Medium***	
Transient receptors					
Allington Lane	Photoviewpoints 8 and 9	Low	Low/Medium	***Low/Medium***	
Burnetts Lane	Photoviewpoints 14, 15 and 16	Medium	Medium	***Medium***	
Blind Lane	Photoviewpoint 15	Medium	Medium	***Medium***	
Firtree Lane	Photoviewpoints 21, 24, 25 and 26	Medium	Medium	***Medium***	
Bubb Lane	Photoviewpoint 17	Low	Low/Medium	***Low/Medium***	

Scenario 2: Baseline situation and Wider OPA

- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered).

Scenario 2: Baseline situation and Wider OPA

- Baseline/Future Baseline + the Wider OPA (assuming the Link Road and OPA Phase 1 have been delivered) + cumulative effects (The assessment of the Wider OPA assumes that the baseline situation includes the OPA Phase 1 and Link Road).

Table 13.3 Scenario 2: Baseline situation and Wider OPA

Scenario 2: Baseline situation and Wider OPA

Visual Receptor	Representative Photoviewpoint	Visual Sensitivity			To be taken forward into assessment
		Value	Susceptibility	*Overall Sensitivity*	
Recreational Receptor					
PRoW F 1	Photoviewpoints 10 and 20	High	Medium	***Medium***	
PRoW F 2	Photoviewpoints 18 and 19	High	Medium	***Medium***	
PRoW F 3	Photoviewpoint 9, 11, 16 and 18	High	Medium	***Low***	
PRoW WE 4	Photoviewpoints 12 and 13	High	Low/Medium	***Low/Medium***	
PRoW F5, F7 and F9	-	Medium	Low/Medium	***Low/Medium***	
PRoW F8	Photoviewpoint 21	High	Medium	***Medium***	
PRoW F10 and F11	Photoviewpoint 22 and 23	High	Medium	***Medium***	
PRoW B743, B744 and B780	Photoviewpoint 6 and 7	High	Medium	***Medium***	
Residential receptors/properties					
Residents overlooking the eastern edge of the site	Photoviewpoint 15	High	Medium	***Medium***	
Residents on Allington Lane	-	High	Medium	***Medium***	
Residents on Fir Tree Lane	Photoviewpoint 21, 24, 25 and 26	High	High	***High***	
Residents on Blind Lane	Photoviewpoint 15	High	Medium	***Medium***	
Workers and Visitors to Chalcroft Farm	-	Medium	Low	***Low***	
Chalcroft Business Centre	Photoviewpoint 14	Low	Low	Low	
Transient receptors					
Allington Lane	Photoviewpoints 8 and 9	Low	Low/Medium	***Low/Medium***	
Burnetts Lane	Photoviewpoints 14, 15 and 16	Low	Low	Low	
Blind Lane	Photoviewpoint 15	Medium	Medium	***Low/Medium***	
Firtree Lane	Photoviewpoints 21, 24, 25 and 26	Medium	Medium	***Medium***	
Bubb Lane	Photoviewpoint 17	Low	Low	***Low***	

13.4.77 In summary, the following receptors will be taken forward to be assessed for Scenario 1 and Scenario 2 (Justification for the scoping down of initial identified viewpoints, to this list of receptors for the assessment of effect, is provided in ES Volume 2 Tech Appendix X.X, LVIA Main Text, Para 7.24)

- Recreational users of PRoW F2
- Recreational users of PRoW F3
- Recreational users of PRoW F10 and F11
- Recreation users of PRoW B743, B744, B746 and B780

- Residents overlooking the eastern edge of the site
- Residents on Fir Tree Lane
- Transient users of Burnetts Lane
- Transient users of Blind Lane
- Transient users of Fir Tree Lane

13.5 INHERENT DESIGN MITIGATION

Proposals and Mitigation

13.5.1 The assessment has taken account of the parameter plans which detail the various open spaces, landscape buffers and overarching design principles and are as follows:

- Access – Drawing No. EAST200403-PP01-P22
- Land Use – Drawing No. EAST200403-PP02-P26
- Green Infrastructure – Drawing No. EAST200403-PP03-P24
- Building Heights – Drawing No. EAST200403-PP04-P23
- Demolition – Drawing No. EAST200403-DEP01-P2

13.5.2 In addition to this it has taken account of the more detailed proposals produced as part of the OPA Phase 1 development produced by Clague.

13.5.3 This assessment has addressed the two scenarios separately within the assessment part of the report, with the Outline Application and OPA Phase 1 schemes assessed as different scenarios.

13.5.4 These proposals and findings have informed the production of the Landscape Strategy Plan (ES Volume 1, Figure 13.12: Landscape Strategy Plan) as well as the submitted Open Space Strategy Document produced by Tyler Grange (Report reference 11705 R05c).

13.5.5 The building heights of the proposed development are proposed to be no higher than 4 storeys within residential parcels.

13.5.6 Three landmark features are proposed and the locations are illustrated on the parameter plans. One is proposed to be located within the local centre, one at the southern gateway off Burnetts Lane and one located at the northern access off Allington Lane. These gateway landmark features are proposed to be 6 storeys in height and the design rationale for these features is provided within the Design & Access Statement. Further details on the proposed locations of these landmark features are found within Section 6 of the ES Volume 2 Appendix 13.1 LVIA report.

13.5.7 A lighting impact assessment produced by Hydrock for both the Wider OPA (Outline Application) and the Phase 1 scheme (OPA Phase 1) are also referenced within the LVIA. These are report references 09820-HYD-XX-XX-RP-Y-5000 (Outline Application) and 09820-HYD-XX-XX-RP-ME-0002 (OPA Phase 1).

Mitigation

13.5.8 For the purposes of this assessment, all landscape and visual mitigation has been embedded into the scheme with the proposed Green Infrastructure mitigation forming the early phase of development.

13.5.9 It has been assumed that the areas of landscape mitigation and Green Infrastructure are to be implemented at completion at Year 1.

13.5.10 The assessment has considered the landscape and visual effects both upon completion, and for residual effects after 15 years when the planting will have established and matured sufficiently to provide effective mitigation.

13.5.11 Details of the mitigation measures are summarised at Section 6 of the ES Volume 2 Appendix 13.1 LVIA.

13.5.12 The Landscape Strategy plan prepared by Tyler Grange incorporates the Design Principles and parameters into the updated layout and provides an illustrative drawing of how these can be incorporated into the areas of Green Infrastructure, including landscape buffers, recreation routes and areas of open space.

13.5.13 The associated Open Space Strategy also prepared by Tyler Grange provides further information on the various proposed mitigation and strategic approach to green and open space for the outline application.

13.5.14 The Landscape Principles document which details the overarching approach to the Green Infrastructure and Landscape proposals for the First Residential Parcel provides a greater

level of detail and should be read in combination with this LVIA and the overarching Landscape Strategy Plan.

Landscape Design Principles and Strategy

13.5.15 The proposals have been developed to ensure that the development responds to the landscape and visual context and incorporates appropriate mitigation measures. Planning Submission

13.5.16 Details of the design principles, landscape principles and landscape strategy for the submitted planning applications are set out in the Design and Access Statement produced by Clague as well as set out in the Phase 1 Landscape Principles document.

Design Principles

13.5.17 Design Principles as set-out in the Design and Access Statement include the following that relate to the landscape, character and visual impacts of the proposals:

- Delivering a landscape led development that builds upon the sites existing natural capital to deliver a usable network of high-quality green corridors to support wildlife, recreation and the movement of residents;
- Protecting and enhancing ecological networks to achieve net biodiversity gain through supporting local biodiversity and habitats;
- Enable healthier lifestyles by prioritising non-motorised transport and providing a high quality and safe movement network across the site and into the surrounding network which puts pedestrians and cyclists first;
- Minimising the use of natural resources with a low carbon approach that manages the production, reuse and recycling of waste, water and other natural commodities;

13.5.18 Specifically the Design and Access Statement identifies the following with regard to the landscape principles of the development of the site:

- Acknowledge the distinct characters of South and North;
- Form of development which responds to the landscape character in terms of height and form, responding to the visibility and/ or enclosure; and
- Respect existing and well-established boundaries and features.

13.5.19 The Design and Access Statement also identifies that the development of the site will have a 'Infrastructure First' approach to development and within this identifies that the blue and green infrastructure are key factors in driving the design and layout of the site.

Building Height Parameters

13.5.20 The Design and Access Statement and Parameters Plans identify that the building heights of the development will not exceed 4 storeys in height, with the exception of gateway/way finding features at the southern gateway, northern gateway and local centre which are identified as being 6 storeys in height.

13.5.21 The design and access statement states that the proposed local centre and 'heart of the community' is:

"identified as a location that could accommodate a landmark structure (up to 6 storey) to reinforce its role. This approach is also noted elsewhere on the site where there is an opportunity to use height as a wayfinder and to reinforce local distinctiveness. This is particularly relevant at the northern and southern gateways to the site where the parameters need to provide adequate capacity to accommodate an architecturally 'strong' and prominent entrance. This is therefore reflected in the proposed height parameters at those locations and the inclusion of the opportunity for a landmark building of height up to 6-storey."

13.5.22 The proposed landmark structure at the northern gateway at the entrance to Allington Lane is proposed to be located on land at 20m AOD and set within the context of existing built form. This landmark structure is proposed to be set within the context of existing retained vegetation, and adjacent to the roundabout access off Allington Lane.

13.5.23 The proposed landmark structure at the southern gateway of the site is located off Burnetts Lane and on land at approximately 25m AOD, within close proximity to the roundabout and adjacent to the proposed employment land at the southern part of the site.

13.5.24 The proposed landmark structure at the local centre is to be located on land at 27m AOD and set amongst the existing framework of mature vegetation forming part of the local centre and community hub, sitting adjacent to the existing residential edge.

13.5.25 The full details of the proposed landmark structures, proposed materials, massing and form are not yet available and as such the LVIA will assess the proposals based on the proposed height parameters, with further detailed proposals required to provide a comprehensive assessment of landmark structures of this height.

13.5.26 The proposed building heights are reduced around Fir Tree Farm to respond to the setting of the Grade II Listed building. Building heights are also proposed to be lower at a maximum of 2.5 storeys adjacent to the properties on the eastern boundary of the site, responding to the more open edges and characteristics along Burnetts Lane.

Lighting Strategy

13.5.27 The lighting strategy produced by Hydrock for the OPA and the Phase 1 assesses the scheme and the effects of lighting on a number of sensitive receptors (report references 09820-HYD-XX-XX-RP-Y-5000 and 09820-HYD-XX-XX-RP-ME-0002). Best Practice lighting principles for the avoidance of light spill, glare and sky glow are proposed as integral features of the scheme design proposals which can be secured by planning condition and technical approvals.

13.5.28 It identifies areas across the site where low level lighting is proposed which responds to the various sensitive receptors and ecological constraints across the site. Where necessary these proposed areas have been referenced within the assessment of landscape and visual effects.

13.5.29 The lighting strategy also identifies the inclusion of potential flood lighting and high levels of illumination associated with the formal sports provision on the eastern edge of the site adjacent to the proposed school.

13.5.30 The lighting strategy is also accompanied by a specialist lighting impact assessment that assesses the impact of lighting by considering nine distinct areas, in addition to the link road.

13.5.31 It concludes that proposed lighting will result in neutral residual effects with mitigation across all areas with the exception of Area 4 (the sports facilities located on the eastern boundary of the site) which will result in Minor Adverse Effects with mitigation.

Landscape Strategy

13.5.32 Tyler Grange have prepared a Landscape Strategy Plan (ES Volume 1, Figure 13.12: Landscape Strategy Plan) which responds to the parameter Plans and identifies a series of recommendations in response to the landscape and visual situation of the site.

13.5.33 The Landscape Strategy Plan responds to the various opportunities and strong Green and Blue Infrastructure and assets that the site offers to provide a strong and comprehensive landscape framework.

13.5.34 The Landscape Strategy Plan reflects and reinforces the principles and characteristics set out above and have been taken into consideration when assessing the susceptibility and sensitivity of the landscape to the proposed development:

13.5.35 In response, the Landscape Strategy identifies the following, and these references should be read in conjunction with ES Volume 1, Figure 13.12: Landscape Strategy:

1. Retention of existing boundary vegetation to filter views and off set development edge.

2. Retain and enhance existing green infrastructure and belts of planting within and between parcels of development.

3. Retain and enhance existing internal native hedgerow planting and enhance with additional characteristic species rich hedgerow plants.

4. Extension to existing woodland with transitional planting and additional habitat creation. Transitional woodland to provide additional characteristic native species and shrub planting.

5. Off set from Burnetts Lane and integration of development into the site with strengthened planting and integration of green links to existing residents with a retention of views across site and green 'lungs' into site while respecting and softening views for residents on Burnetts Lane.

6. Additional tree planting and extension of landscape corridor along solar farm to provide increased Green Infrastructure and additional characteristic planting along Green Corridor to strengthen landscape framework and provide additional tree lined skylines when viewed from residents along the eastern edge of Horton Heath. Proposed tree planting also assist with filtering views of light from the adjacent sports pitches, when in use.

7. Proposed destination play facilities with integrated internal landscaping at location of designated open space with additional recreational links and footpath routes.

8. Retention of existing mature landscape framework and Green Infrastructure.

9. Extension and enhancement to watercourse with additional SuDS features providing increased Green/Blue infrastructure, additional characteristic riparian planting and scattered trees, responding to the existing distinctive watercourse and character while providing an off set to development along Chalcroft and a green route through the site. As identified through the Lighting Assessment completed by Hydrock, this area includes low level lighting which assists in retaining the riparian characteristics along this corridor.

10. Retention of native hedgerow along Chalcroft track with additional scattered tree planting to soften built form.

11. Retention and enhancement of hedgerow planting along Burnetts Lane, with landscape buffer and off set from existing residential properties. Proposed landscape buff er to include additional tree planting to soften built form and assimilate proposed residential edge into existing character of Burnetts Lane, with internal landscaping links proposed to further soften the new settlement edge.

12. Proposed rain gardens and drainage features along link road and at key strategic locations within parcels to provide additional internal landscape links and GI corridors and to soften built form within parcels themselves. Proposed rain gardens to respond to the Blue Infrastructure assets across the wider site.

13. Proposed native hedgerow running alongside ecological buff er to provide additional GI corridor, allowing for additional linear feature, enhancement of characteristic hedgerow planting and allowing for a soft buff er to the ancient woodland and ecological buffer.

14. Internal street scene landscaping through development plots, with internal street trees and plot frontage landscaping buff er. Internal street tree planting to provide benefits for ecology, amenity and reduction in urban heat island effects and impacts on climate change.

15. Ecological habitat enhancement area and off set to Quobleigh Woods with marsh/wet grassland with development avoided and access controlled. Views across to the development parcels softened by proposed tree planting both within parcels and scattered tree planting to edges of development plots within landscape transition areas.

16. Controlled access and footpaths through ecological mitigation area with potential for increased recreational routes through network of green corridors.

17. Retention and incorporation of mature tree planting into landscape buff er with proposed enhancements to understorey planting.

18. Proposed SuDS ponds to provide additional ecological enhancements and recreational benefits within landscape buffer. Proposed SuDS to be integrated into landscape transition areas and reflect characteristic aquatic planting found in the wider landscape.

19. A designed landscape transition zone on the southern boundary, with additional tree planting to provide softer edge to new development.

20. Respond to setting of a Grade II listed building with a designed transition zone.

21. Proposed building heights and parameters of heights across site addressing visual situation, with lower development proposed at visually sensitive edges along Burnetts Lane and in response to the heritage and historic context of the site at Chalcroft and at the Grade II Listed Fir Tree Farm.

13.6 POTENTIAL ENVIRONMENTAL IMPACTS & EFFECTS

13.6.1 Accounting for the inherent mitigation, this section summarises the findings of a detailed assessment of predicted landscape and then separately visual impacts and the effects arising, in Scenarios 1 (OPA Phase 1 and Link Road) and 2 (the Wider OPA).

13.6.2 The following provides an overview of the key landscape findings with further detailed justification provided in the tables in the ES Volume 2, Technical Appendix 13.1 LVIA Technical Report, Section 7. Overall, the assessment on the effects of development for both the OPA Phase 1 and the wider OPA, on the Horton Heath LCA, has found that due to the wider scale of the Horton Heath Undulating Farmlands LCA, impacts of the development will be localised and relevant to the site and its immediate surroundings. The presence of mature tree planting to much of the boundary of the site means that the site is separated from the wider LCA and contained by a strong framework of established planting.

13.6.3 The assessment work has found that the site shares some key characteristics with the Horton Heath Undulating Farmlands LCA, with some intrusive edges, unmanaged agricultural land, tree, and hedgerow belts being a common feature, and the site set within a well wooded landscape with wooded horizons characteristic of the wider landscape beyond the site boundaries. The assessment finds that the site is not within a designated landscape and has an overall Low sensitivity to development.

13.6.4 A full assessment of the predicted visual effects of the proposed development during the construction phases, at completion and after 15 years is set out in the tables in the ES Volume 2, Appendix 13.1 LVIA Technical Report, Section 7. The assessment has assumed that the proposals have included the embedded mitigation measures as illustrated in the Landscape Strategy Plan (See ES Volume 2, Figure 13.12) and within the Design and Access Statement prepared to support the applications.

13.6.5 A summary of the key findings of the assessment are set out below for each of the groups of people (visual receptors) identified within the baseline assessment as having the potential to have their views and visual amenity affected to a significant level by the proposed development.

13.6.6 The effects during the construction phase are therefore generally greater than those experienced upon completion and the residual effects once the landscape mitigation has matured.

13.6.7 The introduction of built form across the site will inevitably introduce built form in a settlement edge agricultural site and the extant consents (application reference X/19/86303 and X/19/86475) establish the principle of development across the site and state that built form and infrastructure are acceptable in planning terms. It is noted however that this LVIA assesses the site and the proposals with the extant permissions in mind but based on the assumption that development has not commenced.

13.6.8 Once the assessment of Scenario 1 is made, the overall assessment of this Baseline is then used to inform the assessment of effects for Scenario 2.

Construction Stage Impacts and Effects

13.6.9 The impacts arising from the construction include those associated with the creation of road infrastructure, associated traffic, excavations, building works, implementation works for public realm and green infrastructure, are common to both development scenarios.

13.6.10 The detailed consideration and narrative for landscape and visual effects arising during construction for Scenario 1 and 2 is contained in the ES Volume 2, Appendix 13.1 LVIA Technical Report and therefore only a summary overview is provided here.

13.6.11 Judgments on the levels of effect have been based on combining considerations of the sensitivity of the receptor with the magnitude or nature of effect to arrive at an overall level of effect.

OPA Phase 1 and Link Road - Landscape Effects

13.6.12 For **Scenario 1**, judgments regarding the construction impacts and corresponding levels of effects on landscape receptors are summarised as follows:

Landscape Receptor - Horton Heath Undulating Farmland LCA

13.6.13 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **temporary moderate adverse** effects at the LCA which has been judged to be of **low sensitivity**.

13.6.14 The construction works will introduce a **medium magnitude** of change including adding some uncharacteristic elements into the local landscape, with the development changing the land use and character of the site area.

Landscape Receptor - Chalcroft LLCA

13.6.15 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **temporary moderate adverse** effects at the LLCA which has been judged to be of **low sensitivity**.

13.6.16 The construction works will introduce a **medium to high magnitude** of change with the introduction of uncharacteristic elements into the local landscape, with the development changing the land use and character of the immediate site area.

Landscape Receptor - Quobleigh LLCA

13.6.17 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **Temporary Moderate Adverse Effects** at the LLCA which has been judged to be of **low sensitivity**.

13.6.18 The construction works will introduce a **medium to high magnitude** of change with the introduction of uncharacteristic elements into the local landscape, with the development changing the land use and character of the immediate site area.

Landscape Receptor - Site Wide Features

13.6.19 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **temporary moderate adverse** Effects which has been judged to be of **medium sensitivity**.

13.6.20 The construction works will introduce a **localised, temporary medium to high magnitude** of change with the introduction of uncharacteristic elements into part of the local landscape, with the development changing the land use and character of this part of the site area.

OPA Phase 1 and Link Road- Visual Effects

13.6.21 Visual effects arising during construction, for **Scenario 1,** include those on the following receptors:

13.6.22 Recreational users on PRoW F2, F3 and F10, F11, B743,744, B746 and B780 have been judged to have a m**edium sensitivity** and the assessment has found that the construction stage operations will have **temporary moderate adverse** visual effects.

13.6.23 The construction activities associated with the implementation of infrastructure, development of the Phase 1 houses and establishment of areas of green infrastructure and open space will cause visual effects on these recreational users. The construction works will introduce a **medium magnitude** of change in views experienced through movement and uncharacteristic elements into the views that may draw attention.

13.6.24 Residents overlooking the eastern edge of the site have a **high sensitivity** and the Scenario 1 construction operations will result in **temporary moderate to major adverse** visual effects.

13.6.25 The construction activities associated with the implementation of infrastructure, development of the Phase 1 houses and establishment of areas of green infrastructure and open space will result in a **medium magnitude** of change on residents. The construction works will introduce movement and uncharacteristic elements into the views that may draw attention.

13.6.26 Residents on Fir Tree Lane have a **high sensitivity** and the proposals will result in temporary **moderate adverse** Visual Effects during construction operations associated with Scenario 1.

13.6.27 The construction activities associated with the implementation of the link road will result in a temporary **medium magnitude** of change on residents. The construction works will introduce movement and uncharacteristic elements into the views.

13.6.28 Transient users of Burnetts Lane, Fir Lane and Blind Lane all share a **medium sensitivity** and the construction operations for Scenario 1 will result in temporary **moderate to major adverse** visual effects.

13.6.29 The construction activities associated with the implementation of infrastructure, development of the Phase 1 houses and establishment of areas of green infrastructure and open space will result in **temporary, medium magnitude** of change on transient users of these three lanes.

The Wider OPA - Landscape Effects

13.6.30 For **Scenario 2**, construction effects on landscape receptors are summarised as follows:

Landscape Receptor - Horton Heath Undulating Farmland LCA

13.6.31 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in

temporary moderate adverse effects at the LCA which has been judged to be of **low sensitivity**.

13.6.32 The construction works will introduce a **temporary medium to high magnitude** of change by adding uncharacteristic elements into the local landscape at a local level, with the development changing the land use and character of the site area. Having said this, the principle of development across various phases of work will introduce construction works within the landscape locally.

Landscape Receptor - Chalcroft LLCA

13.6.33 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **temporary moderate adverse** Effects at the LLCA which has been judged to be of **low sensitivity**.

13.6.34 The construction works will introduce a **temporary medium magnitude** of change adding uncharacteristic elements into the undeveloped local landscape; however, this construction activity will already be established as part of the Phase 1 works.

Landscape Receptor - Quobleigh LLCA

13.6.35 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **temporary moderate adverse** Effects at the LLCA which has been judged to be of **low sensitivity**.

13.6.36 The construction works will introduce a **temporary medium to high magnitude** of change adding uncharacteristic elements, activity, noise and traffic into the local landscape, with the development changing the land use and character of the immediate site area within the LLCA.

Landscape Receptor - Site Wide Features

13.6.37 The construction activities associated with the implementation of infrastructure, development of the houses and establishment of areas of green infrastructure and open space will result in **temporary moderate adverse** Effects which has been judged to be of **medium sensitivity**.

13.6.38 The construction works will introduce a **localised, temporary high magnitude** of change through the introduction of uncharacteristic elements into the local landscape, with the development changing the land use and character of the site area.

The Wider OPA -Visual Effects

13.6.39 Visual effects arising during construction, for **Scenario 2,** include those on the following receptors:

13.6.40 Recreational users on PRoW F2, F3 and F10 and F11 have been judged to have **medium sensitivity** and the assessment has found that the construction stage operations will have **temporary moderate adverse** Visual Effects.

13.6.41 The construction activities associated with the implementation of infrastructure, development of houses and establishment of areas of green infrastructure and open space will cause visual effects on these recreational users. The construction works will introduce a **medium magnitude** of change in views experienced through movement and uncharacteristic elements into the views that may draw attention.

13.6.42 Recreational users on PRoWs B743, B744, B746 and B780 have been judged to have **medium sensitivity** and the assessment has found that the construction stage operations will have **temporary moderate to major adverse** Visual Effects.

13.6.43 The construction activities associated with the implementation of infrastructure, development of houses, installation of two large-scale landmark features and establishment of areas of green infrastructure and open space will cause visual effects on these recreational users. The construction works will introduce a **medium magnitude** of change in views experienced through movement and uncharacteristic elements into the views that may draw attention.

13.6.44 Residents overlooking the eastern edge of the site have a **high sensitivity** and the Scenario 2 construction operations will result in **temporary moderate to major Adverse** Visual Effects.

13.6.45 The construction activities associated with the implementation of infrastructure, development of houses in the wider OPA and establishment of areas of green infrastructure and open space will result in a **medium** magnitude of change on residents. The construction works will introduce movement and uncharacteristic elements into the views that may draw attention.

13.6.46 Residents on Fir Tree Lane have a **high sensitivity** and the proposals will result in **temporary moderate adverse** Visual Effects during construction operations associated with Scenario 1.

13.6.47 The construction activities associated with the implementation of the OPA will result in a temporary **high magnitude** of change on residents. The construction works will introduce movement and uncharacteristic elements into the views.

13.6.48 Transient users of Burnetts Lane, Fir Lane and Blind Lane all share a **medium sensitivity** and the construction operations for Scenario 2 will result in temporary **moderate to major adverse** Visual Effects.

13.6.49 The construction activities associated with the implementation of infrastructure, development of the OPA houses and establishment of areas of green infrastructure and open space will result in **temporary, medium magnitude** of change on transient users of these three lanes, in close proximity.

Operation Stage Impacts and Effects

13.6.50 The Impacts arising during operation include those from the installed residential development, its new buildings, new landmark features, lighting, road infrastructure, greenspaces, establishing planting and associated activity, are also common across both development scenarios.

13.6.51 The detailed consideration and narrative for landscape and visual effects arising during operation, considering effects at commencement and year 15, for Scenario 1 and 2 is contained in the ES Volume 2, Appendix 13.1 LVIA Technical Report and therefore only a summary overview is provided here.

OPA Phase 1 and Link Road - Landscape Effects

13.6.52 **Scenario 1**, operation effects on landscape receptors include:

Landscape Receptor - Horton Heath Undulating Farmland LCA

13.6.53 Given the nature of change and the scale of the development, upon completion, the proposals will give rise to **moderate adverse** effects upon the character of the Horton Heath Undulating Farmlands LCA which has been judged to be of **low sensitivity**.

13.6.54 At completion, a **low to medium magnitude** of change is predicted as although the proposals incorporate a range of embedded landscape mitigation measures, including landscape transition areas, tree planting and implementation of new areas of green space, the planting will take time to mature and become effective.

13.6.55 At year 15, following maturation of the strategic landscape mitigation planting, the proposed development will result in permanent **minor to moderate adverse** Effects upon the LCA. despite the embedded mitigation measures within the proposals, the scale of the development in relation to the LCA means the level is not appreciably improved.

Landscape Receptor - Chalcroft LLCA

13.6.56 At completion, given that proposed landscape mitigation will not have reached maturity, a low to **medium magnitude** of change is predicted, and the effect of the development will be **minor adverse** in terms of its effects on this LLCA which has been judged to be of **low sensitivity**.

13.6.57 By year 15, even though the scale of the Phase 1 parcel and link road will increase built form and introduce some uncharacteristic features, the provision of open space, internal street scene planting, ecological enhancements and retention and enhancements of key landscape features will result in **minor beneficial** effects on the LLCA.

Landscape Receptor - Quobleigh LLCA

13.6.58 At completion, given that proposed landscape mitigation will not have reached maturity, a **low to medium magnitude** of change is predicted, and the effect of the development will be **minor adverse** in terms of its effects on this LLCA which has been judged to be of **low sensitivity**.

13.6.59 By year 15, even though the scale of the Phase 1 development and link road will increase built form and introduce uncharacteristic features, the provision of open space, internal street scene planting, ecological enhancements and retention and enhancements of key landscape features will result in **minor beneficial** effects on the LLCA.

Landscape Receptor - Site Wide Features

13.6.60 Upon completion, the proposed landscape mitigation will not have reached maturity but will increase the available landscape features within the site and increased green links. Given the removal of hedgerow within phase 1 parcel, and the removal of sections of tree planting to accommodate the new link road at certain locations on balance a **low to medium magnitude** of change is still predicted, and the development will be **minor adverse** in terms of its effects on the site wide features which have been judged to be of **medium sensitivity**.

13.6.61 By year 15, even with the loss of small areas of planting and hedgerows, the introduction of built form and infrastructure, enhancements to the existing network of green infrastructure, landscape transition areas and internal tree planting within the Phase 1 scheme and along the link road will increase the landscape framework and networks of habitats within the site. These proposed features will increase the characteristics of planting and provide **minor beneficial** Effects on the site with wide features.

OPA PHASE 1 and Link Road - Visual Effects

13.6.62 **Scenario 1 -** Visual effects arising, during operation, include those on the following receptors:

13.6.63 Recreational users on PRoW F2, F3 have been judged to have **medium sensitivity** and the assessment has found that the implemented Phase 1 and link road will have **moderate adverse** Visual Effects.

13.6.64 Given that mitigation planting will not be established at completion, the Scenario 1 proposals would give rise to a **medium magnitude** of change in views experienced views from PRoW F2 and F3. Residential development is not uncharacteristic in these views however the Phase 1 works, and link road will introduce built form into closer views, which will be a notable change for users of PRoW F2 and F3.

13.6.65 At year 15, Over time, and once mature tree and hedgerow planting will soften the edge of development in combination with the landscape buffer found along the Chalcroft track, but proposed planting will not screen development from views experienced from ProW F3 and a permanent change to views will occur because of the Scenario 1 development. The proposals will give rise to **minor to moderate adverse** Visual Effects. Following maturation of the proposed landscaping, given the scale of the development, and the change in the view, on balance, along with the slightly elevated viewing position the proposals would continue to give rise to some **moderate adverse** Visual Effects in views experienced by users of ProW F2.

13.6.66 Recreational users on PRoWs B743, B744, B746 and B780 have been judged to have **medium sensitivity** and the assessment has found that the construction stage operations will have **minor adverse** Visual Effects.

13.6.67 A medium magnitude of effect is predicted at completion given the proximity of the Link Road to Allington Lane. By year 15, with the maturation of avenue planting, effects will reduce to a **minor adverse** level.

13.6.68 Recreational users on PRoW F10 and F11 have been judged to have m**edium sensitivity** and the assessment has found that the Scenario 1 scheme, at completion, will have **moderate adverse** Visual Effects.

13.6.69 Upon completion, the link road will result in a **low to medium magnitude** of change in the views experienced by these recreational users. There will be more direct views in some places and more filtered views in others.

13.6.70 By year 15, once it has matured, tree planting will soften the link road, but the presence of traffic and lighting associated with the link road will continue to give rise to some **low magnitude** and **moderate adverse** visual effects on users of parts of this route, at its western edge.

13.6.71 Residents overlooking the eastern edge of the site have a **high sensitivity** and the Scenario 1 scheme, at completion, will result in **moderate adverse** Visual Effects.

13.6.72 At completion, these residents will experience a **high magnitude** change in their view. Residents overlooking the site will experience a change in their view with built form, a new gateway landmark feature and residential properties set behind a new landscape buffer. However, it will take time for the buffer to mature and mitigate uncharacteristic elements, experienced in the view.

13.6.73 At year 15, with maturation of tree and landscaping within the landscape buffer, will soften the appearance, however, given the proximity of new residential development, the Phase 1 works will continue to change these views for residents and will result medium magnitude and moderate **adverse** visual effects.

13.6.74 Residents on Fir Tree Lane have a **high sensitivity** and the Scenario 1, at completion, will result in **moderate adverse** Visual Effects.

13.6.75 At completion, residents will experience a **medium magnitude** of change given the proximity of the link road. By year 15, with the maturation of roadside avenue planting, the effects of the new link road will be reduced to **minor adverse** Visual Effects for residents with new tree planting filtering views and softening the new development.

13.6.76 Transient users of Burnetts Lane have been judged to have a **medium sensitivity** and at completion, Scenario 1 scheme will result in **moderate adverse** Visual Effects.

13.6.77 At completion, transient users of Burnetts Lane will experience a **medium magnitude** of change in their view with built form and new residential properties set behind a new landscape buffer. While this landscape buffer matures, it is likely that views of the Phase 1 development will be a notable and an uncharacteristic feature within the scene in the interim.

13.6.78 By year 15, despite the maturation of trees and other planting there will still be a noticeable change albeit more localised, in the view experienced by the users of Burnetts Lane. Some **moderate adverse** level visual effects would remain.

13.6.79 Transient users of Fir Lane and Blind Lane share a **medium sensitivity** and the, at completion, Scenario 1 scheme will result in **moderate adverse** visual effects on Fir Tree lane users and moderate to major effects on users of Blind Lane. At completion, new built form will be seen in views for transient users of Blind Lane with new buildings forming the foreground of views where Blind Lane meets Burnetts Lane and a landmark marker also forming part of the view. From Fir Lane the new link Road will remain open to view before the planting matures. This will result in a **medium magnitude** of change in the views experienced.

13.6.80 At year 15, With the establishment of planting, the effects of the new link road will be reduced but **minor adverse** visual effects for transient users of Fir Tree Lane with new tree planting filtering views and softening the new development. From parts of Blind Lane views will be softened of the link road, however, both the road, new phase 1 development edge and landmark feature would continue to be noticeable and visual effects would be softened but persist resulting in a **moderate adverse l**evel of effect on the users of Blind Lane.

The Wider OPA - Landscape Effects

13.6.81 **Scenario 2 -** operation stage effects on landscape receptors, include:

Landscape Receptor - Horton Heath Undulating Farmland LCA

13.6.82 Given the nature of change and the scale of the development, upon completion, the proposals will give rise to **moderate adverse Effects** upon the character of the Horton Heath Undulating Farmlands LCA which has been judged to be of **low sensitivity**.

13.6.83 At completion, a **medium magnitude** of change is predicted as although the proposals incorporate a range of embedded landscape mitigation measures, including landscape transition areas, tree planting and implementation of new areas of green space, the planting will take time to mature and become effective.

13.6.84 At year 15, following maturation of the strategic landscape mitigation planting, the proposed development will result **low to medium magnitude** and permanent **minor to moderate adverse effects** upon the LCA. Despite the embedded mitigation measures within the proposals, the scale of the development in relation to the LCA means the level is not appreciably improved.

Landscape Receptor - Chalcroft LLCA

13.6.85 At completion, given the scale of the OPA and that proposed landscape mitigation will not have reached maturity, a **medium magnitude** of change is predicted, and the effect of the

development will be **minor adverse** in terms of its effects on this LLCA which has been judged to be of **low sensitivity**.

13.6.86 By year 15, even though the scale of the development will result in an increase in built form and introduce some uncharacteristic features, the provision of open space, internal street scene planting, ecological enhancements and retention and enhancements of key landscape features will result in **minor beneficial effect**s on the LLCA.

Landscape Receptor - Quobleigh LLCA

13.6.87 At completion, given that proposed landscape mitigation will not have reached maturity, a **medium magnitude** of change is predicted, and the effect of the development will be **minor adverse** in terms of its effects on this LLCA which has been judged to be of **low sensitivity**.

13.6.88 By year 15, even though the scale of the development will increase built form and introduce uncharacteristic features, the provision of open space, internal street scene planting, ecological enhancements and retention and enhancements of key landscape features will result in **minor beneficial effects** on the LLCA.

Landscape Receptor - Site Wide Features

13.6.89 Upon completion, the proposed landscape within development parcels and additional enhancements to retained areas of green infrastructure will not have reached maturity but will increase the available landscape features within the site and increased green links. A **medium magnitude** of change is predicted and on balance the effect of development will be **minor adverse** in terms of its effects on the site wide features, which have been judged to be of **medium sensitivity**.

13.6.90 By year 15, even with the loss of small areas of planting and hedgerows, and the scale of the development, the retained green infrastructure and proposed landscape mitigation across the site will increase the characteristic features across the site and will provide **minor beneficial e**ffects on the site wide features.

The Wider OPA - Visual Effects

13.6.91 **Scenario 2 -** Visual effects arising, during operation, include those on the following receptors:

13.6.92 Recreational users on PRoW F2, F3, F10 and F11 have been judged to have **medium sensitivity** and the assessment has found that the OPA scheme, at completion, will have **moderate adverse** visual effects.

13.6.93 Given that mitigation planting will not be established at completion, the Scenario 2 proposals would give rise to a **medium magnitude** of change in views experienced views from PRoW F2 and F3. Residential development is not uncharacteristic in these views however the OPA scheme works will introduce built form into closer views, which will be a notable change for users of PRoW F2 and F3. Users of F10 and F11 will experience a complete change in their views where new development is introduced in the northern parcels of the site. These users will see built form built out within close proximity. In certain locations the existing PRoW runs through the proposed landscape transition areas, providing a softer edge with built form transitioned at the edges of the parcels into the landscape buffers. Retention and enhancement of existing planting on the site will further filter views and impacts will be localised.

13.6.94 At year 15, the development will be assimilated into the landscape with the protected and enhanced landscape buffer matured so that it provides a softer edge to the OAP scheme and more filtered views for users of route F3. The proposals will give rise to **medium adverse** visual effects and result in **minor to moderate adverse** effects. Once mature, tree planting will soften the OPA development and internal street scene planting will filter views within parcels and break up the massing of built form across the site, when viewed by users of PRoW F10 and F11. Although the magnitude of effects on these receptors will reduce to low the level of effect remains moderate adverse given presence of lighting and the link road. Views of the development for users of PRoW F2 will be filtered and softened by the presence of tree and hedgerow planting found adjacent to the footpath and within development parcels. Retained and enhanced planting will provide a soft transition at the new development edges. Established internal planting will break up views to assimilate the wider OPA development into the landscape. There will still be noticeable changes in the view, some in closer proximity and these will be of medium magnitude, despite the maturation Therefore some **moderate adverse** visual effects are predicted to persist on users of F2.

13.6.95 Recreational users of PRoW B743, B744, B746 and B780 have a **medium sensitivity** and the scenario 2 scheme at completion will result in minor adverse visual effects.

13.6.96 Once complete views of the link road will be screened largely by planting along the edge of Allington Lane, but a new landmark feature will remain visible. Some views will remain why link road planting establishes. At year 15, the magnitude of effect on these receptors will reduce but still remain **medium adverse** following maturation of scheme planting due to the scale of structures. A **moderate to major adverse** visual effects, will persist.

13.6.97 Residents overlooking the eastern edge of the site have a **high sensitivity** and the Scenario 2 OPA scheme, at completion, will result in **moderate adverse** Visual Effects.

13.6.98 At completion, residents overlooking the central part of the site and a landmark feature will have a change in their view with new built form along with the school and sports facilities introduced in views. Planting within the parcels on the eastern part of the site will assimilate the new buildings in views and provide greenery in views. Views of the site from residents off Burnetts Lane to the north of the water course will include direct views across the new development and these views will introduce built form within close proximity to the residential edge. Whilst views are generally localised a **medium to high magnitud**e of change is anticipated.

13.6.99 At year 15, with maturation of tree and landscaping within the parcels adjacent to the eastern edge of the site there will be some softening of the appearance of built form, however, given the proximity of new residential development, the OPA scheme will continue to change these views for residents and will still give rise to a medium magnitude of change and some **moderate adverse** visual effects.

13.6.100 Residents on Fir Tree Lane have a **high sensitivity** and the Scenario 2 scheme, at completion, will result in **moderate adverse** Visual Effects.

13.6.101 At completion, residents will experience a **medium magnitude** of change given their proximity to new residents. By year 15, with the maturation of site planting, the visual effects of the OPA on these residents will be reduced to **minor adverse**. Mature tree planting will soften views toward the wider OPA development.

13.6.102 Transient users of Burnetts Lane have been judged to have a medium sensitivity and at completion, the Scenario 2 scheme will result in **moderate adverse** Visual Effects.

13.6.103 At completion, transient users of Burnetts Lane will experience a **high magnitude** of change in their view with built form and new residential properties set in close proximity but behind a new landscape buffer located along the western edge of the development.

13.6.104 By year 15, views across the open landscape will not be retained but replaced with a mature landscape buffer of characteristic planting and increased native hedgerow planting. Proposed mature tree planting within the OPA development plot itself will increase the green edge and create a softer transition and mature tree planting will provide a green street scene for transient users of Burnetts Lane. Despite the maturation of tree and other planting there will a noticeable **medium magnitude** change in the view, which will persist and continue to form part of the view experienced by the users of Burnetts Lane. Some **moderate adverse** level visual effects would remain.

13.6.105 Transient users of Fir Lane and Blind Lane share a **medium sensitivity** and at completion, the Scenario 2 scheme will result in **moderate adverse** Visual Effects. At completion, the new OAP residential development will be a dominant feature when viewed from the Blind Lane/ Burnetts Way junction and views will be direct and uninterrupted, altering the baseline situation of the view. The tree planting proposed along Burnetts Lane when viewed from Blind Lane will offer some limited softening of the new development edge. This will result in a **medium magnitude** of change in the views experienced.

13.6.106 At year 15, with the maturation of the scattered tree planting along Burnetts Lanes will go some way to softening views from Blind Lane. However, the OPA development edge would continue to be noticeable in the near ground and visual effects would be softened but persist resulting in a **moderate adverse** level of effect on the users of Blind Lane. Otherwise as other tree planting and structure planting reaches maturity it will soften views of the OPA development from Fir Tree Lane, but it will still be a noticeable component in the view.

13.7 ADDITIONAL MITIGATION, COMPENSATION & ENHANCEMENT MEASURES

13.7.1 No additional landscape and visual mitigation measures are proposed beyond those that are inherent within the scheme design or are required regardless of any assessment (often termed Tertiary mitigation).

13.8 RESIDUAL ENVIRONMENTAL IMPACTS & EFFECTS

13.8.1 A summarised account of the Residual landscape and visual impacts and effects is set out below under construction and operation stages. Scenario 1 and Scenario 2 have been assessed at both stages.

Construction

13.8.2 Residual landscape and visual impacts and effects, during construction, are the same as those reported above, for Scenarios 1 (OPA Phase 1 and Link Road) and 2 (The Wider OPA). All mitigation accounted for is inherent within the scheme design or is assumed because it represents accepted good practice and/or is a legislative requirement and therefore is not repeated in the assessment. There is no additional or secondary mitigation proposed at this stage.

The OPA Phase 1and Link Road

13.8.3 During the construction of Scenario 1, the predicted residual levels of effect on the identified landscape receptors, arising from the construction activity and building and implementation operations, include: a **temporary moderate adverse** level of landscape effect on the Eastleigh BC Horton Heath Undulating Farmlands LCA, given the scale and location of the activity associated with the Parcel 1 and link road construction. The proposals are judged to also have a **temporary moderate adverse** level of landscape effect on the Chalcroft LLCA, Quobleigh LLCA's (Identified by the Tyler Grange landscape baseline studies) and the site features, in this scenario. This is due to the scale and extent of construction operations across the previously open Phase 1 and the Link Road parts of the site and the nature of indirect effects. These temporary effects are judged to be **significant, at a local level**. However, this needs to be balanced by decision makers with the fact that the site has extant planning permissions for housing and that the proposals comply with adopted and emerging landscape planning policy.

13.8.4 Scenario 1, residual visual effects arising from the construction stage of the scheme include: a **temporary moderate adverse** level of visual effect for users of PRoW F2, F3, F10, F11, B743, B744, B746, B780 and residents of Fir Tree Lane, **moderate to major adverse levels** of visual effect for some residents overlooking the eastern edge of the site, for transient users of Burnetts Lane, Blind Lane and Fir Tree Lane. These localised visual effects, in combination, are judged to be **significant, at a local level**. Effects on any other visual receptors are judged to be **not significant**, even at a local level.

The Wider OPA

13.8.5 For Scenario 2, at this stage, the residual effects arising from the construction activity and building and implementation operations, on landscape receptors includes: a **temporary moderate adverse** level of landscape effect on the Eastleigh BC Horton Heath Undulating Farmlands LCA, given the scale of the activity associated with additional OAP construction

operations. The proposals are judged to have a **temporary moderate adverse** level of landscape effect on the Chalcroft LLCA and Quobleigh LLCA's (Identified by the Tyler Grange landscape baseline studies). **Temporary moderate adverse** effects are predicted on the site, in this scenario. This is due to large scale and extent of temporary construction operations across the OPA site, even in the context of a constructed Phase 1 parcel and the link Road. These landscape effects are judged to be **significant, at a local level**. However, the construction works are by their nature temporary and these effects, as for Scenario 1, need to be balanced by decision makers with the fact that the site has extant planning permissions for housing and that the proposals comply with adopted and emerging landscape planning policy.

13.8.6 Residual visual effects arising from the scheme construction activities, traffic, building and implementation works in Scenario 2, during construction include: **Temporary moderate adverse** levels of Visual Effect for users of PRoW F2, F3, F10 and F11, for Residents of Fir Tree Lane. A **temporary moderate to major adverse** level of visual effect is identified for residents overlooking the eastern edge of the site, users of PRoW B743, B744, B746 and B 780, for transient users of Burnetts Lane, for transient users of Blind Lane and for transient users of Fir Tree Lane. These effects are judged to be **significant, at a local level**.

Operation

13.8.7 During operation, the landscape and visual assessment has accounted for the change in predicted impacts and effects, over time. Year 15 has been used as the timeframe for making judgments on the residual effect assessment conclusions, during operation.

The OPA Phase 1 and Link Road

13.8.8 During the operation of Scenario 1, the predicted residual effects on landscape receptors arising from the proposed Phase 1 development and the link road include: a **minor to moderate adverse** level of landscape effect on the Eastleigh BC Horton Heath Undulating Farmlands LCA, at year 15, given the scale of the proposed development and the addition of some uncharacteristic features. This effect is judged to be **not significant, at a local level**. The proposals are judged to have a **minor beneficial** level of landscape effect on the Chalcroft LLCA and Quobleigh LLCA's (Identified by the Tyler Grange landscape baseline studies) in this scenario and a **minor beneficial** level of effect on site features, at year 15. This is due to the extensive areas of additional green space, open space and the additional characteristic and distinctive new landscape and built features proposed across the Phase 1 and the Link Road parts of the site. These effects are **not significant**.

13.8.9 Scenario 1, residual visual effects arising from the operation stage of the scheme include: a **moderate adverse** level of visual effect for users of PRoW F2, F10 and F11, for residents overlooking the eastern edge of the site, for transient users of Burnetts Lane and for transient users of Blind Lane, which are **judged to be significant, at a local level**. There will be residual **minor to moderate adverse** levels of visual effect on users of PRoW F3 and **minor adverse** levels of visual effect on residents and on transient users of Fir Tree Lane and users of PRoW B743,B744,B746 and B780 which are judged to be **not significant, even at a local level**.

The Wider *OPA*

13.8.10 During the operation of Scenario 2 (The Wider OAP scheme, with the Phase 1 scheme and Link Road as a future baseline), predicted residual effects include: a **moderate to minor adverse** level of landscape effect on the Eastleigh BC Horton Heath Undulating Farmlands LCA, at year 15, given the scale of the proposed development. This effect is judged to be **not significant**. These proposals also are judged to have a **minor beneficial** level of effect on the Chalcroft LLCA and Quobleigh LLCA's (Identified by the Tyler Grange landscape baseline studies) and a **minor beneficial** level of effect on site features, at year 15. This is due to the extensive areas of additional green space, open space and characteristic features proposed across the wider OPA site. These effects are **not significant**.

13.8.11 Residual visual effects arising from the scheme, in operation for Scenario 2, include: **moderate adverse** levels of Visual Effect for users of PRoW F2, F10 and F11, for residents overlooking the eastern edge of the site, for residents on Fir Tree Lane, for transient users of Burnetts Lane, for transient users of Blind Lane and for transient users of Fir Tree Lane. **Moderate to major adverse** visual effects are predicted for users of PRoW B743, B744, B746 and B780 and residents overlooking the eastern edge of the site. These effects are judged to be **significant, at a local level**. The development will otherwise lead to residual **minor adverse** levels of Visual Effects on users of PRoW F3, which are judged to be **not significant**, at a local level.

13.8.12 The judgments above have accounted for the fact that the majority of landscape features on the site are retained and incorporated into the proposals. Where loss of hedgerows and some minor loss of tree cover is required as part of the proposals, the scheme seeks to replace this loss and provide additional tree planting within open spaces to deliver a strong network of GI.

13.8.13 The proposals provide additional benefits by way of open space and play provision with 48.15 hectares of open space and 2.75 hectares of formal open space with an integrated and site wide approach to play and open space provision.

13.8.14 Retained and enhanced green corridors provide a multi-functional approach incorporating play, ecological enhancements, sustainable urban drainage, and recreational and access enhancements with interlinked spaces across the development and benefits not only for new residents but for the existing local population. These positive design principles underpin OPA Phase 1, the link road design and the Wider OPA.

13.8.15 Overall, this LVIA has found that the development of the site and development of this scale can be accommodated without undue harm to the landscape or visual amenity of the site itself or its surroundings.

13.8.16 The approach to the scheme with the retention and enhancement of characteristic green infrastructure and the incorporation of existing landscape features into the scheme has found that the site has the capacity to accommodate development of this scale.

13.8.17 Retained green corridors provide an enclosed landscape within which development parcels can be accommodated and provides an overarching network of green infrastructure which assists in breaking up the massing and built form of new development, with the new proposed community located amongst mature areas of tree planting and green corridors which assist in assimilating the development into the landscape.

13.9 CUMULATIVE EFFECTS

13.9.1 In summary, none of the committed developments would have cumulative impacts with the proposed Horton One Scheme in landscape and visual terms given the scale of the closest projects which are very small scheme and/or the distance from the site, which is too far away for there to be any shared views or effects on shared receptors. Reasons for excluding the committed schemes and scoping them out are set out below in Table 13.4.

Table 13.4: Summary Reasoning for exclusion of sites from the cumulative assessment

Site	Reason for exclusion from further cumulative assessment
One Horton Heath Utilities Enabling Works – Underground cabling	Very small scale works and scheme – no significant in combination effects anticipated
Allington Lane, Burnetts Lane and Bubb Lane access	Very Small scale works and scheme - no significant in combination effects anticipated
Chalcroft Business Park, Burnetts Lane, West End	Very small scale works and scheme - no significant in combination effects anticipated
Land off Botley Road, West End,	Too far away

Southampton	
Land at Hedge End North, Winchester Road, Botley, Southampton (Land north west of Boorley Green)	Too far away
Land to North and East of Boorley Green,Winchester Road, Botley, Southampton SO32 2UA	Too far away
Pembers Hill Farm, Mortimers Lane, Fair Oak, Eastleigh SO50 7EA	Too far away
Land west of Woodhouse Lane	Too far away
Land South of Maddoxford Lane, Boorley Green, Botley, Southampton, SO32 2DB,	Too far away
Land to the south of Maddoxford Lane and west of Westfield, Boorley Green, Botley, SO32 2DB	Too far away
Southampton International Airport, Mitchell Way, Eastleigh,	Too far away

The Mount Hospital, Church Road, Bishopstoke	Too far away
Land to the North and East of Winchester Street, Botley	Too far away
Land at Woodhouse Lane and to the North and East of Botley	Too far away

Village, Eastleigh	
Eastleigh Police Station, 18-24 Leigh Road, Eastleigh, SO50 9DG	Too far away
Land off St Johns Road, South of Foord Road, Hedge End, Southampton SO30 4DG	Too far away
Serenity, Heath House Lane, Hedge End, Southampton, SO30 0LE	Too far away
Land west of Waylands Place and north of Peewit Hill Close, Hedge End, SO31 1DJ	Too far away
Land at Park Farm/North Stoneham Park Stoneham Lane, Eastleigh, SO50 9HS	Too far away
Land south of Chestnut Avenue north Stoneham Park, Chestnut Avenue, Stoneham Lane, Eastleigh	Too far away
Land South of Bursledon Road, Bursledon, Southampton	Too far away

13.9.2 No key In-combination effects for landscape character or visual amenity are anticipated.

13.10 IMPACT OF CLIMATE CHANGE

13.10.1 A summary of the impact of climate change on both Scenario 1 and 2 is provided in Table 13.5 below. Identified potential effects associated with the landscape design and management that could arise based upon reasonable Climate Change Projections include issues associated with biosecurity threats, increased intense rainfall, reducing carbon and excessive

drought and heat, Climate effects on Visual matters principally relate in this instance to issues associated with securing effective establishment, good growth rates and thriving planting in a changing climate that will perform filtering or visual amenity improvement functions. With the identified climate resilience mitigation measures incorporated into the scheme design at outline, detailed and reserved matters planning application stages, the findings of the assessment are considered robust.

13.11 ASSESSMENT SUMMARY

13.11.1 Table 13.5 below, provides an overall summary of the landscape and visual assessment findings for the two scenarios. This is followed by a summary of climate change effects and a further Table 13.6, covering mitigation implementation.

Table 13.5: Landscape and Visual Assessment Summary

Environmental Effect	Sensitivity of Receptor	Nature of Impact	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect	Confidence Level
Construction Effects								
OPA Phase 1 and Link Road -Scenario 1								
Landscape Receptors To be read in conjunction with ES Volume 1, Figures 13.4, 13.5-13.7 and 13.12								
Horton Heath LCA	Low	Direct on and off-site impacts from construction highway infrastructure, building construction operations and associated traffic.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Chalcroft LLCA	Low	Direct impacts from construction works on the site, introducing plant vehicles, movement, and construction activity. Direct impact of Hedgerow removal. Localised, indirect impacts from construction activity of part of Burnett's Way and impacts arising from the detailed scheme implementation	Temporary Medium to High	Temporary Moderate Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High

Quobleigh LLCA	Low	Construction works will directly impact upon the character of Fir Tree Lane and the setting of Fir Tree Farm as well as impacting on existing PRoW and recreation routes through the site. There will be Direct removal of small sections of tree planting and indirect effects arising from the implementation of the landscape works will have an indirect impact on the setting of this area	Temporary Medium to High	Temporary Moderate Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High
Site wide	Medium	Road and building construction works will directly impact existing tree belts where the link road will sever this planting in two locations. There will be direct removal of areas of gappy hedgerows to make way for housing and road construction. There will a need for be temporary footpath closure. Indirect disturbance effects from construction traffic and activity on ancient woodland and Chalcroft Farm, are also predicted given proximity.	Localised Temporary Medium to High	Temporary Moderate Adverse	-	Localised Temporary Medium to High	Temporary Moderate Adverse	High

Visual Receptors To be read in Conjunction with ES Volume1, Figures 13.10 and 13.11 Photosheets								
Recreational users of PRoW F2	Medium	Construction traffic and activity will be present in the view and this will be temporary.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW F3	Medium	Movement and activity associated with the development of the Phase 1 works and the link road construction will be in close proximity	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate/ Adverse	High
Recreational users of PRoW F10 and F11	Medium	Traffic movement, construction and activity associated with the link road will be seen when travelling west towards Allington Lane where the link road crosses the existing PRoW	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High

Recreational users of PRoW B743, B744, B746, and B780	Medium	Recreational users of the footpaths to the west of Allington Lane will experience glimpsed views of the site and the likely change in views associated with the development will be seen as a result of the construction of the link road. Having said this, construction work associated with the roundabout construction is already seen within these views and in places where vegetation has been removed along Allington Lane to accommodate the new access into the site.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Residents overlooking the eastern edge of the site	High	Construction traffic, activity and movement will be seen in close proximity for residents living on the south eastern edge of the site who sit in a slightly elevated position above the site.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Residents on Fir Tree Lane	High	Construction traffic and activity will be introduced to views experienced given the proximity of the link road and the access off Allington Lane.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High

Transient users of Burnetts Lane	Medium	Construction traffic, activity and movement will be seen in close proximity for transient users of Burnetts Lane	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient Users of Blind Lane	Medium	Activity and movement associated with the Phase 1 works will be seen in views for transient users of Blind Lane whose views look directly across towards the site from the east	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient users of Fir Tree Lane	Medium	Users of Fir Tree Lane will experience a change in their view as a result of the new link road construction and this change will affect the western most part of this route	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High

The Wider OPA -Scenario 2								
Landscape								
Horton Heath LCA	Low	Construction work will be largely limited to direct impacts on the site itself with some off-site impacts including the construction of access points and localised impacts on adjacent road network. The construction works will also temporarily indirectly impact upon localised parts of the character of Burnetts Lane, Allington Lane, Chalcroft and Fir Tree Lane. The implementation of areas of open space, green infrastructure, drainage and phases of residential development will temporarily impact the immediate setting of Horton Heath and Allington while works are occur alongside.	Temporary Medium to High	Temporary Moderate to Major Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High

Chalcroft LLCA	Low	Construction works associated with the building of the houses and infrastructure associated with wider outline scheme will directly impact on the character of the various parcels of land across the site. Construction activity will have a localised indirect impact on Chalcroft Farm, as well as to the setting of the Ancient woodland. Implementation works will within parcels will have localised impacts and indirect impacts on the wider setting.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Quobleigh LLCA	Low	Construction building activity will directly impact this LLCA and the implementation of areas of tree planting and strategic green infrastructure will impact on the immediate setting of this area.	Temporary Medium to High	Temporary Moderate Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High

Site wide	Medium	Direct construction impacts will arise on this area from traffic, groundworks, SuDS construction, landscape implementation and planting and the construction of infrastructure and new homes. Indirect impacts of these operations are predicted on Chalcroft track, Allington Lane and Burnetts Lane and on the existing residential edge and local network of roads. There will also be direct impacts from construction and implementation works on the network of footpaths in places where these interface with areas of development.	Localised Temporary High	Temporary ModerateAdverse	-	Localised Temporary High	Temporary Moderate Adverse	High

Visual								
Recreational users of PRoW F2	Medium	Construction traffic and activity will be present in the view	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW F3	Medium	Movement and activity associated with the construction works will be in close proximity to users of PRoW F3	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW F10 and F11	Medium	Construction works associated with the wider OPA will result in traffic movement, construction and activity.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW B743, B744, B746, and B780	Medium	Recreational users of the footpaths to the west of Allington Lane will experience glimpsed views of the site and the likely change in views associated with the construction of this part of the development will be seen as a result of the construction of the landmark building, located at the northern gateway to the site.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High

Residents overlooking the eastern edge of the site	High	Construction traffic, activity and movement is likely to be seen in glimpsed views through existing residential parcels adjacent to the Phase 1 works as well as direct views for residents overlooking the central parcels of the site where these views and construction traffic will be seen in close proximity and would be more apparent within views.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Residents on Fir Tree Lane	High	Residents on the western part of Fir Tree Lane will see construction traffic and activity introduced to views given the proximity of works	Temporary High	Temporary Moderate Adverse	-	Temporary High	Temporary Moderate Adverse	High
Transient users of Burnetts Lane	Medium	Construction traffic, activity and movement will be seen in close proximity for transient users of Burnetts Lane	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient Users of Blind Lane	Medium	Activity and movement associated with the OPA will be seen in glimpsed and longer distance views for transient users of Blind Lane who experience views directly across towards the site, from the east.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient users of Fir Tree Lane	Medium	Transient users of Fir Tree Lane will experience a change in their view as a result of the construction works and the downgrading of this route in part will change access through the site for these users.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High

Operation Effects								
OPA Phase 1 and Link Road -Scenario 1								
Landscape								
Horton Heath LCA	Low	At completion, the development will introduce an uncharacteristic feature within the LCA of a larger scale than other built form in the local surroundings. The proposed landmark structure positioned at the southern gateway will be located amongst the setting of residential and employment land use. With the maturation of the strategic landscape planting and trees within open spaces and along streets, the development will be better assimilated into the landscape. However, given the scale of development in relation to other built form in the LCA some adverse impact on landscape character will remain.	Medium	Moderate Adverse	-	Low to Medium	Minor to Moderate Adverse	High
Chalcroft LLCA	Low	At completion, the development will introduce uncharacteristic features within the LLCA and will increase the scale of the residential development and introduce	Medium	Minor Adverse	-	Low and Positive allowing for maturation of	Minor Beneficial	High

		further built form. The lack of maturity of new planting, at this stage. The proposed landmark structure positioned at the southern gateway will be located amongst the setting of residential and employment land use. The characteristic watercourse running along the southern edge of the solar farm will be incorporated into the proposals and at completion this landscape transition zone will have been enhanced with additional characteristic planting to reinforce existing landscape character. There will continue to be some adverse impacts on the LLCA at this stage given the change in context to surrounding areas and the introduction of built form together with the lack of maturity of new planting, at this stage. By year 15, with the maturation of the link road tree planting, landscape transition areas, trees and hedgerows within the open spaces of the Phase 1 scheme, the development will be better assimilated into the landscape and will integrate				the scheme landscape design, by Year 15		

		characteristic planting to respond to the wider context of the LLCA. The incorporation of additional advanced planting across the Phase 1 site and within emerging parcels will further integrate the development into the landscape. The designed landscape transition zone alongside the ancient woodland will also result in an increased area of habitat enhancement across that area. By this stage the new rain gardens alongside the link road and blue green infrastructure, open spaces, and ecological corridors and some new recreation spaces and access links will provide increasingly beneficial impacts in terms of landscape character and land use. At the same time the established greenspaces will provide additional positive ecosystem services, in a climate resilient manner.						
Quobleigh LLCA	Low	At completion, the development will introduce an uncharacteristic feature within the LLCA in the form of the link road which will increase the scale and proximity of built form within the LLCA. Retained areas of	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation of the scheme	Minor Beneficial	High

		Green Infrastructure will at completion of the link road assist in retaining the characteristic contained nature of the various parcels across the site. Enhancements to the existing landscape framework and green infrastructure and additional planting associated with the link road construction only just establishing at this stage. With the maturation of the associated strategic landscape planting, the planting found along the link road and the enhancements to the characteristic landscape framework within which the site is located, the phase 1 development and the link road will be better assimilated into the landscape and will integrate characteristic planting and combine with positive architecture to positively respond to the context and setting of the LLCA.				landscape design, by Year 15		
Site wide	Medium	Upon completion, the development of the Phase 1 scheme, associated infrastructure and the link road construction will give rise to the introduction of some uncharacteristic	Medium	Minor Adverse	-	Low and Positive allowing for maturation of the scheme	Minor Beneficial	High

		features which will be near site features. The loss of some areas of hedgerow within the Phase 1 parcel along with sections of tree planting will result in permanent loss at completion. Enhancements to retained landscape features will at completion not provide their full benefits. Over time new planting will mature to a more appreciable scale. New characteristic tree and hedgerow planting and enhancements to watercourses and blue infrastructure will also become more apparent so that by year 15 these features will provide increased habitat, amenity and recreation assets.				landscape design, by Year 15		
Visual								
Recreational users of PRoW F2	Medium	On completion, users of PRoW F2 when travelling south towards Chalcroft will see new built form brought in closer proximity to their view. Planting proposed along the footpath route and within the watercourse landscape buffer to the north of the Phase 1 works will only just be established. Development will be largely contained and kept below the skyline (with the exception of the landmark feature)	Medium	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High

		By Year 15, views of the development for users of PRoW F2 will be filtered and softened by the presence of tree and hedgerow planting found adjacent to the new development edge and along the watercourse to the north of the Phase 1. However, new Phase 1 built development and the link road will continue to occupy the view at a closer proximity.						
Recreational users of PRoW F3	Medium	Upon completion of the Phase 1 and link road development, users of PRoW F3 will see a major alteration to their view when seen travelling from Burnetts Lane to the west. The introduction of built form will be set back behind retained hedgerows and allows for proposed tree planting between plot frontages and the upgraded footpath route. Built form will be seen in close proximity for users along this footpath, however, the open and undeveloped nature of the watercourse corridor will be retained to the north of this footpath. The completed link road will also introduce new features into the landscape when viewed from this footpath route where it crosses the PRoW to the south of the solar farm.The proposed landmark structure will	Medium	Moderate Adverse	-	Medium by year 15 with maturation of planting	Minor to Moderate Adverse	High

		be seen within the context of built form. By year 15, once matured, planting along Chalcroft track and along the upgraded footpath and cycle route will provide a soft transition to the new settlement edge and to the wider site beyond. Internal street scene planting will soften built form and provide glimpses of green corridors running through the development when viewed from the north.						
Recreational users of PRoW B743, B744, B746, and B780	Medium	Once complete, views of the link road and associated infrastructure from these footpaths will be screened by the presence of planting found along Allington Lane. The proposed tree planting around the link road will be yet to reach maturity and therefore will not serve to reduce the visual impact at completion. By year 15, Once avenue tree planting is mature, this will assist in filtering views and adding to the established planting found along Allington Lane	Medium	Moderate Adverse	-	Low Adverse by year 15 with maturation of planting	Minor Adverse	High

Recreational users of PRoW F10 and F11	Medium	Upon completion of the link road, recreational users of PRoW F10 and F11 will experience a change in their views where the new link road cuts across the existing PRoW. Where this crossing point is proposed, new areas of tree planting will aid its assimilation into the landscape and filtering of views once mature but at completion will afford direct views of the link road and associated infrastructure. Upon maturity of planting, the link road will be softened by proposed planting at the western edge of the site with tree planting filtering views of the road and its associated infrastructure.	Medium to low	Moderate Adverse	-	Low, by year 15 with maturation of planting	Moderate Adverse	High
Residents overlooking the eastern edge of the site	High	Upon completion, residents overlooking the site will have a change in their view with built form and residential properties set behind a new landscape transition zone. At the entrance into the site the proposed landmark structure will sit above the adjacent built form and will break the skyline in views, however this will be seen amongst the context of surrounding built form and development While this landscape transition zone	High	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High

		matures, it is likely that views of the development will be dominant and an uncharacteristic feature within the views experienced. By year 15, a proposed landscape buffer will have matured in the foreground and proposed mature tree planting within the development plot itself will increase the green edge and provide a softer transition. Mature tree planting will provide a green street scene for residents living along Burnetts Lane						
Residents on Fir Tree Lane	High	Upon completion, views of the link road for residents on Fir Tree Lane will be partially filtered by the presence of establishing avenue tree planting. By year 15, when avenue tree planting is mature, this will soften views experienced towards the new link road and integrate this into views. Residents living on Fir Tree Lane will at this time see the proposed characteristic planting and a soft edge to the link road.	Medium	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Minor Adverse	High
Transient users of	Medium	Upon completion, transient users of Burnetts			-			

Burnetts Lane		Lane will experience a change in their view with built form and new residential properties set behind a new landscape transition zone. At the entrance into the site the proposed landmark structure will sit above the adjacent built form and will break the skyline in views, however this will be seen amongst the context of surrounding built form and development By year 15, Views across the open landscape will not be retained but replaced with a mature landscape buffer of characteristic planting and increased native hedgerow planting. Proposed mature tree planting within the development plot itself will increase the green edge and softer transition and mature tree planting will provide a green street scene for transient users of Burnetts Lane.	High	Moderate Adverse		Medium, by year 15 with maturation of planting	Moderate Adverse	High
Transient Users of Blind Lane	Medium	Upon completion, new built form will be seen in views for transient users of Blind Lane with new buildings forming the foreground of views where Blind Lane meets Burnetts Lane. The new residential development will be a dominant feature when viewed from this	Medium	Moderate to Major Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High

		junction and views will be direct and uninterrupted, altering the baseline situation of the view. It is likely that glimpsed views of the proposed landmark structure will be seen breaking the skyline in views as receptors travel down Blind Lane. Although these views will be seen in the context of additional new built form in places views of the landmark structure will break above the fields seen above Burnetts Lane. The tree planting proposed along Burnetts Lane when viewed from Blind Lane will offer some softening of the new development edge but will not be mature at this stage. At year 15, upon maturation of the scattered tree planting along Burnetts Lane, there would be some notable softening of views from Blind Lane, however, the proximity of the development edge when viewed by transient users at the junction of Burnetts Lane will remain noticeable.						
Transient users of Fir Tree Lane	Medium	Once complete, views of the link road and associated infrastructure will be partially screened by the presence of planting found around the Listed Building, at field	Medium	Moderate Adverse	-	Medium, by year 15 with	Minor Adverse	High

		boundaries and along Fir Tree Lane itself. The proposed tree planting around the link road will be yet to reach maturity and therefore will not serve to reduce the visual impact at this stage. At year 15, when the avenue tree planting is mature, this will filter views toward the new link road and integrate this into views.				maturation of planting		

The Wider OPA -Scenario 2								
Landscape								
Horton Heath LCA	Low	At completion, the development will introduce additional large-scale built form into the landscape and will form part of a much larger area of development in this LCA, sitting amongst established areas of strategic green infrastructure. As the strategic green infrastructure of the proposed development will be delivered as part of the early phases of development, by year 15, with the maturation of trees along main streets, in gardens and within green spaces, the development will be better assimilated into the landscape. However, the scale of the development in relation to the LCA will mean that some adverse effects will continue to persist on the LCA.	Medium	Moderate Adverse	-	Low to Medium, allowing for maturation by Year 15	Minor to Moderate Adverse	High
Chalcroft LLCA	Low	The development will introduce additional built form into the LLCA, with built form already established on the site. The development will increase the scale of development present across the LLCA and	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation by Year 15	Minor Beneficial	High

		will result in the majority of the LLCA being built out with embedded landscape mitigation and green infrastructure as part of the development. The overall provision of green infrastructure across the site will increase. The addition of rain gardens within plots and along strategic locations within development plots will also provide an increase in blue and green infrastructure across the OPA. All new green infrastructure will provide additional longer-term benefits. The provision of street trees, once mature, will also provide benefits for urban greening and will assist in assimilating the development into the landscape as it matures.						
Quobleigh LLCA	Low	At completion, the development will introduce an uncharacteristic feature within the LLCA in the form of residential development and associated infrastructure and this will increase the scale and proximity of built form within the LLCA. Retained areas of Green Infrastructure and enhanced existing green corridors will retain characteristic features and the established	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation by Year 15	Minor Beneficial	High

		landscape framework. Proposed landscaping within parcels will take time to mature. Once mature, the established additional characteristic landscape features and new open spaces with their multiple benefits, alongside the protected original valued assets, will positively assist in assimilating the development.						
Site wide	Medium	The retention of key strategic green corridors and the introduction of a landscape framework which forms the backbone to the development will retain key landscape blue and green features within the development of the site. Introduced landscape features along with new planting within development parcels will once mature, at year 15, increase the characteristic landscape features across the site and provide a holistic approach to green infrastructure. Once mature introduced features will also provide increased habitat, amenity and recreation assets. Areas of open space within the site boundaries and within development plots will also provide increased landscape features and integrated	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation by Year 15	Minor Beneficial	High

		green open space.						
Visual								
Recreational users of PRoW F2	Medium	On completion, users of PRoW F2 will see new built form brought into closer proximity to their view while travelling along this footpath. Planting proposed along the footpath route and within the landscape transition areas near to the solar farm and around the sports pitches will soften views and additional internal planting within the various parcels of development will further soften views for these receptors. On completion, users of PRoW F2 will see new built form brought into closer proximity to their view while travelling along this footpath. Planting proposed along the footpath route and within the landscape transition areas near to the solar farm and around the sports pitches will soften views and additional internal planting within the various parcels of development will further soften views for these receptors. The landscape buffer adjacent to the sports pitches will also assist in reducing the impact	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High

		of light spill associated with the adjacent sports pitches. Within the views for receptors travelling south, the proposed landmark structure will be seen rising above the development parcel and will be seen amongst the setting of surrounding built form. In travelling north along this footpath, glimpsed views of the proposed landmark structure are likely at the local centre, with views seen amongst the setting of existing mature tree planting By year 15, views of the development for users of PRoW F2 will be filtered and softened by the presence of tree and hedgerow planting found adjacent to the footpath and within development parcels. Retained and enhanced planting will provide a soft transition at the new development edges and internal planting will break up views to assimilate the wider OPA development into the landscape						
Recreational users of PRoW B743, B744, B746, and B780	Medium	Once complete, views of the residential development will mostly be filtered due to the presence of planting found along Allington Lane. The landmark structure proposed at the gateway into the site will introduce an	Medium	Moderate to Major Adverse	-	Medium	Moderate to Major Adverse	High

		uncharacteristic feature within the landscape within these views. The proposed landmark structure will sit above the skyline in views, with the rest of the development retained behind tree planting found along Allington Lane.						
Recreational users of PRoW F3	Medium	Upon completion of the development, users of PRoW F3 will see an alteration to their view, however, built form will not be seen as uncharacteristic with the Phase 1 works in close proximity to the route. Development will be seen as an extension to the existing settlement edge. By year 15, new planting within parcels in combination to the strategic green infrastructure will provide a soft transition for users of this PRoW, with the footpath running through the landscape buffer providing a softer edge and views across new development	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Minor Adverse	High
Recreational users of PRoW F10 and F11	Medium	Upon completion of the OPA, users of F10 and F11 will experience a complete change in their views where new development is introduced in the northern parcels of the site.	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High

		These users will see built forms built out within close proximity within views. In certain locations the existing PRoW run through the proposed landscape transition areas, providing a softer edge and built form transitioned at the edges of the parcels. Views of the landmark structures located at the local centre and at Allington Lane are likely to be seen breaking the tree line in views for these receptors, with built form seen in the foreground of views, and the landmark structures seen sitting in the background of views. By year 15, the OPA views of the new development for users of these footpaths will be softened by additional scattered tree planting within landscape transition areas, this planting will not serve to screen views but provide a softer transition at the edges of the development						
Residents overlooking the eastern edge of the site	High	Upon completion, residents overlooking the central part of the site will have a change in their view with new built form along with the school and sports facilities introduced in views. Planting within the parcels on the eastern part of the site will assimilate the	High	Moderate to Major Adverse	-	Medium allowing for maturation by Year 15	Moderate to Major Adverse	High

		new buildings in views and provide greenery into views. Views of the site for residents off Burnetts Lane to the north of the water course will experience direct views across the new development and these views will include built form within close proximity to the residential edge and a new landmark By year 15, Views across the open landscape will continue to not be retained but will be replaced with new built form with integrated tree and hedge planting which once mature will assimilate the development into the landscape by breaking up built form and massing, in the views experienced. In addition, the proposed landmark features will introduce buildings of height within these views for residents overlooking the site.						
Residents on Fir Tree Lane	High	Upon completion, the proposals will introduce uncharacteristic features into views for these residents. By year 15, tree planting will be mature and this will soften views of the new development	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Minor Adverse	High

		for residents along Fir Tree Lane						
Transient users of Burnetts Lane	Medium	Upon completion, transient users of Burnetts Lane will experience a change in their view with built form and new residential properties and a landmark feature set in relatively close proximity within views. behind a new landscape transition strip located along the western edge of the development. At year 15 once the proposed landscape buffer planting has matured. Views across the open landscape will not be retained but replaced with a landscape buffer of characteristic planting and increased native hedgerow planting. Proposed mature tree planting within the development plot itself will increase the green edge and soften the transition. Mature tree planting will provide a green street scene for transient users of Burnetts Lane. Views of the landmark structure will be seen amongst surrounding built form, but will break the treeline in views.	High	Moderate to Major Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High
Transient Users of Blind Lane	Medium	Upon completion new built form will be seen in views for transient users of Blind Lane with			-			High

		new buildings forming the foreground of views where Blind Lane meets Burnetts Lane. The new residential development will be a dominant feature when viewed from this junction and views will be direct and uninterrupted, altering the baseline situation of the view. The tree planting proposed along Burnetts Lane when viewed from Blind Lane will partially soften the new development edge, at this time. At year 15, after maturation of the scattered tree planting along Burnetts Lane, there will be some more pronounced softening of views from Blind Lane, however, the location and proximity of the development edge will mean that there are still direct views of new built development experienced by transient users at the junction of Burnetts Lane.	Medium	Moderate Adverse		Medium allowing for maturation by Year 15	Moderate Adverse	
Transient users of Fir Tree Lane	Medium	Once complete, views of the new proposals, associated infrastructure and changes to the route through the site will be partially screened by the retention of existing planting found around Fir Tree Lane, itself. Additional characteristic planting and enhancements to the green corridors will barely be established	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High

		at this time. By year 15, when tree planting and additional structure planting is mature this will soften views of the OPA development.						

Cumulative Effects

Effect	Description	Mitigation	Significance	Confidence Level
N/A	N/A	N/A	N/A	N/A

Impact of Climate Change

Effect	Description	Mitigation	Significance	Confidence Level
Applies to both Scenario 1 and Scenario 2				
Landscape				
Biosecurity threat	Pests and diseases	Use of plant passports and/or UK provenance stock wherever possible and application of Biosecurity Best Practice in all plant sourcing. Delivered through detailed planting specifications, CEMP and Reserved Matters stage.	Minor	High
Surface Water Flooding	Increased rainfall intensity	Incorporation of SuDs measures, with built in capacity	Minor	High

		for climate change scenarios and provision for intense storm and safe overland flow routes. Maximised porous greenspace and surfacing, over impermeable hard surfacing, as far as possible. Incorporation of rain gardens/SuDS features along the link road and within development parcels and the use of tree pits and planting within areas of hardstanding to increase porous surfacing – details to be confirmed through detailed application and reserved matters applications. Utilisation of landscape transition areas and areas of open space to increase storage capacity across site. Delivered through approved Detailed Planning application and Reserved Matters		

		Applications and Technical Approvals.		
Need to avoid increased carbon release into atmosphere and instead improve sequestration	Need for carbon reduction	Conservation of existing mature trees. Low embodied carbon hardscape product sourcing, recycling of site won soil and other products. Planting of new trees and woodland in the public realm/open spaces and fruit trees in private gardens. Encouragement of the use of public transport with accessible and desirable routes to hubs. Also, Encouragement of the use of shared cycle and footpath routes across site. Delivery through approved Outline and Detailed Planning application, Reserved Matters Applications, Technical Approvals and Arboriculture Method Statement.	Minor	Medium
Failure of planting to thrive and	Increased drought events and heat	Use of trees in public spaces and public realm to provide	Minor	Medium

overheating and health effects		summer shading for users of spaces and buildings. Selection of a mix of plant and tree species with identified drought tolerant attributes alongside, best practice soil management, groundcover and tree pit design. Rainwater harvesting and capture for irrigation purposes. Delivered through approved Outline and Detailed Planning application, Reserved Matters Applications and CEMP to deliver effective tree establishment and maintenance.		
Visual				
Slower planting growth rates and increased failures	Poor planting establishment causing reduction in the effectiveness of visual mitigation	Above Biosecurity measures, sensitive species selection, good soil management and incorporation of best practice installation / underground tree systems. Delivery through detailed design and reserved matters applications and an approved CEMP to draw	Minor	High

		attention and set out requirements for achieving effective establishment and to deliver a monitoring regime.		

Table 13.6: Mitigation Implementation

Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Applies to both Scenario 1 and 2				
Tree Protection, habitat, designed transition areas and soil protection and management, control of working hours	Developer/Contractor	Approved Planning Documents including Arboricultural Impact Assessment (AIA), Tree Protection and Removal Plan and Arboricultural Method Statement (AMS), CEMP and CMP.	Arboricultural Method Statement (AMS), Construction Environmental Management Plan (CEMP), Construction Management Plan (CMP) Monitoring and Review Procedures	Construction Phase
Scheme Design, implementation and establishment	Developer/Contractor	Planning Permission and approved drawings and documents	Construction in accordance with approved drawings and documents	Construction Phase, up to 10 years
Open Spaces and maintenance	Developer/Contractor/Council	Planning Permission and S. 106	Landscape and Ecological Management Plan (LEMP)	Operation Phase and in perpetuity

CHAPTER 14: INTERACTIVE EFFECTS, ASSESSMENT SUMMARY AND MITIGATION IMPLEMENTATION

14.1 INTERACTIVE EFFECTS

14.1.1 As discussed in Chapter 5, interactive effects relate to multiple effects from a single development, which may, when experienced together, give rise to a potentially significant impact upon a receptor.

14.1.2 An analysis has been undertaken into specific receptors, or receptor groups, to identify any predicted residual effects common to a receptor across more than one assessment within the preceding chapters of this ES. Where one receptor, or group of receptors, are predicted to experience multiple effects, consideration has been given to the interaction of these effects and whether significant interactive effects are likely to arise as a result. An example would be where a local resident is affected by dust, noise and a loss of visual amenity during the construction of a scheme, with the result being a greater impact than each individual effect alone.

14.1.3 For some environmental effects, no interactions with other impacts can occur and therefore no interactive effects are considered likely to arise. For example, visual impacts do not interact with impacts on sub-surface land contamination. For other environmental effects it is apparent that interactions could occur and impact in different ways upon an individual receptor. Combined cumulative effects are more likely to arise when the receptor or receptor group is more sensitive to change. Typical examples include ecological and human receptors.

14.1.4 The assessment of interactive effects has been undertaken in two stages.

- The identification and collation of any receptors within the technical assessments predicted to experience a residual effect (significant or otherwise) as a result of the Proposed Development.
- Consideration of the potential interactive effects on the identified receptors from multiple effects.

Receptor collation

14.1.5 The identified residual effects, as set out within the individual technical chapters of the ES, have been reviewed against the receptors they affect. Where there is more than one effect on a particular receptor, there is a requirement to determine whether there is the potential for interactions. If there is the potential for effect interactions then consideration has been given as to whether this is likely to result in a combined significant effect.

14.1.6 Where possible, to assist the consideration of possible interactive effects, receptors which share the same characteristics, sensitivities or qualifying features (such as residential properties), have been grouped together into a single receptor type.

14.1.7 It is important to note that under this methodology the largest effect on a receptor group has been used for the consideration of interactive effects. This presents a worst case scenario given that not all individual receptors within a certain receptor group will experience effects to the same degree.

Potential for interactive effects

14.1.8 There is no established EIA methodology for assessing and quantifying the combined effects of individual impacts arising from a proposed development on sensitive receptors. The assessment of potential interactive effects has therefore been based upon professional judgement, taking into account receptor sensitivity and the defined residual effects identified within each technical assessment.

14.1.9 For the purposes of the interactive effects assessment, only residual effects which are classified as being of minor, moderate, or major significance have been considered. Residual effects of negligible significance have been excluded from the assessment of interactive effects as, by virtue of their definition, they are considered to be imperceptible to an environmental resource or receptor.

Table 14.1 Demolition/Construction Phase

Receptor/Receptor Group	Socio-Economics	Air Quality	Transport and Access	Built Heritage	Ecology	Water Environment	Noise and Vibration	Landscape and Visual
Occupiers of existing dwellings/properties in proximity to the Site	×	×	×	×	×	✓ Minor -ve	✓ Mod -ve	✓ Major -ve
The local population in respect of local services, schools, employment opportunities, etc	✓ Minor +ve	×	×	×	×	×	×	×
Users of local roads	×	×	×	×	×	×	×	✓ Mod -ve
Ecological habitats and species	×	×	×	×	✓ Minor /-ve	×	×	×
Surface and groundwater regimes both on and in proximity to the Site	×	×	×	×	×	×	×	×
Public amenity areas (within and surrounding area)	×	×	×	×	×	×	×	✓ Major -ve
The landscape character of the Site and its surrounding environs	×	×	×	×	×	×	×	✓ Major -ve
Sensitive receptors introduced to the Site by the Proposed Development including site workers, future residents, school children, and other users present during the later phases of construction	×	×	×	×	×	×	×	×

✓ =Residual effect predicted at receptor
× = No effect predicted at receptor
\+ = Positive impact
\- = Negative impact
Mod = Moderate

Table 14.2 Occupation Phase

Receptor/Receptor Group	Socio-Economics	Air Quality	Transport and Access	Built Heritage	Ecology	Water Environment	Noise and Vibration	Landscape and Visual
Occupiers of existing dwellings/properties in proximity to the Site	✗	✗	✗	✗	✗	✗	✗	✓ Major -ve
The local population in respect of local services, schools, employment opportunities, etc	✓ Major +ve	✗	✗	✗	✗	✗	✗	✗
Users of local roads	✗	✗	✓ Minor +ve/-ve	✗	✗	✗	✗	✓ Mod -ve
Ecological habitats and species	✗	✗	✗	✗	✓ Minor +ve/-ve	✗	✗	✗
Surface and groundwater regimes both on and in proximity to the Site	✗	✗	✗	✗	✗	✗	✗	✗
Public amenity areas (within and surrounding area)	✓ Major +ve	✗	✗	✗	✗	✗	✗	✓ Major -ve
The landscape character of the Site and its surrounding environs	✗	✗	✗	✗	✗	✗	✗	✓ Mod -ve
Sensitive receptors introduced to the Site by the Proposed Development including site workers, future residents, school children, and other users present during the later phases of construction	✓ Major +ve	✗	✗	✗	✗	✗	✓ Mod -ve	✗

✓ =Residual effect predicted at receptor
✗ = No effect predicted at receptor
\+ = Positive impact
\- = Negative impact
Mod = Moderate

Potential for interactive effects during construction

14.1.10 As shown in table 14.1, during the construction phase, multiple impacts are only predicted for one receptor group; Occupiers of existing dwellings/properties in proximity to the Wider OPA Site and OPA Phase 1 Site.

14.1.11 During the construction phase of the Proposed Development residents are predicted to experience noise and visual impacts. When these occur together it is possible that the negative effects experienced by human receptors at these locations could be heightened, given noise can be perceived more negatively if the source of the noise (e.g construction plant) is also visible.

14.1.12 However, this is likely to only occur at the receptors closest to the Wider OPA/OPA Phase 1 Site, with the majority of the construction works involving activities that are further from receptors. Therefore, It is not considered that any additional mitigation measures are required as a result of this interactive effect above and beyond those already described within this ES.

14.1.13 In addition to this, construction phase effects are restricted to short periods of time due to the transient nature of the works. Through implementation of the CEMP, the combined effect on the identified sensitive receptors will be minimised.

Potential for interactive effects during occupation

14.1.14 As shown in table 14.2, during the occupational phase, multiple impacts are predicted for three receptor groups.

14.1.15 These impacts range in magnitude and are both positive and negative in nature. However, none of these impacts are above Moderate in magnitude. Therefore, it is not considered that the interaction between them would give rise to any significant effects.

14.2 ASSESSMENT AND MITIGATION

14.2.1 Tables 14.3, 14.4. 14.5 and 14.6 provide a summary of the assessments and the predicted residual effects following mitigation implementation and a summary of the proposed mitigation.

Table 14.3: Assessment Summary – OPA Phase 1

SOCIO ECONOMICS							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects							
Employment	Low	Positive	Low	Not significant	None Required	Low	Not Significant
Operation Effects							
Housing Provision	Medium	Positive	Low	Not significant	None Required	Low	Not Significant
Employment	Low	Positive	Low	Not significant	None Required	Low	Not Significant
Pre-School	Low	Negligible	Negligible	Not significant	None Required	Negligible	Not Significant
Primary	High	Negative	Medium	Not significant	Wider OPA 3FE Primary School/Financial Contribution	Negligible	Not Significant
Secondary	Low	Negligible	Negligible	Not significant	None Required	Negligible	Not Significant
GP Practices	High	Negative	Medium	Significant	Financial Contribution	Negligible	Not Significant
Open Space	Medium	Negative	Low	Not significant	None Required	Low	Not Significant
Play Space	Low	Negligible	Negligible	Not significant	None Required	Low	Not Significant
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**

Housing Provision	The Proposed Development is anticipated to generate additional pressure on the local social infrastructure, such as primary school places and primary healthcare facilities.	Financial Contribution	Not Significant
Impact of Climate Change			
Effect	**Description**	**Mitigation**	**Significance**
Residents using or seeking GP services	An increased risk of over overheating due to a forecast increase in mean average air temperature. An increased risk of surface water flooding, and associated water borne diseases resulting from an increase in average annual precipitation and sea level rise. Both of these have the potential to place an extra burden on primary healthcare services, specifically the demand for GP services.	None required	Not significant
Residents using open space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use local open spaces. It is plausible therefore that there would be a more consistent demand for outdoor amenity space.	None required	Not significant
Residents using child play space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use child play space. It is plausible therefore that there could be a more consistent demand for play space.	None required	Not significant

AIR QUALITY							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects							
Demolition Activities	High	Temporary	Negligible	Not Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Earthworks Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Construction Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Track out Activities	High	Temporary	Low	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Operation Effects							
Additional Road Traffic	High	Permanent	Negligible	Not Significant	None	Negligible	Not Significant

Cumulative Effects			
Effect	**Description**	**Mitigation**	**Significance**
Construction Effects	There is the potential for dust impacts from other nearby construction sites during overlapping construction phases.	Mitigation included within the CEMP will reduce dust impacts from the site and thus the cumulative impacts	Not Significant.
Operational Effects	The impact of road traffic effects from committed development within the area. This is included within the modelled traffic data and presented in the results.	Not required	Not Significant
Impact of Climate Change			
Effect	**Description**	**Mitigation**	**Significance**
Construction	Potential for increased dust impacts due to dryer and warmer weather	Not required	Not Significant
Operational Impacts	Climate change unlikely to change impacts of additional vehicle emissions	Not required	Not Significant

TRANSPORT AND ACCESS						
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Significance/Impact Magnitude**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects						
Severance	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Driver Delay	Very High	Temporary	Slight Adverse	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Delay	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Amenity	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Accidents and Safety	Medium	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Hazardous Loads	Low	Temporary	Negligible	Construction Environmental Management Plan	Negligible	

Operation Effects						
Severance	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Improvements and Off-site highway contributions	Negligible or slight adverse	Permanent
Driver Delay	Very High	Permanent	Slight to Moderate Adverse	Sustainable Transport Improvements and Off-site highway contributions	Slight adverse	Permanent
Pedestrian Delay	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Improvements and Off-site highway contributions	Negligible or Slight Adverse	Permanent
Pedestrian Amenity	High	Permanent	Negligible	Sustainable Transport Improvements and Off-site highway contributions	Slight beneficial	Permanent
Accidents and Safety	Medium	Permanent	Slight to Moderate Adverse	Sustainable Transport Improvements and Off-site highway contributions	Slight adverse	Permanent
Hazardous Loads	Low	Permanent	Negligible	Not Required	Negligible	

Cumulative Effects

Effect	Description	Mitigation	Significance
N/A	N/A	N/A	N/A

Impact of Climate Change

Effect	Description	Mitigation	Significance
N/A	N/A	N/A	N/A

BUILT HERITAGE							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**

Construction Effects							
None identified	N/A	Not required	N./A	None identified	N/A	Not required	N./A
Operation Effects							
None identified	N/A	Not required	N./A	None identified	N/A	Not required	N./A
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**
None identified	N/A				Not required		N./A
Impact of Climate Change							
Effect	**Description**				**Mitigation**		**Significance**
None identified	N/A None identified		N/A		None required	N/A	N/A None identified	N/A

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Occupation / Operational Effects – OPA Phase 1								
River Itchen Special Area of Conservation (SAC) and	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
River Itchen SSSI (and other constituent designated sites)			16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds			create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			through reduction in water quality including exposure to substances with chronic or acute consequential effects.			ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent Maritime SAC (and other constituent	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses and transport into the Solent introducing nutrients, metals and other deleterious substances	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
designated sites)			bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the Solent influencing a possible reduction in water quality including exposure to substances with chronic or acute consequential effects.			sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance.		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads,	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and transport into the Solent.			pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent SPA (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including estuaries, intertidal flats, saline lagoons,	Low	Moderate (Could be significant)	The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.			recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details. The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys. However, residents of One Horton Heath will wish to also visit the New Forest SPA. Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites. With the inclusion of the additional on site (and local connected) recreational resources set out in Table 10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore No Significant Likely Occupational/Operational Effect will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the Wider OPA. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						to avoid these effects will be successfully implemented.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						erosion from these areas is considered to be negligible. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Solent and Southampton Water Ramsar (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and thereby the Solent associated features of interest.					
New Forest SPA (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect
New Forest SAC (and other constituent	Disturbance/ degradation of designated features as	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
designated sites)	a result of increased recreation		a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.					
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated	Low	Moderate (Could be significant)		Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is limited to the majority of this SINC, therefore the impact of increased recreational pressure	Low	Negligible (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.			access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Round Copse, West End Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)		Will Not Occur	No likely significant effect
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure is negligible.	Low	Negligible (not significant)	None	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Treeline Break Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Negligible (not significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will Not Occur	No likely significant effect
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure	Low	Negligible (not significant)		Will Not Occur	No likely significant effect
Watercourses (other than those listed or associated with designated sites listed above) –	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants)	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Priority Habitat			substances with chronic or acute consequential effects.			at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust		
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)		Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Minor (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas.	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures		

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						to avoid these effects will be successfully implemented.		
Marshy Grassland	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			in the receiving watercourses and associated features of interest.					
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	See measures included for watercourses	Will Not Occur	No likely significant effect
Hedgerows	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Bats	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	Minor Non-significant likely effect
	Indirect degradation of foraging resource	High	Artificial lighting can attract flying nocturnal invertebrates (particularly moths) drawing them a way form unlit area into lit areas, thereby reducing the availability of prey for light sensitive species (such as brown long-eared bats)	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	Minor Non-significant likely effect
	Increase in predation risk	Low	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Great Crested Newt	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
	Entrapment	High	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Otter	Pollution	Medium	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very low	No likely significant effect
Water Vole	Pollution	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Will Not Occur	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.			to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
Reptiles	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Very Low	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						to avoid these effects will be successfully implemented.		
	Entrapment	High	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Badger	Increase in road collision mortality	Low	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Breeding Birds	Increase in road collision mortality (all species but particularly barn owl)	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Moderate (Could be significant)	Road speeds within Phase 1 will be under 20 Mph through a residential scheme, therefore no increase in road traffic mortality is expected.	Very Low	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Invertebrates	Alteration of behaviour	Medium	Artificial light can alter the behaviour of nocturnal invertebrates, thereby affecting population viability and breeding.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Fish (on site)	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency.	Low	Moderate (Could be significant)	See measures for watercourses	Very Low	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.					
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest.	Low	Moderate (Could be significant)		Very Low	No likely significant effect
	Changes in flow regime	High	Change in riverine flow associated with modified drainage and effects on fish and associated habitat features from a change in flow regime.	Low	Moderate (Could be significant)		Very Low	No likely significant effect

ECOLOGY								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Invasive Species	Spread of invasive species into habitat present (in particular tributaries of the River Itchen)	High	Degradation of affected natural habitats through reduction in diversity and dominance of non-native species that do not provide foraging resource for native invertebrate/animal species.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

HYDROLOGY							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
CONSTRUCTION EFFECTS							
Flood risk to downstream persons and property A CEMP containing site management measures and through the phasing of the delivery of the surface water drainage and flood mitigation measures will minimise effect on site drainage.	Very High	Temporary	Negligible to Very Low Adverse	Neutral to Moderate Adverse	-	Negligible to Very Low Adverse	Neutral to Moderate Adverse

Surface Water Quality Adoption of best practice construction site management with adequate contingency planning, following the principles of pollution prevention will be formalised and incorporated into a CEMP to reduce the risk of a pollution event occurring from potentially polluting construction activities.	Medium to Very High	Temporary	Negligible to Low Adverse	Neutral to Moderate Adverse	Surface water quality monitoring and management plan	Negligible to Low Adverse	Neutral to Moderate Adverse
OPERATION EFFECTS							
Flood risk to downstream persons and property Provision of a surface water drainage system based on SuDS principles to attenuate and release runoff at controlled rate and sequentially designed site layout	Very High	Permanent	Negligible to Low Beneficial	Neutral to Moderate Beneficial	-	Negligible to Low Beneficial	Neutral to Moderate Beneficial
Surface Water Quality Surface water drainage system based on SuDS principles to intercept and provide pollution treatment	Medium to Very High	Permanent	Negligible to Low Adverse	Neutral to Moderate Adverse	Surface water quality monitoring and management plan	Negligible to Very Low Adverse	Neutral to Moderate Adverse
Nutrients Connection to public sewer draining to Peel Common WwTW and	Very High	Temporary	Very Low	Moderate Adverse	Deliver 'Nutrient Neutrality' and net reduction as part of Wider OPA	Negligible to Medium Beneficial	Neutral to Major Beneficial

delivering on-site and off-site nutrient mitigation.							

NOISE AND VIBRATION							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects – OPA Phase 1							
Noise at existing residential	Medium	Noise audible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Vibration at existing residential	Medium	Vibration perceptible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Construction Effects – The Wider OPA							
Noise at existing residential	Medium	Noise audible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Vibration at existing residential	Medium	Vibration perceptible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Noise at nearby bird habitats	Medium	Bird response to construction noise	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Noise and vibration at fish habitats	Medium	Fish response to construction noise and vibration	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Operation Effects – OPA Phase 1							
Development generated road traffic	Medium	Audible change in noise environment at existing receptors	Negligible	Neutral	n/a	Negligible	Neutral
Noise in proposed gardens	Medium	Noise present in gardens	Negligible	Neutral	2m high garden wall/fencing	Negligible	Neutral

Noise in proposed habitable rooms	Medium	Noise present in habitable rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Industrial noise at proposed dwellings Chalcroft Industrial Estate	Medium	Industrial noise present at proposed dwellings	Negligible	Neutral	n/a	Negligible	Neutral
Operation Effects – Wider OPA							
Development generated road traffic	Medium	Audible change in noise environment at existing receptors	Low - Negligible	Moderate - Neutral	n/a	Low - Negligible	Moderate - Neutral
Noise in proposed gardens	Medium	Noise present in gardens	Medium - Negligible	Major - Neutral	2m high garden wall/fencing in combination with 15m standoff. Alternative location of gardens on screened side of dwellings	Negligible	Neutral
Noise in proposed habitable rooms	Medium	Noise present in habitable rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Noise at proposed school	Medium	Noise present in teaching areas	Negligible	Neutral	n/a	Negligible	Neutral
Noise at proposed school	Low	Noise present in offices and meeting rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Industrial noise at proposed dwellings Chalcroft Industrial Estate	Medium	Industrial noise present at proposed dwellings	Medium - Negligible	Major - Neutral	2m high close boarded fencing	Low	Moderate
Cumulative Effects							

Effect	Description	Mitigation	Significance
Change in road traffic noise 2020 to 2023	Change in road traffic noise levels as a result of the OPA Phase 1 development, in combination with committed developments and general increase in baseline environment over time.	n/a	Negligible
Change in road traffic noise 2020 to 2030	Change in road traffic noise levels as a result of the Wider OPA development, in combination with committed developments and general increase in baseline environment over time.	n/a	Low

Impact of Climate Change			
Effect	**Description**	**Mitigation**	**Significance**
n/a			

LANDSCAPE AND VISUAL								
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**	**Confidence Level**
Construction Effects								
OPA Phase 1 and Link Road -Scenario 1								
Landscape Receptors To be read in conjunction with ES Volume 1, Figures 13.4, 13.5-13.7 and 13.12								
Horton Heath LCA	Low	Direct on and off-site impacts from construction highway infrastructure, building construction operations and associated traffic.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Chalcroft LLCA	Low	Direct impacts from construction works on the site, introducing plant vehicles, movement, and construction activity. Direct impact of Hedgerow removal. Localised, indirect impacts from construction activity of part of Burnett's Way and impacts arising from the detailed scheme implementation	Temporary Medium to High	Temporary Moderate Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High
Quobleigh LLCA	Low	Construction works will directly impact upon the character of Fir Tree Lane and the setting of Fir Tree Farm as well as impacting on existing PRoW and recreation routes through the site. There will be Direct removal of small sections of tree planting and indirect effects arising from the implementation of the landscape works will have an indirect impact on the setting of this area	Temporary Medium to High	Temporary Moderate Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High
Site wide	Medium	Road and building construction works will directly impact existing tree belts where the link road will sever this planting in two locations. There will be direct removal of areas of gappy hedgerows to make way for housing and road construction. There will a need for be temporary footpath closure. Indirect disturbance effects from construction traffic and activity on ancient woodland and Chalcroft Farm, are also predicted given proximity.	Localised Temporary Medium to High	Temporary Moderate Adverse	-	Localised Temporary Medium to High	Temporary Moderate Adverse	High

Visual Receptors To be read in Conjunction with ES Volume1, Figures 13.10 and 13.11 Photosheets								
Recreational users of PRoW F2	Medium	Construction traffic and activity will be present in the view and this will be temporary.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW F3	Medium	Movement and activity associated with the development of the Phase 1 works and the link road construction will be in close proximity	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate/ Adverse	High
Recreational users of PRoW F10 and F11	Medium	Traffic movement, construction and activity associated with the link road will be seen when travelling west towards Allington Lane where the link road crosses the existing PRoW	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW B743, B744, B746, and B780	Medium	Recreational users of the footpaths to the west of Allington Lane will experience glimpsed views of the site and the likely change in views associated with the development will be seen as a result of the construction of the link road. Having said this, construction work associated with the roundabout construction is already seen within these views and in places where vegetation has been removed along Allington Lane to accommodate the new access into the site.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Residents overlooking the eastern edge of the site	High	Construction traffic, activity and movement will be seen in close proximity for residents living on the south eastern edge of the site who sit in a slightly elevated position above the site.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Residents on Fir Tree Lane	High	Construction traffic and activity will be introduced to views experienced given the proximity of the link road and the access off Allington Lane.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Transient users of Burnetts Lane	Medium	Construction traffic, activity and movement will be seen in close proximity for transient users of Burnetts Lane	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient Users of Blind Lane	Medium	Activity and movement associated with the Phase 1 works will be seen in views for transient users of Blind Lane whose views look directly across towards the site from the east	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient users of Fir Tree Lane	Medium	Users of Fir Tree Lane will experience a change in their view as a result of the new link road construction and this change will affect the western most part of this route	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Operation Effects								

OPA Phase 1 and Link Road -Scenario 1								
Landscape								
Horton Heath LCA	Low	At completion, the development will introduce an uncharacteristic feature within the LCA of a larger scale than other built form in the local surroundings. The proposed landmark structure positioned at the southern gateway will be located amongst the setting of residential and employment land use. With the maturation of the strategic landscape planting and trees within open spaces and along streets, the development will be better assimilated into the landscape. However, given the scale of development in relation to other built form in the LCA some adverse impact on landscape character will remain.	Medium	Moderate Adverse	-	Low to Medium	Minor to Moderate Adverse	High
Chalcroft LLCA	Low	At completion, the development will introduce uncharacteristic features within the LLCA and will increase the scale of the residential development and introduce further built form. The lack of maturity of new planting, at this stage. The proposed landmark structure positioned at the southern gateway will be located amongst the setting of residential and employment land use. The characteristic watercourse running along the southern edge of the solar farm will be incorporated into the proposals and at completion this landscape transition zone will have been enhanced with additional characteristic planting to reinforce existing landscape character. There will continue to be some adverse impacts on the LLCA at this stage given the change in context to surrounding areas and the introduction of built form together with the lack of maturity of new planting, at this stage. By year 15, with the maturation of the link road tree planting, landscape transition areas, trees and hedgerows within the open spaces of the Phase 1 scheme, the development will be better	Medium	Minor Adverse	-	Low and Positive allowing for maturation of the scheme landscape design, by Year 15	Minor Beneficial	High

		assimilated into the landscape and will integrate characteristic planting to respond to the wider context of the LLCA. The incorporation of additional advanced planting across the Phase 1 site and within emerging parcels will further integrate the development into the landscape. The designed landscape transition zone alongside the ancient woodland will also result in an increased area of habitat enhancement across that area. By this stage the new rain gardens alongside the link road and blue green infrastructure, open spaces, and ecological corridors and some new recreation spaces and access links will provide increasingly beneficial impacts in terms of landscape character and land use. At the same time the established greenspaces will provide additional positive ecosystem services, in a climate resilient manner.						
Quobleigh LLCA	Low	At completion, the development will introduce an uncharacteristic feature within the LLCA in the form of the link road which will increase the scale and proximity of built form within the LLCA. Retained areas of Green Infrastructure will at completion of the link road assist in retaining the characteristic contained nature of the various parcels across the site. Enhancements to the existing landscape framework and green infrastructure and additional planting associated with the link road construction only just establishing at this stage. With the maturation of the associated strategic landscape planting, the planting found along the link road and the enhancements to the characteristic landscape framework within which the site is located, the phase 1 development and the link road will be better assimilated into the landscape and will integrate characteristic planting and combine with positive architecture to positively respond to the context and setting of the LLCA.	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation of the scheme landscape design, by Year 15	Minor Beneficial	High
Site wide	Medium	Upon completion, the development of the Phase 1 scheme, associated infrastructure and the link	Medium	Minor Adverse	-	Low and Positive allowing for	Minor Beneficial	High

		road construction will give rise to the introduction of some uncharacteristic features which will be near site features. The loss of some areas of hedgerow within the Phase 1 parcel along with sections of tree planting will result in permanent loss at completion. Enhancements to retained landscape features will at completion not provide their full benefits. Over time new planting will mature to a more appreciable scale. New characteristic tree and hedgerow planting and enhancements to watercourses and blue infrastructure will also become more apparent so that by year 15 these features will provide increased habitat, amenity and recreation assets.				maturation of the scheme landscape design, by Year 15		
Visual								
Recreational users of PRoW F2	Medium	On completion, users of PRoW F2 when travelling south towards Chalcroft will see new built form brought in closer proximity to their view. Planting proposed along the footpath route and within the watercourse landscape buffer to the north of the Phase 1 works will only just be established. Development will be largely contained and kept below the skyline (with the exception of the landmark feature) By Year 15, views of the development for users of PRoW F2 will be filtered and softened by the presence of tree and hedgerow planting found adjacent to the new development edge and along the watercourse to the north of the Phase 1. However, new Phase 1 built development and the link road will continue to occupy the view at a closer proximity.	Medium	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High
Recreational users of PRoW F3	Medium	Upon completion of the Phase 1 and link road development, users of PRoW F3 will see a major alteration to their view when seen travelling from Burnetts Lane to the west. The introduction of built form will be set back behind retained hedgerows and allows for proposed tree planting between plot frontages and the upgraded footpath route. Built form will be seen in close proximity for users along	Medium	Moderate Adverse	-	Medium by year 15 with maturation of planting	Minor to Moderate Adverse	High

		this footpath, however, the open and undeveloped nature of the watercourse corridor will be retained to the north of this footpath. The completed link road will also introduce new features into the landscape when viewed from this footpath route where it crosses the PRoW to the south of the solar farm.The proposed landmark structure will be seen within the context of built form. By year 15, once matured, planting along Chalcroft track and along the upgraded footpath and cycle route will provide a soft transition to the new settlement edge and to the wider site beyond. Internal street scene planting will soften built form and provide glimpses of green corridors running through the development when viewed from the north.						
Recreational users of PRoW B743, B744, B746, and B780	Medium	Once complete, views of the link road and associated infrastructure from these footpaths will be screened by the presence of planting found along Allington Lane. The proposed tree planting around the link road will be yet to reach maturity and therefore will not serve to reduce the visual impact at completion. By year 15, Once avenue tree planting is mature, this will assist in filtering views and adding to the established planting found along Allington Lane	Medium	Moderate Adverse	-	Low Adverse by year 15 with maturation of planting	Minor Adverse	High
Recreational users of PRoW F10 and F11	Medium	Upon completion of the link road, recreational users of PRoW F10 and F11 will experience a change in their views where the new link road cuts across the existing PRoW. Where this crossing point is proposed, new areas of tree planting will aid its assimilation into the landscape and filtering of views once mature but at completion will afford direct views of the link road and associated infrastructure. Upon maturity of planting, the link road will be softened by proposed planting at the western edge of the site with tree planting filtering views of the road and its associated infrastructure.	Medium to low	Moderate Adverse	-	Low, by year 15 with maturation of planting	Moderate Adverse	High

Residents overlooking the eastern edge of the site	High	Upon completion, residents overlooking the site will have a change in their view with built form and residential properties set behind a new landscape transition zone. At the entrance into the site the proposed landmark structure will sit above the adjacent built form and will break the skyline in views, however this will be seen amongst the context of surrounding built form and development While this landscape transition zone matures, it is likely that views of the development will be dominant and an uncharacteristic feature within the views experienced. By year 15, a proposed landscape buffer will have matured in the foreground and proposed mature tree planting within the development plot itself will increase the green edge and provide a softer transition. Mature tree planting will provide a green street scene for residents living along Burnetts Lane	High	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High
Residents on Fir Tree Lane	High	Upon completion, views of the link road for residents on Fir Tree Lane will be partially filtered by the presence of establishing avenue tree planting. By year 15, when avenue tree planting is mature, this will soften views experienced towards the new link road and integrate this into views. Residents living on Fir Tree Lane will at this time see the proposed characteristic planting and a soft edge to the link road.	Medium	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Minor Adverse	High
Transient users of Burnetts Lane	Medium	Upon completion, transient users of Burnetts Lane will experience a change in their view with built form and new residential properties set behind a new landscape transition zone.At the entrance into the site the proposed landmark structure will sit above the adjacent built form and will break the skyline in views, however this will be seen amongst the context of surrounding built form and development By year 15, Views across the open landscape will not be retained but replaced with a mature landscape buffer of characteristic planting and	High	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High

		increased native hedgerow planting. Proposed mature tree planting within the development plot itself will increase the green edge and softer transition and mature tree planting will provide a green street scene for transient users of Burnetts Lane.						
Transient Users of Blind Lane	Medium	Upon completion, new built form will be seen in views for transient users of Blind Lane with new buildings forming the foreground of views where Blind Lane meets Burnetts Lane. The new residential development will be a dominant feature when viewed from this junction and views will be direct and uninterrupted, altering the baseline situation of the view. It is likely that glimpsed views of the proposed landmark structure will be seen breaking the skyline in views as receptors travel down Blind Lane. Although these views will be seen in the context of additional new built form in places views of the landmark structure will break above the fields seen above Burnetts Lane. The tree planting proposed along Burnetts Lane when viewed from Blind Lane will offer some softening of the new development edge but will not be mature at this stage. At year 15, upon maturation of the scattered tree planting along Burnetts Lane, there would be some notable softening of views from Blind Lane, however, the proximity of the development edge when viewed by transient users at the junction of Burnetts Lane will remain noticeable.	Medium	Moderate to Major Adverse	-	Medium, by year 15 with maturation of planting	Moderate Adverse	High
Transient users of Fir Tree Lane	Medium	Once complete, views of the link road and associated infrastructure will be partially screened by the presence of planting found around the Listed Building, at field boundaries and along Fir Tree Lane itself. The proposed tree planting around the link road will be yet to reach maturity and therefore will not serve to reduce the visual impact at this stage. At year 15, when the avenue tree planting is mature, this will filter views toward the new link road and integrate this into views.	Medium	Moderate Adverse	-	Medium, by year 15 with maturation of planting	Minor Adverse	High

Table 14.4: Assessment Summary – Wider OPA

SOCIO ECONOMICS							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects							
Employment	Low	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Operation Effects							
Housing Provision	Medium	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Employment	Low	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Pre-School	Low	Negligible	Negligible	Not Significant	None Required	Negligible	Not Significant
Primary	High	Positive	Low	Not Significant	None Required	Low	Not Significant
Secondary	Low	Negligible	Negligible	Not Significant	None Required	Negligible	Not Significant
GP Practices	High	Negative	High	Significant	Financial Contribution	Negligible	Not Significant
Open Space	Medium	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Play Space	Medium	Positive	Medium	Not Significant	None Required	Medium	Not Significant
Cumulative Effects							

Effect	Description	Mitigation	Significance
Housing Provision	The Proposed Development is anticipated to generate additional pressures on the local social infrastructure, such as primary healthcare facilities.	Financial Contribution	Not Significant
Impact of Climate Change			
Effect	**Description**	**Mitigation**	**Significance**
Residents using or seeking GP services	An increased risk of over overheating due to a forecast increase in mean average air temperature. An increased risk of surface water flooding, and associated water borne diseases resulting from an increase in average annual precipitation and sea level rise. Both of these have the potential to place an extra burden on primary healthcare services, specifically the demand for GP services.	None required	Not significant
Residents using open space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use local open spaces. It is plausible therefore that there would be a more consistent demand for outdoor amenity space.	None required	Not significant
Residents using child play space	The forecast increase in the mean average temperature is likely to encourage people outdoors more often to use child play space. It is plausible therefore that there could be a more consistent demand for play space.	None required	Not significant

AIR QUALITY							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects							
Demolition Activities	High	Temporary	Negligible	Not Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Earthworks Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Construction Activities	High	Temporary	Medium	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Track out Activities	High	Temporary	Low	Potentially Significant	Specific measures to be included in the CEMP as outlined in Appendix 7.4	Negligible	Not Significant
Operation Effects							

Additional Road Traffic	High	Permanent	Negligible	Not Significant	None	Negligible	Not Significant

Cumulative Effects

Effect	Description	Mitigation	Significance
Construction Effects	There is the potential for dust impacts from other nearby construction sites during overlapping construction phases.	Mitigation included within the CEMP will reduce dust impacts from the site and thus the cumulative impacts	Not Significant.
Operational Effects	The impact of road traffic effects from committed development within the area. This is included within the modelled traffic data and presented in the results.	Not required	Not Significant

Impact of Climate Change

Effect	Description	Mitigation	Significance
Construction	Potential for increased dust impacts due to dryer and warmer weather	Not required	Not Significant
Operational Impacts	Climate change unlikely to change impacts of additional vehicle emissions	Not required	Not Significant

TRANSPORT AND ACCESS						
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Significance/Impact Magnitude**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects						
Severance	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Driver Delay	Very High	Temporary	Slight Adverse	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Delay	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Pedestrian Amenity	High	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary
Accidents and Safety	Medium	Temporary	Negligible	Construction Environmental Management Plan	Negligible	Temporary

Hazardous Loads	Low	Temporary	Negligible	Construction Environmental Management Plan	Negligible	
Operation Effects						
Severance	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Negligible or slight adverse	Permanent
Driver Delay	Very High	Permanent	Slight to Moderate Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Slight adverse	Permanent
Pedestrian Delay	High	Permanent	Negligible or Slight Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Negligible or Slight Adverse	Permanent
Pedestrian Amenity	High	Permanent	Negligible	Sustainable Transport Strategy, Off-site highway works and contributions	Slight beneficial	Permanent
Accidents and Safety	Medium	Permanent	Slight to Moderate Adverse	Sustainable Transport Strategy, Off-site highway works and contributions	Slight adverse	Permanent
Hazardous Loads	Low	Permanent	Negligible	Not Required	Negligible	
Cumulative Effects						

Effect	Description	Mitigation	Significance
N/A	N/A	N/A	N/A
Impact of Climate Change			

Effect	Description	Mitigation	Significance
N/A	N/A	N/A	N/A

BUILT HERITAGE							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects							

Physical impact to Firtree Farmhouse as a result of change in use (arising from changes to building fabric and possible wear and tear associated with new use)	Grade II Listed Building – designated heritage asset of less than the highest significance	Direct, permanent	Negative (level cannot be ascertained on the basis of current information)	Negative (level cannot be ascertained on the basis of current information)	Heritage Impact Assessment following identification of new change of use. Potential further measures could include historic building watching brief.	Minor Negative	Minor Negative
Non-physical impact to Firtree Farmhouse as a result of construction traffic, machinery, noise and vibrations, hoarding, and alteration of views due to removal of vegetation	Grade II Listed Building – designated heritage asset of less than the highest significance	Indirect, temporary	Minor Negative	Minor Negative	Any required hedgerow removal should be carefully sited and limited in scale. Appropriate siting of construction activities.	Minor Negative	Minor Negative
Non-physical impact to Firtree Farmhouse due to removal of Victoria House	Grade II Listed Building – designated heritage asset of less than the highest significance	Indirect, permanent	Neutral	Neutral	None required	Neutral	Neutral
Operation Effects							
Non-physical impact to Firtree Farmhouse due to changes in its setting resulting from presence of new development	Grade II Listed Building – designated heritage asset of less than the highest significance	Indirect, permanent	Negative (level cannot be ascertained on the basis of current information)	Negative (level cannot be ascertained on the basis of current information)	Retention of the key aspects of the immediate garden setting of Firtree Farmhouse and potential reinstatement of orchard planting. Retention and enhancement of existing vegetation screening. Adoption of appropriate design standards and layout of new buildings.	Minor Negative	Minor Negative
Cumulative Effects							
Effect	**Description**				**Mitigation**		**Significance**

None identified	N/A	Not required	N./A

Impact of Climate Change

Effect	Description	Mitigation	Significance
Potential impact to historic fabric of Firtree Farmhouse	Potential damage to and/or deterioration of building fabric as a result of increased rainfall and driving winds.	Adopt and implement an appropriate maintenance strategy. Improvements to building's thermal performance, should be undertaken with due consideration of the appropriate guidance and an understanding of the performance of the building fabric.	Minor Negative

ECOLOGY (CONSTRUCTION EFFECTS)

Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Construction Effects - Wider OPA and Link Road								
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment	Low	Moderate – could be significant	Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from	Very low	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.			the bank edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to		
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest.	Low	Moderate – could be significant		Will not occur	Significant positive likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of hydrological regime	V High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665	Low	Moderate – could be significant	water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details. Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net zero nutrient and sediment emission measures described in above.	Will not occur	No Likely Significant Effect
Solent Maritime SAC (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			(redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes, macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, through the conversion to urban land use and low nutrient managed open spaces	Low	Moderate – could be significant		Will not occur	Significant positive likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			and habitats with potential effects on eutrophication levels in the River Itchen and associated features of interest.					
	Modification of hydrological regime	V High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the Itchen at SU 46198 16665	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect
Solent SPA (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with potential effects on eutrophication levels and associated features of interest.	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect
Solent and Southampton Water RAMSAR (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	V High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and transport into the Solent, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and transported into the Solent resulting in a reduction in water	Low	Moderate – could be significant	See measures for River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other constituent designated sites)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	V High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses and transported to the Solent with potential effects on eutrophication levels and associated features of interest.	Low	Moderate – could be significant		Will not occur	No Likely Significant Effect
New Forest SPA (and other constituent designated sites)	No likely significant effects						Will not occur	No Likely Significant Effect
New Forest SAC (and other constituent designated sites)	No likely significant effects						Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Emer Bog SAC (and other constituent designated sites)	No likely significant effects						Will not occur	No Likely Significant Effect
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects. Works are sufficiently distant from this SINC with limited pathways such that direct construction phase effects are unlikely.	Low	Moderate (could be significant)	Production of a detailed Construction Environmental Management Plan (CEMP) (see table 10.7 for detailed description of required components) A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: • No excavation (except SuDS, respecting RPAs) • No construction related activities or activities likely to have negative effect on habitat • Biodiversity Enhancement permitted	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						• No additional lighting >0.5lux The 15m ecological buffer will be demarcated with a significant species rich hedgerow, fence earth bank and ditch features to prevent public access into these areas. The ecological buffer will be designed to effectively extend the existing habitats within the SINC woodland and to provide a transitional habitat and structure, replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the following restricted uses and constraints: • Footpaths • Cycleways • SuDS • Biodiversity enhancement permitted		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						• Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux. It is envisaged that ecological enhancement measures will be delivered at the earliest available opportunity. Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs. A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement. A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat creation measures and to inform a responsive system of remedial works to ensure that the condition of retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC;		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						therefore, the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.		
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)	Design measures have been included within the SuDS scheme (see Chapter 11 of this ES) to avoid changes to the hydrological regime, water quality or soil levels that would negatively affect trees and shrubs. A robust water quality monitoring regime of all SUDS basins and flows into/out of the One Horton Heath Site (including sediments, turbidity, conductivity, pH, nitrates and phosphates) will be implemented to provide feedback on the efficacy of net zero nutrient/sediment (including SuDS) treatment measures and to inform a responsive system of remedial management works to ensure that the long-term function of these features is maintained. Please refer to Chapter 11 of this ES for full details. Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and	Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			characteristics and quality entering the SINC			zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.		
Round Copse Site of Importance for Nature Conservation (SINC)	Pollution	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Heart's Copse Site of Importance for Nature	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Conservation (SINC)			Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality		Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of onsite hydrological regime affecting habitats.		Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Treeline Break Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			soil and water quality including exposure to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Field West of Treeline Break (Long Field) Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Quobleigh Pond and Woods Site of Importance for Nature Conservation (SINC)	Direct damage	High	Deposition of dust arising from construction activities. Discharge of soil/sediment from construction activities into the SINC from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the SINC, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the SINC through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the SINC	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Fair Oak School Meadow Site of Importance for Nature Conservation (SINC) / Wyvern Technical College Meadow Site of Importance for Nature Conservation (SINC)	Pollution	High	Deposition of dust arising from construction activities. Specific buffer prescriptions have been agreed for the protection of existing watercourses.	Very Low	Minor Non-significant	Production of a detailed Construction Environmental Management Plan (CEMP) (see table 10.7 for detailed description of required components)	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) (measured from the bank edge of water limit when watercourse is full). Watercourse severance has been minimised through the development. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the habitat through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the watercourse and associated features of interest.	Low	Moderate (could be significant)		Will not occur	Significant positive likely effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Negligible	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Ponds – see bats, birds, amphibians and reptiles as well– Priority Habitat	Habitat Change	High	The poor condition pond at Chalcroft Farm will be protected and restored through the development. The pond in Quobleigh wood will be unaffected by construction and enhanced. A net increase in ponds will be delivered by the proposals including a network of new wildlife ponds along the western boundary of the site to facilitate recolonisation of the southwest of the site by great crested newts and extend the range and population size of the Quobleigh metapopulation	Low	Moderate (could be significant)	All ponds will be subject to high quality conservation management delivered in perpetuity under a detailed LEMP.	Low	Non-Significant positive likely effect
	Direct damage	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See also measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the SINC and associated features of interest.	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect
Parkland	Habitat Change	High	The area of parkland on site will be extended though planting by 0.5 ha (50%)	Low	Moderate (could be significant)		Low	Non-Significant positive likely effect
	Pollution	High	Deposition of dust arising from construction activities.	Low	Moderate (could be significant)	See also measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Will not occur	No Likely Significant Effect
Marshy Grassland – see bats, birds, amphibians and reptiles as well – Priority Habitat	Habitat Change	High	Construction activities will result in an unavoidable loss of 0.24ha of poor quality areas of marshy grassland	Low	Moderate (could be significant)	The retained habitat areas will be significantly enhanced and managed in perpetuity to increase species diversity through improvements to the hydrological and grazing regimes to increase the value of these habitats. Additional wetland habitat will also be	Low	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						provided in the form of ponds and wetland habitats to compliment these retained habitat areas.		
	Direct damage	High	Deposition of dust arising from construction activities. Damage to retained habitats through accidental access with machinery. Discharge of soil/sediment from construction activities into the feature from surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)	Areas of this habitat will be immediately adjacent to areas of significant construction works. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very low	No Likely Significant Effect
	Change in nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving	Low	Moderate (could be significant)		Very low	Non-Significant

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	affecting water quality		watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the feature and associated features of interest.					positive likely effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Moderate (could be significant)		Very low	Non-Significant positive likely effect
Hedgerows	Habitat Change	High	Construction activities will result in an unavoidable loss of 1.17km of hedgerows.	Medium	Major (could be significant)	6.24km of new native, species rich hedgerow (with trees) will be created. These hedgerows will be protected by a minimum 5m buffer from the development and not subject to lighting levels >0.5 lux. These will be managed in perpetuity for the benefit	Low	Non-Significant positive likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						of wildlife under a comprehensive LEMP. The OPA net position shows: •Loss of 1.17 km of hedgerow (9.3% of baseline) •Retention of 9.21km of hedgerow (73 % of baseline) •Creation of 6.24 km of new species rich hedgerows This results in a post construction figure of 15.45 km resulting a total species rich hedgerow net gain of 22.8%. •Enhancement of 2.2km of retained hedgerow from species poor to species rich hedgerows, with standard trees where appropriate. This is in addition to the 22.8% gain in extent.		
	Direct Damage	High	Deposition of dust arising from construction activities. Damage to retained habitats through accidental access with machinery. Discharge of soil/sediment from construction activities into the feature from	Moderate	Moderate (could be significant)	Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created on a minimum of a like for like basis.	Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			surface runoff introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of soil and water quality including nutrient enrichment. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature, affecting designated features through reduction in soil and water quality including exposure to substances with chronic or acute consequential effects.			Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas. Areas of this habitat will be immediately adjacent to areas of significant construction works. See measures for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)		
	Change in nutrients affecting water quality	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses into the feature through the conversion to urban land use and low nutrient managed open spaces and habitats with potential effects on eutrophication levels in the feature and associated features of interest.	Low	Moderate (could be significant)		Will not occur	Significant positive likely effect
	Modification of onsite hydrological regime	High	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems,	Low	Moderate (could be significant)		Will not occur	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	affecting habitats.		blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature					
Broadleaved Semi-Natural Woodland	Habitat Change	High	The construction of the link road and local road sections will result in the unavoidable loss of 0.8ha (12.3%) of semi-natural broadleaved woodland on site, at either end of the central woodland belt.	Medium	Major (significant)	Measures described in 10.7 and Table 10.11 and illustrated on the Integrated / Embedded Landscape, Visual, Ecological Mitigation drawing location in Appendix 10.12 of this chapter of the ES are considered adequate to mitigate for construction phase effects. Measures described for the adjacent woodland SINC sites (Quobleigh Pond and Woods, Round Copse, Treeline Break and Chalcroft Business Park), are also applicable to this habitat. The development will result in the creation of 5.6ha of semi-natural broadleaved woodland in areas designed to effectively extend the existing mature woodland and designated SINC sites. This results in	Very Low	No Likely Significant Effect
	Pollution	High	Deposition of dust arising from construction activities. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into the feature including exposure to substances with chronic or acute consequential effects.	Low	Moderate (could be significant)		Very Low	No likely significant effect
	Direct damage	High	Direct impact through plant movement in RPAs or accidental physical damage.	Low	Moderate (could be significant)		Low	No likely significant effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Modification of onsite hydrological regime affecting habitats.	High	Modification of onsite hydrological regime through modifications to soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction supply of water or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality supplying the feature.	Low	Moderate (could be significant)	a total of 11.3 ha of woodland across the site post construction, a net increase in this priority habitat of 164%. The location of these areas of new habitat will complement the existing habitats and will be more likely to succeed on an accelerated timescale due to the presence of a mature donor habitat immediately adjacent to these locations. The existing areas of woodland on site will be enhanced through sensitive planting to promote greater species diversity in both species and structure of the woodlands by implementing a planting and management scheme to enhance herb, scrub and canopy layers and to account for the predicted loss of ash trees within the woodlands to Ash Dieback.	Low	No Likely Significant Effect
Bats	Removal of habitat features	High	Impacts on bat roosts and supporting habitats (including buildings, hedgerows, woodlands, watercourses and mature trees) and adjacent habitats.	High	Major (significant)	A number of low status roosts for common bats species are present within the buildings on site, the majority of which are to be demolished. These will be compensated for through the provision of roost type/species appropriate bat boxes and “natural” roost features created on retained trees in appropriate locations (i.e. in close proximity to existing flight lines,	Very Low	No Likely Significant Effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						adjacent to high value habitat, relatively undisturbed and unlit areas). A maternity roost for brown long-eared bats will be directly affected by the demolition. A mitigation roost will be constructed in the vicinity of Hearts Copse following the criteria for this roost type as described in the bat mitigation guidelines and delivered under licence. Substantial tree and shrub planting will reinforce the connection this location to existing flight lines and maternity roost locations within Hearts Copse. The removal of mature trees has been minimised through careful masterplan layout. Where trees containing potential roost features are retained, these will be protected by the buffer specifications as described for hedgerows (O & P) and woodland (G) in section 10.7. Where trees with potential roost features are required to be removed, a precautionary principle will be applied that assume the presence of the most likely roost type for the feature. This is considered appropriate as tree roosts are dynamic and can be readily		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						occupied/abandoned by a variety of species at any given time, making firm assessment of the roost types present particularly challenging. Mitigation and licensing requirements will therefore be informed by subsequent inspections prior to any impacts on these features. A suite of species and habitat specific monitoring regimes will be implemented to provide feedback on the efficacy of mitigation and habitat creation measures for specific receptor species in accordance with legislative and policy requirements. This monitoring will inform a responsive system of remedial measures to ensure that the intended function of these measures is realised and maintained in perpetuity. See A to N and T to X above.		
	Habitat Severance	High	Severance of key habitat connecting roost and feeding/breeding areas etc. Artificial lighting of habitat features during construction. Increased lighting levels associated with new link road, estate roads and additional external and internal building lighting may result in indirect	High	Major (significant)	Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats.	Very Low	Minor Non-significant likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			impacts on foraging and commuting habitats (disturbance, ultimately resulting in loss of habitat)			•Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation •Minimising the width of the road crossing •Clear span design •Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. •A minimum height of 3m under bridge crossings. •Sensitive design of any lighting that may be required in these areas. •Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses.		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource including through severance and lighting effects.	High	Major (significant)	The loss of foraging habitat across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (see G, H, I, O & P). Additional habitat creation and enhancement measures described above for woodland (including woodland extensions), hedgerows, marshy grassland, ponds, watercourses and water quality will all enhance the foraging provision on site within the retained habitats.	Very Low	Minor Non-significant likely effect
Great Crested Newt	Pollution	High	Accidental pollution on site construction activities (e.g. hydrocarbons, herbicides, paints, solvents and other materials used) and discharge into habitats used including exposure to substances with chronic or acute consequential effects.	High	Major (significant)	Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been largely avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected	Very Low	Minor Non-significant likely effect
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, marshy grassland, woodlands,	High	Major (significant)		Very Low	Minor Non-significant likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			watercourses and mature trees) and adjacent habitats.			during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated		
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat within 250m of breeding pond and associate traffic movements.	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	High	Major (significant)		Very Low	Minor Non-significant likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat within 500m to two restored and two created and optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation. The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking		

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan. See A to N		
Otter	Habitat Severance	High	Habitat fragmentation due to habitat loss and disturbance	Low	Moderate (could be significant)	The riparian corridors across the site are considered to be connective habitat for otter and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction. The design principles describe above for bats will also allow otter to move freely along the riparian corridor under	Very Low	No likely significant effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						the link road and therefore reduce collision risk.		
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat within 30m of riparian habitats and associate traffic movements.	Low	Moderate (could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction and maintain connectivity.	Very low	No likely significant effect
Water Vole	Habitat Severance	Low	Habitat fragmentation due to habitat loss and disturbance	Low	Negligible (not significant)	The riparian corridors across the site are considered to be connective habitat for water vole and are minor tributaries of the River Itchen and therefore a potential pathway for pollution effects including sediment and hydrocarbons. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to	Will Not Occur	No likely significant effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						water vole in the wider river catchment during construction. The design principles describe above for bats will also allow water vole to move freely along the riparian corridor under the link road and therefore reduce collision risk and maintain connectivity.		
	Killing/injury	Low	Constriction operations in/adjacent to suitable habitat within 30m of riparian habitats and associate traffic movements.	Low	Moderate (could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for the River Itchen SAC and SSSI also afford protection to otter in the wider river catchment during construction.	Will Not Occur	No likely significant effect
Dormouse	Disturbance	High	Construction activity and noise in proximity to nest sites.	High	Major (significant)	See A- N and T above Ongoing annual dormouse tube monitoring to inform licencing requirements for each phase of the project.	Very Low	Minor Non-significant likely effect
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including hedgerows, woodlands, and mature trees)	High	Major (significant)		Very Low	Minor Non-significant likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			and adjacent habitats connected to central woodland within territorial range.			Avoidance of hedgerow severance within 150m of confirmed records (currently only within woodland north of solar farm). No lighting associated with road crossings of woodland habitat Installation of suitable aerial structure (e.g. Peoples Trust for Endangered Species, 2019[1]) across roads severing woodland, in combination with suitable planting to strengthen vegetated corridors Provision of deciduous woodland adjacent to key retained woodland corridor to ensure no net loss of habitat and to maximise availability of food plants throughout the active part of the year. Provision of 150 dormouse nest boxes within retained woodland corridors to maximise and extend suitable nesting		
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat and associate traffic movements.	High	Major (significant)		Very Low	Minor Non-significant likely effect
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	High	Major (significant)		Very Low	Minor Non-significant likely effect

1 https://ptes.org/wp-content/uploads/2019/09/White-Hughes-2019-dormouse-bridge.pdf

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						habitats. Annual nest box monitoring to be carried out. Sensitive woodland management to restore and maximise opportunities for dormouse (e.g. Forestry Commission 2019[2] and the Hampshire Dormouse Group[3])		
Reptiles	Pollution	High	Accidental pollution on site construction activities (e.g. hydrocarbons, herbicides, paints, solvents and other materials used) and discharge into habitats used including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for marshy grassland, woodland, hedgerows, ponds and great crested newts are also relevant to reptiles.	Very Low	Minor Non-significant
	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant

2 Forestry Commission. 2019. A Protocol fo Undertaking Woodland Management in England Where Dormice Are Present. Protocol Version 4.

3 https://hampshiredormousegroup.co.uk/resources/woodland-habitat-management/

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Habitat Severance	High	Severance of key habitat connecting resting places, foraging habitats and breeding habitats Artificial lighting of habitat features during construction	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
	Killing/injury	High	Constriction operations in/adjacent to suitable habitat and associate traffic movements.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
	Direct loss/degradation of key foraging habitat	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	Low	Moderate (Could be significant)		Very Low	Minor Non-significant
Badger	Damage/ destruction of setts	Low	Construction within close proximity of sett location (distance dependent on magnitude of vibration) causing collapse of tunnels	Very Low	Negligible (not significant)	Very limited badger activity observed on site over a 2 year monitoring period. No active setts recorded in 2020. Works areas within 30m of suitable sett construction habitat will be subject to a pre-works inspection The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES	Very Low	Negligible (not significant)
	Entrapment	Low	Open, steep sided excavations during construction can entrap animals.	Very Low	Negligible (not significant)		Very Low	Negligible (not significant)

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						will ensure that suitable measures to avoid these effects will be successfully implemented. The measures as described for marshy grassland, woodland, hedgerows, ponds and great crested newts are also relevant to reptiles.		
Breeding Birds	Destruction of habitat features	High	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Moderate (Could be significant)	Provision of new habitat will continue to support a similar species assemblage and population size. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant
	Disturbance (Barn Owl only)	High	Construction activity and noise in proximity to nest sites.	Moderate	Major (significant)	Work that risk disturbance to barn owl will avoid the key breeding/nesting period (March-August). The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
	Damage/ destruction of active nests	High	Removal of habitat within close proximity of nest location, or of connected structures (i.e. buildings or branches) causing collapse of supporting vegetation.	Low	Moderate (Could be significant)	Works areas within 5m of suitable nest construction habitat will be subject to a pre-works inspection should work occur in the period March-September (inclusive). The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant
	Direct loss/degradation of key foraging habitat (barn owl)	High	Reduction in available food source/diversity/abundance of foraging resource through habitat destruction or pollution/lighting effects. Reduction in foraging resource can also occur as a result of habitat severance.	Moderate	Major (significant)	The existing nest location will be moved in a phased process whereby an identical box will be erected in the far south west of the site in winter 2020 (approx. 600m from the nearest link road section) with the existing box retained until the winter prior to the operational phase of the road (estimated 2022 – relocation in winter 2021). At which point the occupied box will be relocated (outside of breeding season) to a tree within 100m of the new nest box. This will recreate the current associated adult and nest roost configuration between the nest box and the roost in Chalcroft Farm. This relocation will seek to reduce collision risk and to reduce the potential for	Very Low	Minor Non-significant

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						disturbance effects form the residential areas. The marshy grassland areas in this vicinity of the nest box will be enhanced and managed to increase the population of field voles to provide an increased foraging resource.		
Invertebrates	Destruction of habitat features	Medium	Impacts on terrestrial habitat adjacent to breeding sites, resting/hibernation features and supporting habitats (including ponds hedgerows, woodlands, marshy grassland, watercourses and mature trees) and adjacent habitats.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Fish (on-site) (see also watercourses)	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
			substances with chronic or acute consequential effects.					
	Modification of onsite hydrological regime affecting habitats.	Medium	Modification of onsite hydrological regime including small scale 0/1st stage headwater catchments through change in soil drainage character, introduction of formal drainage, severance of drainage systems, blockage of natural drainage systems with reduction in extent of wetland habitats (including marshy grassland/wet woodland) or supply of water to standing or running water bodies, or change in flood regime resulting in an increase on volume/rate and transport of sediment/erosion etc and change in flow characteristics and quality entering the feature	Low	Minor (not significant)	With the inclusion of the additional mitigation set out in Table 10.11 of Section 10.7 of this Chapter of the ES it is considered reasonable to conclude that any changes in construction phase water quality are likely to be within the range of natural variability and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of fish habitat and the fish population. As such, whilst the Sensitivity of the on site fish habitat and assumed population is Medium, the Magnitude of change is Very Low and therefore Low (not significant) effects would arise. Taking into account the rigorous water quality/sediment monitoring and management intervention measures set out in Table 10.11, a Not Significant Likely Construction Effect will occur to the fish population associated with the onsite/adjacent watercourses (or further downstream) from sediment or other associated pollution during construction associated with the OPA Phase 1.	Very Low	Positive non-significant likely effect
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest.	Low	Minor (not significant)		Very Low	Positive non-significant likely effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
Invasive Species	Spread of invasive species into habitat present (in particular tributaries of the River Itchen)	High	Degradation of affected natural habitats through reduction in diversity and dominance of non-native species that do not provide foraging resource for native invertebrate/animal species.	Low	Moderate (Could be significant)	There is a significant risk of spreading Himalayan balsam during works to construct the Quobleigh stream link road crossing. This could result in the spread of seed into the downstream tributaries and into the River Itchen SSSI. However, measures outlined in the CEMP and a separate invasive species strategy document will ensure that this plant is not caused to spread during works. There is a risk that additional species will be transported to site in materials or machinery. Specific biosecurity measures will be described an implemented through a CEMP to mitigate for the risk of transfer of invasive species and through the inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid this effect will be successfully implemented. The sensitivity of receptor habitats that could be subject to the spread of invasive species (particularly the dispersal of Himalayan balsam into watercourses) are high but, with effective management and monitoring,	Very Low	No likely significant effect

ECOLOGY (CONSTRUCTION EFFECTS)								
Receptor	Impact	Sensitivity of Receptor	Effect	Impact Magnitude	Significance	Additional Mitigation	Residual Impact Magnitude	Residual Significance of Effect
						the magnitude of this change is considered to be low and there is, therefore, no likely significant effect on habitats or designated sites due to the introduction of invasive species.		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Occupation / Operational Effects – Wider OPA and Link Road								
River Itchen Special Area of Conservation (SAC) and River Itchen SSSI (and other	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from construction activities into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, deposition of the sediment may affect	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
constituent designated sites)			designated features including macrophytes, macroinvertebrates, notably condition of salmon spawning habitat (redds) through smothering vegetation, blocking voids within the coarse bedload used by fish and invertebrates, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the River Itchen at the confluence located at SU 46198 16665, upstream of Itchen Valley Country Park, affecting designated features including macrophytes,			other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			macroinvertebrates, fish, and birds through reduction in water quality including exposure to substances with chronic or acute consequential effects.			ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions. Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use	Will Not Occur	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Solent Maritime SAC (and other constituent designated sites)	Pollution (sediment, hydrocarbons etc)	Very High	Discharge of soil/sediment from operation/occupation of the site from various activities into on site/receiving watercourses and transport into the Solent introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the Solent influencing a possible reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. Taking into account the change in land use and Additional Measures set out in Table 10.11 and in Chapter 11 of this ES, in particular the provision of a robust, monitored and managed SuDS system, it is considered reasonable to conclude that although the River Itchen SAC and SSSI has a Very High level of sensitivity, the Magnitude of change will be Negligible and therefore No Significant occupation likely effect will occur as a result of sediment (or other associated contaminant) emissions.		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						Please refer to Chapter 11 of this ES for full details.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and transport into the Solent.	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated	Will Not Occur	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible.		
Solent SPA (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	The Wider OPA will include the provision of an extensive network of footpaths and play/sports facilities as part of the scheme, both within the developed areas and as green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km SANG (suitable alternative natural space) route, that includes at least 2.5km of route that allows informal access and dog walking. A detailed comparison of the on site provision against SANG criteria has been completed. Please refer to Chapter 14 for full details.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						The on-site recreational provision at One Horton is expected to cater for most day-to-day walking and cycling journeys. However, residents of One Horton Heath will wish to also visit the New Forest SPA. Eastleigh Borough Council is in ongoing negotiations with Natural England with respect to the effectiveness of the on-site recreational provision. Should these negotiations conclude that further measures are required, a financial contribution to the Solent Recreation Mitigation Strategy SPD will be made to removing this additional pressure from the Solent SAC/SPA and Ramsar sites. With the inclusion of the additional on site (and local connected) recreational resources set out in Table		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						10.11 of Section 10.7 of this Chapter of the ES and set out in more detail in Chapter 14 of this ES, together with any necessary payments to the Solent Recreational Mitigation Strategy SPD, it is considered reasonable to conclude that any changes in recreational pressure on the SPA and Ramsar (or constituent SSSI etc) are likely to be within the range of typical recreational use for the wider residential population, and there would be no short-term or long-term change to the conservation status of habitat/species receptors or the integrity of designated sites. As such, whilst the sensitivity of the Solent and Southampton Water SPA and constituent SSSIs remains the same, the Magnitude of change reduces to Very Low and therefore Moderate (could be significant effects) could arise. Subject to		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						final negotiations with Natural England, financial contribution to the Solent Bird Aware SPD fund to support specific recreation mitigation measures at the SPD would be made, and therefore No Significant Likely Occupational/Operational Effect will occur to the Solent and Southampton Water SPA/Ramsar from recreational pressure associated with the Wider OPA. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic	Low	Moderate (Could be significant)	The developed Wider OPA and associated Link Road will result in a widespread change from the agricultural land use to	Will Not Occur	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			maturing mixed use development, implemented and occupied in phases, that will be characterised by permanent surfaces including impermeable and hard wearing roads, pavements, roofing and other infrastructure that will generate surface runoff that will be directed into formal drainage, transporting any urban sediment that may be present into the formal SUDS system. Other surfaces will be permeable comprising e.g. permeable paving, amenity vegetation such as managed grass and other more ornamental landscape planting, as well as significant areas of Green Infrastructure associated with the Wider OPA and associated Link Road. Soil erosion from these areas is considered to be negligible. The inherent and additional measures (all based on robust		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Solent and Southampton Water Ramsar (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Very Low	No likely significant effect
	Change in nutrients affecting water quality	Very High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Will Not Occur	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and thereby the Solent associated features of interest.					
New Forest SPA (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
New Forest SAC (and other constituent designated sites)	Disturbance/ degradation of designated features as a result of increased recreation	Very High	Recreational disturbance from human and dog walking in areas associated with sensitive bird species, notably with effects on breeding viability. The site contains a range of habitats that support these bird species including: estuaries, intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland and grazing marsh.	Low	Moderate (Could be significant)	See measures as described for the Solent SPA (and other constituent designated sites)	Very Low	No likely significant effect
Emers Bog SAC (and other constituent designated sites)	No likely significant effect						Will Not Occur	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the	Low	Moderate (Could be significant)		Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			receiving watercourses and associated features of interest.			outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is limited to the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park	Low	Negligible (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			that lies outside the perimeter security fence.			refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Round Copse, West End Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure	Low	Moderate (Could be significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			to substances with chronic or acute consequential effects.					
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Low	Moderate (Could be significant)		Very Low	No likely significant effect
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of	Low	Negligible (not significant)	None	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			increased recreational pressure is negligible.					
Hearts Copse, West End, Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development	Low	Moderate (Could be significant)		Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.					
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure is negligible.	Low	Negligible (not significant)		Very Low	No likely significant effect
Treeline Break Site of Importance for Nature Conservation (SINC)	Pollution (sediment, hydrocarbons etc)	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the SINC affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Negligible (not significant)	See measures above for Chalcroft Distribution Park Site of Importance for Nature Conservation (SINC)	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
	Disturbance/degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas. Public access is not permitted into this SINC, therefore the impact of increased recreational pressure	Low	Negligible (not significant)		Very Low	No likely significant effect
Quobleigh Pond and Woods Site of Importance for Nature Conservation (SINC)	Disturbance/degradation of habitat features as a result of increased recreation	High	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas from the PRoW in the centre of this site.	Low	Moderate (Could be significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Fair Oak School Meadow Site of Importance for Nature Conservation (SINC)	Disturbance of designated features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Moderate (Could be significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods)		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Wyvern Technical College Meadow Site of Importance for Nature Conservation (SINC)	Disturbance of designated features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Moderate (Could be significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Watercourses (other than those listed or associated with designated sites listed above) – Priority Habitat	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	The proper implementation of a SuDS management / treatment train using a combination of upstream Source Control and Strategic SuDS Features will create greater resilience and allow the system to collect sediment (including silt and other associated contaminants) at various points which can then be removed as part of periodic maintenance. Creating a diverse SuDS scheme throughout the site will help to overcome the issues previously faced by SuDS. Ensuring that the principles of the site wide Water Management Strategy are taken forward into the future Reserved Matters Applications and ensuring that effective maintenance and management procedures are	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from	Low	Moderate (Could be significant)		Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			followed will be the key to ensuring the overall effectiveness of the SuDS scheme. The SuDS system and water course inflows and outflows will be monitored (e.g. for sediment, turbidity, electrical conductivity, pH) to highlight reduced performance of any SuDS feature and allow for management intervention to ensure consistent and ongoing high quality performance. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Minor (not significant)	An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details. The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details. The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
Ponds – see bats, birds, amphibians and reptiles as	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
well– Priority Habitat			habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.			to avoid these effects will be successfully implemented.		
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Parkland	Increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas including potential vandalism.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Marshy Grassland	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Change in nutrients affecting water quality	High	Change in nutrient (nitrate and phosphate) emissions from the operation/occupation of the site largely associated with domestic and business generation, with agricultural contributions	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			ceasing and application of fertilisers in open spaces minimised or avoided, but with generation of nutrients from urban operations including discharge of treated sewage arising from the development and urban sediment discharge, with potential effects on siltation and eutrophication levels in the receiving watercourses and associated features of interest.			to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	See measures included for watercourses	Very Low	No likely significant effect
Hedgerows	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			exposure to substances with chronic or acute consequential effects.					
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Broadleaved Semi-Natural Woodland	Pollution (sediment, hydrocarbons etc)	High	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects.	Very Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
	Disturbance/ degradation of habitat features as a result of increased recreation	Medium	Recreational disturbance and degradation of habitat from an increase in access and unmanaged use of habitat areas.	Low	Minor (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Bats	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats	High	Major (significant)	Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. •Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation •Minimising the width of the road crossing •Clear span design	Very Low	Minor Non-significant likely effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						•Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. •A minimum height of 3m under bridge crossings. •Sensitive design of any lighting that may be required in these areas. •Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses. The inherent and additional measures (all based on robust and tried and tested methods)		

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.		
	Indirect degradation of foraging resource	High	Artificial lighting can attract flying nocturnal invertebrates (particularly moths) drawing them a way form unlit area into lit areas, thereby reducing the availability of prey for light sensitive species (such as brown long-eared bats)	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	Minor Non-significant likely effect
	Increase in predation risk	Low	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Great Crested Newt	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Moderate (Could be significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Increase in predation risk	Low	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Entrapment	Low	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Otter	Pollution	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Disturbance/ degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Water Vole	Pollution	Low	Accidental pollution from site operation/occupation (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will	Will Not Occur	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			watercourses and into the habitat affecting designated features through a reduction in soil or water quality including exposure to substances with chronic or acute consequential effects. Increase in litter and fly tipping.			ensure that suitable measures to avoid these effects will be successfully implemented.		
	Disturbance/ degradation of habitat features as a result of increased recreation	Low	Recreational disturbance and degradation of habitat from an increase in access and informal use of habitat areas.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Will Not Occur	No likely significant effect
Reptiles	Increase in road collision mortality	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (woodland, marshy grassland, hedgerows and riparian habitats – particularly within 250m of breeding ponds).	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
	Entrapment	High	Entrapment in road and drainage infrastructure	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Badger	Increase in road collision mortality	Low	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Breeding Birds	Increase in road collision mortality (all species but particularly barn owl)	High	Increase in collision risk due to increased new roads across the site, particularly in areas of severance of high suitability habitat (marshy grassland, woodland, hedgerows and riparian habitats.	Low	Moderate (Could be significant)	The link road is likely to be categorised as a "Modern A Road" class according to the Barn Owl Trust Whilst a modern A road, the link road will be designed to accommodate measures described within this report to reduce the road collision mortality rate including: •Sections where the road is situated on an embankment present the highest risk followed by sections at existing ground levels. In these areas, the creation of obstacles (natural or artificial with a preference for natural) which force birds to fly higher across roads will be incorporated into the scheme. •Areas where the road is situated in a cutting present a lower risk and will not require additional planting, although	Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
						this will be considered as part of the wider road landscaping scheme. •Verges south of the link road will be maintained in a short, thatchless condition to reduce the potential for field vole.		
	Increase in predation risk	High	An increase in the population of domestic cats is likely to increase predation risk.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect
Invertebrates	Alteration of behaviour	Medium	Artificial light can alter the behaviour of nocturnal invertebrates, thereby affecting population viability and breeding.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Negligible	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Fish (on site)	Pollution	High	Discharge of soil/sediment from construction activities into on site/receiving watercourses, introducing nutrients, metals and other deleterious substances bound on the sediment particles and influencing other aspects of water quality including nutrient enrichment and water transparency. Accidental pollution on site construction activities (e.g. hydrocarbons, paints, solvents and other materials used) and discharge into on site/receiving watercourses resulting in a reduction in water quality including exposure to substances with chronic or acute consequential effects.	Low	Moderate (Could be significant)	See measures for watercourses	Very Low	No likely significant effect
	Nutrients	High	Change (likely overall reduction during the course of the construction phasing) of agricultural sourced nutrients (in particular nitrates and	Low	Moderate (Could be significant)		Very Low	No likely significant effect

ECOLOGY (OPERATIONAL EFFECTS)								
Receptor	**Impact**	**Sensitivity of Receptor**	**Effect**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
			phosphates) entering the soil and discharged through onsite/receiving watercourses with potential effects on eutrophication levels and associated features of interest.					
	Changes in flow regime	High	Change in riverine flow associated with modified drainage and effects on fish and associated habitat features from a change in flow regime.	Low	Moderate (Could be significant)		Very Low	No likely significant effect
Invasive Species	Spread of invasive species into habitat present (in particular tributaries of the River Itchen)	Low	Degradation of affected natural habitats through reduction in diversity and dominance of non-native species that do not provide foraging resource for native invertebrate/animal species.	Low	Negligible (not significant)	The inherent and additional measures (all based on robust and tried and tested methods) set out in Table 10.7 and 10.11 of this Chapter of the ES will ensure that suitable measures to avoid these effects will be successfully implemented.	Very Low	No likely significant effect

NOISE AND VIBRATION							
Environmental Effect	**Sensitivity of Receptor**	**Nature of Impact**	**Impact Magnitude**	**Significance**	**Additional Mitigation**	**Residual Impact Magnitude**	**Residual Significance of Effect**
Construction Effects – OPA Phase 1							
Noise at existing residential	Medium	Noise audible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Vibration at existing residential	Medium	Vibration perceptible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Construction Effects – The Wider OPA							
Noise at existing residential	Medium	Noise audible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Vibration at existing residential	Medium	Vibration perceptible within living areas	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Noise at nearby bird habitats	Medium	Bird response to construction noise	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Noise and vibration at fish habitats	Medium	Fish response to construction noise and vibration	Medium - Negligible	Major – Neutral	Construction best practice, CEMP and limits.	Low - Negligible	Moderate - Neutral
Operation Effects – OPA Phase 1							
Development generated road traffic	Medium	Audible change in noise environment at existing receptors	Negligible	Neutral	n/a	Negligible	Neutral
Noise in proposed gardens	Medium	Noise present in gardens	Negligible	Neutral	2m high garden wall/fencing	Negligible	Neutral
Noise in proposed habitable rooms	Medium	Noise present in habitable rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Industrial noise at proposed dwellings Chalcroft Industrial Estate	Medium	Industrial noise present at proposed dwellings	Negligible	Neutral	n/a	Negligible	Neutral

Operation Effects – Wider OPA							
Development generated road traffic	Medium	Audible change in noise environment at existing receptors	Low - Negligible	Moderate - Neutral	n/a	Low - Negligible	Moderate - Neutral
Noise in proposed gardens	Medium	Noise present in gardens	Medium - Negligible	Major - Neutral	2m high garden wall/fencing in combination with 15m standoff. Alternative location of gardens on screened side of dwellings	Negligible	Neutral
Noise in proposed habitable rooms	Medium	Noise present in habitable rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Noise at proposed school	Medium	Noise present in teaching areas	Negligible	Neutral	n/a	Negligible	Neutral
Noise at proposed school	Low	Noise present in offices and meeting rooms	Medium - Negligible	Major - Neutral	Glazing and ventilation strategy	Negligible	Neutral
Industrial noise at proposed dwellings Chalcroft Industrial Estate	Medium	Industrial noise present at proposed dwellings	Medium - Negligible	Major - Neutral	2m high close boarded fencing	Low	Moderate

Cumulative Effects

Effect	Description	Mitigation	Significance
Change in road traffic noise 2020 to 2023	Change in road traffic noise levels as a result of the OPA Phase 1 development, in combination with committed developments and general increase in baseline environment over time.	n/a	Negligible
Change in road traffic noise 2020 to 2030	Change in road traffic noise levels as a result of the Wider OPA development, in combination with committed developments and general increase in baseline environment over time.	n/a	Low

Impact of Climate Change

Effect	Description	Mitigation	Significance
n/a			

LANDSCAPE AND VISUAL								
Construction Effects								
The Wider OPA -Scenario 2								
Landscape								
Horton Heath LCA	Low	Construction work will be largely limited to direct impacts on the site itself with some off-site impacts including the construction of access points and localised impacts on adjacent road network. The construction works will also temporarily indirectly impact upon localised parts of the character of Burnetts Lane, Allington Lane, Chalcroft and Fir Tree Lane. The implementation of areas of open space, green infrastructure, drainage and phases of residential development will temporarily impact the immediate setting of Horton Heath and Allington while works are occur alongside.	Temporary Medium to High	Temporary Moderate to Major Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High
Chalcroft LLCA	Low	Construction works associated with the building of the houses and infrastructure associated with wider outline scheme will directly impact on the character of the various parcels of land across the site. Construction activity will have a localised indirect impact on Chalcroft Farm, as well as to the setting of the Ancient woodland. Implementation works will within parcels will have localised impacts and indirect impacts on the wider setting.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Quobleigh LLCA	Low	Construction building activity will directly impact this LLCA and the implementation of areas of tree planting and strategic green infrastructure will impact on the immediate setting of this area.	Temporary Medium to High	Temporary Moderate Adverse	-	Temporary Medium to High	Temporary Moderate Adverse	High

Site wide	Medium	Direct construction impacts will arise on this area from traffic, groundworks, SuDS construction, landscape implementation and planting and the construction of infrastructure and new homes. Indirect impacts of these operations are predicted on Chalcroft track, Allington Lane and Burnetts Lane and on the existing residential edge and local network of roads. There will also be direct impacts from construction and implementation works on the network of footpaths in places where these interface with areas of development.	Localised Temporary High	Temporary ModerateAdverse	-	Localised Temporary High	Temporary Moderate Adverse	High
Visual								
Recreational users of PRoW F2	Medium	Construction traffic and activity will be present in the view	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW F3	Medium	Movement and activity associated with the construction works will be in close proximity to users of PRoW F3	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW F10 and F11	Medium	Construction works associated with the wider OPA will result in traffic movement, construction and activity.	Temporary Medium	Temporary Moderate Adverse	-	Temporary Medium	Temporary Moderate Adverse	High
Recreational users of PRoW B743, B744, B746, and B780	Medium	Recreational users of the footpaths to the west of Allington Lane will experience glimpsed views of the site and the likely change in views associated with the construction of this part of the development will be seen as a result of the construction of the landmark building, located at the northern gateway to the site.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Residents overlooking the eastern edge of the site	High	Construction traffic, activity and movement is likely to be seen in glimpsed views through existing residential parcels adjacent to the Phase 1 works as well as direct views for residents overlooking the central parcels of the site where these views and construction traffic will be seen in close proximity and would be more apparent within views.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Residents on Fir Tree Lane	High	Residents on the western part of Fir Tree Lane will see construction traffic and activity introduced to views given the proximity of works	Temporary High	Temporary Moderate Adverse	-	Temporary High	Temporary Moderate Adverse	High
Transient users of Burnetts Lane	Medium	Construction traffic, activity and movement will be seen in close proximity for transient users of Burnetts Lane	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High

Transient Users of Blind Lane	Medium	Activity and movement associated with the OPA will be seen in glimpsed and longer distance views for transient users of Blind Lane who experience views directly across towards the site, from the east.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
Transient users of Fir Tree Lane	Medium	Transient users of Fir Tree Lane will experience a change in their view as a result of the construction works and the downgrading of this route in part will change access through the site for these users.	Temporary Medium	Temporary Moderate to Major Adverse	-	Temporary Medium	Temporary Moderate to Major Adverse	High
The Wider OPA -Scenario 2								
Landscape								
Horton Heath LCA	Low	At completion, the development will introduce additional large-scale built form into the landscape and will form part of a much larger area of development in this LCA, sitting amongst established areas of strategic green infrastructure. As the strategic green infrastructure of the proposed development will be delivered as part of the early phases of development, by year 15, with the maturation of trees along main streets, in gardens and within green spaces, the development will be better assimilated into the landscape. However, the scale of the development in relation to the LCA will mean that some adverse effects will continue to persist on the LCA.	Medium	Moderate Adverse	-	Low to Medium, allowing for maturation by Year 15	Minor to Moderate Adverse	High
Chalcroft LLCA	Low	The development will introduce additional built form into the LLCA, with built form already established on the site. The development will increase the scale of development present across the LLCA and will result in the majority of the LLCA being built out with embedded landscape mitigation and green infrastructure as part of the development. The overall provision of green infrastructure across the site will increase. The addition of rain gardens within plots and along strategic locations within development plots will also provide an increase in blue and green infrastructure across the OPA.	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation by Year 15	Minor Beneficial	High

		All new green infrastructure will provide additional longer-term benefits. The provision of street trees, once mature, will also provide benefits for urban greening and will assist in assimilating the development into the landscape as it matures.						
Quobleigh LLCA	Low	At completion, the development will introduce an uncharacteristic feature within the LLCA in the form of residential development and associated infrastructure and this will increase the scale and proximity of built form within the LLCA. Retained areas of Green Infrastructure and enhanced existing green corridors will retain characteristic features and the established landscape framework. Proposed landscaping within parcels will take time to mature. Once mature, the established additional characteristic landscape features and new open spaces with their multiple benefits, alongside the protected original valued assets, will positively assist in assimilating the development.	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation by Year 15	Minor Beneficial	High
Site wide	Medium	The retention of key strategic green corridors and the introduction of a landscape framework which forms the backbone to the development will retain key landscape blue and green features within the development of the site. Introduced landscape features along with new planting within development parcels will once mature, at year 15, increase the characteristic landscape features across the site and provide a holistic approach to green infrastructure. Once mature introduced features will also provide increased habitat, amenity and recreation assets. Areas of open space within the site boundaries and within development plots will also provide increased landscape features and integrated green open space.	Low to Medium	Minor Adverse	-	Low and Positive allowing for maturation by Year 15	Minor Beneficial	High
Visual								
Recreational users of PRoW F2	Medium	On completion, users of PRoW F2 will see new built form brought into closer proximity to their view while travelling along this footpath. Planting proposed along the footpath route and within the landscape transition areas near to the solar farm	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High

		and around the sports pitches will soften views and additional internal planting within the various parcels of development will further soften views for these receptors. On completion, users of PRoW F2 will see new built form brought into closer proximity to their view while travelling along this footpath. Planting proposed along the footpath route and within the landscape transition areas near to the solar farm and around the sports pitches will soften views and additional internal planting within the various parcels of development will further soften views for these receptors. The landscape buffer adjacent to the sports pitches will also assist in reducing the impact of light spill associated with the adjacent sports pitches. Within the views for receptors travelling south, the proposed landmark structure will be seen rising above the development parcel and will be seen amongst the setting of surrounding built form. In travelling north along this footpath, glimpsed views of the proposed landmark structure are likely at the local centre, with views seen amongst the setting of existing mature tree planting By year 15, views of the development for users of PRoW F2 will be filtered and softened by the presence of tree and hedgerow planting found adjacent to the footpath and within development parcels. Retained and enhanced planting will provide a soft transition at the new development edges and internal planting will break up views to assimilate the wider OPA development into the landscape						
Recreational users of PRoW B743, B744, B746, and B780	Medium	Once complete, views of the residential development will mostly be filtered due to the presence of planting found along Allington Lane. The landmark structure proposed at the gateway into the site will introduce an uncharacteristic feature within the landscape within these views. The proposed landmark structure will sit above the skyline in views, with the rest of the development	Medium	Moderate to Major Adverse	-	Medium	Moderate to Major Adverse	High

		retained behind tree planting found along Allington Lane.						
Recreational users of PRoW F3	Medium	Upon completion of the development, users of PRoW F3 will see an alteration to their view, however, built form will not be seen as uncharacteristic with the Phase 1 works in close proximity to the route. Development will be seen as an extension to the existing settlement edge. By year 15, new planting within parcels in combination to the strategic green infrastructure will provide a soft transition for users of this PRoW, with the footpath running through the landscape buffer providing a softer edge and views across new development	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Minor Adverse	High
Recreational users of PRoW F10 and F11	Medium	Upon completion of the OPA, users of F10 and F11 will experience a complete change in their views where new development is introduced in the northern parcels of the site. These users will see built forms built out within close proximity within views. In certain locations the existing PRoW run through the proposed landscape transition areas, providing a softer edge and built form transitioned at the edges of the parcels. Views of the landmark structures located at the local centre and at Allington Lane are likely to be seen breaking the tree line in views for these receptors, with built form seen in the foreground of views, and the landmark structures seen sitting in the background of views. By year 15, the OPA views of the new development for users of these footpaths will be softened by additional scattered tree planting within landscape transition areas, this planting will not serve to screen views but provide a softer transition at the edges of the development	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High
Residents overlooking the eastern edge of the site	High	Upon completion, residents overlooking the central part of the site will have a change in their view with new built form along with the school and sports facilities introduced in views. Planting within the parcels on the eastern part of the site will assimilate the new buildings in views and provide greenery into views.	High	Moderate to Major Adverse	-	Medium allowing for maturation by Year 15	Moderate to Major Adverse	High

		Views of the site for residents off Burnetts Lane to the north of the water course will experience direct views across the new development and these views will include built form within close proximity to the residential edge and a new landmark By year 15, Views across the open landscape will continue to not be retained but will be replaced with new built form with integrated tree and hedge planting which once mature will assimilate the development into the landscape by breaking up built form and massing, in the views experienced. In addition, the proposed landmark features will introduce buildings of height within these views for residents overlooking the site.						
Residents on Fir Tree Lane	High	Upon completion, the proposals will introduce uncharacteristic features into views for these residents. By year 15, tree planting will be mature and this will soften views of the new development for residents along Fir Tree Lane	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Minor Adverse	High
Transient users of Burnetts Lane	Medium	Upon completion, transient users of Burnetts Lane will experience a change in their view with built form and new residential properties and a landmark feature set in relatively close proximity within views. behind a new landscape transition strip located along the western edge of the development. At year 15 once the proposed landscape buffer planting has matured. Views across the open landscape will not be retained but replaced with a landscape buffer of characteristic planting and increased native hedgerow planting. Proposed mature tree planting within the development plot itself will increase the green edge and soften the transition. Mature tree planting will provide a green street scene for transient users of Burnetts Lane.	High	Moderate to Major Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High

		Views of the landmark structure will be seen amongst surrounding built form, but will break the treeline in views.						
Transient Users of Blind Lane	Medium	Upon completion new built form will be seen in views for transient users of Blind Lane with new buildings forming the foreground of views where Blind Lane meets Burnetts Lane. The new residential development will be a dominant feature when viewed from this junction and views will be direct and uninterrupted, altering the baseline situation of the view. The tree planting proposed along Burnetts Lane when viewed from Blind Lane will partially soften the new development edge, at this time. At year 15, after maturation of the scattered tree planting along Burnetts Lane, there will be some more pronounced softening of views from Blind Lane, however, the location and proximity of the development edge will mean that there are still direct views of new built development experienced by transient users at the junction of Burnetts Lane.	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High
Transient users of Fir Tree Lane	Medium	Once complete, views of the new proposals, associated infrastructure and changes to the route through the site will be partially screened by the retention of existing planting found around Fir Tree Lane, itself. Additional characteristic planting and enhancements to the green corridors will barely be established at this time. By year 15, when tree planting and additional structure planting is mature this will soften views of the OPA development.	Medium	Moderate Adverse	-	Medium allowing for maturation by Year 15	Moderate Adverse	High

Cumulative Effects

Effect	Description	Mitigation	Significance	Confidence Level
N/A	N/A	N/A	N/A	N/A

Impact of Climate Change

Effect	Description	Mitigation	Significance	Confidence Level
Applies to both Scenario 1 and Scenario 2				
Landscape				
Biosecurity threat	Pests and diseases	Use of plant passports and/or UK provenance stock wherever possible and application of Biosecurity Best Practice in all plant sourcing. Delivered through detailed planting specifications, CEMP and Reserved Matters stage.	Minor	High
Surface Water Flooding	Increased rainfall intensity	Incorporation of SuDs measures,with built in capacity for climate change scenarios and provision for intense storm and safe overland flow routes. Maximised porous greenspace and surfacing, over impermeable hard surfacing, as far as possible. Incorporation of rain gardens/SuDS features along the link road and within development parcels and the use of tree pits and planting within areas of hardstanding to increase porous surfacing – details to be confirmed through detailed application and reserved matters applications. Utilisation of landscape transition areas and areas of open space to increase storage capacity across site. Delivered through approved Detailed Planning application and Reserved Matters Applications and Technical Approvals.	Minor	High
Need to avoid increased carbon release into	Need for carbon reduction	Conservation of existing mature trees. Low embodied carbon hardscape product sourcing,	Minor	Medium

atmosphere and instead improve sequestration		recycling of site won soil and other products. Planting of new trees and woodland in the public realm/open spaces and fruit trees in private gardens. Encouragement of the use of public transport with accessible and desirable routes to hubs. Also, Encouragement of the use of shared cycle and footpath routes across site. Delivery through approved Outline and Detailed Planning application, Reserved Matters Applications, Technical Approvals and Arboriculture Method Statement.		
Failure of planting to thrive and overheating and health effects	Increased drought events and heat	Use of trees in public spaces and public realm to provide summer shading for users of spaces and buildings. Selection of a mix of plant and tree species with identified drought tolerant attributes alongside, best practice soil management, groundcover and tree pit design. Rainwater harvesting and capture for irrigation purposes. Delivered through approved Outline and Detailed Planning application, Reserved Matters Applications and CEMP to deliver effective tree establishment and maintenance.	Minor	Medium
Visual				
Slower planting growth rates and increased failures	Poor planting establishment causing reduction in the effectiveness of visual mitigation	Above Biosecurity measures, sensitive species selection, good soil management and incorporation of best practice installation / underground tree systems. Delivery through detailed design and reserved matters applications and an approved CEMP to draw attention and set out requirements for achieving effective	Minor	High

		establishment and to deliver a monitoring regime.		

Table 14.5: Mitigation Implementation – OPA Phase 1

SOCIO ECONOMICS				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Financial Contribution	District Council	Planning Obligation/CIL	GP Places	Upon phased occupation of the Proposed Development
Financial Contribution	District Council	Planning Obligation/CIL	Primary School Places	If the Wider OPA 3FE Primary School is not delivered.

AIR QUALITY				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Construction Measures in CEMP	Contractor	Planning Condition		Construction Phase

TRANSPORT AND ACCESS				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Bubb Lane to Burnetts Lane link road and associated junctions	Developer	S278/S38	N/A	Spring 2021
Pedestrian/cycle route along eastern end of WEF3 (Chalcroft Farm Access Road)	Developer	S278/S38	N/A	TBC
Traffic calming along Burnetts Lane	Developer or HCC	S278/S106	N/A	TBC
Financial contributions towards surfacing improvements at local PROW routes	HCC	S106	N/A	TBC
Infrastructure at Bubb Lane/Link Road roundabout including extended footway and pedestrian crossing	Developer	S278/S106	N/A	TBC

Proposed OPA Phase 1 Site Layout provision of pedestrian and cycle routes	Developer	S278/S38	N/A	TBC
Proposed OPA Phase 1 Site Layout securing routes appropriate for bus use	Developer or HCC	S106	N/A	TBC
Off-site highway contributions (EBC as developer has already paid £2,880,776.74)	HCC	S106	N/A	TBC
Proposed OPA Phase 1 Site Layout allowing connections onto other local PROW routes	Developer	S278/S38	N/A	TBC
Provision of a Full Travel Plan	Developer	S106	N/A	3 months prior to 1st occupation

CULTURAL HERITAGE				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
None required	N/A	N/A	N/A	N/A

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
	e.g. Developer/Contractor/Council	e.g. Planning Condition S.106	How will the implementation of the mitigation measure be monitored?	e.g. construction phase or specific trigger
INHERENT DESIGN MITIGATION MEASURE				
Production of a detailed Construction Environmental Management Plan (CEMP)	Eastleigh Borough Council or agents thereof under the	Planning Condition	CEMP management responsibilities, duties,	Pre-construction

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
	control of Eastleigh Borough Council		monitoring, reporting, improvement plan Communications and complaints reporting system	
Watercourses protected by 10m ecological buffer (excluding SuDS)	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP.	Pre-construction (design)
Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created in accordance with the prescriptions detailed in the DEFRA Biodiversity metric 2.0. Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process. and LEMP Delivered through CEMP	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
Woodland and tree removal and severance has been minimised through the design process. Retained existing woodlands will be enhanced through the introduction of a high quality Woodland Management Plan, discussed later in the ES Chapter.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
			delivered under a detailed LEMP	habitat to minimise interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
Areas of important marshy grassland have been excluded from the development area and will be enhanced by the project. These areas will be subject to high quality conservation management discussed later in the ES Chapter.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP	Preconstruction avoidance through design. LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP
ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT				
OPERATION – ALL PHASES Discharge of foul water (sewage) to Peel Common Waste Water Treatment Works and not into the River Itchen. Suitable treatment at Peel Common Wastewater Treatment Works within consented limits. Comprehensive SuDS infrastructure including features such as interceptors, permeable paving, rain gardens, swales, vegetated SuDS ponds, sediment forebays. Successful treatment of nitrates and phosphates using robust methodology. Purchase of Defra/NE/ EBC nutrient credits if necessary, to demonstrate overall net zero nutrient emissions from the development, monitoring regime to demonstrate no emissions and feedback mechanism to enable effective management intervention if necessary. This approach has been designed with the express requirement that the development is nutrient neutral and does not result in any increase in nitrate, phosphate or sediment runoff into the receiving watercourses, the River Itchen and the Solent systems. Please refer to Chapter 11 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses. Corrective measures or adaptations to	Construction: Suitable temporary measures to be implemented during construction as required to avoid construction related effects (see CEMP) Operation: SuDS to be delivered in advance of each phase to ensure that no negative effects on water quality.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
			design for subsequent phases to be informed by on site monitoring of SuDS performance.	
CONSTRUCTION AND OPERATION – ALL PHASES Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from the bank edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	Construction: Suitable temporary measures to be implemented during construction as required to avoid construction related effects (see CEMP) Operation: SuDS to be delivered in advance of each phase to ensure that no negative effects on water quality.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION – ALL PHASES Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net zero nutrient and sediment emission measures described in above.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	
OPERATION – ALL PHASES Potable water abstraction and balancing River Itchen flows is comprehensively dealt through strategic measures being implemented by Southern Water e.g. Review of Consent process and Water Resource Management Plan. Please refer to Chapter 11 of this ES and Environment Agency Position Statement for full details.	Southern Water – beyond remit of the OHH Project	Southern Water Abstraction Consent	Catchment wide strategy beyond the remit of the development	N/A

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION – ALL PHASES Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance. See also Chapter 11.	Phased throughout development in accordance with strategy agreed pre-construction
OPERATION – ALL PHASES Provision of an extensive network of footpaths and play/sports facilities within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km (optional shorter 2.5km) SANG route, that includes at least 2.5km of this within semi-natural settings that offer a	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of recreational provision that is utilised widely by residents	Delivered on a phased basis in accordance with strategy agreed pre-construction See Chapter 14

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
greater element of open space provision provided by more distant open greenspace, including at least 2.5km of route that allows informal access and dog walking. Please refer to Chapter 14 of this ES.			See Chapter 14	
OPERATION – ALL PHASES Subject to final negotiations between EBC and with Natural England in relation to the extent on-site features prevent recreational impacts, if required, an appropriate financial contribution will be paid into the Solent Aware SPD fund, to effectively prevent associated disturbance effects that could result in likely significant effects on the features of interest (bird assemblage and supporting habitats). Please refer to Chapter 14 of this ES.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of compliant measures to ensure that there is no significant effect on Solent SPA	Delivered on a phased basis in accordance with strategy agreed pre-construction.
CONSTRUCTION AND OPERATION – ALL PHASES A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux The 15m ecological buffer will be demarcated with a significant species rich hedgerow and ditch features to prevent public access into these areas. The ecological buffer will be planted to echo the existing habitats within the SINC woodland and to provide a transitional habitat and structure,	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP.	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats. LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the following restricted uses and constraints: Footpaths Cycleways SuDS Biodiversity enhancement permitted Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux.				
CONSTRUCTION AND OPERATION – ALL PHASES Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No effects on retained trees	Pre-construction strategy agreed.
CONSTRUCTION AND OPERATION – ALL PHASES A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of all relevant measures as set out in this chapter	LEMP agreed pre-construction
CONSTRUCTION AND OPERATION – ALL PHASES A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat creation measures and to inform a responsive system of remedial works to ensure that the condition of	Eastleigh Borough Council or agents thereof under the	Planning Condition	Delivery of relevant measures as set out in this chapter	Habitat Monitoring Strategy agreed pre-construction

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.	control of Eastleigh Borough Council			
OPERATION – ALL PHASES An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of recreational provision that is utilised widely by residents See Chapter 14	Delivered on a phased basis in accordance with strategy agreed pre-construction See Chapter 14
OPERATION – ALL PHASES The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of on-site open space strategy and homeowner information packs See Chapter 14	Pre-occupation See Chapter 14
CONSTRUCTION AND OPERATION – ALL PHASES A 15m ecological buffer subject to the specifications as described in G will be implemented between the link road and the woodland to protect the habitat and to ensure that root protection areas are respected.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No effects on retained trees	LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
OPERATION – ALL PHASES Acoustic fencing will be installed to minimise operational phase noise disturbance from the link road on sensitive habitats (and associated species receptors e.g. breeding birds). Please refer to Chapter 12 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Measures designed to avoid disturbance to wildlife where required. Please refer to Chapter 12 of this ES for full details.	Strategy agreed prior to construction within CEMP. Please refer to Chapter 12 of this ES for full details.
OPERATION – ALL PHASES Additional (2.2ha) of grassland recreational areas that will provide suitable alternative areas for recreation. CONSTRUCTION AND OPERATION – ALL PHASES The new woodland extension to the west of the existing woodland will provide high value habitat for a broad range of receptors including GCN, bats, birds, invertebrates and reptiles.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of on-site open space strategy and homeowner information packs See Chapter 14	Pre-occupation See Chapter 14
CONSTRUCTION AND OPERATION – ALL PHASES Flight pond will be restored and enhanced for invertebrates, fish, amphibian, reptiles, birds and mammals.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pond enhanced to good condition (GCN HSI category)	In accordance with GCN Masterplan Strategy.
CONSTRUCTION AND OPERATION – ALL PHASES Hedgerows with mature trees at regular intervals (SINC or non SINC) will have a 15m buffer (measured from tree stems) Hedgerows without mature trees or only occasional trees (SINC or non SINC) will have a minimum 5m ecological buffer (plus RPA around any mature trees to be retained) measured from the centre line of the hedgerow.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Retained hedgerows protected as per the measures agreed within CEMP and LEMP.	Protection measures delivered during construction by CEMP LEMP agreed prior to construction

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
These buffers will be subject to the following constraints: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux All hedgerows will be managed for biodiversity in accordance with a long-term management plan, including new planting to infill gaps in hedgerows and ongoing high quality management. See A to N				
CONSTRUCTION AND OPERATION – ALL PHASES Where the removal or severance of woodland is unavoidable, compensatory native species rich planting will occur in accordance with the prescriptions detailed in the DEFRA Biodiversity metric 2.0. New areas of woodland and woodland extension are also included in the proposals. Woodland management and monitoring will be implemented from the start of the project delivery process if not before to maximise habitat value, structure and longevity, including the control of non-native invasive species.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process. and LEMP Delivered through CEMP	Preconstruction avoidance through design. Habitat creation to be completed as to minimise the interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
CONSTRUCTION– ALL PHASES	Eastleigh Borough Council or agents thereof under the	Planning Condition and EPS mitigation	Delivered in accordance with EPS Mitigation licences as appropriate, including	

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Roost Loss A number of low status roosts for common bats species are present within the buildings on site, the majority of which are to be demolished. These will be compensated for through the provision of roost type/species appropriate bat boxes and “natural” roost features created on retained trees in appropriate locations (i.e. in close proximity to existing flight lines, adjacent to high value habitat, relatively undisturbed and unlit areas). A maternity roost for brown long-eared bats will be directly affected by the demolition. A mitigation roost will be constructed in the vicinity of Hearts Copse following the criteria for this roost type as described in the bat mitigation guidelines and delivered under an EPS licence. Substantial tree and shrub planting will reinforce the connection this location to existing flight lines and maternity roost locations within Hearts Copse. The removal of mature trees has been minimised through careful masterplan layout. Where trees containing potential roost features are retained, these will be protected by the buffer specifications as described for hedgerows (O & P) and woodland (G). Where trees with potential roost features are required to be removed, a precautionary principle will be applied that assume the presence of the most likely roost type for the feature. This is considered appropriate as tree roosts are dynamic and can be readily occupied/abandoned by a variety of species at any given time, making firm assessment of the roost types present particularly challenging. Mitigation and licensing requirements will therefore be informed by subsequent inspections prior to any impacts on these features.	control of Eastleigh Borough Council	licence as required.	post construction monitoring.	Bat Mitigation Strategy Approved pre-construction. EPS licence secured as required. Preconstruction avoidance through design. Habitat creation to be completed as to minimise the interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION – ALL PHASES Bat Habitat Severance/Road Collision Mitigation Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation Minimising the width of the road crossing Clear span design Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. A minimum height of 3m under bridge crossings. Sensitive design of any lighting that may be required in these areas. Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Bat Mitigation Strategy to be approved pre-construction No impact observed on commuting bats. Minimal road casualties observed	
CONSTRUCTION AND OPERATION – ALL PHASES Bat Loss/degradation of foraging habitat Mitigation	Eastleigh Borough Council or agents thereof under the	Planning Condition	Bat Mitigation Strategy to be approved pre-construction	

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
The loss of foraging habitat across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (see G, H, I, O & P). OPERATION – ALL PHASES Bat Lighting Mitigation (also for other nocturnal species). Specific design measures have been included as a key design principle to keep additional lighting to a minimum across the site. Where lux levels must exceed 0.5 lux on any valuable retained or created habitat, a further detailed assessment of the lighting design to include wavelength, directionality and duration/timing of lighting will be conducted to inform lighting design for each phase of development to ensure no deleterious effect on affected habitats. OPERATION – ALL PHASES Bats and cat predation (also relevant to other fauna). Home owner packs will provided to identify the effects of cat predation on biodiversity and to encourage homeowners to not own cats, or if they do to take a responsible approach including keeping cats in at night, use of bells etc.	control of Eastleigh Borough Council			
CONSTRUCTION AND OPERATION – ALL PHASES Bat mitigation efficacy. A suite of species and habitat specific monitoring regimes will be implemented to provide feedback on the efficacy of mitigation and habitat creation measures for specific receptor species in accordance with legislative and policy requirements. This monitoring will inform a responsive system of remedial measures to ensure that the intended function of these measures is realised and maintained in perpetuity.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition and/or EPS Mitigation licences as required	Bat Mitigation Strategy to be approved pre-construction	

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat within 500m to two restored and two created and	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Successful delivery of EPS mitigation licence measures to maintain favourable conservation status of GCN population on site.	GCN Strategy Approved pre-construction. EPS licence secured as required.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation. The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road				

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan.				
CONSTRUCTIONAND OPERATION – ALL PHASES Watercourse road crossing points locations to be designed as single span to facilitate continuation of hydrological regime and landscape permeability for terrestrial mammals including otter. Mammal crossings will be included where provision for mammal access cannot be incorporated along the stream at water level.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of landscape connectivity for nocturnal mammals along watercourses	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTIONAND OPERATION – ALL PHASES Watercourse restoration using best practice measures (e.g. as defined by the UK River Restoration Centre) to increase physical habitat diversity, reconnect to the floodplain, increase light levels to the channel and riparian corridor and maximise species diversity, controlling non-native species.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of watercourse enhancement measures.	Watercourse Enhancement Strategy agreed prior to construction with enhancements delivered during construction at appropriate timings through development lifespan.
CONSTRUCTIONAND OPERATION – ALL PHASES Water vole has not been recorded during 2018-2020, although historic records are present. Further surveys will be conducted on a precautionary basis to ensure no effects and legal compliance. Measures outlined in A – O will be relevant to habitat that could be used by this species. Measures set out in FF and GG are also relevant and will avoid effects on water vole should they be recorded in the area in the future.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of landscape connectivity for nocturnal mammals along watercourses	Protection measures delivered during construction by CEMP LEMP agreed prior to construction

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION – ALL PHASES Precautionary surveys will continue to ensure any new setts or re-activated setts are taken into account in the construction programme. Should it be necessary Natural England badger licences will be sought to ensure legal compliance in terms of disturbance of any setts and any requirements for exclusions/sett closure/provision of artificial setts. Deep excavations will be covered at night or suitable mammal ladders/earth maps will be provided to allow large mammals including badger to exit excavations.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction inspections completed, and actions taken to ensure no effects on badger setts.	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION – ALL PHASES Habitats requiring works during the nesting season (March-September inclusive) will be subject to a pre-works nesting bird check with measures implemented to protect any active nests likely to be affected by the works. Please refer to Chapter 12 for full details on measures to minimise construction disturbance through noise and vibration. CONSTRUCTION Where areas of suitable nesting habitat for valued bird species is lost, suitable alternative nesting habitat will be provided on site through a network of bird boxes, features incorporated to buildings, new tree and shrub planting and enhanced grassland, woodland, wetlands. CONSTRUCTION AND OPERATION – ALL PHASES Measures to minimise the risk of disturbance to birds during nesting will be implemented as defined elsewhere above in A to O, including both on site and off sites notably SSSI, SPA and SAC habitats. Please refer to Chapter 12 for full details on measures to minimise construction and occupation disturbance through noise and vibration.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction surveys inspections and actions taken to ensure no effects on badger setts.	
CONSTRUCTION– ALL PHASES The existing barn owl nest box will be relocated into the area in the vicinity of Hearts Copse (>600m from link road) to reduce road collision risk associated with the link road. Delivery of	Eastleigh Borough Council or agents thereof under the	Planning Condition	Pre-construction surveys inspections as required and actions	Barn Owl Strategy agreed prior to construction.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
significant screening of link road as it proceeds northwards from Chalcroft Farm to avoid road traffic mortality. Enhancement of grassland habitats and hedgerow buffers for small mammals will provide additional foraging resource for barn owl to compensate for the loss of low value foraging habitats.	control of Eastleigh Borough Council		taken to ensure site continues to safely support breeding barn owl without acting as a population sink.	
CONSTRUCTION AND OPERATION – ALL PHASES The loss of high value invertebrate habitats across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (See A to O and T to X).	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net loss of high value invertebrate habitats. Delivery of sensitive lighting plan	Habitat protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION Ongoing annual dormouse tube monitoring to inform licencing requirements for each phase of the project. CONSTRUCTION Avoidance of hedgerow severance within 150m of confirmed records (currently only within woodland north of solar farm). OPERATION No lighting associated with road crossings of woodland copses CONSTRUCTION AND OPERATION Installation of suitable aerial structure (e.g. Peoples Trust for Endangered Species, 2019[4]) across roads severing woodland, in combination with suitable planting to strengthen vegetated corridors	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of the favourable conservation status of dormouse on site.	Dormouse Strategy approved pre-construction. EPS licence secured as required.

4 https://ptes.org/wp-content/uploads/2019/09/White-Hughes-2019-dormouse-bridge.pdf

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
OPERATION Provision of replacement woodland adjacent to key retained woodland corridor to ensure no net loss of habitat and to maximise availability of food plants throughout the active part of the year. CONSTRUCTION AND OPERATION Provision of 150 dormouse nest boxes within retained woodland corridors to maximise and extend suitable nesting habitats. Annual nest box monitoring to be carried out. CONSTRUCTION AND OPERATION Sensitive woodland management to restore and maximise opportunities for dormouse (e.g. Forestry Commission 2019[5] and the Hampshire Dormouse Group[6]) OPERATION Provision of suitable advice in homeowner packs and on information boards regarding dormouse and responsible enjoyment of the countryside. NB access is limited to key habitats suitable for dormouse.				

HYDROLOGY				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
CEMP	Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase
SuDS	Developer/Principal Contractor	Planning Condition	Surface water quality monitoring and management feedback loop	Lifetime of development / Phased delivery

5 Forestry Commission. 2019. A Protocol fo Undertaking Woodland Management in England Where Dormice Are Present. Protocol Version 4.

6 https://hampshiredormousegroup.co.uk/resources/woodland-habitat-management/

Appropriately designed watercourse crossings	Developer/Principal Contractor	Planning Condition / Land Drainage Consent	Compliance with Land Drainage Consent	Construction Phase
Surface water quality monitoring	Developer/Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase through to Operation
Connection to Peel Common WwTW	Developer	Planning Condition / S106 / S98	Compliance with Planning Condition on Foul Water Drainage Strategy	Lifetime of development / Phased delivery

NOISE AND VIBRATION				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Construction Environmental Managements Plan	Contractor	Planning condition	CEMP submitted and approved by LPA	Construction Phase
Acoustic screening	Contractor	Planning condition	Mitigation scheme submitted and approved by LPA	Prior to start of works
Glazing and ventilation scheme	Contractor	Planning condition	Strategy be submitted and approved by LPA	Prior to start of works

LANDSCAPE AND VISUAL				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Applies to both Scenario 1 and 2				
Tree Protection, habitat, designed transition areas and soil protection and management, control of working hours	Developer/Contractor	Approved Planning Documents including Arboricultural Impact Assessment (AIA), Tree Protection and Removal Plan and Arboricultural Method Statement (AMS), CEMP and CMP.	Arboricultural Method Statement (AMS), Construction Environmental Management Plan (CEMP), Construction Management Plan (CMP) Monitoring and Review Procedures	Construction Phase
Scheme Design, implementation and establishment	Developer/Contractor	Planning Permission and approved drawings and documents	Construction in accordance with approved drawings and documents	Construction Phase, up to 10 years
Open Spaces and maintenance	Developer/Contractor/Council	Planning Permission and S. 106	Landscape and Ecological Management Plan (LEMP)	Operation Phase and in perpetuity

Table 14.6: Mitigation Implementation – Wider OPA

SOCIO ECONOMICS				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Financial Contribution	District Council	Planning Obligation/CIL	GP Places	Upon phased occupation of the Proposed Development

AIR QUALITY				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Construction Measures in CEMP	Contractor	Planning Condition		Construction Phase

TRANSPORT AND ACCESS				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Bubb Lane to Burnetts Lane link road and associated junctions	Developer	S278/S38	N/A	Spring 2021
Burnetts Lane to Allington Lane link road	Developer	S278/S38	N/A	TBC
Improvement to eastern end of Fir Tree Lane	Developer	S278/S38	N/A	TBC
Pedestrian/cycle route along eastern end of WEF3 (Chalcroft Farm Access Road)	Developer	S278/S38	N/A	TBC
Traffic calming along Burnetts Lane	Developer or HCC	S278/S106	N/A	TBC
Improvements to local footpath route which runs to the south of the railway (route to secondary school)	Developer or HCC	S278/S106	N/A	TBC
Upgrades to FOHHF7 to accommodate pedestrians and cyclists	Developer or HCC	S278/S106	N/A	TBC

Financial contributions towards surfacing improvements at local PROW routes	HCC	S106	N/A	TBC
Infrastructure at Bubb Lane/Link Road roundabout including extended footway and pedestrian crossing	Developer	S278/S106	N/A	TBC
Masterplan provision of pedestrian and cycle routes	Developer	S278/S38	N/A	TBC
Downgrading of central section of Fir Tree Lane to become footway/cycleway	Developer	S278/S38	N/A	TBC
Provision of bus serving the development and associated infrastructure	Developer or HCC	S106	N/A	TBC
Off-site highway contributions (EBC as developer has already paid £2,880,776.74)	HCC	S106	N/A	TBC
Provision of Framework Travel Plan	Developer	S106	N/A	3 months prior to 1st occupation

CULTURAL HERITAGE				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Heritage assessment following identification of change of use to Firtree Farmhouse	Developer	Listed Building Consent; Planning Condition	Assessment to be submitted as part of future planning application and Listed Building Consent.	At reserved matters application for Phase 3 (or any stand-alone application for works to the Listed Building).
Mitigation by design to ensure appropriate layout and design which responds sensitively to the Listed Building and its setting	Developer/LPA	Planning Condition	Through planning application as part of reserved matters stages for Phases 3 and 6.	At reserved matters application stage for Phases 3 and 6.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
	e.g. Developer/Contractor/Council	e.g. Planning Condition S.106	How will the implementation of the mitigation measure be monitored?	e.g. construction phase or specific trigger
INHERENT DESIGN MITIGATION MEASURE				
Production of a detailed Construction Environmental Management Plan (CEMP)	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	CEMP management responsibilities, duties, monitoring, reporting, improvement plan Communications and complaints reporting system	Pre-construction
Watercourses protected by 10m ecological buffer (excluding SuDS)	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP.	Pre-construction (design)
Hedgerow removal and severance has been minimised through the design process. Where the removal or severance of hedgerows is unavoidable, compensatory native species rich hedgerows will be created in accordance with the prescriptions detailed in the DEFRA Biodiversity metric 2.0. Suitable protection barriers will be installed to prevent accidental damage to retained hedgerows and their root protection areas.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process. and LEMP	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
			Delivered through CEMP	Protection measures delivered during construction by CEMP
Woodland and tree removal and severance has been minimised through the design process. Retained existing woodlands will be enhanced through the introduction of a high quality Woodland Management Plan, discussed later in the ES Chapter.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP
Areas of important marshy grassland have been excluded from the development area and will be enhanced by the project. These areas will be subject to high quality conservation management discussed later in the ES Chapter.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP	Preconstruction avoidance through design. LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP
ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT				
OPERATION – ALL PHASES Discharge of foul water (sewage) to Peel Common Waste Water Treatment Works and not into the River Itchen. Suitable treatment at Peel Common Wastewater Treatment Works within consented limits. Comprehensive SuDS infrastructure including features such as interceptors, permeable paving, rain gardens, swales, vegetated SuDS ponds, sediment forebays. Successful treatment of nitrates and phosphates using robust methodology.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to	Construction: Suitable temporary measures to be implemented during construction as required to avoid

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Purchase of Defra/NE/ EBC nutrient credits if necessary, to demonstrate overall net zero nutrient emissions from the development, monitoring regime to demonstrate no emissions and feedback mechanism to enable effective management intervention if necessary. This approach has been designed with the express requirement that the development is nutrient neutral and does not result in any increase in nitrate, phosphate or sediment runoff into the receiving watercourses, the River Itchen and the Solent systems. Please refer to Chapter 11 of this ES for full details.			demonstrate efficacy of measures employed for previous phases as development progresses. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	construction related effects (see CEMP) Operation: SuDS to be delivered in advance of each phase to ensure that no negative effects on water quality.
CONSTRUCTION AND OPERATION – ALL PHASES Retention, protection and restoration of watercourses and associated riparian corridors including bankside and in channel enhancement measures, promoting reconnection with the floodplain and Stage 0 features, delivered in accordance with a detailed long-term water features management plan. All watercourses will be protected by a 10m ecological buffer (excluding SUDS connections and ecological improvements) with an associated 10-50m green infrastructure corridor (measured from the bank edge of water limit when watercourse is full i.e. bankfull). This buffer will be enhanced with appropriate habitat management and habitat creation measures that complement and enhance the watercourses.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to	Construction: Suitable temporary measures to be implemented during construction as required to avoid construction related effects (see CEMP) Operation: SuDS to be delivered in advance of each phase to ensure that no negative effects on water quality.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
			design for subsequent phases to be informed by on site monitoring of SuDS performance.	
CONSTRUCTION AND OPERATION – ALL PHASES Inclusion of wetland/watercourse features within the GI and watercourse corridors to promote on-site attenuation of surface waters emerging from the OHH area to enable long-term high quality wetland/watercourse habitats, promoting physical habitat diversity, reconnection to the floodplain and Stage 0 headwater processes, to ensure no further downstream mobilisation of soil/riverine sediment and nutrients and to provide ecologically valuable natural filtration features within the development such as wetland areas reed beds etc that is above and beyond the net zero nutrient and sediment emission measures described in above.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance.	
OPERATION – ALL PHASES Potable water abstraction and balancing River Itchen flows is comprehensively dealt through strategic measures being implemented by	Southern Water – beyond remit of the OHH Project	Southern Water	Catchment wide strategy beyond the	N/A

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Southern Water e.g. Review of Consent process and Water Resource Management Plan. Please refer to Chapter 11 of this ES and Environment Agency Position Statement for full details.		Abstraction Consent	remit of the development	
CONSTRUCTION – ALL PHASES Phased delivery of development and associated reduction in nutrient inputs as agricultural activities cease and zero/low nutrient/sediment input/output activities start. This will include interim land use change to reduce existing nutrient levels from the soil to reduce duration of legacy release from soils to water once agricultural activities cease. Please refer to Chapter 11 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net increase in nitrate, phosphate or sediment discharge into watercourses. Monitoring program designed to demonstrate efficacy of measures employed for previous phases as development progresses to evidence not net increase in nitrate, phosphate or sediment discharged into watercourses originating from the development. Corrective measures or adaptations to design for subsequent phases to be informed by on site monitoring of SuDS performance. See also Chapter 11.	Phased throughout development in accordance with strategy agreed pre-construction

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
OPERATION – ALL PHASES Provision of an extensive network of footpaths and play/sports facilities within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. This includes the provision of a 5km (optional shorter 2.5km) SANG route, that includes at least 2.5km of this within semi-natural settings that offer a greater element of open space provision provided by more distant open greenspace, including at least 2.5km of route that allows informal access and dog walking. Please refer to Chapter 14 of this ES.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of recreational provision that is utilised widely by residents See Chapter 14	Delivered on a phased basis in accordance with strategy agreed pre-construction See Chapter 14
OPERATION – ALL PHASES Subject to final negotiations between EBC and with Natural England in relation to the extent on-site features prevent recreational impacts, if required, an appropriate financial contribution will be paid into the Solent Aware SPD fund, to effectively prevent associated disturbance effects that could result in likely significant effects on the features of interest (bird assemblage and supporting habitats). Please refer to Chapter 14 of this ES.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of compliant measures to ensure that there is no significant effect on Solent SPA	Delivered on a phased basis in accordance with strategy agreed pre-construction.
CONSTRUCTION AND OPERATION – ALL PHASES A 50m wide green infrastructure corridor (measured from tree stems on outer edge of perimeter woodland) will separate the developed areas from areas of highly valuable woodland habitat, including ancient woodland. This 50m corridor includes a 15m ecological buffer in which the following specifications apply: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process and appropriate management delivered under a detailed LEMP.	Preconstruction avoidance through design. Habitat creation to be completed as early as possible but must be completed prior to the loss of habitat to minimise interval between loss and maturation of new habitats. LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
No additional lighting >0.5lux The 15m ecological buffer will be demarcated with a significant species rich hedgerow and ditch features to prevent public access into these areas. The ecological buffer will be planted to echo the existing habitats within the SINC woodland and to provide a transitional habitat and structure, replicating natural woodland expansion/succession to increase diversity and to protect and enhance the existing habitat. The zone between 15-50m from the habitat boundary will be subject to the following restricted uses and constraints: Footpaths Cycleways SuDS Biodiversity enhancement permitted Minimal additional lighting where this does not compromise ecological function, ideally >0.5lux.				
CONSTRUCTION AND OPERATION – ALL PHASES Design measures have been included to avoid changes to the hydrological regime or soil levels that would negatively affect trees and shrubs.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No effects on retained trees	Pre-construction strategy agreed.
CONSTRUCTION AND OPERATION – ALL PHASES A detailed long term habitat management plan will be implemented to deliver habitat management and enhancement.	Eastleigh Borough Council or agents thereof under the	Planning Condition	Delivery of all relevant measures as set out in this chapter	LEMP agreed pre-construction

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
	control of Eastleigh Borough Council			
CONSTRUCTION AND OPERATION – ALL PHASES A robust habitat monitoring regime will be implemented to provide feedback on the efficacy of buffers and habitat creation measures and to inform a responsive system of remedial works to ensure that the condition of retained habitats is maintained, the intended habitat conditions of newly created habitats are realised and that the long-term function of these features is maintained. Public access is excluded from the majority of this SINC, therefore the impact of increased recreational pressure will be limited to the narrow strip to the north and west of Chalcroft business park that lies outside the perimeter security fence.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of relevant measures as set out in this chapter	Habitat Monitoring Strategy agreed pre-construction
OPERATION – ALL PHASES An extensive network of footpaths and play/sports facilities are incorporated within the scheme, both within the developed areas and the green infrastructure corridors across the site to provide easy local access to outdoor recreational facilities and to deliver on site recreational capacity. Please refer to Chapter 14 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of recreational provision that is utilised widely by residents See Chapter 14	Delivered on a phased basis in accordance with strategy agreed pre-construction See Chapter 14
OPERATION – ALL PHASES The management of public access recreation on site, particularly dogs, will be restricted within sensitive habitats and buffers through landscape design, site interpretation and community outreach, householder packs and appropriate fencing and signage in key habitat areas. Access will be focussed on the existing network of paths and public Rights of Way within the northern reaches of the woodland that are currently subject to moderate levels of recreational disturbance through the location of site linkages to the PROW network and the selective use of site interpretation and waymarking. Public access into the majority of the woodland and ecologically rich habitat adjacent to the OHH site will be discouraged through the construction of new fencing/ditches and the creation of densely planted scrub and hedgerows. Please refer to Chapter 14 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of on-site open space strategy and homeowner information packs See Chapter 14	Pre-occupation See Chapter 14

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION – ALL PHASES A 15m ecological buffer subject to the specifications as described in G will be implemented between the link road and the woodland to protect the habitat and to ensure that root protection areas are respected.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No effects on retained trees	LEMP agreed prior to habitat loss Protection measures delivered during construction by CEMP
OPERATION – ALL PHASES Acoustic fencing will be installed to minimise operational phase noise disturbance from the link road on sensitive habitats (and associated species receptors e.g. breeding birds). Please refer to Chapter 12 of this ES for full details.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Measures designed to avoid disturbance to wildlife where required. Please refer to Chapter 12 of this ES for full details.	Strategy agreed prior to construction within CEMP. Please refer to Chapter 12 of this ES for full details.
OPERATION – ALL PHASES Additional (2.2ha) of grassland recreational areas that will provide suitable alternative areas for recreation. CONSTRUCTION AND OPERATION – ALL PHASES The new woodland extension to the west of the existing woodland will provide high value habitat for a broad range of receptors including GCN, bats, birds, invertebrates and reptiles.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of on-site open space strategy and homeowner information packs See Chapter 14	Pre-occupation See Chapter 14
CONSTRUCTION AND OPERATION – ALL PHASES Flight pond will be restored and enhanced for invertebrates, fish, amphibian, reptiles, birds and mammals.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pond enhanced to good condition (GCN HSI category)	In accordance with GCN Masterplan Strategy.
CONSTRUCTION AND OPERATION – ALL PHASES Hedgerows with mature trees at regular intervals (SINC or non SINC) will have a 15m buffer (measured from tree stems)	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Retained hedgerows protected as per the measures agreed	Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Hedgerows without mature trees or only occasional trees (SINC or non SINC) will have a minimum 5m ecological buffer (plus RPA around any mature trees to be retained) measured from the centre line of the hedgerow. These buffers will be subject to the following constraints: No excavation (except SuDS, respecting RPAs) No construction related activities or activities likely to have negative effect on habitat Biodiversity Enhancement permitted No additional lighting >0.5lux All hedgerows will be managed for biodiversity in accordance with a long-term management plan, including new planting to infill gaps in hedgerows and ongoing high quality management. See A to N			within CEMP and LEMP.	LEMP agreed prior to construction
CONSTRUCTION AND OPERATION – ALL PHASES Where the removal or severance of woodland is unavoidable, compensatory native species rich planting will occur in accordance with the prescriptions detailed in the DEFRA Biodiversity metric 2.0. New areas of woodland and woodland extension are also included in the proposals. Woodland management and monitoring will be implemented from the start of the project delivery process if not before to maximise habitat value, structure and longevity, including the control of non-native invasive species.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery through master planning process. and LEMP Delivered through CEMP	Preconstruction avoidance through design. Habitat creation to be completed as to minimise the interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION– ALL PHASES Roost Loss A number of low status roosts for common bats species are present within the buildings on site, the majority of which are to be demolished. These will be compensated for through the provision of roost type/species appropriate bat boxes and “natural” roost features created on retained trees in appropriate locations (i.e. in close proximity to existing flight lines, adjacent to high value habitat, relatively undisturbed and unlit areas). A maternity roost for brown long-eared bats will be directly affected by the demolition. A mitigation roost will be constructed in the vicinity of Hearts Copse following the criteria for this roost type as described in the bat mitigation guidelines and delivered under an EPS licence. Substantial tree and shrub planting will reinforce the connection this location to existing flight lines and maternity roost locations within Hearts Copse. The removal of mature trees has been minimised through careful masterplan layout. Where trees containing potential roost features are retained, these will be protected by the buffer specifications as described for hedgerows (O & P) and woodland (G). Where trees with potential roost features are required to be removed, a precautionary principle will be applied that assume the presence of the most likely roost type for the feature. This is considered appropriate as tree roosts are dynamic and can be readily occupied/abandoned by a variety of species at any given time, making firm assessment of the roost types present particularly challenging. Mitigation and licensing requirements will therefore be informed by subsequent inspections prior to any impacts on these features.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition and EPS mitigation licence as required.	Delivered in accordance with EPS Mitigation licences as appropriate, including post construction monitoring.	Bat Mitigation Strategy Approved pre-construction. EPS licence secured as required. Preconstruction avoidance through design. Habitat creation to be completed as to minimise the interval between loss and maturation of new habitats. Protection measures delivered during construction by CEMP

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION – ALL PHASES Bat Habitat Severance/Road Collision Mitigation Three locations where the link road severs high value foraging and connective habitat have been identified on site that present a traffic collision risk to bats. Minimising habitat loss in these areas by designing the road approach to the habitat in a perpendicular orientation Minimising the width of the road crossing Clear span design Incorporation of suitable measures to ensure safe crossing following the most recent research into the efficacy of such measures to minimise road collision mortality. A minimum height of 3m under bridge crossings. Sensitive design of any lighting that may be required in these areas. Additional compensatory habitat may be required. Significant vegetation will be retained either side of the construction areas in these locations to encourage the use of underpasses.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Bat Mitigation Strategy to be approved pre-construction No impact observed on commuting bats. Minimal road casualties observed	

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION – ALL PHASES Bat Loss/degradation of foraging habitat Mitigation The loss of foraging habitat across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (see G, H, I, O & P). OPERATION – ALL PHASES Bat Lighting Mitigation (also for other nocturnal species). Specific design measures have been included as a key design principle to keep additional lighting to a minimum across the site. Where lux levels must exceed 0.5 lux on any valuable retained or created habitat, a further detailed assessment of the lighting design to include wavelength, directionality and duration/timing of lighting will be conducted to inform lighting design for each phase of development to ensure no deleterious effect on affected habitats. OPERATION – ALL PHASES Bats and cat predation (also relevant to other fauna). Home owner packs will provided to identify the effects of cat predation on biodiversity and to encourage homeowners to not own cats, or if they do to take a responsible approach including keeping cats in at night, use of bells etc.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Bat Mitigation Strategy to be approved pre-construction	
CONSTRUCTION AND OPERATION – ALL PHASES Bat mitigation efficacy. A suite of species and habitat specific monitoring regimes will be implemented to provide feedback on the efficacy of mitigation and habitat creation measures for specific receptor species in accordance with legislative and policy requirements. This monitoring will inform a responsive	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition and/or EPS Mitigation	Bat Mitigation Strategy to be approved pre-construction	

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
system of remedial measures to ensure that the intended function of these measures is realised and maintained in perpetuity.		licences as required		
CONSTRUCTION Great crested newt and other amphibian/reptile mitigation Key amphibian/reptile habitats have been avoided and will be protected and enhanced. Where valuable amphibian habitats must be affected, appropriate measures will be implemented to ensure that animals are protected during construction and that there is no detrimental effect on the favourable conservation status of the populations present on site. These measures include: Implementation of a series of linked Natural England EPS licences coordinated through the implementation of a great crested newt masterplan Avoidance measures to minimise areas of habitat loss and to maintain habitat connectivity Sensitive approach to vegetation clearance including consideration of timing, duration and methodology. This will employ measures of phased vegetation removal in accordance with best practise under a detailed method statement. Exclusion from working areas until works have ceased and habitat reinstated	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Successful delivery of EPS mitigation licence measures to maintain favourable conservation status of GCN population on site.	GCN Strategy Approved pre-construction. EPS licence secured as required.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
Capture from exclusion areas and translocation to retained receptor habitat Translocation of the southern low size class Chalcroft population from the single poor quality pond and associated poor quality and disturbed terrestrial habitat within 500m to two restored and two created and optimised northern ponds in Chalcroft Wood on land owned by Eastleigh Borough Council, with high quality terrestrial habitat. This will provide a closer association with the larger part of the existing metapopulation promoting breeding success and genetic diversity, increasing the territory used by great crested newt into optimal habitat for the construction phase. Chalcroft pond will be retained and restored, including connectivity for great crested newt to return to the southern habitat. A necklace of new ponds will link the northern population with restored and enhanced habitats in the south. Measures to prevent entrapment in drainage systems and connectivity across roads Provision of enhanced terrestrial habitat and a network of created and restored ponds and wetlands, together with resting and overwintering habitats Habitat compensation and enhancement measures will be delivered in accordance with industry best practise ensuring compliance with policy and legislation. The management of recreation on site, particularly dogs, and cats through landscape design, householder packs and appropriate fencing and signage in key habitat areas, particularly close to known and potential future breeding ponds and adjacent habitats. Key elements of GCN mitigation will be delivered under EPS mitigation licences, as appropriate, with additional elements of the development				

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
delivered under a non-licensable method statement where the likelihood of an offence is negligible. Habitat connectivity will be maintained through the designation, enhancement and long-term management of ecological connective corridors to maintain the landscape permeability both on and across the site for amphibians/reptiles. Measures will also be incorporated in road designs at key severance locations to facilitate safe passage to avoid collision mortality and entrapment risk. Measures have been incorporated into the masterplan to minimise risk and disturbance to the populations present and to facilitate the recolonisation and natural dispersal/recolonisation of the population across the site post construction to new wildlife ponds constructed to appeal to breeding GCN via a comprehensive network of suitable connective habitats linking existing populations to these new features. All habitats managed for amphibians/reptiles will be subject to a detailed long-term management plan.				
CONSTRUCTIONAND OPERATION – ALL PHASES Watercourse road crossing points locations to be designed as single span to facilitate continuation of hydrological regime and landscape permeability for terrestrial mammals including otter. Mammal crossings will be included where provision for mammal access cannot be incorporated along the stream at water level.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of landscape connectivity for nocturnal mammals along watercourses	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTIONAND OPERATION – ALL PHASES Watercourse restoration using best practice measures (e.g. as defined by the UK River Restoration Centre) to increase physical habitat diversity, reconnect to the floodplain, increase light levels to the channel and riparian corridor and maximise species diversity, controlling non-native species.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Delivery of watercourse enhancement measures.	Watercourse Enhancement Strategy agreed prior to construction with enhancements delivered during construction at appropriate timings through development lifespan.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTIONAND OPERATION – ALL PHASES Water vole has not been recorded during 2018-2020, although historic records are present. Further surveys will be conducted on a precautionary basis to ensure no effects and legal compliance. Measures outlined in A – O will be relevant to habitat that could be used by this species. Measures set out in FF and GG are also relevant and will avoid effects on water vole should they be recorded in the area in the future.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of landscape connectivity for nocturnal mammals along watercourses	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION – ALL PHASES Precautionary surveys will continue to ensure any new setts or re-activated setts are taken into account in the construction programme. Should it be necessary Natural England badger licences will be sought to ensure legal compliance in terms of disturbance of any setts and any requirements for exclusions/sett closure/provision of artificial setts. Deep excavations will be covered at night or suitable mammal ladders/earth maps will be provided to allow large mammals including badger to exit excavations.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction inspections completed, and actions taken to ensure no effects on badger setts.	Protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION – ALL PHASES Habitats requiring works during the nesting season (March-September inclusive) will be subject to a pre-works nesting bird check with measures implemented to protect any active nests likely to be affected by the works. Please refer to Chapter 12 for full details on measures to minimise construction disturbance through noise and vibration. CONSTRUCTION Where areas of suitable nesting habitat for valued bird species is lost, suitable alternative nesting habitat will be provided on site through a network of bird boxes, features incorporated to buildings, new tree and shrub planting and enhanced grassland, woodland, wetlands. CONSTRUCTION AND OPERATION – ALL PHASES Measures to minimise the risk of disturbance to birds during nesting will be	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction surveys inspections and actions taken to ensure no effects on badger setts.	

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
implemented as defined elsewhere above in A to O, including both on site and off sites notably SSSI, SPA and SAC habitats. Please refer to Chapter 12 for full details on measures to minimise construction and occupation disturbance through noise and vibration.				
CONSTRUCTION– ALL PHASES The existing barn owl nest box will be relocated into the area in the vicinity of Hearts Copse (>600m from link road) to reduce road collision risk associated with the link road. Delivery of significant screening of link road as it proceeds northwards from Chalcroft Farm to avoid road traffic mortality. Enhancement of grassland habitats and hedgerow buffers for small mammals will provide additional foraging resource for barn owl to compensate for the loss of low value foraging habitats.	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Pre-construction surveys inspections as required and actions taken to ensure site continues to safely support breeding barn owl without acting as a population sink.	Barn Owl Strategy agreed prior to construction.
CONSTRUCTION AND OPERATION – ALL PHASES The loss of high value invertebrate habitats across the site has been minimised through the retention of key high value habitats. These habitats will be protected and enhanced, with connectivity between these habitat areas and potential roost sites maintained both across the site and the wider landscape through the measures to protect these specific habitats (See A to O and T to X).	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	No net loss of high value invertebrate habitats. Delivery of sensitive lighting plan	Habitat protection measures delivered during construction by CEMP LEMP agreed prior to construction
CONSTRUCTION Ongoing annual dormouse tube monitoring to inform licencing requirements for each phase of the project. CONSTRUCTION Avoidance of hedgerow severance within 150m of confirmed records (currently only within woodland north of solar farm). OPERATION No lighting associated with road crossings of woodland copses	Eastleigh Borough Council or agents thereof under the control of Eastleigh Borough Council	Planning Condition	Maintenance of the favourable conservation status of dormouse on site.	Dormouse Strategy approved pre-construction. EPS licence secured as required.

ECOLOGY				
Mitigation Measure	Implementing Agent(s)	Legal Instrument	Compliance Target	Implementation Timescale
CONSTRUCTION AND OPERATION Installation of suitable aerial structure (e.g. Peoples Trust for Endangered Species, 2019[7]) across roads severing woodland, in combination with suitable planting to strengthen vegetated corridors OPERATION Provision of replacement woodland adjacent to key retained woodland corridor to ensure no net loss of habitat and to maximise availability of food plants throughout the active part of the year. CONSTRUCTION AND OPERATION Provision of 150 dormouse nest boxes within retained woodland corridors to maximise and extend suitable nesting habitats. Annual nest box monitoring to be carried out. CONSTRUCTION AND OPERATION Sensitive woodland management to restore and maximise opportunities for dormouse (e.g. Forestry Commission 2019[8] and the Hampshire Dormouse Group[9]) OPERATION Provision of suitable advice in homeowner packs and on information boards regarding dormouse and responsible enjoyment of the countryside. NB access is limited to key habitats suitable for dormouse.				

7 https://ptes.org/wp-content/uploads/2019/09/White-Hughes-2019-dormouse-bridge.pdf

8 Forestry Commission. 2019. A Protocol fo Undertaking Woodland Management in England Where Dormice Are Present. Protocol Version 4.

9 https://hampshiredormousegroup.co.uk/resources/woodland-habitat-management/

HYDROLOGY				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
CEMP	Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase
SuDS	Developer/Principal Contractor	Planning Condition	Surface water quality monitoring and management feedback loop	Lifetime of development / Phased delivery
Appropriately designed watercourse crossings	Developer/Principal Contractor	Planning Condition / Environmental Permit /Land Drainage Consent	Compliance with Environmental Permit /Land Drainage Consent	Construction Phase
Surface water quality monitoring	Developer/Principal Contractor	Planning Condition	Compliance with WFD assessment criteria	Construction Phase through to Operation
Connection to Peel Common WwTW	Developer	Planning Condition / S106 / S98	Compliance with Planning Condition on Foul Water Drainage Strategy	Lifetime of development / Phased delivery

NOISE AND VIBRATION				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Construction Environmental Managements Plan	Contractor	Planning condition	CEMP submitted and approved by LPA	Construction Phase
Acoustic screening	Contractor	Planning condition	Mitigation scheme submitted and approved by LPA	Prior to start of works
Glazing and ventilation scheme	Contractor	Planning condition	Strategy be submitted and approved by LPA	Prior to start of works

LANDSCAPE AND VISUAL				
Mitigation Measure	**Implementing Agent(s)**	**Legal Instrument**	**Compliance Target**	**Implementation Timescale**
Applies to both Scenario 1 and 2				
Tree Protection, habitat, designed transition areas and soil protection and management, control of working hours	Developer/Contractor	Approved Planning Documents including Arboricultural Impact Assessment (AIA), Tree Protection and Removal Plan and Arboricultural Method	Arboricultural Method Statement (AMS), Construction Environmental Management Plan (CEMP), Construction Management Plan (CMP)	Construction Phase

		Statement (AMS), CEMP and CMP.	Monitoring and Review Procedures	
Scheme Design, implementation and establishment	Developer/Contractor	Planning Permission and approved drawings and documents	Construction in accordance with approved drawings and documents	Construction Phase, up to 10 years
Open Spaces and maintenance	Developer/Contractor/Council	Planning Permission and S. 106	Landscape and Ecological Management Plan (LEMP)	Operation Phase and in perpetuity