

# Gavray Drive West

BICESTER

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## ENVIRONMENTAL STATEMENT

April 2015

Coordinated by  
**David Lock Associates Ltd**  
on behalf of **Gallagher Estates Ltd**  
**Charles Brown**  
and **Simon Digby**

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## **1.1 INTRODUCTION**

- 1.1.1 Gallagher Estates, Charles Brown and Simon Digby (the “Applicants”) are submitting an Outline Planning Application (OPA) for residential development (the “Proposed Development”) on land north of Gavray Dive, Bicester (the “Application Site” or “Site”). This application site is known as Gavray Drive West, comprising land west of Langford Brook. The formal description of the Proposed Development is set out in Chapter 2.
- 1.1.2 The Application Site lies within the administrative boundary of Cherwell District Council (CDC). The location of the Site and alignment of the OPA boundary is shown in **Appendix 1.1**.
- 1.1.3 This Environmental Statement (ES) reports the findings of an Environmental Impact Assessment (EIA) of the Proposed Development. EIA is a process whereby the likely significant environmental effects of a proposed development are rigorously assessed. It enables potentially “significant” environmental effects to be identified and appropriate mitigation measures to be proposed, removing or minimising potential adverse effects.
- 1.1.4 The purpose of this opening chapter of the ES is to outline the background to the proposals, explain the scope of the ES and set out its structure.

## **1.2 BACKGROUND**

### **Outline Planning Application**

1.2.1 This ES forms part of the OPA for the Proposed Development, which includes a number of other documents:

- application form and ownership certificates;
- application plans (the Site Location Plan, Site Plan and Parameter Plan);
- Design and Access Statement;
- Planning Statement (incorporating draft Heads of Terms for a Section 106 Agreement, an Open Space Assessment, details of affordable housing provision and Statement of Community Involvement);
- Transport Assessment
- Travel Plan; and
- Flood Risk Assessment.

### **Summary of the Policy Context**

1.2.2 The OPA is submitted in the context of the Government's promotion of growth and development within its *National Planning Policy Framework (NPPF)*. The NPPF stipulates a presumption in favour of sustainable development as the "golden thread" running through the planning system. The NPPF urges local planning authorities to plan for and react positively to development proposals that demonstrate economic, social and environmental sustainability.

1.2.3 It is within this positive national policy context for growth and development that this OPA for a residential development is submitted. The land is also identified in the emerging local planning policy as an allocation for housing, providing a supportive local context within which to deliver the Proposed Development.

1.2.4 Further details of the planning policy context for the Proposed Development are set out in Chapter 3.

### 1.3 THE EIA PROCESS

#### Need for an EIA

- 1.3.1 The *Town and Country Planning (Environmental Impact Assessment) Regulations 2011* (the “EIA Regulations”) require that any proposed development falling within the description of a “Schedule 2 development” within the meaning of the Regulations will be required to be subject to EIA where such development is likely to have “significant” effects on the environment, by virtue of factors such as its nature, size or location (as screened under Schedule 3). The ES is required by Directive 2001/92/EU of the European Parliament and of the Council dated 13 December 2001 and amended in 2014 by Directive 2014/52/EU.
- 1.3.2 Projects listed in Schedule 2 are deemed to be EIA development under part 10(b) of Schedule 2 of the EIA Regulations and falls within the “urban development projects” category. Projects listed in Schedule 2 which exceed the thresholds in the supporting column may be screened to determine if EIA is required. This OPA exceeds the threshold set out in Schedule 2 of the EIA Regulations. The applicants have determined that the OPA should be the subject of an EIA process. This ES has therefore been prepared and is submitted on a voluntary basis with the planning application.

#### Scoping

- 1.3.3 A Scoping Report was sent to Cherwell District Council (CDC) in September 2014 setting out the proposed approach. In response, CDC provided a scoping opinion on 6 November 2014 (application number 14/00009/SCOP). This opinion was issued at the same time as a separate scoping opinion for the adjacent site ‘Gavray Drive East’ (14/00008/SCOP).
- 1.3.4 CDC’s opinion comprised correspondence from consultees. CDC did not indicate whether all comments were reasonable and appropriate. Nevertheless, these detailed comments have been considered and used to guide the approach of each ES chapter. A summary is set out below along with an explanation as to how the ES has addressed the issues raised:

- **Bicester Town Council**

Strongly object to the development, suggesting the site is unique to Bicester and having many species of flora and fauna endangered by the proposal. *Response: The ES examines the ecological impacts in chapter 9.*

- **Launton Parish Council**

Offered no objections or comments.

- **Aylesbury Vale District Council**

Offered no comments but previously supported the proposal in making provision for the rail chord to enable Evergreen 3 rail link.

- **Planning Policy, CDC**

Officers set out the emerging Policy from the draft Local Plan. *Response: Chapter 3 sets out the relevant policies in national local policy. Individual chapters also set out relevant policies to each specific discipline.*

- **Anti-social Behaviour Manager**

Confirmed approach to assessing noise in terms of the proposed development and suitability of the site. The officer requested that position on vibration be explained. *Response: This is addressed in chapter 7.*

- **Environmental Protection Officer**

Confirmed air quality assessment proposals approach and requested that any affect by contamination be addressed. *Response: This is addressed in chapters 8 and 14.*

- **Ecology Officer**

No objection to the extent of the EIA.

- **Landscape Architect**

Identified the LVIA and arboricultural requirements as appropriate.

- **Oxfordshire County Council**

**Highways**

Required a Transport Assessment. Suggested the development will be required to incorporate SUDs. Infiltration drainage methods were identified as the preferred method of dealing with surface water on the site. Where infiltration methods are not viable, run off would need to be restricted to greenfield run off rates. *Response: The application is accompanied by a Transport Assessment. The ES considers transport impacts in chapter 5. Drainage matters are dealt with in Chapter 13.*

**Archaeology**

Accepted an updated EIA chapter (from that previously approved) including any relevant historic environment information.

- **Environment Agency**



Set out specific requirements for inclusion in the Flood Risk Assessment. On nature conservation, the EA suggested a buffer zone along both sides of the Langford Brook and a management plan for the riparian habitat and ecological surveys of the brook enhancements to the brook. *Response: A Flood Risk Assessment accompanies the application. A Water Resources forms chapter 13 of this ES. The ecology chapter (9) provides full details of the surveys undertaken including assessment of the brook. No development is proposed adjacent to the brook, in the floodplain.*

- **Thames Water**

Need to consider total net increase in water and waste water to serve the development as well as any offsite impacts. Thames Water sought the EIA to examine both development sites and include consideration of water supply, sewage treatment, surface water drainage protection of sewers and water mains within the development site during construction. *Response: Matters related to water supply and sewage treatment are considered in chapter 15.*

- **Natural England**

Natural England advised that it was not a priority to advise on the detail of the EIA.

**Berkshire and Buckinghamshire Oxfordshire Wildlife Trust (BBOWT)**

BBOWT provided a detailed response covering the following matters:

Net gain in biodiversity. *Response: chapter 9 (ecology) sets out the net gain in biodiversity.*

Assessment of receptors. *Response: The ES considers the assessment of receptors in chapter 9.*

Bird assemblage. *Response: The ES considers the overall bird assemblage in chapter 9.*

Harvest Mouse. *Response: The ES includes details of the harvest mouse survey in chapter 9.*

Botanical Survey. *Response: The ES includes details of the botanical survey in chapter 9. An arboricultural assessment is also included in chapter 10.*

Hydrological Assessment. *Response: The ES includes details of the in chapter 9 (ecology) and in chapter 13 (water resources).*

Avoidance of built development in the CTA. *Response: There is no built development proposed in the CTA.*

Biodiversity benefits from SUDS. *Response: This is noted and considered in chapter 9.*

- **Network Rail**

Identified no station related issues. Highlighted that Network Rail requires access to the railway. Requested that traffic impact on rail crossings be assessed. *Response: Contact has been made with Network Rail to determine any impact on rail crossings and discuss any wider issues.*

- **Dominic Woodfield**

Dominic Woodfield provided detail comments, including:

Comments on the scope and extent of ecological surveys. *Response: the scope and extent of surveys is explained in chapter 9 ecology.*

Concern that the drainage regime underpinning the grassland habitats could be subject of derogation. *Response: this is considered in Chapter 9 Ecology and in Chapter 13 Water Resources.*

Requesting the type and source of primary aggregates for land raise and detail to consider construction traffic assessments. *Response: This level of detail would follow any consent, but is discussed in chapter 9.*

Suggested that cumulative impact required consideration. *Response: The approach to considering Cumulative Impact is set out in paragraph 2.6, and again in each chapter.*

No net loss for biodiversity. *Response: This is considered in Chapter 9.*

- **An Unidentified Town Councillor**

Strongly objected to any development due to “unique landscape” and sought protection of the wetland. *Response: Landscape impacts are considered in chapter 8 and ecological impacts in chapter 9.*

1.3.5 A staffed public exhibition was held on 27 November 2014 held at Bicester Town Council offices at The Garth, Bicester between 3 and 8 pm. It was advertised widely to the public via a press notice and leaflet drop. A notice was placed in the Bicester Advertiser on Thursday 13 November. The notice outlined the proposal, showed the extent of the proposed development on an annotated aerial photo, and gave details of the public exhibition.

1.3.6 An invitation to the public exhibition was also hand delivered by DBS Marketing to approximately 2,300 local households and businesses, focused on Langford Village located immediately south of Gavray Drive.

1.3.7 Invitations were sent directly to the following list of individuals to attend a dedicated session of the exhibition. The list was discussed and agreed with Cherwell District Council:

- Rebecca Horley, Principal Planning Officer at Cherwell District Council
- Councillor Mrs Lynn Pratt (Mayor, District and Town Councillor, North Ward)
- Councillor Mr M. Magee (District and Town Councillor)
- Councillor Dan Sames (District and Town Councillor)
- Councillor N Cotter (District and Town Councillor)
- Bicester Town Council
- Langford Village Community Association
- Dominic Woodfield, Bioscan (UK) Ltd

1.3.8 Contact details (phone and email) were provided on the newspaper adverts, leaflets and letters. No emails were received. One phone call was received with a question unrelated to the proposal having regard to the maintenance of open space in Langford Village. This was not directly related to the proposals for Gavray Drive.

1.3.9 The exhibition itself comprised a series of exhibition boards explaining the proposal, site history, design influences and the technical response to issues such as drainage, highways and ecology. A draft Parameter Plan was included. Members of the project team were available to answer questions, including consultants from Odyssey Markides (highways), JBA Consulting (drainage) as well as representatives from Gallagher Estates and David Lock Associates.

1.3.10 In addition to the exhibition, Glen Langham of Gallagher Estates and David Keene of David Lock Associates presented to Bicester Town Council on 8 December 2014. The presentation was based on the exhibition material. A question and answer session followed.

1.3.11 Further information can be found in the Community Involvement section of the Planning Statement.

1.3.12 In addition to this consultation, the authors of each chapter have contacted Council Officers, statutory consultees and stakeholders where appropriate and required. Where this has occurred it is set out in each chapter.

## **Competence**

1.3.13 David Lock Associates (DLA) are the editor in chief of this document and authors of specific chapters, as identified below. DLA are members of The Institute of Environmental Management and Assessment (IEMA). This is a not-for-profit membership organisation established to promote best practice standards in environmental management, auditing and assessment. As the premier body in this field, the Institute offers unrivalled ongoing support to environmental professionals and aims to promote sustainability through improved environmental practice and performance.

## **Approach to Environmental Assessment**

1.3.14 in line with the IEMA best practice this Environmental Impact Assessment has been an integrated part of the proposal's evolution, the aim being to reduce the severity of significant environmental effects, or even, where possible, remove them, through the design process. Such mitigation is referred to as inherent or design mitigation. By following the process of positive reiteration, the potential for advantageous effects of the developments can be enhanced. In assessing the environmental impacts arising from the proposed developments, full account has been taken of both its construction and operational phases.

1.3.15 The ES assessment process adopted by the project team has included:

- a) an initial data trawl for site designations;
- b) environmental work conducted during the selection process of the land uses within the proposal;
- c) discussions with the land owners;
- d) study of the relevant Ordnance Survey mapping;
- e) baseline identification of sensitive receptors and resources;
- f) liaison with utility providers;
- h) liaison with the Environment Agency;
- i) liaison with statutory consultees;
- j) site visits;
- k) impact identification;
- l) liaison with County Council;
- m) liaison with District Council;
- n) scoping of the issues to be assessed with the District Council and their advisors;
- o) liaison with non statutory consultees;

- p) liaison with stakeholders as defined by the Statement of Community Involvement that forms part of this application
- q) liaison with Councillors and Parish representing residents in Bicester;
- r) revising mitigation proposals; and
- s) the identification and reporting of any residual significant effects.

### **Methodology and Terminology**

- 1.3.16 The Environmental Statement complies with Schedule 4 Part 2 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.
- 1.3.17 The term '**impact**' is used to identify the change that a process will create over a specified period of time. For example, construction machinery will result in an increase in local noise levels while in use. This change is the impact of the activity. The term 'effect' will describe the outcome of the assessment of an impact upon a receptor. Following the same example, the impact of noise from the use of construction machinery would be assessed for its effect upon a receptor.
- 1.3.18 Each topic assessed, as required by the Scoping and Screening Opinion provided by the local planning authority, where possible and appropriate includes a summary matrix in the conclusions section outlining the results of the assessment process having taken into account the mitigation measures proposed as part of the planning application.
- 1.3.19 For any effect to be '**significant**' it must exceed a specific threshold. Wherever possible, such thresholds are set using national industry norms. Where such norms do not exist, the experience of the assessor has been used to determine the significant threshold. Effects falling below the threshold are termed 'non-significant effects.'
- 1.3.20 Above the threshold a simple matrix comparing the severity of the impact upon the '**sensitivity**' of the receptor will be used. The '**magnitude**' of the impact will wherever possible be based upon a measurable element but will also include factors such as duration, timing and seasonality. The sensitivity element will include the number and type of receptor.
- 1.3.21 The significance of the impact will be related to four terms, namely, '**Major**', '**Moderate**', '**Minor**' and '**insignificant**'. Individual specialisms have assessment guidelines developed by professional bodies, e.g. the Landscape Institute and IEMA and where it is more appropriate these will be utilized within this ES.

1.3.22 All effects will be assessed for significance based on agreed mitigation measures being in place. Some impacts cannot be directly mitigated and therefore compensatory measures may be required to offset the predicted adverse effects. Where such measures are proposed these will be described and taken into account in the assessment of significant effects.

### **Limitations**

1.3.23 The EIA considers the likely effects of the Proposed Development using a combination of current knowledge of the Site and its context; and desktop and survey investigations. Requests for information have been made to other parties who may hold relevant data pertinent to the assessment. Appropriate regard has been had to relevant national and local planning policy; and relevant legislation, guidance and best practice.

1.3.24 Every reasonable effort has been made to obtain data concerning the existing baseline conditions and to accurately predict the effects of the Proposed Development. Known deficiencies, or where it has been necessary to make assumptions, are documented within individual topic chapters. For some topics, there are no commonly accepted methodologies for assessing impacts (such as in the case of socio-economic effects). In these cases, professional judgement and experience have been applied to inform the EIA.

1.3.25 A realistic worst case scenario has been assessed. Each chapter explains where professional judgement is being used and where the approach is based upon guidance, policy or legislation.

## 1.4 STRUCTURE OF THE ES

1.4.1 This ES has been compiled by David Lock Associates, drawing together contributions from a number of specialist consultancies as relevant to each topic chapter.

1.4.2 The ES includes chapters on each topic identified as potentially being significantly affected by the Proposed Development. Chapters are supported by figures and technical appendices. A Non-Technical Summary presents the principal findings of the EIA in non-technical language to make the findings readily accessible to members of the public.

1.4.3 The ES is structured as set out below:

**Table 1.1: ES chapters and authors**

Chapter	Topic	Author
Chapter 1	Introduction	David Lock Associates
Chapter 2	The Site and the Proposed Development	David Lock Associates
Chapter 3	Planning Policy Overview	David Lock Associates
Chapter 4	Socio-Economic Impacts	David Lock Associates
Chapter 5	Transport	Odyssey Markides
Chapter 6	Air Quality	Arup
Chapter 7	Noise and Vibration	Arup
Chapter 8	Landscape and Visual Impact	Environmental Dimension Partnership
Chapter 9	Ecology	Environmental Dimension Partnership
Chapter 10	Arboriculture	Environmental Dimension Partnership
Chapter 11	Historic Environment	Environmental Dimension Partnership
Chapter 12	Agriculture and Soil Resources	Kernon Countryside Consultants
Chapter 13	Water Resources	JBA Consulting
Chapter 14	Ground Conditions	Odyssey Markides
Chapter 15	Utilities and Waste	Odyssey Markides
Chapter 16	Conclusion and Cumulative Impacts	David Lock Associates

## **1.5 AVAILABILITY OF THE DOCUMENT**

1.5.1 The timetable for consultation on the OPA including the ES will be determined by CDC. Further information on that consultation can be obtained from CDC.

1.5.2 The ES will be available to view on the Planning section of the CDC website ([www.cherwell.gov.uk](http://www.cherwell.gov.uk)).

1.5.3 Copies of the ES can be purchased from David Lock Associates at the address below:

David Lock Associates  
50 North Thirteenth Street  
Central Milton Keynes  
MK9 3BP

1.5.4 The ES is priced as follows:

- CD of the full ES: free of charge
- Hard copy of the Non-Technical Summary: free of charge
- Hard Copy of ES: £250







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**2.1 INTRODUCTION**

- 2.1.1 This chapter provides a general description of the Application Site and its immediate context. Where required, more detailed descriptions of the Site, its surroundings and specific features are offered within relevant topic chapters.
- 2.1.2 The chapter also provides a description of the Proposed Development, reports construction stage assumptions, the alternatives to the Proposed Development that have been considered and the approach to the assessment of cumulative effects that has been adopted.

## **2.2 APPLICATION SITE**

### **Site Location**

2.2.1 The site location plan identifies the boundary of outline planning application. It is 6.9 hectares in extent. The Site is located close to the town centre and north of Langford Village. It is clearly delineated by the new rail chord. Gavray Drive is the southern boundary with Langford Brook defining the eastern boundary.

2.2.2 The wider context for the Site is of employment development to the north and west - beyond the rail lines. Langford Village is located to the south with the remaining section of the Gavray Drive allocation to the east. Gavray Drive connects to the A4421 via a roundabout junction.

2.2.3 Figure 2.1 contains the Site Location Plan.

### **Physical Characteristics**

2.2.4 The Site is in agricultural use with limited landscape features. There is a hedge line adjacent to Gavray Drive and one at the western end of the Site. Two footpaths cross the Site in a broadly north to south direction. Views into the Site are limited by its contained position adjacent to two railway lines. The main views are from Gavray Drive. The Site is not situated within a statutory landscape designation. The Site is relatively flat, but it slopes gently from west to east with the low point of the Langford Brook.

## 2.3 DEVELOPMENT PROPOSALS

2.3.1 The Environmental Statement assessed a residential component comprising up to 180 new dwellings at an average density of around 40 dwellings per hectare. The Proposed Development will have graduated densities with higher densities in central locations and lower densities at the edge. This will provide variety, character, a range of street scenes, plot designs and house types.

2.3.2 Proposed Development will include a mix of 1-4 bedroom properties, including terraces, semi-detached and detached properties and some apartments. Houses will be mainly 2 storey in height, with some 2.5 and perhaps 3 storey dwellings. The approach to design is elaborated in the Design & Access Statement that accompanies the OPA.

2.3.3 Provision will be made for affordable housing, with a mix of tenures encouraging a balanced community. The amount, type and tenure of affordable housing will be subject to negotiation with CDC. Draft Local Plan Policy BSC 3 seeks a target of up to 30% affordable homes, 70% of which are to be social rented affordable dwellings and 30% other types of intermediate affordable homes.

2.3.4 The formal description of Proposed Development, for which Outline Planning Permission is sought, is as follows:

*Residential development including affordable housing, public open space, localised land remodelling, compensatory flood storage and structure planting.*

2.3.5 The Parameter Plan (drawing number 001 Rev C) is included in Figure 2.2. This has formed the basis for the EIA. The detailed design of the Proposed Development would be in accordance with this overarching development framework. This conformity would be secured by appropriate conditions attached to any grant of Outline Planning Permission.

### **Land Use**

2.3.6 The Proposed Development comprises a residential scheme together with areas of public open space.

### **Amount**

2.3.7 The amount of development is set out below:

- up to 180 residential dwellings (class C3);
- green infrastructure informal open space and landscape areas and children's play space;
- sustainable urban drainage systems, including attenuation basins and drainage channels;
- connections to the surrounding highway, footpath, cycleway and bridleway network;
- infrastructure and utilities provision, including car parking; and
- ground remodelling and engineering works.

### **Scale**

2.3.8 The scale of the Proposed Development has regard to the existing context of the Site, its relationship to the local and wider landscape, its gentle topography, views and the nature of existing development. The existing development context is domestic in scale, with building heights generally ranging between two and a half storeys in height (but allowing for some three storey), the majority being two storeys.

2.3.9 In terms of proposed building heights, Proposed Development will be up to a maximum of 12.5 metres to ridge height, with the majority of buildings across the Site being 2 to 2.5 storeys in height (equating to 12 metres above AOD). Building height will be measured against AOD across the Site.

## **Layout**

2.3.10 The Proposed Development comprises of a walkable residential neighbourhood. The area will benefit from access to key open space. The Proposed Development will ensure the provision of clear and accessible links within and between the wider development area and to Bicester town centre.

2.3.11 The precise layout of the Proposed Development will be determined at Reserved Matters stage. However the key principles of the layout include:

- The establishment of a high quality public realm and open space network promoting active and vibrant spaces, opportunity for play space, sustainable drainage features and general amenity;
- Provision of an attractive green setting to the Proposed Development with retention of pedestrian and cycle connections through the site to the wider area, utilising the new footbridge to improve pedestrian accessibility;
- Layout of housing to overlook streets and public open spaces; and
- Good quality existing landscape features to be retained within a publicly accessible network of open spaces as a community asset.

2.3.12 In order to create a sense of place a network of green spaces with new leisure routes has been designed which integrates with the dwellings to provide an attractive outlook and setting. The provision of Public Open Space meets Cherwell District Council's open space provision.

2.3.13 The internal roads have been designed to inform, and through the use of materials, to reduce car speeds to a minimum. The layout facilitates pedestrian and cycle movement, and accessibility.

## **Proposed Access Strategy**

2.3.14 All properties within the Proposed Development are served by the internal access arrangements of the Site. Safe and satisfactory access and egress for the Site will be provided via a T junction off Gavray Drive.

## **Green Infrastructure and Open Space**

2.3.15 An inter-connected, multi-functional network of landscape and green infrastructure is proposed. Within this network, environmental enhancement, outdoor recreation,



pedestrian and access, surface water attenuation, biodiversity habitats. The key principles are that both the hard and soft landscaping be designed to help define the boundary between the public and private realm and to raise the quality beyond normal expectations. In this way accessibility and legibility is to be enhanced and the relationship with the surrounding area defined.

2.3.16 Further key landscape principles are to:

- Establish a high quality landscape using appropriate native and ornamental species displaying strong colour and form for year-round interest, to soften the new build development and connect and contain spaces;
- Retained hedgerows along the Site boundaries will create a strong landscape framework to define the extent of development and provide appropriate transition between the Site and adjacent residential areas and Local Wildlife Site;
- Existing trees along the boundary hedgerows will add height and structure as well as offering shade, particularly within the public open space;
- Encourage the enhancement of biodiversity within the area is a key part of the Proposed Development and will be achieved through the provision of suitable native species; and
- Design for ease of maintenance; the soft landscaping would be managed in conjunction with a monitoring programme to ensure the long term beneficial impact for wildlife and ecological habitats.

2.3.17 The main area of open space provision lies at the eastern edge of the Site, to complement the course of the Langford Brook and respect the boundary to the Local Wildlife Site. Open space requirements from emerging Local Plan Policy BSC11, together with the amount of open space provision proposed by the Proposed Development are set out in the table below. The figures are based on the quantum of housing assessed in the Environmental Statement (180 units) and an average household size for Cherwell District of 2.45 persons per household. This equates to an estimated population of 441.

Category of Open Space	Draft Cherwell Local Plan	Requirements for development	Amount of POS proposed
General Green Space (overall)	2.40 ha / 1000 rural/edge dwellers	1.06 ha	2.0 ha to include Play area
Children/Teen Play Areas	0.78 ha / 1000 people	0.34 ha	

### **Sustainable Urban Drainage**

2.3.18 Due to the introduction of impermeable surfaces as a result of the Proposed Development, appropriate drainage arrangements are required to manage the increased surface water arising from the Site. A range of sustainable urban drainage solutions will be incorporated into both the built and green environments. SuDS (Sustainable Drainage Systems) will be implemented in order to reduce flood risk, minimise pollution and provide landscape and wildlife benefits. Attenuation SuDS will be required to limit surface water runoff to current rates.

### **Ecology**

2.3.19 There are no international, national or other statutory designations on the Site. East of the Site is a Local Wildlife Site and there is also an area to the east of the Site which is within the River Ray Conservation Target Area. The proposed layout of the Proposed Development has taken into account habitats and features of local value at an early design stage and seeks to retain and enhance these features.

### **Affordable Housing**

2.3.20 Provision will be made for affordable housing, providing a mix of tenure to ensure delivery of a balanced community. The amount, type and tenures of affordable housing will be subject to subject of negotiation and discussions with Cherwell District Council and agreed in the light of the wider requirement for infrastructure delivery and other planning and design objectives. Draft Local Plan Policy BSC 3 seeks a target of up to 30% affordable homes, 70% of which to be social rented affordable rented dwellings and 30% as other forms of intermediate affordable homes.

**“Production Processes”**

2.3.21 The EIA Regulations require the main characteristics of any “production processes” to be described. The Proposed Development will not include any light industrial uses within (Class B1c), nor general industrial (Class B2) uses. As such, no “production processes” are proposed by the Proposed Development.

**Residues and Emissions**

2.3.22 The Regulations also require any residues and emissions to be identified and quantified. They would be limited to nitrogen dioxide, particulate matter and noise arising from construction of the Proposed Development and from road traffic and other activity it would generate once operational. These matters are assessed in detail in chapters 6 and 7.

## **2.4 CONSTRUCTION STAGE**

2.4.1 The EIA assumes that the construction stage would last some 3 years. Following reserved matters applications and discharge of conditions applications, it is likely that construction could begin in late 2016/2017. It is assumed that construction would be complete in 2020.

2.4.2 A Construction Environmental Management Plan (CEMP) is envisaged, to mitigate potential adverse environmental effects during the construction stage. Provision of the CEMP is expected to be secured by a condition on any grant of Outline permission, requiring the submission and approval of the CEMP prior to the commencement of development. Relevant details of the prospective CEMP are referred to in pertinent topic chapters.

## 2.5 CONSIDERATION OF ALTERNATIVES

- 2.5.1 The EIA Regulations require any alternatives to the Proposed Development that have been studied by the Applicant to be outlined and the reasons for their rejection set out.
- 2.5.2 The scope of any consideration of **alternative sites to the Proposed Development** is strongly influenced by the allocation in the Cherwell Local Plan: Schedule of Proposed Main Modifications to the (Submission) Local Plan (August 2014) (see Chapter 3 of this ES). Given the Local Plan's evidence base which includes comparative site assessments for the district's growth, which include the Options for Growth Document (2008) and the Cherwell Local Plan SA Addendum for Main Modifications (2014) which underpin the proposals, it is not necessary to consider potential alternative sites around the town in this EIA.
- 2.5.3 In terms of potential **alternative designs of the Proposed Development**, these have evolved as the result of an ongoing, iterative, design process, in which various design alternatives have emerged, been proposed and considered. The design specification has been influenced by factors such as planning policy requirements; environmental constraints identified through the EIA process and feedback through consultation with the public, stakeholders, Bicester Town Council and Cherwell District Council.
- 2.5.4 These factors have influenced decision –making on options and alternatives for the various parameters which constitute the outline site design, for example the scale of the Proposed Development; type of housing, location of built elements, landscaping considerations and the provision of services and infrastructure.
- 2.5.5 It is considered that the Proposed Development were conceived through a transparent and comprehensive assessment of the reasonable alternatives. Options for the spatial distribution of housing growth to meet an identified need have been adequately assessed through the EIA process and within the local planning framework whether they have been subjected to public and independent scrutiny. Meanwhile the site design has evolved to take account of policy and environmental constraints and the views of stakeholders and the community.

## 2.6 CUMULATIVE EFFECTS

2.6.1 The EIA has had appropriate regard to the likely future existence of the wider proposed development within Bicester. In particular, the transport assessment (chapter 5) takes account of modelling of the traffic effects of the Proposed Development in conjunction with other elements of the proposed Bicester allocations.

2.6.2 The Illustrative Cherwell Submission Local Plan (October 2014) comprises the emerging policy framework for Bicester, setting out proposed allocations in the town. The EIA has taken into account various major development projects in the area which, in conjunction with the proposed application site development, could collectively impose a significant impact on the environment.

2.6.3 All chapters have considered the following housing schemes:

	Permissions Granted a 31 March 2014	Local Plan; New Allocation 2014-2031	Total Projected Supply 2014-2031
North West Bicester	393	2900	3293
Graven Hill	0	2100	2100
South West Bicester Phase 1	1362	100	1462
South West Bicester Phase 2	0	726	726
South East Bicester	0	1500	1500
Gavray Drive (this includes land east of the Langford Brook)	0	300	300
Talisman Road	125	0	125

2.6.4 These developments are set out in the Local Plan Housing Trajectory 2011-31 (Cherwell District Council). This shows the projected supply of housing in the period up to, and beyond, the estimated completion of the Gavray Drive West site in 2020. Where relevant, the potential cumulative environmental effects of these developments with the Proposed Development have been assessed.

2.6.5 In addition, CDC's employment trajectory (2011-2031) identifies allocated land that is expected to provide for employment uses within the Plan period. This comprises:

- Bicester Business Park (29.5 ha)
- Bicester Gateway (18 ha)
- Land at North East Bicester (15 ha)
- South East Bicester (40 ha)

2.6.6 In chapter sets out which sites have been considered in term sof the cumulative impact, and where excluded, the reasons for this.

2.6.7 Draft site policy requires each individual development site to provide the necessary infrastructure to support itself without placing any constraint or unreasonable burden upon either preceding or subsequent development sites so as to ensure that individual sites are capable of coming forward independently, yet in a complementary manner. The OPA is submitted in this context and the application proposals demonstrate accordance with this approach.

### **Design and Mitigation**

2.6.8 The EIA process and its accompanying consultation programme have served to shape and refine the application site proposals by identifying any potential adverse effects, issues or constraints that could be effectively 'designed out' of the Proposed Development at an early stage. In this way the site design parameters have evolved in response to external and public feedback consultation and the results of technical assessments, and have undergone various iterations to incorporate measures to mitigate or simply avoid adverse environmental impacts, or enhance the environmental benefits of the scheme.

2.6.9 Consideration for the environment is an inherent aspect of this sustainable development project. In this way the Proposed Development has been conceived and have evolved in a manner consistent with principles of sustainable design, which include but are not limited to the following:

- Environmentally sensitive planning and layout;
- Implementing best practice in urban design
- Habitat creation;
- Sustainable drainage systems (SUDS);
- Permeable development for pedestrians and cyclists: and
- Landscaping.

2.6.10 Each technical chapter to the ES explains how identified adverse impacts will be avoided, reduced or compensated, with regards to 'in built' measures pertaining to the site design; measures associated with operational methods and techniques; or specific strategies or action plans.

2.6.11 Cherwell District Council provided a scoping opinion, on request, on 6 November 2014 (ref: 14/0009/SCOP). This has assisted in identifying the issues which require consideration through the assessment.

2.6.12 As far as possible, potential significant adverse environmental impacts have been 'designed out' of the scheme through the holistic, participatory and iterative EIA and site

design processes, and through conformance with the over-arching principles of sustainable design. However measures have also been incorporated into the proposals to mitigate any impacts that cannot be adequately addressed through design. A crucial part of the EIA process is to assess the significance of the impacts following implementation of the proposed mitigation, otherwise known as 'residual impacts'. Residual impacts are considered in the individual technical chapters.





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### **3.1 INTRODUCTION**

3.1.1 The Government's commitment to the delivery of sustainable development is enshrined in the *Localism Act* (2011) and *National Planning Policy Framework* (2012). Local planning authorities are duty bound to prepare positive plans to encourage sustainable development that meets an area's need for homes, jobs and open space. Section 38(6) of the *Planning and Compulsory Purchase Act 2004* requires that planning applications must be determined in accordance with the prevailing development plan unless material considerations indicate otherwise.

3.1.2 This chapter of the ES sets out the relevant planning policy context for the Proposed Development. It provides a general overview, and where necessary to support specific assessment areas, is supplemented by a more detailed policy review within the relevant topic chapters.

### 3.2 NATIONAL PLANNING POLICY

#### National Planning Policy Framework (NPPF)

- 3.2.1 The *National Planning Policy Framework* (NPPF) was published in March 2012; at its core is a presumption in favour of sustainable development for plan making and decision taking. The three dimensions of sustainable development – economic, social and environmental – are outlined, although it is the policies in the entire NPPF, taken collectively, which constitute the definition of sustainable development. At paragraph 49, the NPPF confirms that “housing applications should be considered in the context of the presumption in favour of sustainable development”.
- 3.2.2 The Government’s commitment to delivery of sustainable development is enshrined in the Localism Act and National Planning Policy Framework (NPPF). Local Planning Authorities are duty bound to prepare positive plans to encourage sustainable development that meets the area’s need for homes, jobs and open space.
- 3.2.3 The NPPF provides a clear decision taking framework and approach (para 14) to the determination of planning applications. The focus is the Presumption in Favour of Sustainable Development. In the absence of an up to date development plan policy, permission is to be granted unless there are adverse impacts that demonstrably and significantly outweigh the benefits of development. In the context of a time-expired or out of date local plan, consideration needs to be given to the balance of adverse impacts when assessed against the policies of the NPPF as a whole.
- 3.2.4 It is the policies of the entire NPPF, taken collectively, which provide the definition of sustainable development. Development of Gavray Drive - West accords with this definition. The development will enhance an existing vibrant and healthy community through a mix of housing and by enhancing the natural environment through integration of existing habitats into the wider green infrastructure network and the use of renewable energy technologies.
- 3.2.5 The NPPF provides 12 core planning principles that should underpin plan making and decision taking. Those relevant to the proposal are summarised below, alongside a commentary on conformity.

<b>Core Planning Principle</b>	<b>Conformity of Site</b>
Plan-led system with up to date local plans setting out a positive vision	There is no up to date adopted Local Plan.  The site is proposed to be allocated for development as part of the main

	<p>modifications to the emerging Local Plan. The application scheme delivers a major residential led urban extension in accordance with the emerging policy Bicester 13.</p>
<p>Sustainable economic development to deliver homes, businesses, infrastructure and local places that are needed, based on an assessment of local need.</p>	<p>The potential benefits of development of land at Gavray Drive - West, are recognised by the emerging Local Plan and its evidence base. The scheme has the potential to deliver a substantial proportion of Cherwell's housing requirement, both market and affordable, supported by local community facilities. As such it will also have a positive impact on economic development and housing objectives within the District.</p>
<p>High quality design and amenity</p>	<p>The applicant is committed to the creation of a desirable new community that reflects Bicester's vernacular and to creating walkable residential neighbourhoods. The Parameter Plan submitted with the application demonstrates best practice in form and layout. This is addressed in detail in the Design and Access Statement (DAS). The application is in outline form so the actual design of buildings and amenity space is reserved. Nevertheless, the DAS includes artist impressions showing the design aspirations for the site.</p>
<p>Take account of the different roles and character of different areas including promoting the vitality of main urban areas and recognising the intrinsic character and beauty of the countryside.</p>	<p>Additional housing will support the vitality of the town centre and shops and services near to the site. The development layout has been influenced by the landscape context and topographical features of the site. Development parcels, the form and type of open space and route-ways take account of the established physical features.</p>
<p>Support the transition to a low carbon future.</p>	<p>The scheme takes full account of potential flood risk though the provision of SUDS, will incorporate the principles of sustainable development, including maximising the potential for walking, cycling, public transport and minimising the carbon footprint. Buildings will be built to the Building Regulation Standard in force, at the time of construction.</p>
<p>Contribute to conserving and enhancing the natural environment and reducing pollution</p>	<p>Chapter 9 (Ecology) and 8 (Landscape) demonstrate how the development conserves and enhances the natural environment. Air pollution and noise are considered under chapters (6 and 7) and demonstrate that with mitigation, impacts can be reduced to acceptable levels.</p>

Promote mixed use developments	Best use will be made of the land available, through the provision of new accessible green space.
Manage growth to make the fullest use of sustainable modes of transport and focus development in sustainable locations.	The scheme will encourage the use of sustainable transport in the form of public transport, walking and cycling through routes to the centre. The site is contiguous with the existing urban area.
Improve health, social and cultural wellbeing and deliver community and cultural facilities to serve local need.	Requirements may be delivered through a Section 106 Agreement. This is subject of discussion with CDC, and falls outside of the scope of this ES.

3.2.6 The NPPF contains specific policy relating to 13 key themes. Each of these themes are considered in more detail below.

*Building a Strong Competitive Economy*

3.2.1 The proposed development supports a strong, competitive economy in Bicester and the wider District. The Government recognises that competitive economies are as much about removing barriers to growth, such as local housing need, as it is providing new employment land. The application proposes some 180 homes, part of the planned growth at Bicester, supporting investment by delivering much needed, housing.

3.2.2 The development will establish a new population (some residents will move from other parts of Bicester) that will help to support the enhanced retail and business elements proposed in the town centre. The economy will be supported by increased expenditure on goods and services. The area is close to major employment opportunities and within easy walking and cycling distance.

*Ensuring the Vitality of Town Centres*

3.2.7 The NPPF promotes competitive town centre environments and recognises town centres as the heart of their communities. The new population created by the proposed development will rely on town centre and other established retail centres for comparison shopping and leisure, which will help to ensure the town centre's vitality.

*Promoting Sustainable Transport*

3.2.8 The National Planning Practice Guidance (NPPG) provides further information on each theme. ID 42-006-20140306 of the NPPG identifies the benefits of preparing a Transport Assessment. It states:

*Travel Plans, Transport Assessments and Statements can positively contribute to:*

- *encouraging sustainable travel;*
- *lessening traffic generation and its detrimental impacts;*
- *reducing carbon emissions and climate impacts;*
- *creating accessible, connected, inclusive communities;*
- *improving health outcomes and quality of life;*
- *improving road safety; and*
- *reducing the need for new development to increase existing road capacity or provide new roads*

3.2.9 The proposed development adopts the approach advocated in the NPPF that people should be given choice about how they travel with a transport system balanced in favour of sustainable transport modes. Footways and cycle routes throughout the scheme support walking and cycling as realistic options. A Travel Plan will highlight opportunities for sustainable travel for all businesses and new homes. The Transport Assessment accompanying the OPA outlines the range of sustainable transport measures proposed, alongside the modal shift predicted.

*Delivering a Wide Choice of High Quality Homes*

3.2.10 Paragraph 49 of the NPPF notes that housing applications should be considered in the context of the presumption in favour of development. This Planning Statement demonstrates how the development can be defined as sustainable by delivering a scheme that is sensitive to the environment, supports economic growth and establishes a socially robust community.

3.2.11 The development could deliver up to 180 dwellings of the planned requirement of 10,129 units for Bicester to 2031. The application does not specify the number of homes proposed, however, the ES has tested up to 180 homes. The site is deliverable, in the context of footnote 11 of paragraph 47 of the NPPF, in that it is available, offers a suitable location for development and has a reasonable prospect of housing delivery within five years. The mix of housing types and tenures will be refined at reserved matters stage. The precise mix of affordable housing will be negotiated with CDC as part of S106 discussions.

### *Requiring Good Design*

3.2.12 ID 26-006-20140306 of the NPPG provides further information on design in the planning process and states:

*Design impacts on how people interact with places. Although design is only part of the planning process it can affect a range of economic, social and environmental objectives beyond the requirement for good design in its own right. Planning policies and decisions should seek to ensure the physical environment supports these objectives. The following issues should be considered:*

- *local character (including landscape setting);*
- *safe, connected and efficient streets;*
- *a network of greenspaces (including parks) and public places;*
- *crime prevention;*
- *security measures;*
- *access and inclusion;*
- *efficient use of natural resources; and*
- *cohesive & vibrant neighbourhoods*

3.2.13 The development values the importance of good design. The Design & Access Statement demonstrates the high quality design approach and the ability to establish a sense of place and identity. The principles in the Design & Access Statement will be taken forward at reserved matters stage for each development phase.

### *Promoting Healthy Communities*

3.2.14 ID 53-002-20140306 of the NPPG explains the links between health and planning, that development should avoid adverse impacts on human health, create opportunities for people to make healthy choices, promote active travel and physical activity, and promote access to high quality open spaces and opportunities for play, sport and recreation.

3.2.15 The network of footpaths, cycle routes and green infrastructure incorporating formal and informal open space will encourage activity and healthy lifestyles.

### *Meeting the Challenge of Climate Change and Flooding*

3.2.16 ID 7-030-20140306 of the NPPG identifies the objectives of a flood risk assessment. It states:

- The objectives of a site-specific flood risk assessment are to establish:*
- *whether a proposed development is likely to be affected by current or future flooding from any source;*
  - *whether it will increase flood risk elsewhere;*
  - *whether the measures proposed to deal with these effects and risks are appropriate;*



- *the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;*
- *whether the development will be safe and pass the Exception Test, if applicable.*

3.2.17 ID 7-068-20140306 of the NPPG provides a checklist of matters to be addressed in a flood risk assessment.

3.2.18 The NPPF notes that reductions in greenhouse gas emissions and resilience to climate change can be encouraged through good planning. Development will meet the Code for Sustainable Homes in place at the time of construction. The Design & Access Statement details the ways in which this may be achieved.

3.2.19 The NPPF requires that development should be directed away from areas at highest risk of flooding. As the site is over 1 hectare in size, a Flood Risk Assessment forms part of the OPA documentation and concludes that the site is suitable for the proposed development in the context of the NPPF sequential test.

3.2.20 Sustainable urban drainage solutions will be incorporated into both the built and green environments. SuDS will be implemented to reduce flood risk, minimise pollution and provide landscape and wildlife benefits. The drainage strategy set out in the FRA will result in rates of run-off being reduced below existing and will produce a significant local benefit.

#### *Conserving and Enhancing the Natural Environment*

3.2.21 ID 8-016-20140306 of the NPPG explains how biodiversity should be taken into account in preparing a planning application ID 8-018-20140306 of the NPPG identifies the issues that should be considered when seeking to avoid, mitigate or compensate for significant harm to biodiversity and that green infrastructure can help to mitigate any significant harm to biodiversity (ID 8-019-20140306). The following paragraphs assess the development against relevant themes.

3.2.22 The NPPF places an emphasis on protecting valued landscapes, minimising impacts on biodiversity and preventing unacceptable levels of pollution, and on mitigating impacts where these occur. The ecological value of the site has been assessed in the Environmental Statement. This process has allowed a master plan to be developed that retains and enhances areas of ecological value.

*Conserving and Enhancing the Historic Environment*

3.2.23 The NPPF recognises the contribution that heritage assets make to our knowledge and understanding of the past and the desirability of new development to make a positive contribution to local character and distinctiveness. The application site does not include any heritage assets. There are no Conservation Areas, Registered Parks or Gardens, or Scheduled Monuments located within the site.

### 3.3 LOCAL POLICY

#### **Cherwell District Local Plan (1996)**

3.3.1 The Cherwell Local Plan was adopted in 1996 and had an end date of 2001. The base date for the plan was 1986. It remains part of the statutory Development Plan for the area but ran to only 2011. Some policies are 'saved' until the Council's Local Development Framework that will replace the adopted Cherwell Local Plan, is in place.

3.3.2 The Secretary of State's saving of policies beyond 2011 was explicitly related to the requirement to ensure a continual supply of land for housing land and only insofar as those saved policies remain consistent with national guidance (such as the NPPF) which the Secretary of State indicated should carry considerable weight.

3.3.3 Gavray Drive – West is allocated for employment uses. The Proposal Map shows a historic commitment to employment generating development on a large part of Gavray Drive, proposed recreation land within the centre of the site (Policy R1) and an area of new employment development (Policy EMP1). The saved policies also have some limited relevance to the determination of this application are:

- Policy C1 and C2 which seek to promote the interests of nature conservation and ensure the protection of sites of local nature conservation value;
- Policy C7 which seeks to prevent harm to the topography and character of landscape by requiring development to take into account changes in level slope and not to detract from important views;
- Policy C9 which seeks to ensure compatibility of development with rural location in terms of its type, scale and size;
- Policy C13 which seeks to preserve areas of high landscape value;
- Policy C14 which seeks to retain important trees, woodland and hedgerows and ensure that new planting uses species native to the area;
- Policy C15 which seeks to prevent the coalescence of settlements;
- Policy C25 seeks protection, enhancement and preservation of sites and/or settings of important archeological origin and scheduled ancient monuments;
- Policy C28 seeks sympathetic layout, design and external appearance of new development and use of traditional building materials;
- Policy C30 seeks that new housing is compatible with appearance, character, scale of existing dwellings in the vicinity and ensures acceptable standards of amenity and privacy;

- Policy ENV1 seeks to ensure the amenities of the environment and neighbouring residents are not unduly affected by development;
- Policy H5 sets out a target affordable housing provision of 20% in Bicester, subject to viability of the scheme;
- Policy R12 requires the provision of 2.43 ha of public open space per 1,000 population; and
- Policy TR1 that requires provision of highways improvements and/or additional public transport.

3.3.4 The overall spatial strategy and level of growth for CDCC, whilst saved until the Local Plan is adopted, will be replaced by a more ambitious growth strategy as set out in the Draft Cherwell Local Plan 2031.

#### ***Non-Statutory Cherwell Local Plan***

3.3.5 The Non-Statutory Cherwell District Local Plan 2011 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on the plan was discontinued prior to adoption. The Non-Statutory Cherwell Local Plan is not part of the statutory development plan but it has been approved as interim planning policy for development control purposes.

3.3.6 As such any relevant development plan policies offer general policy provisions and do not contain any site specific policy detail. The saved policies which are relevant (albeit to a limited degree) to the determination of this application are:

- Housing policies H1a, H3, H4 and H7 that relate to the criteria upon which locations for housing will be assessed which includes the need to take into account the physical and environmental constraints on development of land, not to be built at a density of less than 30 dwellings per hectare, provide for a mix of dwellings to include an element of affordable housing;
- Transport and Development policies TR1, TR2, TR3, TR4, TR5, TR8, TR9 and TR11 that require development proposals to contribute to achieving the objectives of the local transport plan, located where it can be realistically reached by all modes of transport, be supported by Transport Assessments and Travel Plans, provide appropriate mitigation measures and set out an approach for their implementation, ensure safe movement for all transport modes and free flow of traffic, provide appropriate cycling and pedestrian networks and facilities, provide satisfactory parking;

- Recreation and Community facilities policies, R8, R9 and R10A that require provision of 2.43 ha per 1000 population of public open space to include an element of formal sports and children’s play, and areas of informal open space that contribute to the “greening” of residential areas and if necessary, secure off site enhancement of built sport and recreation facilities.
- Conserving and Enhancing the Environment policies EN1, EN15, EN16, EN17, EN23, EN24, EN25, EN27, EN28, EN34 and EN44 that require development proposals to take into account their likely impact on built and natural environment, provide appropriate measures to control surface water drainage, limit loss of best and most versatile agricultural land, avoid building on contaminated land unless adequate mitigation is secured, be supported by ecological surveys, promote interests of nature conservation to include protected species, incorporate, where possible, the creation of new ecological habitats to include a need to protect the rural character of Salt Way, and the character and appearance of the wider landscape to reduce harm and visual intrusion and protect the setting and character of listed buildings; and
- Urban Design and the Built Environment policies D1, D3, and D12 that seek development proposals to be locally distinctive in built development and landscape, ensure a permeable and legible form of development, provide a mix of compatible uses, reflect the site’s landform and natural features, include retention and enhancement of important landscape features, protect important views and vistas.

### **Emerging Local Plan Policy**

Cherwell Local Plan 2031: Submission Document (2014)

3.3.7 The Cherwell Local Plan (2031) provides the policy framework to deliver sustainable growth to 2031 and beyond. The Submission Draft (January 2014), was submitted to the Secretary of State in January 2014. The document is not part of the adopted development plan for Cherwell. The weight to be attached to individual policies within the plan is based on their consistency with the NPPF.

3.3.8 The Cherwell Local Plan is currently at examination stage. The Examination in Public commenced in June 2014 and was suspended to identify further land for housing to demonstrate that the plan properly meets the objectively assessed housing needs identified in the 2014 Oxfordshire Strategic Housing Market Assessment. The plan does not form part of the statutory development plan but is a

material consideration, providing a clear indication of the future growth strategy for the district.

3.3.9 In August 2014, CDC published its schedule of Proposed Main Modifications to the (Submission) Local Plan. The spatial strategy seeks to manage growth and focus development in and around Bicester and Banbury. Policy BSC 1 sets out the district wide housing provision of 22,840, with 10,129 homes to be provided at Bicester.

3.3.10 Para C.25 sets out a clear vision for Bicester in 2031. Development of Gavray Drive will be a key component of that delivering that vision including *deliver development that will increase Bicester's self-containment, provide higher-value job opportunities and reduce the proportion of out-commuting; and Provide for new development in accessible locations that will maximise opportunities for providing sustainable transport choices, for reducing traffic congestion and for reducing the proportion of out-commuting.*

3.3.11 The proposed Main Modifications propose development on Gavray Drive. Draft Policy Bicester 13 – Gavray Drive is set out below.

#### **Strategic Development: Bicester 13 – Gavray Drive**

*C.101a The majority of the site is part of the River Ray Conservation Target Area. Part of the site is a local wildlife site and is situated to the east of Bicester town centre. It is bounded by railway lines to the north and west. The site comprises individual trees, tree and hedgerow groups, and scrubland/vegetation. The Langford Brook water course flows through the middle of the site. The western part of the site may include improved grassland (a BAP priority habitat). The central and eastern section of the site contains lowland meadow, a There is an additional BAP priority habitat which is a lowland meadow in the centre of the site. There are a number of protected species located towards the eastern part of the site. There are several ponds and a small stream, known as the Langford Brook, which runs from north to south through the middle of the site. A range of wildlife has been recorded including butterflies, great crested newts and other amphibians, reptiles, bats and birds.*

*There are risks of flooding on some parts of the site therefore mitigation measures must be considered. There is also a risk of harming the large number of recorded protected species towards the eastern part of the site. Impacts need to be minimised by any proposal. Approximately a quarter of the site is within Flood Zones 2 and 3 therefore any development would need to be directed away from this area.*

*Although there are a number of known constraints such as Flood Zone 3, River Ray Conservation Target Area and protected species, this could be addressed with appropriate mitigation measures by any proposal.*

#### **Policy Bicester 13 - Gavray Drive** **Development Area: 23 hectares**

*Development Description - a housing site to the east of Bicester town centre. It is bounded by railway lines to the north and west and the A4421 to the east*

#### **Housing**

- **Number of homes - 300 dwellings**
- **Affordable Housing - 30%**

Infrastructure Needs

- Education – Contributions sought towards provision of primary and secondary school places;
- Open Space – to include general greenspace, play space, allotments and sports provision as outlined in Policy BSC11: Local Standards of Provision – Outdoor
- Recreation. A contribution to off-site formal sports provision will be required.
- Community – contributions towards community facilities
- Access and movement – from Gavray Drive.

Key Site Specific Design and Place Shaping Principles

- Proposals should comply with Policy ESD16
- A high quality development that is locally distinctive in its form, materials and architecture. A well designed approach to the urban edge which relates to the road and rail corridors.
- That part of the site within the Conservation Target Area should be kept free from built development. Development must avoid adversely impacting on the Conservation Target Area and comply with the requirements of Policy ESD11 to secure a net biodiversity gain.
- Protection of the Local Wildlife Site and consideration of its relationship and interface with residential and other built development
- Detailed consideration of ecological impacts, wildlife mitigation and the creation, restoration and enhancement of wildlife corridors to protect and enhance biodiversity
- The preparation and implementation of an Ecological Management Plan to ensure the long- term conservation of habitats and species within the site to be agreed with the Council in-consultation with local biodiversity interest groups.
- Development proposals to be accompanied by a landscape and visual impact assessment together with a heritage assessment. Development proposals to be accompanied and influenced by a landscape and visual impact assessment and a heritage impact assessment.
- The preparation of a structural landscaping scheme, which incorporates and enhances existing natural features and vegetation. The structural landscaping scheme should inform the design principles for the site. Development should retain and enhance significant landscape features (e.g. hedgerows) which are or have the potential to be of ecological value.
- A central area of open space either side of Langford Brook, incorporating part of the Local Wildlife Site and with access appropriately managed to protect ecological value. No formal recreation within the Local Wildlife Site.
- Provision of public open space to form a well connected network of green areas within the site, suitable for formal and informal recreation
- Provision of Green Infrastructure links beyond the development site to the wider town and open countryside

- Retention of Public Rights of Way and a layout that affords good access to the countryside
- New footpaths and cycleways should be provided that link with existing networks, the wider urban area and schools and community facilities. Access should be provided over the railway to the town centre.
- A linked network of footways which cross the central open space, and connect Langford Village, Stream Walk and Bicester Distribution Park.
- Ensure that there are no detrimental impacts on downstream Sites of Special Scientific Interest through hydrological, hydro chemical or sedimentation impacts
- A layout that maximises the potential for walkable neighbourhoods and enables a high degree of integration and connectivity between new and existing communities
- A legible hierarchy of routes to encourage sustainable modes of travel. Good accessibility to public transport services with local bus stops provided. Provision of a transport assessment and Travel Plan
- Additional bus stops on the A4421 Charbridge Lane will be provided, with connecting footpaths from the development. The developers will contribute towards the cost of improving bus services in the wider South East Bicester area.
- Provision of appropriate lighting and the minimisation of light pollution based on appropriate technical assessment
- Provision of public art to enhance the quality of the place, legibility and identity.
- Demonstration of climate change mitigation and adaptation measures including exemplary demonstration of compliance with the requirements of policies ESD 1 – 5
- Take account of the Council's Strategic Flood Risk Assessment for the site
- Consideration of flood risk from Langford Brook in a Flood Risk Assessment and provision of an appropriate buffer. Use of attenuation SuDS techniques (and infiltration techniques in the south eastern area of the site) in accordance with Policy ESD 7: Sustainable Drainage Systems (SuDS) and taking account of the Council's Strategic Flood Risk Assessment
- Housing must be located outside Flood Zone 3 and the principles set out in Policy ESD 6: Sustainable Flood Risk Management will be followed.
- The provision of extra-care housing and the opportunity for community self-build affordable housing
- An archaeological investigation to inform an archaeological mitigation scheme as required
- An archaeological field evaluation to assess the impact of the development on archaeological features
- A detailed survey of the agricultural land quality identifying the best and most versatile agricultural land and a soil management plan.



3.3.12 The planning application seeks outline planning permission for the development of Gavray Drive – West in conformity with the emerging site specific Policy Bicester 13. Furthermore, the Design & Access Statement demonstrates how the form and layout of development and the disposition of land uses across the site responds to the specific place shaping principles in emerging Policy Bicester 13.

3.3.13 The following general policies are also relevant, accepting that the weight to be attached to them will reflect the status of the Local Plan at the time of the determination of this application.

*Policy BSC 2 Effective and Efficient Use of Land; Policy BSC 3 Affordable Housing; Policy BSC 4 Housing Mix*

3.3.14 Policy BSC 2 aims for new housing to be provided at a net density of no less than 30 dwellings per hectare. Policy BSC 3 requires 30% affordable homes, expected to comprise a 70% affordable/social rented dwellings and 30% intermediate affordable. Policy BSC 4 requires a mix of homes to meet requirements for housing need and ensure provision of socially inclusive communities, identified in the Oxfordshire Strategic Housing Market Assessment and Cherwell Housing Strategy (2014).

3.3.15 The application proposals will provide for affordable housing as part of the proposals. The tenure and mix of dwellings will be fixed through the s106 agreement and subsequent reserved matters pursuant to any outline planning permission.

*BSC10: Open space, sport and recreation provision; BSC 11: Local Standards of Provision – Outdoor Recreation.*

3.3.16 Policy BSC10 supports convenient access to open space, sport and recreation provision and seeks to ensure that new development provides sufficient quantity commensurate to the need generated by the proposals. The development provides green space for play, recreation and walking/cycling.

*ESD 1: Mitigating and Adapting to Climate Change; ESD 3: Sustainable Construction; ESD 6: Sustainable Flood Risk Management; ESD 7: Sustainable Drainage Systems (SuDS)*

3.3.17 Policy ESD1 seeks to ensure development reduces the need to travel and encourages sustainable travel options, seeks reductions in carbon emissions, promotes low carbon/ renewable energy use and encourages the use of sustainable drainage methods. Policy ESD 3 encourages all new residential development to reflect high quality design and high environmental standards demonstrating sustainable construction methods. Policy ESD 6 directs new development to areas with the lowest probability of flooding in accordance with the Sequential Test as

defined within the NPPF and requires development proposals to be accompanied by site specific flood risk assessments to assess all sources of flood risk. Policy ESD 7 requires developments to use sustainable urban drainage systems for the management of surface water run-off. As outlined earlier in this statement, the FRA concludes that the application site is suitable for the proposed development in the context of the NPPF.

*Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment*

3.3.18 Policy ESD 10 seeks to protect and enhance the biodiversity and the natural environment through the protection of trees, retention of features of biodiversity value and creation of features to enhancement biodiversity such as creation of wildlife corridors to ensure new habitat connectivity. The proposed layout has taken into account habitats and features of value at an early stage.

*Policy ESD1: Conservation Target Areas*

3.3.19 Policy ESD11 affects the eastern part of the site. No built development is proposed for this area. It is proposed to provide biodiversity enhancements in this area, together with flood attenuation and a Local Equipped Area of Play (LEAP).

*ESD 13: Local Landscape Protection and Enhancement*

3.3.20 Policy ESD 13 seeks opportunities to secure the enhancement of the character and appearance of the landscape and requires development to respect and enhance local landscape character. The Design & Access Statement demonstrates the evolution of the proposals, the development layout and structure as a whole has been strongly influenced by the landscape context and topographical features of the site. A detailed landscape and visual impact assessment forms part of the ES and demonstrates that the scheme has been designed to fit within the wider landscape.

*ESD 16: The Character of the Built and Historic Environment*

3.3.21 Policy ESD 16 requires new development proposals to understand and respect an area's unique built, natural and cultural context by improving the character and appearance of the area and the way it functions; to support efficient use of land and infrastructure; to reinforce or re-interpret local distinctiveness through a contemporary design response; to respect local topography and landscape features to include skylines, significant trees and historic boundaries; to conserve and enhance heritage assets; to promote permeable and accessible development and promote high quality multifunctional streets to include pedestrian movement within the public realm; and to

respect existing amenities for existing and future development. The potential effects on heritage assets have been considered at the masterplanning stage. Appropriate site investigations have been carried out.

*Policy ESD 18: Green Infrastructure*

3.2.1 Policy ESD 18 seeks to ensure that green infrastructure is integral to the planning of new development. The Parameter Plan includes green infrastructure along the Langford Brook. No development is proposed in the floodplain. CDC's open space standards are met.

*Policy INF 1: Infrastructure*

3.3.22 Policy INF 1 requires development proposals to demonstrate that infrastructure requirements can be met including the provision of transport, education, health, social and community facilities. The application proposals accord with this requirement through delivery of the following:

- contributions to off-site junction improvements;
- a proportion of affordable housing;
- land and contributions as appropriate for education, sports provision and community facilities;
- green infrastructure including informal open space and landscape areas and children's play space; and
- sustainable urban drainage systems.

**Bicester Masterplan Draft SPD**

3.3.23 Cherwell District Council and Oxfordshire County Council have jointly commissioned WYG Planning & Design to prepare a 'blueprint' or Masterplan for the future development of Bicester. The Draft Masterplan has been produced alongside the Local Plan. Once adopted, the masterplan will be a Supplementary Planning Document (SPD), and will become a material consideration in the determination of planning applications to guide local businesses, land owners and developers in preparing planning applications.

3.3.24 The Masterplan intends to provide a vision for development in Bicester up to 2031 and beyond. It seeks to:

- Provide a range of employment uses that create between 15,000 and 20,000 new jobs in manufacturing, industrial and research employment sectors, to enhance the role of Bicester in the regional economy and reduce out-commuting;
- Provide a total of 10,300 new homes; approximately 6,500 homes up to 2031 and a further 3,800 by 2040 to deliver the Local Plan requirements;
- Create a network of open spaces, including 90 hectares for sports pitches, 70 hectares for open space and 280 hectares for amenity areas to address the existing shortfall;
- Limit the future growth of the town and separation from the adjacent villages, through the creation of strategic landscape buffers;
- Create a transport and movement strategy that will reduce traffic congestion; and,
- Establish a Town Centre Action Area to ensure the coordination of retail, social, health and leisure development to increase town centre activity and create new jobs.

3.3.25 The Concept Masterplan identifies the future broad shape of the town and is based upon the landscape and other constraints identified. The concept masterplan identifies the potential maximum capacity of the town, from just under 30,000 residents to up to in excess of 50,000. The Concept Masterplan identifies:

- A limit to the future growth and separation from the adjacent villages by a strategic landscape buffer.
- A transport and movement strategy that will reduce traffic congestion and enable improved connectivity between the neighbourhoods and town centre.
- A Town Centre Action Area to coordinate the retail, social, health and leisure development that will be needed.

3.3.26 The Framework Masterplan sets out a detailed set of proposals that connect the transport and movement, housing, employment, green infrastructure and the town centre actions together. The main features of the Framework Masterplan include:

- Major new logistic, hi-tech and manufacturing sites located on the new strategic road network on the eastern side of the town;
- RAF Bicester allocated as a special mixed use employment area focusing on aviation, conservation and heritage activities and tourism facilities;
- Smaller scale sites forming part of sustainable mixed use neighbourhoods and the eco-development at North West Bicester;
- Changes to the strategic road network to enable improved connectivity;
- New Bicester Town Railway Station to provide the opportunity to create a new entrance into the town and sustainable movement links to Bicester Business Park and Graven Hill;

- Residential development focused on the key strategic sites;
- Four reserve sites at Caversfield, East Bicester, Graven Hill and Bicester Gateway.

3.3.27 The draft masterplan identifies the wider Gavray Drive site for housing and open space, in line with the emerging Local Plan



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#### **4.1 INTRODUCTION**

- 4.1.1 This chapter has been prepared by David Lock Associates, to report the socio-economic effects of the Proposed Development during the construction stage and following completion.
- 4.1.2 This chapter assesses the current social and economic conditions in the Bicester area (specifically South Ward), as well as the wider Cherwell district area and examines the likely significant effects of the Proposed Development on population, housing, employment, education, health, community facilities, open space and retail. The direct and indirect effects of the Proposed Development and their significance are assessed.
- 4.1.3 A scoping report was submitted to Cherwell District Council on 24 September 2014 and the Council responded on 6 November 2014 which sets out the level of detail required for the ES. The response did not highlight any specific points that needed a further response from the applicants. The relevant consultees that were approached as part of the scoping report include Bicester Town Council, Launton Parish Council, and Planning Policy Officers of Cherwell District Council.



## **4.2 ASSESSMENT METHODOLOGY**

### **Scope**

4.2.1 The Site lies in the district of Cherwell, within the South Ward of Bicester. This ward encompasses the south-eastern area of Bicester and is bound by two railway lines; the Birmingham to London Marylebone line to the north and the Oxford to Bletchley line to the west. The ward also extends to the A41 to the south and the A4421 to the east.

4.2.2 It should be noted that the Proposed Development will have effects on the wider area of Bicester and as a result the Study Area, where appropriate, takes Bicester as a whole into account. The Study Area focuses on the urban area of Bicester but to provide context and for comparative purposes reference is also made to baseline data for Cherwell District, the South East and nationwide.

### **Data sources**

4.2.3 This environmental impact assessment draws upon published Government and local authority statistics, and economic strategy documents relating to the area, including the 2011 Census, other ONS data and documents published by Cherwell District Council and other organisations such as the NHS.

4.2.4 The assessment also draws upon supporting studies that are submitted in support of the Outline Planning Application (OPA). All data sources will be referenced throughout this chapter.

4.2.5 The following prevailing socio-economic conditions in Cherwell including the immediate context of the Site have been considered in identifying the likely significant effects of the Proposed Development:

- demographic profile;
- economic activity, including unemployment, business activity around the Site, skills and occupational structure;
- housing stock, affordability and quality;
- living environment and aggregate deprivation;
- school capacity; and
- healthcare capacity.

4.2.6 The assessment takes into account predicted population within the Proposed Development and its likely demographic profile.

#### **Assessment approach**

4.2.7 Following an understanding of the baseline conditions, the assessment examines the potential significant environmental effects that the Proposed Development would be likely to have in terms of:

- changes in population numbers and housing;
- changes in employment provision and commuting patterns;
- number of construction related jobs generated through the phased construction programme;
- the impacts associated with increased demand on social infrastructure, including:
  - education;
  - health;
  - public open space for formal and informal recreation;
  - community facilities;
  - retail; and
  - accessibility and public safety.

4.2.8 Opportunities to mitigate any potential adverse effects are then identified as well as any residual effects that might remain following mitigation.

4.2.9 With regard to the manner in which the duration of impact is described, temporary impacts (short to medium term) are considered to be those associated with the construction stage and permanent impacts (long term) are those associated with the completed Proposed Development.

#### **Assessment Criteria**

4.2.10 There are no generally accepted criteria for assessing the significance of socio-economic effects and, in some cases, it can be difficult to quantify or measure such effects. The assessment of significance of impacts is based on the magnitude of the predicted change to the baseline position, as well as the sensitivity of the socio-economic “receptors”. Where the effect has been difficult to quantify, qualitative professional judgment has been applied, based on experience. Impacts are identified as either beneficial or adverse, whilst their significance is classified as either “major”, “moderate”, “minor” or “insignificant”.

4.2.11 Magnitudes of change are rated as Large, Moderate, Small or Insignificant and can be Direct or Indirect, and Beneficial or Adverse. Examples of changes of each of these levels of magnitude are set out in Table 4.1.

4.2.12 **Table 4.1: Examples of socio-economic changes of different magnitude**

<b>Magnitude</b>	<b>Direct Effects</b>	<b>Indirect Effects</b>
<b>Large Beneficial</b>	Substantial increase in, for example, jobs, homes, retail, green space and improvements to other socio-economic indicators as a direct consequence of the Proposed Development.	Substantial increase in for example, jobs, homes, retail, green space and improvements to other socio-economic indicators as an indirect consequence of but not only related to the Proposed Development.
<b>Moderate Beneficial</b>	Moderate increase in, for example, jobs, homes, retail, green space and improvements to other socio-economic indicators as a direct consequence of the Proposed Development.	Moderate increase in for example, jobs, homes, retail, green space and improvements to other socio-economic indicators as an indirect consequence of but not only related to the Proposed Development.
<b>Small Beneficial</b>	Minor increase in, for example, jobs, homes, retail, green space and improvements to other socio-economic indicators as a direct consequence of the Proposed Development.	Minor increase in for example, jobs, homes, retail, green space and improvements to other socio-economic indicators as an indirect consequence of but not only related to the Proposed Development.
<b>Negligible</b>	No appreciable effect on net employment on site, retail provision, housing provision or other socio-economic indicators as a direct consequence of the Proposed Development.	No appreciable effect on net employment off site, retail provision, housing provision or other socio-economic indicators indirectly related to the Proposed Development.
<b>Small Adverse</b>	Minor loss of for example, jobs, homes,	Minor loss of for example, jobs, homes,

	retail, green space and deterioration of other socio-economic indicators as a direct consequence of the Proposed Development.	retail, green space and deterioration to other socioeconomic indicators as an indirect consequence of but not only related to the Proposed Development.
<b>Moderate Adverse</b>	Moderate loss of for example, jobs, homes, retail, green space and deterioration of other socio-economic indicators as a direct consequence of the Proposed Development.	Moderate loss of for example, jobs, homes, retail, green space and deterioration to other socio-economic indicators as an indirect consequence of but not only related to the Proposed Development.
<b>Large Adverse</b>	Substantial loss of for example, jobs, homes, retail, green space and deterioration of other socio-economic indicators as a direct consequence of the Proposed Development.	Substantial loss for example, of jobs, homes, retail, green space and deterioration to other socio-economic indicators as an indirect consequence of but not only related to the Proposed Development.

4.2.13 The Proposed Development will affect the Site and its surroundings to varying degrees, depending on the sensitivity of the receptor. The sensitivity of local receptors to the effects of the Proposed Development is classified as high, medium, low or insignificant as set out in Table 4.2 below.

4.2.14 Using an example is an appropriate way to demonstrate the relative sensitivities of different socio-economic receptors. The Proposed Development will create a range of employment opportunities. Those opportunities associated with the construction stage will be temporary and therefore considered low in sensitivity; however, some employment will also be required to serve some of the elements of the Proposed Development, such as the local centres. Those jobs will be permanent and will deliver a lasting impact on socio-economic conditions and should therefore be considered as being of high sensitivity.

**Table 4.2: Sensitivity of socio-economic receptors**

Receptor	Nature of Effect	Sensitivity
<b>Construction</b>		
Population, Housing, Education and Health	Temporary	Negligible
Employment	Temporary	Low
<b>Completed Development</b>		
Population & Housing	Permanent	High
Employment	Permanent	High
Education	Permanent	Medium
Health	Permanent	Medium
Community Facilities	Permanent	Medium
Open Space	Permanent	Medium
Retail	Permanent	Medium

4.2.15 The significance of the socio-economic effects of the Proposed Development is determined by the interaction between the magnitude of the change and the sensitivity of the receptor concerned. Table 4.3 comprises a matrix that demonstrates how the significance of effects has been determined.

**Table 4.3: Significance of socio-economic effects**

MAGNITUDE of Change	SENSITIVITY of receptor to Change			
	High	Medium	Low	Negligible
Large	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Insignificant
Small	Moderate	Minor	Minor	Insignificant
Negligible	Minor	Insignificant	Insignificant	Insignificant

4.2.16 The residual effects of these levels of significance vary from major levels of significance, where the effects are likely to be important considerations at a local or district level which could become problematic if the effects are adverse. Moderate significance may not be important at a local level individually but collectively could increase the overall effects on a particular area. The effects could be mitigated or enhanced through detailed design work. Minor effects may be raised as local issues

but are unlikely to be of importance in the decision-making process. Insignificant effects will be below the level of perception or have no effect whatsoever.

#### **Uncertainties and limitations**

4.2.17 The data used has been sourced from official projections and data, and any limitations with the scope can be attributed to the inherent limitations of the data. This section whilst describing and assesses the proposed effects caused by the development on the baseline socio-economic conditions, the degree of impact and its significance can often be subjective.

### 4.3 RELEVANT POLICY

4.3.1 This section identifies planning policies at national and local level that are particularly relevant to the socio-economic effects of the Proposed Development. Policies of broader relevance to the Proposed Development are introduced in **Chapter 2** of this ES.

#### **National Planning Policy Framework (March 2012)**

4.3.2 The *National Planning Policy Framework* (NPPF) sets out a “presumption in favour of sustainable development” (paragraph 14) and seeks to promote “sustainable economic growth through the planning system” (paragraph 19).

4.3.3 At paragraph 17, the NPPF sets out a series of core planning principles that should underpin both plan- making and decision-taking; these state that planning should:

- find ways to enhance and improve the places in which people live their lives;
- proactively drive and support sustainable economic development to deliver homes and business and industrial units, infrastructure and thriving local places;
- seek to secure high quality design and a good standard of amenity;
- promote the vitality of the main urban areas, protect Green Belts, recognise the intrinsic character and beauty of the countryside and support thriving communities within it;
- encourage the effective use of land;
- promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising some land can perform many functions ( such as wildlife, recreation, flood risk mitigation, carbon storage, or food production); and
- support local strategies to improve health, social and cultural wellbeing and deliver sufficient community and cultural facilities to meet local needs.

4.3.4 Paragraph 69 of the NPPF acknowledges the role of the planning system in facilitating healthy and inclusive communities and safe and accessible developments which contain clear and legible pedestrian routes and high quality public open space.

4.3.5 Paragraph 70 of the NPPF seeks the promotion of social, recreational and cultural facilities and services, such as high quality open space and community facilities such as local shops, meeting places, sports venues and places of worship.

### **National Planning Policy Guidance**

4.3.6 ID 26-006-20140306 of the NPPG provides further information on design in the planning process and states:

*“Design impacts on how people interact with places. Although design is only part of the planning process it can affect a range of economic, social and environmental objectives beyond the requirement for good design in its own right. Planning policies and decisions should seek to ensure the physical environment supports these objectives. The following issues should be considered:*

- *local character (including landscape setting);*
- *safe, connected and efficient streets;*
- *a network of greenspaces (including parks) and public places;*
- *crime prevention;*
- *security measures;*
- *access and inclusion;*
- *efficient use of natural resources; and*
- *cohesive & vibrant neighbourhoods.”*

4.3.7 ID 53-002-20140306 of the NPPG explains the links between health and planning, that development should avoid adverse impacts on human health, create opportunities for people to make healthy choices, promote active travel and physical activity, and promote access to high quality open spaces and opportunities for play, sport and recreation.

### **The Development Plan**

4.3.8 The statutory adopted Development Plan for Cherwell District Council comprises the saved policies from the Cherwell Local Plan (adopted in 1996), originally intended to cover the period up until 2001, but has since been saved beyond that period and many policies from that plan remain extant.

4.3.9 The Non-Statutory Cherwell District Local Plan 2011 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on the plan was discontinued prior to adoption. The Non-Statutory Cherwell Local Plan is not part of the statutory development plan but it has been approved as interim planning policy for development control purposes.



### **Emerging Local Policy**

#### ***Cherwell Local Plan 2031: Illustrative Cherwell Submission Local Plan (February 2015)***

- 4.3.10 Cherwell District Council submitted their new Local Plan (2006-2031) for examination in January 2014, and was the subject of hearings held in June 2014. The examination has been formally suspended to allow for Cherwell to undertake modifications to the proposed development plan.
- 4.3.11 Consultation on Proposed Modifications took place from 22<sup>nd</sup> August to 3<sup>rd</sup> October 2014, where the primary reasons for making these modifications is to ensure the district can sufficiently meet the objectively assessed need for 22,840 homes (2011-2031) as identified in the new 2014 Oxfordshire Strategic Housing Market Assessment (SHMA).
- 4.3.12 The Local Plan Examination recommenced in December 2014 and following the hearings an Illustrative Cherwell Submission Local Plan was published in February 2015 to assist the Examination.
- 4.3.13 The spatial strategy identified in the Plan sets out how the assessed need of 22,840 homes will be managed throughout the district. Policy BSC1 states 10,129 homes should be built in Bicester. This is the largest designation of housing in the Plan and equates to almost 45% of the identified housing distribution.
- 4.3.14 The Proposed Modifications identify new development sites to facilitate the assessed housing need throughout Cherwell. Bicester 13 is a new proposed policy at Gavray Drive, of which this planning application relates the western part of land north of Gavray Drive.
- 4.3.15 Policy Bicester 13 is proposed as a strategic housing allocation for the district and would provide 300 dwellings of which 30% are affordable. The infrastructure requirements for the site include contributions towards the provision of primary and secondary school places, include open space provision including general green and place space, allotments and formal sports on and off-site, contributions towards community facilities, specifically the establishment of the town cemetery and access and movement from Gavray Drive.

4.3.16 Draft Policy Bicester 13 also sets out a number of key site specific design and place shaping principles to guide development. These are set out below incorporating further proposed modifications based on the representations received during the consultation period:

- Proposals should comply with Policy ESD16
- A high quality development that is locally distinctive in its form, materials and architecture. A well designed approach to the urban edge which relates to the road and rail corridors.
- That part of the site within the Conservation Target Area should be kept free from built development. Development must avoid adversely impacting on the Conservation Target Area and comply with the requirements of Policy ESD11 to secure a net biodiversity gain.
- Protection of the Local Wildlife Site and consideration of its relationship and interface with residential and other built development. Ecological surveys must be undertaken to identify habitats and species of value and any mitigation measures required, including those required to mitigate cumulative impacts on Local Wildlife Sites.
- Detailed consideration of ecological impacts, wildlife mitigation and the creation, restoration and enhancement of wildlife corridors to protect and enhance biodiversity. The preparation and implementation of an Ecological Management Plan to ensure the long term conservation of habitats and species within the site to be agreed with the Council in consultation with local biodiversity interest groups.
- Development proposals to be accompanied and influenced by a landscape and visual impact assessment and a heritage assessment.
- The preparation of a structural landscaping scheme, which incorporates and enhances existing natural features and vegetation. The structural landscaping scheme should inform the design principles for the site. Development should retain and enhance significant landscape features (e.g. hedgerows) which are or have the potential to be of ecological value.
- A central area of open space either side of Langford Brook, incorporating part of the Local Wildlife Site and with access appropriately managed to protect ecological value. No formal recreation within the Local Wildlife Site.
- Provision of public open space to form a well-connected network of green areas within the site, suitable for formal and informal recreation.
- Provision of Green Infrastructure links beyond the development site to the wider town and open countryside.
- Retention of Public Rights of Way and a layout that affords good access to the countryside.

- New footpaths and cycleways should be provided that link with existing networks, the wider urban area and schools and community facilities.
- Access should be provided over the railway to the town centre.
- A linked network of footways which cross the central open space, and connect Langford Village, Stream Walk and Bicester Distribution Park.
- Ensure that there are no detrimental impacts on downstream Sites of Special Scientific Interest through hydrological, hydro chemical or sedimentation impacts.
- A layout that maximises the potential for walkable neighbourhoods and enables a high degree of integration and connectivity between new and existing communities. A legible hierarchy of routes to encourage sustainable modes of travel. Good accessibility to public transport services with local bus stops provided. Provision of a transport assessment and Travel Plan.
- Additional bus stops on the A4421 Charbridge Lane will be provided, with connecting footpaths from the development. The developers will contribute towards the cost of improving bus services in the wider South East Bicester area.
- Provision of appropriate lighting and the minimisation of light pollution based on appropriate technical assessment.
- Provision of public art to enhance the quality of the place, legibility and identity.
- Demonstration of climate change mitigation and adaptation measures including exemplary demonstration of compliance with the requirements of policies ESD 1 – 5.
- Proposals should take account of the Council's Strategic Flood Risk Assessment for the site.
- A consideration of flood risk from Langford Brook in a Flood Risk Assessment and provision of an appropriate buffer. Use of attenuation SuDS techniques (and infiltration techniques in the south eastern area of the site) in accordance with Policy ESD 7: Sustainable Drainage Systems (SuDS) and taking account of the Council's Strategic Flood Risk Assessment.
- Housing must be located outside Flood Zone 3 and the principles set out in Policy ESD6: Sustainable Flood Risk Management will be followed.
- The provision of extra-care housing and the opportunity for community self-build affordable housing.
- An archaeological investigation to inform an archaeological mitigation scheme as required.
- An archaeological field evaluation land quality identifying the best and most versatile agricultural land and a soil management plan.

- A detailed survey of the agricultural land quality identifying the best and most versatile agricultural land and a soil management plan.

#### **4.4 BASELINE CONDITIONS**

4.4.1 This section describes the current socio-economic conditions within the Study Area.

##### **General Geographic Context**

4.4.2 The Application Site lies to the east of the built up area of Bicester and comprises approximately 6.92ha (including access). It is bounded by Gavray Drive to the south, the Birmingham to Marylebone rail line (Chiltern Line) to the north, the Oxford to Bletchley railway line to the west and further green space to the east.

4.4.3 Beyond Gavray Drive to the south, residential development has been completed at Langford Village and Bicester Fields Farm. Bicester town centre is located approximately 1.3km to the west of the western boundary of the Site offering a range of retail, commercial, employment and residential activities. North of the Birmingham to Marylebone rail line is the Bicester Distribution Park which comprises a large footprint B8 distribution units.

4.4.4 The Site lies within the South Ward of Bicester.

##### **Population**

4.4.5 The population of the Cherwell District was approximately 141,868 as per the Mid-Year estimates for 2013. At the time of the 2011 Census<sup>1</sup>, 5,411 lived within the Bicester South Ward.

4.4.6 Bicester South Ward incorporates an area of 153 hectares, with an average density of 35.4 persons per hectare, which is significantly higher than density of people across the whole of Cherwell district, which accommodates an average of 2.4 persons per hectare. This identifies the predominantly urban nature of Bicester South Ward, and the non-metropolitan and rural nature of Cherwell district.

4.4.7 A higher proportion of Bicester South Ward's residents are between 30 and 44 years old, with the median age of the Ward being 33 and the mean age being 31.6. These figures are however lower than the district, region and national mean and median). This is reflected in Table 4.4.

##### **Table 4.4: Population Age Structure**

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<sup>1</sup> The 2011 Census is the most up-to-date data set for population at ward level.

	Bicester South Ward	Cherwell	South East	England
<b>Persons aged 0-4</b>	10.2%	6.9%	6.2%	6.3%
<b>Persons aged 5-14</b>	14.5%	11.9%	11.6%	11.4%
<b>Persons aged 15-19</b>	4.8%	5.9%	6.2%	6.3%
<b>Persons aged 20-44</b>	15.6%	34.0%	32.7%	34.3%
<b>Persons aged 45-64</b>	20.2%	26.0%	26.1%	25.4%
<b>Persons aged 65+</b>	4.9%	15.3%	17.1%	16.4%

Source: ONS, 2011 (Census: Usual resident population by five year age group, wards in England and Wales).

4.4.8 The 2011 Census reports a male/female population split of 49.5: 50.5%. There is a marginally lower proportion of female residents within Bicester South Ward compared to the district, regional and national percentage split, which are 50.6%, 50.9% and 50.8% respectively.

4.4.9 Projections indicate a continuing rise in population with 151,000 forecast to be living in the district by 2021. This is an increase of 6.4% from the population of 141,868 taken from the 2011 census. The population projections are trend based projections, which means assumptions for future levels of births, deaths and migration are based on observed levels over the previous five years. They show what the population will be if recent trends in these continue. Since these assumptions are based solely on recent demographic trends, the projections do not account for socio-economic factors, or factors such as new house building in the area.

**Table 4.5: Population Projections for Cherwell District (Figures in thousands)**

Year	2014	2015	2016	2017	2018	2019	2020	2021
<b>Population Projections</b>	145	146	147	147	148	149	150	151

Source: 2012-based Subnational Population Projections for Local Authorities in England (ONS, 2014) (Rounded Figures)

### Housing

4.4.10 The DCLG Interim housing projections (2013) indicated that there would be 59,135 homes in the district by 2014. Table 4.6 indicates the proposed upwards trajectory in the number of households in Cherwell District Council. These figures indicate only projections, and are considered by the Oxfordshire SHMA to project forward lower household formation rates over the 2011-2021 period. These figures indicate a 12.1% growth in the number of households being formed, which is higher than other districts within Oxfordshire.

**Table 4.6: Household Projections for Cherwell District Council**

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Household Projections</b>	58,414	59,135	59,845	60,532	61,215	61,877	62,527	63,154	63,765

Source: Table 406, Interim 2011-based household projections by district, England 1991-2021.<sup>2</sup>

4.4.11 The Oxfordshire Strategic Housing Market Assessment reported its findings in March 2014 and identifies a need of between 1,090-1,190 (and suggested a midpoint of 1,140) new homes every year from 2011 to 2031. This represents a significant housing need for the district, with the district under an increasing amount of pressure to provide new homes.

4.4.12 The upward trajectory in the number of households for Cherwell District Council reflects in part, the suppression of household formation rates since 2007 as a result of lower housebuilding and therefore results in a small increase in the average household size. The average household size in Cherwell has increased since 2001 (2.45 in 2011 compared with 2.43 in 2001), which is identified within Table 4.7 Average household size has been static across Oxfordshire as a whole, the South East Region or England.

**Table 4.7 Average Number of People per Household**

	Census 2001	Census 2011
<b>Cherwell</b>	2.43	2.45
<b>Oxfordshire</b>	2.41	2.41
<b>South East</b>	2.38	2.38
<b>England</b>	2.36	2.36

Source: Adapted from Data Note 4: Average Household Size within Oxfordshire, District Data Analysis service, 2012

4.4.13 The percentage number of property owners with property owned outright in Bicester is far lower than the Cherwell average and the South East region. Equally the proportion of affordable housing tenure is lower in Bicester, as demonstrated in Table 4.8.

**Table 4.8 Dwelling Tenures**

<sup>2</sup> The 2011 Census is the most up-to-date data set for household projections

	<b>Owned Outright</b>	<b>Owned with a mortgage or loan</b>	<b>Shared Ownership</b>	<b>Rented from Local Authority</b>	<b>Other social rented</b>	<b>Private Rented</b>	<b>Living Rent Free</b>
<b>Bicester South Ward</b>	15.9%	55%	0.6%	0.2%	5.2%	22.6%	0.7%
<b>Cherwell</b>	30.9%	38.4%	0.8%	2.6%	9.6%	16.2%	1.6%
<b>South East</b>	32.5%	35.1%	1.1%	5.8%	7.9%	16.3%	1.3%

Source: Table QS405EW, 2011 Census- Tenure, Households, Local Authorities in England and Wales<sup>3</sup>

4.4.14 Cherwell District Council produced a *Strategic Housing Market Assessment Review and Update* in 2012 to supplement the SHMA which was undertaken on a strategic level across Oxfordshire in 2007. Bicester has range in average rental price from £521 pcm for a studio flat to £2,042 pcm for a 5 bedroom property.

4.4.15 Table 4.9 indicates the range of dwelling types found in Bicester – derived from Lower Super Output Area.

**Table 4.9 Stock Type and Mix – Bicester**

	<b>Converted Flat</b>	<b>Purpose Built Flat</b>	<b>Terraced</b>	<b>Semi Detached</b>	<b>Detached</b>
<b>Bicester</b>	28	365	3,709	3,259	3,526

Source: Derived from Census commissioned tables; extracted from Cherwell SHMA review and update

4.4.16 Cherwell District Council's housing completions have steadily decreased in recent years, falling from a peak of 1067 total completions in 2005/2006 to 340 total completions in 2012/13. The highest number of completions since 2006/2007 is 455 completions achieved in the following year (2007/2008).

4.4.17 There is evidence of slightly overcrowded living conditions in Bicester South Ward, as approximately 13% of the population live within dwellings of over 1.5 persons per bedroom<sup>4</sup> compared to 12% in Cherwell.

<sup>3</sup> The 2011 Census is the most up-to-date data set for household tenures

<sup>4</sup> ONS 2011 Census: Persons Per Bedroom



**Employment**

4.4.18 The Cherwell Local Plan Submission (January 2014) states that rates of employment and economic activity in Cherwell district are relatively high, and above the South East average, but have experienced lower levels of growth in recent years compared to nearby authorities.

**Table 4.10 Economic Activity**

<b>All people</b>	<b>Bicester South Ward</b>	<b>Cherwell</b>	<b>South East</b>	<b>England</b>
<b>Economically active</b>	87.9%	75.7%	72.1%	69.9%
<b>Economically Inactive</b>	12.1%	24.3%	27.9%	30.1%
<b>Employee Full Time</b>	61.2%	45.3%	40.4%	38.6%
<b>Employee Part Time</b>	14%	14.6%	13.8%	13.7%
<b>Self Employed</b>	8%	10.3%	11.0%	9.8%

Source: Table QS601EW, 2011 Census – Economic Activity.<sup>5</sup>

4.4.19 Table 4.10 also indicates that the district of Cherwell has a high number of economically active people, compared to the regional and national percentage. Within the district, Bicester is the second highest town for employment, and the third highest sub-area behind Banbury and the rural areas of Cherwell, with 20% of all employment in the District located here.

4.4.20 The type of work that the residents of Cherwell are involved in varies by sector. Cherwell’s key employment sectors are Wholesale and retail trade; Manufacturing; and Health & Education sectors.

4.4.21 According to the Cherwell Economic Analysis Study 2012, there are 67,100 employee jobs in the district of Cherwell, with a further 8,000 self-employed persons. The study also confirmed that the employment in Cherwell in the period from 1998-2008 grew more slowly (0.6% per annum) compared to a national average (0.9% per annum), as set out in the Cherwell Economic Analysis Study (August 2012).

<sup>5</sup> The 2011 Census is the most up-to-date data set for employment in key sectors.

4.4.22 Table 4.11 indicates that the largest employment sector in Cherwell, is retail, with a higher proportion of residents in Cherwell employed in this sector compared to county and national average.

**Table 4.11 Employment in Key Sectors (to include sub categories)**

<b>Industry</b>	<b>Cherwell (%)</b>	<b>Oxfordshire (%)</b>	<b>Great Britain (%)</b>
<b>Industrial</b>	17%	12%	13%
<b>Warehousing</b>	9%	6%	7%
<b>Office</b>	18%	23%	24%
<b>Knowledge Economy</b>	16%	27%	19%
<b>Research and Development</b>	1%	3%	1%
<b>Low Carbon sectors</b>	20%	22%	20%
<b>Creative Industries</b>	4%	5%	4%
<b>Tourism</b>	10%	10%	10%
<b>Retail and customer activities</b>	33%	27%	28%

Source: Cherwell Analysis Study (2012)

4.4.23 2011 Census Data concludes that a high proportion of Cherwell residents commute for longer distances to work than the South East average. The average distance of commute in Cherwell is 16.9km, compared with 16.6km for the South East. The England and Wales average commute is 15km, as set out in Census 2011 Table QS702EW.

4.4.24 Conversely, smaller comparable sectors are office and the knowledge economy. These sectors are only third and fifth largest employment sectors respectively. In Oxfordshire, these sectors constitute the joint first and third largest employment sectors. This is influenced by the fact that Cherwell and Bicester is located near to a key office centre at Oxford, and in a sub-regional context, close to Milton Keynes.

4.4.25 The *Economic Analysis Study for Cherwell*<sup>6</sup> outlines the prospective strategy for economic growth for the district going into the future plan period. It concludes that Cherwell is a district of “high economic activity yet low growth”, and there is scope to increase economic competitiveness.

4.4.26 The Submission Local Plan indicates that Bicester is to be a target for significant employment growth, specifically green technology and the knowledge based sectors, high tech companies and higher value distribution companies.

4.4.27 The Submission Local Plan lists a number of proposed strategic employment sites in close proximity to the Site and the wider Bicester area:

- North West Bicester Eco-Town (25.5Ha)
- Graven Hill (26Ha)
- Bicester Business Park (29.5Ha)
- Bicester Gateway (15Ha)
- North East Bicester Business Park (8Ha)
- South East Bicester (18Ha)

**Education**

4.4.27 Within Bicester there are a total of 17 primary schools and 3 secondary schools. The majority of these are Community schools which are maintained and run by Oxfordshire County Council. The closest primary schools to the site are Langford Village Community Primary School, Longfields Primary School and Launton CE School, the latter located in the nearby village of Launton. The nearest secondary schools to the site are Bicester Community College and The Cooper School. The full list can be found in Table 4.12.

**Table 4.12 Bicester Schools**

Primary School	Admission number (2013)	Distances from Site (miles)	
		By Car	By Foot
Brookside Primary School	37	1.9	1.3
Bure Park Primary School	73	2.5	1.9

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<sup>6</sup> Roger Tym & Partners – Cherwell District Council: Cherwell Economic Analysis Study (August 2012)

Charlton-on-Otmoor CE Primary School	14	6.5	6.3
Chesterton CE (VA) Primary School	20	3.9	3.1
Finmere CE Primary School	3	8.6	8.3
Five Acres Primary School	49	2.5	2.3
Fringford CE Primary School	14	5.5	5.3
Fritwell CE Primary School	19	7.9	7.1
Glory Farm Primary School	78	2.0	1.7
Heyford Park Free School	19	7.9	6.5
King's Meadow School	49	3.5	2.2
Langford Village Community Primary School	66	0.9	0.4
Launton CE School	18	1.6	1.6
Longfields Primary School	36	1.6	0.6
Southwold Primary School	43	2.7	2.0
St Edburg's CE (VA) School	27	2.1	1.1
St Mary's (VA) Catholic Primary School	25	2.2	1.4
<b>Total Places</b>	<b>590</b>		
<b>Secondary School</b>	<b>Admission number (2013)</b>		
Bicester Community College	110	1.9	1.4
Heyford Park Free School	58	7.9	6.5
The Cooper School	223	2.2	1.4
<b>Total Places</b>	<b>391</b>		

Source: Pupil Place Plan 2014-2018

4.4.28 The Pupil Place Plan (PPP) ensures that there are enough school places in the correct area. The Plan is updated annually and the current PPP recognises there are increases in demand for places at both primary and secondary schools.

4.4.29 Chesterton Primary School and Launton CE School, the schools in close proximity to the Site, both have the potential to expand if required in response to housing growth. Bure Park Primary School and St Edburg's Primary School have agreed to expand or increase their admission numbers, the latter expanding as part of the relocation to Kingsmere housing development in the South West of Bicester, whilst Five Acres Primary School and Longfields Primary School have already increased their intake.

4.4.30 The recent opening of Heyford Park Free School has eased immediate pressures on demand in the Bicester area by offering both primary and secondary education, however eventually two additional secondary establishments will be required, one at SW Bicester (expected to open 2018) and one within the NW Bicester eco-town development (opening no sooner than 2020).

4.4.31 It is expected that all housing developments in the Bicester area will contribute towards increasing primary and secondary capacity. This is supported by policy BDC07 (Meeting Educational Needs) in the Submission Local Plan which states that new schools where development demands it, and it acknowledges that provision of pre-school, primary and secondary accommodation will be required throughout the plan period (to 2031), due to population growth.

#### **Health and Health Facilities**

4.4.32 The Site is within the administrative area of NHS Oxfordshire, which operates a Clinical Commissioning Group for Oxfordshire. Emergency care is provided through four main emergency hospital centres. The commissioning group is split through localities who provide the local services, with services in Bicester provided through the North East Oxfordshire Locality Group.

4.4.33 There are no Emergency Departments or Acute and Specialist Hospitals in Bicester, however a Community Hospital is almost completed and will serve as a midpoint between hospital and home for rehabilitation. The nearest Emergency Department is John Radcliffe Hospital, Oxford, which delivers many of the services to a good service but requires overall improvement, as confirmed in the most recent Care Quality Commission inspection report.

4.4.34 There are four GP surgeries within Bicester: Bicester Health Centre, North Bicester Surgery, Victoria House Surgery and Montgomery House Surgery. All of the surgeries indicated above are accepting new patients who live within the specified catchment area (all of which cover the Site). Paragraph B.150b of the Local Plan Submission states there is a need for more GP provision in Bicester to support development in this area.

4.4.35 There are a range of public and private dental practices in Bicester; these are Causeway Dental Practice, Market Square Dental Practice, Greytown Dental Practice, Pomeroy & Rust Dental Practice, and Bicester Dental Care. Causeway Dental Practice and Greytown Dental Practice are accepting new patients.

4.4.36 Private dental surgeries and pharmacies are delivered under open market conditions and are based on the strength of local demand. Therefore, it is assumed that where demand exceeds supply, the gap will be met by an individual pharmacist or dentist opening a shop/clinic in the area.

4.4.37 Cherwell has a varied health profile, with an ageing population and comparatively low rates of deprivation. With this, Cherwell has lower rates of long term unemployment and drug misuse than the national average. However, Cherwell has a comparatively high ratio of obese adults and this remains a public health objective for the area, as stated in the 2014 Health Profile for Cherwell District.

4.4.38 In comparison, Bicester South Ward has a greater number of younger people and therefore the health profile varies from that of Cherwell as a whole. The Bicester South Ward Health Profile of 2014 indicates that the ward performs either significantly better or not significantly different from the average, for instance, the ward has a lower ratio of obese adults and lies generally along the national average for illness and hospital admission related indicators. Table 4.13 shows a comparison of general health at ward, district and national levels.

**Table 4.13 – General Health 2011**

	<b>Bicester South</b>	<b>Cherwell</b>	<b>South-East</b>	<b>England</b>
<b>All usual residents</b>	5,411	141,868	8,634,750	53,012,456
<b>Very good health</b>	3,284	71,403	4,232,707	25,005,712
<b>Good health</b>	1,721	49,163	2,989,920	18,141,457
<b>Fair health</b>	323	15,844	1,037,592	6,954,092
<b>Bad health</b>	65	4,261	291,456	2,250,446
<b>Very bad health</b>	18	1,197	83,075	660,749

*Source: ONS 2013, General Health – 2011 Bicester South Ward*

**Open Space, Sport and Leisure**

4.4.39 The most recent Open Space assessment took place in 2011, an updated of a background study in 2006, and covered all areas within Cherwell District. The assessment indicated that across the district there are shortages of parks and gardens, natural and semi-natural green space, amenity green space, allotments and spaces for children and young persons. Table 4.14 demonstrates this shortfall specifically for Bicester.

**Table 4.14 – Open Space Assessment - Bicester**

	Total Ha	Ha per 1000 pop	Local standard ha per 1000	Total shortfall (ha)
<b>Bicester Parks/Gardens</b>	2.63	0.09	0.48	11.69
<b>Bicester Natural/Semi-Natural green space</b>	17.71	0.59	0.69	2.87
<b>Bicester Amenity green space</b>	36.72	1.23	1.23	0
<b>Bicester Allotments</b>	2.86	0.10	0.37	8.18
<b>Bicester Children / Young Persons Space</b>	3.26	0.10 younger 0.01 older	0.59 younger 0.19 older	14.72 younger 5.29 older

Source: Adapted from 2011 Open Space Update

4.4.40 No ward analysis was undertaken during the 2011 assessment and therefore open space figures for Bicester South Ward independently are not available. To address the shortfalls the assessment claims an urban edge park is sought after of 11.69 ha, more natural/semi-natural open space will be provided with future developments and 0.7 ha of allotment space will be handed back to Cherwell District Council.

4.4.41 The most recent assessment of recreational and sports facilities for the district concluded that there was an under supply of sports hall and swimming pool provision in the district, and this is emphasised within the Draft Local Plan and reflected within Policy BSC12 (Indoor Sport, Recreation and Community Facilities).

4.4.42 Sports provision and access is not consistent through Cherwell, which can partly be attributed to its primarily rural nature. Bicester currently has a range of sports facilities in the town, including Bicester Leisure Centre and sports facilities at The Cooper School. Background Studies into the assessment of need for Artificial Grass Pitches, Sports Halls and Pools conclude that Bicester will need to increase its provision to facilitate future developments in the town.

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### **Community Facilities**

- 4.4.43 There are a range of community centres throughout the urban area of Bicester. The nearest to the Gavray Drive site are Langford Village Community Centre and Bicester East Community Centre, of which Langford is located approximately 975m on foot using local footpaths or 1.5km driving.
- 4.4.44 The closest post office to the Site is located within Bicester town centre if travelling by foot or Launton if travelling by car, approximately 1 mile and 1.6 miles respectively. The main library is located in Bicester Town Ward and is approximately 1 mile away by foot.
- 4.4.45 Thames Valley are the responsible police force for the area, and also cover the rest of Oxfordshire, Buckinghamshire and Berkshire. The nearest police station is located Queens Avenue, Bicester, which is located 1.2 miles away on foot or 1.8 miles by vehicle. It is closed Sundays and Mondays and offers a vast range of services.
- 4.4.46 Bicester and West Cherwell are covered by the Oxfordshire Fire and Rescue service, with one station located in Bicester on Queens Avenue. The current service is on call on a part time basis and they are looking to recruit staff to cover days and weekends.

### **Deprivation**

- 4.4.47 As outlined within previous topics, Cherwell has a low level of deprivation. That said, 12.3% of children live in poverty within the district, and the Submission Local Plan outlines that the deprivation is restricted to pockets, amongst a generally affluent district.
- 4.4.48 The level of deprivation in the Bicester South Ward is a considerable amount lower than Cherwell and the averages for the South East and England. This is demonstrated in Table 4.15, as ONS have outlined the number of households considered deprived by four characteristics – Employment, Education, Health and Disability, and Housing.

**Table 4.15 – Dimensions of Deprivation**

	Bicester South Ward	Cherwell – Non Metropolitan District	South East – Region	England - Country
All Households	2,136	56,728	3,555,463	22,063,368



Household is Not Deprived in Any Dimension	1,368	28,244	1,695,912	9,385,648
Household is Deprived in 1 Dimension	590	17,982	1,145,825	7,204,181
Household is Deprived in 2 Dimensions	140	8,547	569,744	4,223,982
Household is Deprived in 3 Dimensions	37	1,772	129,939	1,133,622
Household is Deprived in 4 Dimensions	1	183	14,043	115,935

*Source: Derived from Office of National Statistics, Indices of Deprivation 2010<sup>7</sup>*

4.4.49 ONS indices of deprivation has ranked the Bicester South Ward (Output area E01028463), towards to lower end of the deprivation scale in a consideration of output areas, taking into account all of the relevant indices, as set out in the Indices of Deprivation statistics from ONS. On the Indices of Deprivation, Bicester South Ward is ranked as being worse than the national average in only one area – Barriers to Housing and Services, with Index of Multiple Deprivation, Employment, Health Deprivation, Crime and Living Environment indices being ranked in the least deprived category.

### **Retail**

4.4.50 Amongst the Local Plan background evidence documents was an updated Retail Study, commissioned by Cherwell District Council in 2010. This was superseded by a complete study assessing the health of retail centres. Cherwell's Economic Development Strategy outlines that Bicester has a very strong retail offering because of the Bicester Village retail development, however ensuring that the town centre can operate alongside Bicester Village is a key priority of the Strategy.

4.4.51 Bicester Village is an out of town retail development easily accessed from the A41, M40 and A34. Much of the town centre retail units is focussed along Sheep Street in a pedestrianised zone. It is anticipated that both areas will offer a mix of retail, with high value retailers at Bicester Village with independent retailers and local services in the town centre, drawing in a wide range of people to Bicester.

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<sup>7</sup> The 2010 Indices of Deprivation data is the most up-to-date data set.

4.4.52 The Cherwell Retail Study of 2012 analyses the retail uses within Bicester town centre and finds that it is a healthy town centre which offers a broad range of convenience and comparison retail floorspace which will be complemented by the Sainsbury's superstore which is under construction and will open in 2013. The town centre lacks key national retailers that are typically found in successful town centres, however representation of national retailers is strong.

4.4.53 The nearest A1 local convenience store is located at Langford Village where there is a Tesco Express, a pharmacy and a fast food restaurant, which are approximately 1km walking or 1.5km driving. The nearest main superstore is Aldi at Launton Road in terms of walking distance, however as most residents will require a car or public transport to do their shopping the nearest superstores are Lidl (further north along Launton Road) and Tesco at Pringle Drive (adjacent to Bicester Shopping Village).

#### **Public Safety**

4.4.54 Crime across Bicester South Ward has decreased by 3% in 2014 compared to 2013 with a reduction in crime in the ward from 160 to 134. A similar rate of decrease has been recorded across Cherwell District as a whole.<sup>8</sup>

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<sup>8</sup> UK Crime Statistics sourced from Economic Policy Centre.

## 4.5 LIKELY SIGNIFICANT EFFECTS

### Construction stage

4.5.1 This section identifies the likely significant direct and indirect effects the Proposed Development is likely to have on existing and future residents, users and visitors; and assesses the significance of these effects both during and after construction.

### *Effects during demolition and construction*

4.5.2 There are no buildings on the Site, therefore there will be no effects created by demolition as part of this Proposed Development.

4.5.3 A Construction Environmental Management Plan (CEMP) will be adopted that will ensure that any environmental issues arising during the construction stage of the Proposed Development will be dealt with appropriately and in accordance with relevant legislation and to minimise disruption to existing communities.

4.5.4 It is anticipated that the overall effects of construction for the Proposed Development will be minimal due to its size and the intention for construction to last for a 3 year period. Significant effects on population, housing, education, health and other community facilities are not expected during the construction stage. Effects are only likely to become significant during the occupation stage of the development.

4.5.5 However the Proposed Development will generate construction related employment, which is considered to be the most prominent effect of the construction stage. This is calculated assuming a total construction cost of approximately £22,122,000 (£122,900 per dwelling<sup>9</sup>). If assuming that labour costs associated with the construction and completion of the Proposed Development are at an average of 25% of the total development costs, then labour costs would be circa £5,530,500.

4.5.6 To establish the effect of the construction phase in terms of direct additional employment in Cherwell, the associated labour costs are divided by the average cost of construction labour. Neighbourhood Statistics' Median gross full-time annual earnings by occupation, Great Britain, April 2014 suggest that the average annual earnings for full-time employees in the construction industry is £25,985. From this it can be estimated that the development could yield some 215 person-years direct additional employment.

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<sup>9</sup> Assuming a dwelling size of 100m<sup>2</sup> of 2 storeys in the South-East.

- 4.5.7 Notwithstanding the direct construction job creation as referred to above, there would also be indirect effects through the supply of materials from local businesses and the expenditure of salaries in the wider locality. It is considered likely that most of these companies would be located within Bicester and the surrounding areas. Indeed, most construction workers are likely to be employed from the local labour market which would promote beneficial effects within this area. This increase in spending and job creation would also be experienced by those companies who are indirectly benefiting from the construction of the Proposed Development, such as building suppliers/merchants.
- 4.5.8 In the light of the above, it can be concluded that the likely significant direct and indirect effects of the construction works upon job creation and expenditure would be **temporary**, of **local scale** and of **moderate beneficial** significance. As the effects are temporary this assessment is not considered to be significant in the overall context of the EIA.

### **Post-Completion**

#### ***Effects on population***

- 4.5.9 The average household size in Cherwell, according to the 2011 Census data is 2.45. Based upon the projected figures a development of up to 180 dwellings will therefore provide a maximum of 441 in additional population. This figure assumes that all new households originate from outside the District. However, a proportion of the new homes are likely to be occupied by existing Bicester residents buying first homes, residents trading up or downsizing, or people on waiting lists for affordable housing.
- 4.5.10 This will provide a fairly moderate growth in the population for Bicester if considered against the time period for development. However when considered against allocated sites in other parts of Bicester then population growth will be of a more significant scale.
- 4.5.11 The development will also bring permanent and lasting income to the local economy. The income and spend of the new residents in the local economy will increase local Gross Value Added (GVA) which will have positive indirect effects upon the local Bicester economy.
- 4.5.12 Some 180 new households are assessed within this Environmental Statement as proposed by the development, and taking the average median income for Cherwell

District of £23,124 (as per the Annual survey of hours and earnings (2014), it can be assumed that the development has the potential of supporting approximately £4,162,320 per annum of gross household income that could be spent within the local economy.

- 4.5.13 The impacts on existing businesses, in particular within the town centre, will be beneficial as the Proposed Development does not contain any large scale retail uses and, as such, avoids competition with the town centre. Furthermore, the new residents will also help to further sustain the town centre.
- 4.5.14 The broad range of housing opportunities is expected to make a positive contribution to helping to provide a better balance in the local population, increasing housing opportunities south of the town.
- 4.5.15 The wider effects of population growth in turn, impact upon local infrastructure services such as health and education. New residents within the Proposed Development are likely to affect the demand for key community services slightly, within the immediate environs of the Site. These direct effects will not be assessed in within this chapter.
- 4.5.16 On this basis, the effect of the population increase, is considered to be **permanent**, of **local to regional scale** (but primarily local) and of **major beneficial** significance. There will be more residents within Bicester as a result of the development who will contribute to the labour market generate and support the local and national economies, which is a significant factor as part of the EIA.

#### ***Effects on the housing market***

- 4.5.17 Up to 180 new properties can potentially be added to the housing stock of Bicester on the Site, which will comprise of a variety of different types of housing, to include detached, semi-detached, terraced, flats and apartments. The actual mix to be provided would be determined at reserved matters phases of development and would be subject to discussion with Cherwell District Council.
- 4.5.18 Draft Local Plan Policy BSC3, seeks some 30% affordable dwellings, as a proportion of social rented and intermediate, to help meet the affordable housing needs in Cherwell and Bicester.
- 4.5.19 An element of affordable housing will be provided as part of the overall proposed mix of tenures, to contribute to the affordable housing stock in the local area and Cherwell district, producing a significant beneficial role in meeting the diverse housing needs.

- 4.5.20 Population projections confirm that significant number of new households will be established within the life of the next plan period, both from natural population increase and in-migration into the district. The housing market in Cherwell continues to present challenges with regards to affordability and access to the housing market. Figures from the Shelter Housing Databank state that average house price to income ratios remain high, albeit that the ratio reduced between 2012 and 2013 from 8.26 to 7.91.
- 4.5.21 The County SHMA (2014) reports future growth of the population of the district. New housing as a result of the Proposed Development would contribute towards meeting directly the expected demand from more households seeking accommodation in the District. Indirectly, the Proposed Development will assist with lessening the pressure on housing markets elsewhere, thereby increasing choice and affordability at local, district and regional level.
- 4.5.22 On this basis both the direct and indirect effects of the Proposed Development on the local and regional housing market will be **permanent**, of **local** and to some extent **regional** scale and of **moderate beneficial significance** for the long term development of the area. As the development will meet local demand from households for dwellings the significance from an EIA perspective is significant to a small extent.

#### ***Effects on employment***

##### *Direct Employment*

- 4.5.23 The Site is agricultural land and currently undeveloped, with minimal employment generated by the agricultural land. This planning application is not for employment provision in the Proposed Development, therefore there are no direct effects on employment within Bicester.

##### *Indirect Employment*

- 4.5.24 The principal source of indirect employment will be through the income and expenditure of the residents of the new development, who will indirectly spend money on existing facilities and services in the local area, and therefore provide some potential to create jobs through their activity.
- 4.5.25 The Proposed Development will provide housing for approximately 380 economically active people (based on the 2011 rate of economic activity of working age residents in Bicester). This will be offset by some existing residents of the District becoming no

longer economically active, primarily through retirement. The addition of economically active residents will have a positive economic effect on the local area.

*Overall Economic Effects*

4.5.26 In summary, the most significant effects of the Proposed Development on the local economy, at the time of completion, would be:

- a significant capital investment through the construction process; and
- indirect FTE jobs in local shops and services.

4.5.27 The effects of the Proposed Development on the local labour market are therefore assessed as being **permanent**, of **local** scale, and of **moderate beneficial** significance. No jobs are being created on site but the development will generate a substantial labour market which is significant for the EIA.

**Effects on education facilities**

4.5.28 The Proposed Development's likely impact upon education provision, depends upon a number of variables – namely the number of additional children generated as a consequence of development which will combine with other factors such as the availability of school places in the area in line with the schoolchildren numbers in the area over a period of time (expected increase).

4.5.29 Cherwell *Draft Planning Obligations SPD* of July 2011 references derived Pupil Generation rates per dwelling, which are indicated in table 4.16.

**Table 4.16 – Pupil generation rates per dwelling**

	1 bed	2 bed	3 bed	4+ bed
Primary (4-10)	0.00	0.17	0.39	0.51
Secondary (11-15)	0.00	0.09	0.23	0.35
Sixth Form (16-17)	0.00	0.01	0.03	0.07

4.5.30 Based on the above calculations, and average mix, an average of 0.268 primary age pupils per dwelling might arise. Based on the same calculations, an average of 0.168 secondary age pupils per dwelling could emerge. A mean average of 0.028 sixth form pupils could be created per dwelling.

- 4.5.31 From this it could be considered that the following amount of children could be generated by the development: 48 primary school aged children (ages 4-10); 30 secondary school aged children (11-15); and, 5 sixth form pupils (16-18).
- 4.5.32 Although there is no onsite provision of primary or secondary education, it is considered that there is capacity in the local area to accommodate the numbers of both primary and secondary school children, despite increasing demand in Bicester, the wider Cherwell District and Oxfordshire as a whole. Chesterton Primary and Launton CE School are the nearest to the Site and both have capacity to expand or increase their admission numbers, whilst Heyford Park Free School decreases immediate pressures on secondary education provision, although it is acknowledged that two new secondary establishments will be required as housing developments come forward.
- 4.5.33 The impact of the Proposed Development on education will be addressed as part of the Section 106 agreement. Overall it is expected that the new development will have **permanent** effects, of **local** scale and of **moderate beneficial** significance. Given the number of potential pupils generated from the development and the lack of on-site provision this significance in terms of the EIA is not significant.

#### ***Effects on health***

- 4.5.34 The development provides direct and indirect opportunities to support general health and healthy lifestyles. The delivery of a sustainable form of development contributes significantly to achieving and enhancing the health of local people. Specifically, the new development will create demand for new health services. However the GP surgeries in Bicester are located within 1.5 miles of the Site and it is considered that these are able to meet the potential need generated by the Proposed Development.
- 4.5.35 The Proposed Development will deliver public open space and semi-natural green space close to and easily accessible from where people live that will also boost the quality of life for existing and new residents and allow people to live active and healthy lifestyles.
- 4.5.36 Overall, the effects of the Development upon health are expected to be **permanent**, of **local** scale and of **minor beneficial** significance. The population increase does not warrant new services to be provided on-site or elsewhere, therefore the significance in terms of the EIA is not significant.



**Effects on open space, sports and leisure provision**

4.5.37 The Proposed Development will provide approximately 2 ha of public open space for play and informal recreation and walking / cycling. The open space requirements for Cherwell District are set out in Table 8 of Policy BSC11 of the emerging Local Plan. Open space requirements from the emerging Local Plan together with the amount of open space provision proposed by the development are set out in 4.17 below. The figures are based on the housing numbers of which the ES is assessing (up to 180 units) and are multiplied by the average household size for Cherwell District of 2.45 persons per household. This equates to a population of 441.

**Table 4.17 – Open space requirements for Cherwell.**

Category of Open Space	Draft Cherwell Local Plan	Requirements for development	Amount of POS proposed
General Green Space (overall)	2.74 ha / 1000	1.18 ha	2.00 ha to include play areas
Children/Teen Play Areas	0.78 ha / 1000 people	0.34 ha	

4.5.38 The public open space will be provided at the eastern end of the Site. Within this will be a local equipped area of play which abuts the eastern boundary of the Site and is in close proximity to the northern boundary of the Site.

4.5.39 The public open space is located next to a site of high ecological value and will ultimately contribute towards and enhance this asset adjacent to the Site. The Site has footpath connections to adjacent sites and the public open space will provide an attractive and accessible space for residents of other local areas to use by walking or cycling to the Site.

4.5.40 Although the Proposed Development results in an overall loss of on-site open space, the quality of the public open space to be provided will be much greater than what currently exists and will be made available to the public which is not currently the case. The public open space to be provided is considered to be a **permanent** effect of **local** scale and **moderate beneficial** significance to existing and future residents, users and visitors. Given the ecological sensitivity of the area and the importance of providing open space on-site this effect is considered significant in the context of the EIA.

**Effects on community facilities**

- 4.5.41 There will inevitably be demand for community services and facilities created as a result of the proposed development, based on its size and the consequent increase in the population by approximately 441.
- 4.5.42 No on-site community facilities are proposed as part of this application, however the nearest community facilities are located at Langford Village, approximately 975m on foot using local footpaths or 1.5km driving. It is unlikely that other community facilities across Bicester will be used, or at the very least used by pedestrians from the Site.
- 4.5.43 Overall, the effects of the Proposed Development on community facilities are expected to be **permanent**, of **local scale** and of **negligible** significance

#### ***Effects on retail provision***

- 4.5.44 The Proposed Development will not deliver any retail as part of this application. Therefore all shopping needs of the Proposed Development will be provided outside of the Site.
- 4.5.45 Local retail and superstore provision is considered adequate to meet the needs of residents at the Site, with suitable accessibility to all. The Proposed Development will also provide further footfall for Bicester town centre and Bicester Shopping Village, enhancing its status as a key shopping destination.
- 4.5.46 The effects of on the existing local centres, superstores, Bicester town centre and Bicester Shopping Village are likely to arise from additional money being spent at these locations, therefore the effects can be considered to be **permanent** and of **moderate benefit**, and of a **local scale**. The new dwellings will contribute towards maintaining the viability of the retail provision in Bicester as the Site is well-served. However the significance of this is minimal in terms of the overall EIA.

#### ***Effects on Public Safety***

- 4.5.47 A key element of the Proposed Development is to open the Site up to the public and increase its accessibility. The site will be used during both day and night which will increase indirect surveillance and help reduce existing and perceived levels of crime. As part of the detailed design it is envisaged that the development will make use of well-designed security features, including active, mixed frontages and lighting strategies.

4.5.48 During the construction of the Proposed Development there might be the need for security fencing or other measures to provide the required safety while the development is not yet advanced enough to provide a sufficient level of indirect surveillance.

4.5.49 In terms of crime and public safety, the Proposed Development would have beneficial effects upon the surrounding areas as the level of activity will be increased and with it indirect surveillance and perceived safety. This could indirectly affect both the local housing market and local economy by attracting new interest and investment.

4.5.50 It is considered that the Proposed Development would have **permanent, local** to the development and of **minor beneficial** effects on crime and public safety both for the development and its surroundings.

#### **4.6 MITIGATION MEASURES**

- 4.6.1 As shown in the previous section, the socio-economic effects of the Proposed Development will be beneficial during both the construction phase, as well as after completion.
- 4.6.2 Suitably worded conditions on any planning permission will be discussed and agreed with Cherwell District Council, as well as delivery thresholds that will form part of the Section 106 legal agreement, to ensure that any harm caused by the development will be appropriately mitigated.

## 4.7 RESIDUAL EFFECTS

4.8.1 As shown in the previous sections of this ES chapter, all effects of the Proposed Development will be predominantly beneficial. Consequently, the residual effects during construction and following completion of the Proposed Development would remain identical to those described within the assessment of the likely significant effects.

4.8.2 In summary, the overall socio-economic effects of the Proposed Development are considered to be beneficial, as it will:

- provide a wide choice of housing of a broad range of types and tenures;
- increase expenditure in existing businesses and shops.
- utilise the capacity of off-site primary and secondary school provision;
- increase formal green space provision; and
- maintain public safety.

4.8.3 The residual effects have also considered the cumulative effects of development alongside the specific socio-economic direct and indirect effects through construction to occupation stage of development.

### Summary of effects

4.8.4 The effects identified are summarized in Table 4.18 below:

**Table 4.18: Summary of effects**

Likely significant effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Job creation and expenditure	Temporary; local scale; moderate beneficial	None required	Temporary; local scale; <b>moderate beneficial;</b>
<b>Post-completion stage</b>			
Increase in population	Permanent; local to regional scale; major beneficial	Associated provision of infrastructure, insofar as this is necessary.	Permanent; local to regional scale; <b>moderate beneficial</b>
Housing market	Permanent; local to regional	None required	Permanent; local to regional scale;

	scale; moderate beneficial		<b>moderate beneficial</b>
Job creation and expenditure	Permanent; local scale; moderate beneficial	None required	Permanent; local scale; <b>moderate beneficial</b>
Education Facilities	Permanent; local scale; moderate beneficial	None required	Permanent; local scale; <b>moderate beneficial</b>
Health	Permanent; local scale; minor beneficial	None required	Permanent; local scale; <b>minor beneficial</b>
Community Facilities	Temporary, local scale; small negligible	Section 106 contributions	Permanent; local scale; <b>minor beneficial</b>
Open Space Provision	Permanent; local scale; moderate beneficial	None required	Permanent; local scale; <b>moderate beneficial</b>

## **4.8 CUMULATIVE EFFECTS**

4.8.1 As shown in sections 4.6 and 4.7 of this chapter there are no significant effects in socio-economic terms as a result of the Proposed Development. However there will be some potential cumulative effects arising on combination with other permitted or proposed developments in the area that need to be considered. The sites listed below relate to other housing sites or areas proposing significant amounts of employment space:

- Graven Hill (Housing and Employment)
- South East Bicester (Housing and Employment)
- Gavray Drive East (Housing)
- Talisman Road (Housing)
- Bicester Business Park (Employment)
- North-East Bicester (Employment)

4.8.2 Given that the effects arising from the Proposed Development will not be significant, the same will be true for its cumulative effects with other schemes in the area.

4.8.3 All of the schemes listed above will generate employment during their construction phases and following their completion, with the exception of Gavray Drive East and Talisman Road, which are smaller in scale and are allocated for and approved for residential development only. As the Proposed Development is not providing any employment on site there is no competition between any of the employment sites.

4.8.4 The scale of the employment schemes means that, other than Bicester Business Park and North-East Bicester, a significant number of housing will also be provided on these sites. The housing proposed and approved at these locations will be a significant amount to support the forecast population growth and demand for housing in Bicester. The Proposed Development will provide housing to support rather than drive-up population growth in Bicester and therefore is not in direct competition with any of the residential schemes listed above.







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## **5.1 INTRODUCTION**

- 5.1.1 This chapter of the ES assesses the likely significant effects of the proposed development in terms of Transport and Access and has been produced by Odyssey Markides (OM).
- 5.1.2 The chapter describes the assessment methodology, baseline conditions at the site and surroundings, the likely significant environmental effects, the mitigation measures required to prevent, reduce or offset any significant adverse effects and the likely residual effects after these measures have been employed.
- 5.1.3 The content of this chapter has been informed by the Transport Assessment (TA), which is a stand-alone document that has been submitted as part of the planning application, also produced by OM.
- 5.1.4 The TA describes the accessibility of the Site in terms of proximity to trip attractors typical of residential developments and the availability of alternative modes of travel to the private car. The TA estimates the travel demands generated by the scale of the development and assesses how these demands can be accommodated within the transport infrastructure that will be in place when the development takes place, identifying a mitigation strategy where necessary.

## 5.2 ASSESSMENT METHODOLOGY

### Scope

5.2.1 In September 2014, the Applicant submitted a Request for a Scoping Opinion for the site (14/00009/SCOP). This was supported by an Environmental Impact Assessment Scoping Report, which included a specific section on the proposed content of the Transportation and Access chapter of the ES.

5.2.2 This Scoping Report stated that the ES will address the following Transportation and Access related effects:

- Temporary generation of heavy goods vehicles (HGVs) during the demolition and construction works to include any traffic movements associated with the potential importation of fill;
- Effects of the development on traffic flows and capacities of the local highway network;
- Effects of the development on accessibility by sustainable modes

5.2.3 A Scoping Response was received from CDC in November 2014, which referenced a consultation response from OCC stating that any planning application should be accompanied by a TA, *'as detailed but not necessarily limited to that outlined within the submission.'* The Scoping Response also stated that cumulative effects be considered, *'not only of recently completed developments but of those 'in planning' or envisaged as part of CDC's Bicester masterplan.'*

5.2.4 Prior to the Scoping Response being received from CDC in November 2014, in order to expedite the analysis, OM suggested to OCC that a Previous Scoping Response associated with an earlier Scoping Opinion (reference 14/00001/SCOP), be relied upon. This Previous Scoping Response provided a more comprehensive list of requirements than the most recent Scoping Response. Both Scoping Responses have been used to define the scope of the assessment.

### Data sources

5.2.5 The following data sources have been used in the compilation of this assessment:

- Junction turning count traffic surveys, undertaken 14<sup>th</sup> May 2014;
- Link flow automatic traffic count (ATC) surveys for each of the junction approach arms, undertaken 10<sup>th</sup> – 16<sup>th</sup> May 2014;
- Personal Injury Accident data, sourced from OCC; and
- Public transport timetable information, publically available.

5.2.6 Development related trip generation calculations were made using the industry standard TRICS<sup>1</sup> database, with growth rates taken from the TEMPRO<sup>2</sup> database and distribution profile and mode splits informed by 2011 Census data

5.2.7 Traffic generation within the study area that is associated with identified committed development proposals has been accounted for using publically available transport related documentation submitted as part of any relevant planning application.

#### **Consultees**

5.2.8 OCC were consulted on the Scoping Opinion by CDC and their response is included within CDC's formal Scoping Opinion. A request for further confirmation on committed development sites was issued to OCC, but no response was forthcoming.

#### **Assessment approach**

5.2.9 The scale and extent of the assessment has been undertaken in accordance with Institute of Environmental Assessment (IEA) Guidelines. These guidelines state that the assessment should be limited to highway links subject to traffic flow increases of more than 30% or where the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%.

5.2.10 These guidelines also state that specifically sensitive areas or receptors should be included where traffic flows are predicted to increase by 10% or more. Sensitive areas or receptors could include congested junctions, schools, accident hotspots and/or cyclists and pedestrians.

5.2.11 The assessment encompasses a study area that extends to those junctions defined within the Previous Scoping Response as requiring capacity assessments. This study area encompasses the following junctions:

- Gavray Drive / Mallards Way
- Gavray Drive / A4421 Wretchwick Way
- Peregrine Way / A4421 Wretchwick Way
- Peregrine Way / A4421 Wretchwick Way / A4421 Neunkirchen Way
- A41 / London Road / A4421 Seelschield Way / Gravenhill Road

5.2.12 Beyond the extent of the study area the impact of the development will have dissipated to a level that detailed assessment is not required

5.2.13 ATC surveys have been used to establish the existing daily traffic flows along each approach arm to the junctions that have been defined as being sensitive, along with the proportion of traffic flows that were HGV movements and vehicle speeds.

5.8.1 Anticipated daily traffic flows for a future year baseline scenario of 2020 when the development proposal is anticipated to be fully operational have then been calculated. A TEMPRO traffic growth factor from 2014-2020 has been applied to the observed flows and the anticipated daily traffic associated with committed development sites, for which there is a planning approval in place or an application has been submitted have been added. Development delivery trajectories for these committed development proposals up to 2020 are taken from CDC's Local Plan.

5.8.2 Vehicle movements and distribution profiles associated with these committed development proposals have been sourced from the transport related documents that were submitted in support of the planning applications. Where the distribution profiles have not extended to the study area associated with this specific development proposal, traffic flows are distributed based on existing turning movements and/or retaining traffic along strategic routes, rather than through residential areas.

5.8.3 The Table below identifies the committed development proposals that are considered as part of this future year baseline scenario.

**Table 5.1: Committed Development Sites**

Site (Local Plan reference)	Planning Reference (where relevant)
North West Bicester (Bicester 1)	10/01780/HYBRID/ 14/01384/OUT
Graven Hill (Bicester 2)	11/01494/OUT
South West Bicester Phase 1	06/00967/OUT
South West Bicester Phase 2 Bicester 3)	13/00847/OUT
Talisman Road	09/01952/OUT 13/01226/REM
Bicester Business Park Tesco Relocation	12/01193/F
Bicester Village Phase 4	12/01209/F

5.4.1 Highway works associated with these committed development proposals include:

- The full signalisation of the A41 / London Road / A4421 Seelscheid Way / Gravenhill Road roundabout junction, which is a pre-occupation condition of the approved development at Graven Hill

5.4.2 Transport infrastructure changes to this future year baseline, which do not necessarily impact upon the scope of this assessment, are those schemes identified as funded within CDC's Infrastructure Delivery Plan, which include:

- East/West Rail Phase 1 Oxford to Bicester (formerly known as Evergreen 3), which includes a station upgrade to Bicester Town and a fast Chiltern Railways service between Oxford and London Marylebone;
- Improved bus facilities at Bicester Town Station; and
- East West Rail Phase 2 (Oxford to Milton Keynes, Bletchley to Bedford, project completion expected December 2017).

5.4.3 The following projects, which are of particular significance to the Site but which do not necessarily impact upon the scope of this assessment, are also identified within the Infrastructure Delivery Plan to be implemented:

- A4421 Charbridge Lane Crossing – conversion of the current level crossing into a grade separated over bridge;
- Ensuring delivery of high quality public transport from all strategic sites to Bicester Town Centre and Rail Stations;
- Highway capacity improvements on peripheral routes; and
- Improved pedestrian and cycle links from East Bicester to the town centre, via Bicester Town Station.

5.8.4 It is against this future year baseline scenario that the development impact will be assessed.

5.8.5 However, the Scoping Opinion Response to application reference 14/00009/SCOP stated that as part of the EIA, cumulative effects are considered, 'not only of recently completed developments but of those 'in planning' or envisaged as part of CDC's Bicester Masterplan.'

5.8.6 Additional allocated sites within the emerging CDC Local Plan have therefore been considered as part of a separate cumulative impact scenario at the end of this chapter. This includes an additional 120 units for the remainder of the Gavray Drive allocated site, located immediately east of the application site.

5.8.7 The Table below identifies the additional allocated sites that have been considered as part of this cumulative scenario.

**Table 5.2: Allocated Development Sites**

Site (Local Plan reference)
South East Bicester (Bicester 12)
Bicester Gateway (Bicester 10)
Land at North East Bicester (Bicester 11)
Other/Windfall Residential Sites
Gavray Drive (Bicester 13)

5.8.8 Development delivery trajectories for these allocated sites are again taken from CDC's Local Plan. The Local Plan anticipates 112 residential units will be delivered by 2020 from other/windfall sites. This scale of development has been distributed to the other residential committed/allocated sites on a pro rata basis. Without the benefit of a specific planning application, trip generation and distribution profiles for specific sites have relied upon information included within the submission documents for the committed development sites. Similarly, where a site is envisaged to accommodate some form of commercial development, the same land uses and plot ratios approved for the Graven Hill committed development site have been adopted.

5.2.14 The South East Bicester site is also identified as potentially delivering an eastern relief road between the existing Gavray Drive roundabout junction and the A41. The introduction of this additional infrastructure will result in a potential redistribution of traffic already on the local highway network and development traffic, accommodating traffic between the A4421 north of Gavray Drive and the A41, which would therefore avoid the A41 / B4100 London Road / A4421 Seelscheid Way / Gravenhill Road roundabout junction. Traffic has therefore been redistributed to account for the influence of this relief road within the cumulative scenario.

5.2.15 In terms of quantifying development impact during construction, estimates of the number of HGV movements have been quantified based on project experience.

5.2.16 In terms of quantifying development impact during operation, the TA has used the industry standard TRICS database and 2011 Census data to calculate the anticipated number of trips generated by the scale of development. Peak hour 85<sup>th</sup> percentile trip



rates from proxy residential sites within the TRICS database that are located within England but outside of London in terms of region and suburban area, neighbourhood centre and edge of town in terms of location were selected. Any site without a bedroom ratio of at least 2 bedrooms per unit and a parking ratio of at least 2 spaces per unit for the private units were also rejected. This resulted in a proxy site selection totalling 23 private residential sites and 6 affordable sites. The number of trips generated by the proposed 180 residential units using these proxy sites are reproduced below.

**Table 5.3: Anticipated Vehicle Trip Generation**

AM Peak			PM Peak			Daily		
IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
50	69	119	71	60	131	493	520	1013

5.5.1 Vehicular trip distribution has been quantified using 2011 Census data Table WU03EW, which details the 'location of usual residence and place of work by method of travel to work.' The site's middle super output area reference is adopted as the trip origin, with all trip destinations taken at local authority level and middle super output area for trips with a destination within Cherwell District itself. The distribution profile for this journey purpose is assumed to be representative of all journey purposes. It has been assumed that all trips use the strategic road network via the A4421 to access the site, rather than through the residential areas to the south and west. All exit movements therefore left turn onto Gavray Drive, with all entry movements turning right into the site.

5.5.2 These development trips have been added to the baseline scenario to quantify the development impact.

**Significance criteria**

5.2.17 The significance level attributed to each effect has been assessed based on the magnitude of change due as a result of the development, and the sensitivity of the affected receptor to change. The assessment of potential effects of the development has taken into account both the construction and operational phases. Any effect during the construction phase is considered to be short to medium term, with effects associated with the operational phase considered to be long term.

5.2.18 Effects, which are beneficial or adverse, have therefore been identified as either:

- Major effect: where the development could be expected to have a very significant, long term effect on the highway and public transport networks;
- Moderate effect: where the development could be expected to have a noticeable long term effect on the highway and public transport networks;
- Minor effect: where the development could be expected to result in a small, barely noticeable, localised and short term effect on the highway and public transport networks; and
- Negligible: where no discernible effect is expected as a result of the development on the highway and public transport networks.

5.2.19 For highway or public transport networks there are often no set thresholds of significance for the magnitude of effect or sensitivity of receptors as each area will have a unique set of conditions and principles, in which case there has been a need for interpretation and professional judgement based on knowledge of the Site and/or the availability of quantitative data.

5.2.20 For this particular assessment, consideration is given to the change in daily vehicle movements on each of the links within the study area during the construction and operational phases, the change in bus and rail patronage during the AM peak period and a qualitative review of the impact on pedestrian amenity.

5.2.21 The thresholds that have therefore been adopted to determine the magnitude of change as a result of the development are set out in Table 5.4.

**Table 5.4: Assessment Criteria for Magnitude of Effect**

<b>Receptor</b>	<b>Negligible</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>
Change in average HGV two way daily link flows during construction	Less than 10%	10-20%	20-30%	Greater than 30%
Change in average daily link flows during operation	Less than 10%	10-20%	20-30%	Greater than 30%
Change in AM peak hour public	Less than 10% of total	10-20% of total	20-30% of total capacity	Greater than 30% of total

Receptor	Negligible	Minor	Moderate	Major
bus patronage (one-way) during operation	capacity	capacity		capacity
Change in pedestrian amenity, safety and severance	An imperceptible change to amenity and safety	A small change to amenity and safety	A large change to amenity and safety	A very large change to amenity and safety

5.2.22 In terms of sensitivity of receptors, given there is no immediate residential frontage to any of the highway links within the study area, they are considered to have a low sensitivity, with a 10m landscape buffer between the Gavray Drive carriageway and those existing units to the south offering some protection.

5.2.23 In terms of total public bus capacity as a receptor, given the additional capacity that will be delivered as a result of the significant investment in rail infrastructure that is currently occurring and the number of bus services that are accessible from within the town centre, this receptor is considered to have a low sensitivity to change.

5.2.24 In terms of pedestrian amenity, safety and severance, existing networks are likely to have spare capacity to accommodate additional demand, with the assessment taking a more qualitative approach. The focus is therefore on the magnitude of change rather than sensitivity for this receptor. More detailed consideration of safety will have been undertaken by reviewing historical Personal Injury Accident (PIA) data.

5.2.25 When the magnitude of change and sensitivity of a receptor is considered together, the following significance matrix detailed in Table 5.5 is applicable.

**Table 5.5: Significance Matrix**

Sensitivity of Receptor	Magnitude of Effect		
	Major	Moderate	Minor
Major	Major	Major/ Moderate	Moderate
Moderate	Major/ Moderate	Moderate	Moderate/ Minor
Low	Moderate	Moderate/ Minor	Minor

5.2.26 Using this table therefore, a significant effect can be defined as one that would have a Moderate or Major/Moderate or Major effect.

**Uncertainties and limitations**

- 5.2.27 For the identified committed development sites that have been included, many of the assessments that were undertaken to support planning applications did not encompass the highway network within our study area. Assumptions have therefore been made regarding the trip distribution of vehicle movements through the study area, based on observed turning movements.
- 5.2.28 For any allocated site for which there is no planning application assumptions have been made regarding the type of development, trip generation and distribution profile, using proxy information from committed developments

### 5.3 RELEVANT POLICY

#### **National Planning Policy Framework (March 2012)**

5.3.1 The National Planning Policy Framework (NPPF) sets out that promoting sustainable transport is a way of achieving sustainable development and that planning decisions should take account of whether:

- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- Safe and suitable access to the site can be achieved for all people; and
- Improvements can be undertaken within the transport network that cost effectively limits the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

5.3.2 The NPPF states that planning decisions should ensure that developments generating significant movements are located where the need to travel will be minimised and the use of sustainable modes can be maximised, giving priority to pedestrian and cycle movements and creating safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians. The NPPF also states that key facilities such as primary schools and local shops should be located within walking distance of most properties.

5.3.3 With regards to car parking, the NPPF does not include any standards and recommends that local planning authorities should set standards based on the accessibility of the development, availability of public transport and local car ownership levels.

#### **Planning Practice Guidance (2014)**

5.3.4 PPG 2014 identifies the requirements for an Environmental Impact Assessment, stating that the aim is to ensure *'that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process.'*

## Oxfordshire County Council Planning Policy Guidance

### Local Transport Plan 3

- 5.3.5 Oxfordshire County Council's (OCC) Local Transport Plan 3 (LTP3) focuses on attracting and supporting economic investment and growth, delivering transport infrastructure, tackling congestion and improving quality of life.
- 5.3.6 The LTP3 identifies that there is anticipated to be significant business and residential development within Bicester, reflecting the town's advantageous connectivity, being close to the M40 (J9), at a rail crossroads of two major strategic routes, with good strategic bus links to central Oxford and elsewhere and good links to Oxford and the Science Vale. To support development, LTP3 identifies that infrastructure improvements will need to be implemented, including upgrading the Eastern Perimeter Road (the A41 Aylesbury Road and the A4421 Wretchwick Way, Charbridge Lane and Skimmingdish Lane), developing park and ride and providing an enhanced rail and bus network.
- 5.3.7 Specifically with regards to development, Policies SD1 and SD2 under Chapter 8 of LTP3 state:
- Policy SD1. OCC will seek to ensure that:
    - The location and layout of new developments minimise the need for travel and can be served by high quality public transport, cycling and walking facilities;
    - Developers promote sustainable travel for all journeys associated with new development, especially those to work and education, and;
    - The traffic from new development can be accommodated safely and efficiently on the transport network
  - Policy SD2. OCC will:
    - Secure contributions from new developments toward improvements for all modes of transport. These can be financial contributions or direct works for the mitigation of adverse transport impacts in the immediate locality and/or wider area improvements;
    - Ensure that all infrastructure associated with the developments is provided to appropriate design standards;
    - Set local routeing agreements to protect environmentally sensitive locations from traffic generated by new developments, and
    - Normally seek commuted sums towards the long term operation and maintenance of facilities, services and infrastructure.

5.3.8 The narrative to support these policies highlights OCC's requirements for development to be located in areas that are accessible by sustainable modes of travel, with proposed site layouts supporting pedestrian and cyclist movement, thereby reducing the reliance on travel by private car. Where additional vehicular movements are generated and these materially impact upon the performance of the existing local highway network, this impact should be mitigated, including the adoption of routeing arrangements for construction vehicle access.

5.3.9 In addition to the specific policies regarding development, the LTP3 includes a specific Area Strategy for Bicester, which seeks to provide the infrastructure necessary to support the aspirations for development, with investment funding secured from both external and developer sources. It is understood that this Area Strategy replaces the Bicester Integrated Transport and Land Use Strategy 2000 (BicITLUS).

5.3.10 The Area Strategy is built on providing additional highway infrastructure, increasing the capacity on perimeter routes thereby reducing the strain on the town centre, accommodating strategic rail initiatives such as East West Rail and strengthening the town's pedestrian, cycle and bus networks. These aspirations are expressed in specific Bicester policies BIC1-BIC3.

5.3.11 Of particular relevance to the Site in terms of proximity and improving accessibility are references within BIC1 to required solutions to the Charbridge Lane railway level crossing, complemented by focussed enhancements to the A4421 between the junctions with Bicester Road and Launton Road. BIC2 identifies an aspiration to improve pedestrian, cycle and public transport links to Bicester's railway stations, an overall improved bus service along key routes, and improving urban pedestrian and cycle routes between residential developments and the town centre, including a pedestrian footbridge over the railway as part of East West Rail

**Cherwell District Local Plan (1996) and Non-Statutory Cherwell District Local Plan (2011)**

5.3.12 In terms of adopted planning policy, saved policies within the Adopted Cherwell Local Plan 1996 and the Non-Statutory Cherwell Local Plan 2011 are a material consideration in planning decisions.

5.3.13 Chapter 6 of the Non-Statutory Cherwell Local Plan details the transport related planning policies against which development proposals are assessed. In summary they relate to:

- Locating developments in areas that reflect their anticipated demand;
- The requirement for a TA;
- The requirement for development to mitigate its impact;
- The requirement to ensure the development does not generate any safety concerns;
- The requirement to support sustainable modes of travel; and
- The requirement to provide an appropriate level of car and cycle parking.

#### **Draft Cherwell Local Plan (2014)**

5.3.14 The site is referenced within the October 2014 Proposed Submission version of the Local Plan (Strategic Development Bicester Policy 13).

5.3.15 Bicester Policy 13 identifies a number of Key Site Specific Design and Place Shaping Principles, which with regards to transport and access, are:

- Retention of Public Rights of Way and a layout that affords good access to the countryside;
- New footpaths and cycleways should be provided that link with existing networks, the wider urban area and schools and community facilities;
- Access should be provided over the railway to the town centre;
- A linked network of footways which cross the central open space, and connect Langford Village, Stream Walk and Bicester Distribution Park;
- A layout that maximises the potential for walkable neighbourhoods and enables a high degree of integration and connectivity between new and existing communities;
- A legible hierarchy of routes to encourage sustainable modes of travel;
- Good accessibility to public transport services with local bus stops provided.

5.3.16 Whilst there are no transport and development specific policies within the emerging document, Strategic Objective 13 states that CDCs will promote sustainable development *'to reduce the dependency on the private car as a mode of travel, increase the attraction of and opportunities for travelling by public transport, cycle and on foot, and to ensure high standards of accessibility for people with impaired mobility.'*

5.3.17 Furthermore, Policy SLE4 details CDC's aspiration to support modal shift and more sustainable locations for employment and housing growth. The proposed modifications also identify that, *'All development where reasonable to do so, should facilitate the use*



*of sustainable modes of transport to make the fullest possible use of public transport, walking and cycling. Encouragement will be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. Development which is not suitable for the roads that serve the development and which have a severe traffic impact will not be supported.'*

5.3.18 The document confirms that in the Infrastructure Delivery Plan the following modifications to the Bicester transportation network, which are of particular significance to the Wider Site accessibility, are now funded:

- East/West Rail Phase 1 Oxford to Bicester (formerly known as Evergreen 3), which includes a station upgrade to Bicester Town and a fast Chiltern Railways service between Oxford and London Marylebone;
- Improved bus facilities at Bicester Town Station; and
- East West Rail Phase 2 (Oxford to Milton Keynes, Bletchley to Bedford, project completion expected December 2017).

5.3.19 The document identifies that in the Infrastructure Delivery Plan the following projects, which are of particular significance to the Wider Site accessibility, will be implemented:

- A4421 Charbridge Lane Crossing – conversion of the current level crossing into a grade separated over bridge;
- Ensuring delivery of high quality public transport from all strategic sites to Bicester Town Centre and Rail Stations;
- Highway capacity improvements in peripheral routes; and
- Improved pedestrian and cycle links from East Bicester to the town centre, via Bicester Town Station.

## 5.4 BASELINE CONDITIONS

### Introduction

5.4.1 A future year baseline scenario of 2020 has been adopted, when the development proposal is anticipated to be fully operational. The assessment methodology has identified the committed and/or allocated development sites that have been adopted within this future year baseline scenario.

### Highway Network

5.4.2 The local highway network is indicated on Figure 3.1 within the TA.

5.4.3 Gavray Drive, which forms the Site's southern boundary and from which it is accessed, is a single carriageway road, subject to a 30mph speed limit, providing access to residential development to the south via Mallards Way and Whimbrel Close. A number of bell mouth junctions have been constructed along the northern side of Gavray Drive to provide access to future development. Gavray Drive terminates just short of the rail line that serves Bicester Town Station to the south.

5.4.4 The A4421 Wretchwick Way forms part of Bicester's Eastern Distributor Route, connecting the A41 in the south to the A421 to the north, and is subject to a 50mph speed limit. Where it passes the site it is a wide single carriageway. The junction between Gavray Drive and Wretchwick Way is located at the south-east corner of the Site and takes the form of a normal three-armed roundabout.

5.4.5 To the south of Gavray Drive, Wretchwick Way provides access to Peregrine Way, which is effectively a large crescent acting as the main spine road to the Langford Village development. The northern connection between Peregrine Way and Wretchwick Road is a ghost island priority junction, whilst the southern junction is a normal three arm roundabout.

5.4.6 To the south of this roundabout the A4421 is dualled, before joining the A41 at a large five-arm roundabout. As well as the A41, this roundabout also gives access to the town centre via the B4100 London Road. The fifth arm accesses a Ministry of Defence site to the south via Gravenhill Road, which provides access to the Graven Hill (Bicester 2) development site.

5.4.7 ATCs undertaken between the 10<sup>th</sup> and 16<sup>th</sup> of May 2014 recorded the existing traffic flows and HGV proportions on the local highway network. Table 5.6 summarises the results of these surveys, detailing the average two way daily traffic flows, average HGV

proportions, average traffic speeds in each direction and the average weekday traffic flows during peak periods.

**Table 5.6: Existing Traffic Flows**

Count location	Average two-way daily traffic flow	Average two-way HGV proportion	Average speeds (mph)	AM Peak Average two way weekday PCU	PM Peak Average two way weekday PCU
A4421 Charbridge Lane	11392	9.9%	41.5	1246	1280
Gavray Drive	1646	5.3%	30.5	135	138
A4421 Wretchwick Way	10340	11.2%	48.2	1261	1312
A4421 Neunkirchen Way	13626	8.0%	37.4	1461	1499
A41 South	19693	6.4%	38.4	2234	2237
A41 North	21576	8.3%	42.7	2142	2120
London Road	9794	5.3%	38.9	932	1184

5.4.8 It is readily apparent from Table 5.3 that the volume of traffic on Gavray Drive is relatively low when compared with the rest of the highway network study area.

5.4.9 Junction capacity tests have been undertaken as part of the TA, with results indicating that each of the junctions within the study area operate within capacity under existing traffic flows. As part of this analysis, a comparison was made between turning counts recorded at each of the junctions in 2012 and 2014, which demonstrated that there has been a reduction in vehicle movements during each of the peak periods.

### Rail

5.4.10 Bicester benefits from having two national railway stations, Bicester North and Bicester Town.

5.4.11 Bicester North is the main station for the town and is operated by Chiltern Railways. It provides access to Birmingham, Stratford-upon-Avon, Leamington Spa, Banbury, Aylesbury, Princes Risborough, High Wycombe and London Marylebone. The station is located approximately 2000m walk distance from the Site centre via a pedestrian route via Gavray Drive and a footpath toward Laughton Road over the railway line and then via Longfields and another pedestrian route over the Chiltern mainline to access the station from Queens Avenue via the north.

5.4.12 There are 3-4 services during peak hours to London Marylebone, with a journey time of just over 1 hour and 1 service to Birmingham with a journey time of 75 minutes.

- 5.4.13 Bicester Town, also operated by Chiltern Railways, acts as the terminating station on the Oxford to Bicester Lane. However, as part of Chiltern Railways Evergreen 3 project, now known as East/West Rail Phase 1, this station is currently closed. The station is located approximately 1,150m walk distance from the Site via the residential estates to the south.
- 5.4.14 This project, which CDC's Infrastructure Delivery Plan states is fully funded, will provide a new passenger service between Oxford and London Marylebone via Bicester and High Wycombe, through the introduction of a new link between Bicester Town and the existing Chiltern mainline described above using land located within Gavray Drive West. Subsequent East/West phases will deliver a rail link between East Anglia and Central, Southern and Western England.
- 5.4.15 This service provision will reduce journey times between Bicester and Oxford and will provide two Oxford to London Marylebone trains an hour.
- 5.4.16 The Infrastructure Delivery Plan states that there will be trains running between London Marylebone and Bicester with expected completion August 2015, with the full route to Oxford open in Spring 2016.
- 5.4.17 The Infrastructure Delivery Plan also identifies a number of proposals to improve both pedestrian and public transport accessibility to this station as a result of its redevelopment.

#### **Bus**

- 5.4.18 The Site benefits from Gavray Drive being part of an existing hail and ride bus corridor that accommodates existing Bicester Circular bus services 22 and 23, which are operated by Thames Travel and which offers an hourly service to the town centre and North West Bicester. In addition, service S5, operated by Stagecoach, offers an hourly service from Launton to Oxford via the residential area south of the Site and Bicester town centre.
- 5.4.19 In addition to these locally accessible services, there are also a number of services that can be accessed from the town centre, including service number X5, operated by Stagecoach, which runs from Oxford to Cambridge via Bicester, Buckingham, Milton Keynes and Bedford, with a 30 minute service frequency. Stagecoach also operate service number 26, which provides a 30 minute service frequency to Kingsmere.

5.4.20 Chiltern Railways also operate a Taxibus service, which provides a route to Bicester North Station from various points around Bicester, for use by Chiltern Rail customers. The Taxibus network encompasses Langford Village, stopping at Peregrine Way and Mallards Way and including Gavray Drive on its route, which operates as a hail and ride section. The service operates against a regular timetable to access the station during peak hours. Outside these hours it operates as a more traditional taxi service giving individuals access to the station from their own home.

#### **Pedestrian and Cycle Network**

5.4.21 Gavray Drive is a 7.3m wide single carriageway road with a 2m wide footway on the northern side of the carriageway and a 3m shared use footway/cycleway on the southern side, which forms part of the National Cycle Network Route 51 between Oxford and Milton Keynes.

5.4.22 Gavray Drive terminates to the west due to existing rail infrastructure and there is no link across the railway provided at this point. However, the shared footpath cycleway continues from Gavray Drive and on to Laughton Road via a DDA compliant footbridge over the north/south railway line. This link benefits from street lighting along its length. The bridge is already well used by pedestrians from the Banbury Fields and Langford Village developments. The northern section is less well used, but usage would increase as a result of development.

5.4.23 Immediately north of where this footpath connects to Launton Road is a toucan crossing providing access to pedestrians and cyclists using the shared footway/cycleway on the western side of Launton Road. The footway on the western side of Launton Road is generally 3m wide but, as it approaches the town centre, it narrows in places to less than 2m and cyclist dismount markings are provided to improve safety.

5.4.24 This route will form an important link from the site to the centre of Bicester, which is approximately 1km from the centre of the development.

5.4.25 To the east of the site, Wretchwick Way is a busy road and forms part of the Eastern Distributor Road around Bicester. It is well lit and a 3 metre wide footway/cycleway runs along the length of the western side of the carriageway.

5.4.26 There are also several shared use pedestrian/cycle links from Gavray Drive running south through Langford Village.. Most have a thermoplastic marking running along the centre to segregate the two user groups. These routes provide good access to

the local centre and primary school in Langford Village and beyond into the town centre and Bicester Town Station.

5.4.27 Cycle distances of up to 5 miles are generally considered as reasonable by most members of the cycling community and such journeys would take up to 27½ minutes. On this basis, the whole of Bicester, Ambrosden, Middleton Stoney, Upper Arccott and Marsh Gibbon are all accessible within a 30 minute cycle ride.

#### **Walk Distances to Trip Attractors**

5.4.28 To fully assess the potential for future residents to walk to different sites within the area, a series of isochrones have been produced relating to the centre of the Wider Site. These are shown in Figure 6.1.

5.4.29 Table 5.7 below shows the distance from the centre of the Site to typical trip attractors for residential land uses.

**Table 5.7 Walk Distance to Trip Attractors**

<b>Destination</b>	<b>Distance</b>	<b>Attractor</b>
Local shops	600m	Retail
Launton Road Industrial Estate	850m	Employment
Langford Primary School	800m	Education
Town Centre	1200m	Employment, Retail, Leisure
Bicester Town Rail Station	1150m	Public Transport
Bicester North Rail Station	2000m	Public Transport
Cooper Secondary School	2000m	Education
Bicester Community College	1900m	Education
Kings End Hospital	1550m	Healthcare

#### **PIA Data**

5.4.30 The accident data for the following junctions has therefore been sourced for a period of 39 months between 01/01/2011-31/03/2014.

- Gavray Drive / A4421 Wretchwick Way roundabout
- Peregrine Way / Wretchwick Way priority junction
- Peregrine Way / Wretchwick Way /Neunkirchen Way roundabout
- A41 / London Road / A4421 Seelscheid Way / Gravenhill Road roundabout.

- 5.4.31 The accident data revealed a limited number of incidents at the first three junctions all of which were classified as 'Slight' in terms of severity.
- 5.4.32 The accident data analysis for the last Junction (A41 / London Road / A4421 Seelscheid Way / Gravenhill Road roundabout) shows a much higher number of accidents for the same period, which is unsurprising given the higher number of vehicle movements through this junction. These incidents included two classified as 'Serious' and one 'Fatal' incident.
- 5.4.33 The fatality occurred under normal weather and road conditions when a medium-sized vehicle (Class C1), coming from A41 west turning left into A4421, collided with a pedal cycle crossing the road, with the cyclist sustaining fatal injuries. The cause of the accident was attributed to the cyclist failing to judge the other person's path or speed and entering the road at a point with no crossing provision from the footway.

## 5.5 LIKELY SIGNIFICANT EFFECTS

### Construction stage

5.5.3 Likely significant transportation and access related effects that may arise from construction include:

- Increase in vehicle movements associated with construction staff accessing the site;
- Increase in proportion of daily HGV movements within the local highway network along route that construction vehicle are most likely to use and that will be agreed with OCC / CDC;
- Reduction in amenity and safety for pedestrians and cyclists.

5.5.4 The number of construction employees on site during peak activity, based on project experience, will be in the order of 40-60 employees, not all of which will arrive to the site by car. This is less than the total number of residents when the site is fully occupied.

5.5.5 In terms of construction vehicle routeing, the site benefits from being located within close proximity to the strategic A4421, which ensures that construction vehicles are not reliant on access via adjacent residential areas, other than via Gavray Drive.

5.5.6 It has been assumed that all construction vehicles route via the A4421 south and then A41 west

### Likely significant Effect – Proportion of HGV Movements

5.5.7 OM have undertaken an analysis to estimate the number of construction vehicles that will be generated by the proposals during the earthworks phase of construction. The earthworks will require an estimated total of material for fill totalling some 22,700m<sup>3</sup>.

5.5.8 There is an assumed 29 week earthworks programme and this will translate to approximately 14 one way construction vehicle movements per day, spread evenly across traditional working hours during this phase. This is based on a 1.2 bulking factor and a reliance on 20 tonne tipper trucks to transport this material,

5.5.9 For the construction phase, assuming a two year delivery programme, based on project experience it is estimated that there will be a peak of 81 construction vehicle movements per week, which equates to approximately 15 movements per day, slightly worse therefore than the earthworks phase.



5.5.10 Table 5.8 details the change in daily HGV proportions on the local highway network as a result of this additional HGV traffic during this period of construction. It is based on the construction route described above and each arrival movement generating an equivalent departure movement, i.e. two way flow. The assessment has also included the number of movements generated by construction staff, using 2011 Census data to estimate the proportion of employees that will drive and adopting the same distribution profile as adopted for commercial developments within the Graven Hill submission. 2018 has been adopted as year of assessment, with the identified committed developments having been delivered.

**Table 5.8: Change in HGV Proportions during Construction**

Count location	Receptor Sensitivity	Baseline HGV % (2018)	Daily Construction Traffic Movements	Construction Staff Movements	Resulting HGV %	Percentage Change HGVs %	Magnitude of Change	Significance
A4421 Charbridge Lane	Low	9.2%	0	14	9.2%	-0.1%	Negligible	Minor
Gavray Drive	Low	5.1%	30	66	6.4%	26.0%	Moderate	Moderate/Minor
A4421 Wretchwick Way	Low	10.1%	30	51	10.3%	1.7%	Negligible	Minor
A4421 Neunkirchen Way	Low	7.4%	30	51	7.5%	2.0%	Negligible	Minor
A41 South	Low	6.8%	0	7	6.8%	-0.030%	Negligible	Minor
A41 North	Low	6.8%	30	35	6.9%	1.28%	Negligible	Minor
London Road	Low	5.3%	0	9	5.3%	0.08%	Negligible	Minor

5.5.11 Using the Significance Matrix in Table 5.2, it can be seen that the additional HGV traffic will result in a minor temporary adverse effect, across the majority of the receptors based on their sensitivity which would not be considered significant for the purposes of environmental impact assessment.

5.5.12 The volume of additional HGV traffic relative to existing traffic flows and HGV proportions, will, however, result in a moderate / minor temporary adverse effect on Gavray Drive receptor, which again would not be considered significant for the purposes of environmental impact assessment.

**Potential Effect – Reduction in amenity and safety for pedestrians and cyclists**

5.5.13 The introduction of construction vehicle movements turning from the site to Gavray Drive, and therefore crossing the site access, will result in a reduction in amenity and perceived safety of pedestrians.

5.5.14 However, as there are existing footways away from the carriageway edge, the magnitude of effect on pedestrian amenity and safety is considered to be a minor temporary adverse effect.

5.5.15 Cyclists benefit from off-road cycle routes running parallel with Gavray Drive and the A4421 and so the magnitude of effect on cyclist amenity and safety is a minor temporary adverse effect.

**Post-completion stage**

5.5.16 The post-completion stage of the proposed development will see the occupation of up to 180 residential units, accessed from Gavray Drive.

**Potential Effect – Change in average daily two way link flows during operation**

5.5.17 Table 5.6 details the change in average daily two way link flows as a result of the development during operation. It should be noted that the development will be fully occupied in 2020 and as a result TEMPRO growth factors have been applied to the 2014 ATC traffic flows to quantify the anticipated future baseline traffic flows. In addition the traffic flows associated with the identified committed development have also been included within this 2020 future year baseline scenario against which the effect of the development is assessed.

**Table 5.9: Change in Average Daily Link Flows During Operation**

Count location	Receptor Sensitivity	2020 Future Baseline Traffic Flows	Anticipated Development Traffic Flows	Total Traffic Flows	Percentage Change %	Magnitude of Change	Significance
A4421 Charbridge Lane	Low	14025	277	14302	2%	Negligible	Minor
Gavray Drive	Low	1856	1013	2870	55%	Major	Moderate
A4421 Wretchwick Way	Low	13035	737	13772	6%	Negligible	Minor
A4421 Neunkirchen Way	Low	16930	737	17666	4%	Negligible	Minor
A41 South	Low	25333	96	24529	0%	Negligible	Minor
A41 North	Low	29838	612	30450	2%	Negligible	Minor
London Road	Low	11366	28	11394	0%	Negligible	Minor

- 5.5.18 Using the Significance Matrix in Table 9.2, it can be seen that the additional traffic during operation will result in a moderate long term adverse effect on Gavray Drive which is considered significant, but with all other receptors having a minor adverse effect which is not considered significant.
- 5.5.19 This impact can, however, be attributed to the fact that Gavray Drive currently serves a limited number of residential units, with a two way baseline flow of only 1856 vehicle movements.

**Potential Effect – Change in AM peak hour public bus patronage.**

- 5.5.20 A multimodal trip generation assessment within the Travel Plan that was submitted as part of the planning application using the same proxy site analysis as described above, has demonstrated that approximately 3% of commuting trips are undertaken by bus. On the assumption that this is representative of all journey purposes, applying this proportion to the all mode trips detailed in Table 5.6 results in an anticipated increase in one way exit trips totalling 6 trips during the AM peak.
- 5.5.21 Adjacent to the site, there are 3 bus routes operational in the AM peak, a single Bicester circular service 22 and two Services S5 to Oxford. Assuming a capacity of 48 passengers for each of these buses, the additional trips account for just 3.5% of total capacity if it is assumed that all bus trips are reliant on these services. Clearly there are likely to be some bus trips that are more reliant on services within the town centre, reducing this impact.
- 5.5.22 Based on this impact, using the Significance Matrix in Table 5.2, it can be seen that this will result in a minor long term adverse effect based on the receptor having a low sensitivity to change.

**Potential Effect – Change in pedestrian amenity, safety and severance.**

- 5.5.23 The development benefits from being located adjacent to an established pedestrian network, with direct routes to the town centre and local facilities to the south, including Bicester Town station.
- 5.5.24 The scale of development will not result in any perceptible change to pedestrian or cycle journey times, safety or amenity and nor is it believed that the additional number of vehicle movements will have any perceptible change to pedestrian severance. The effect is therefore considered to be, at worse, minor adverse.

**5.6 MITIGATION MEASURES****Construction stage**

5.6.1 Notwithstanding the significance of effect on receptors that has been calculated, which in terms of daily traffic impact is minor for all links other than Gavray Drive, which is moderate, a number of measures will be implemented to mitigate the general effect of additional construction vehicles, which will be finalised within a Construction Environmental Management Plan that is likely to be a requirement conditioned in any planning permission.

5.6.2 These measures include:

- Agreeing routes to and from the Site, avoiding residential and congested routes as far as possible;
- Scheduling deliveries to avoid morning and evening peak hours;
- Controlled working hours;
- On-site loading and unloading;
- Encouraging the construction workforce to access the Site using public transport;
- Wheel washers will be provided for transport vehicles leaving the Site;
- Operation of plant will be carried out in such a way that noise is minimised;
- Re-use and recycle excavated materials and waste as much as possible;
- Avoid lorries leaving the Site empty wherever possible (i.e. anything that needs to leave the Site to be taken on delivery lorries if at all practicable), and
- Signage and hoarding used to control pedestrian access around the Site.

**Post-completion stage**

5.6.3 Notwithstanding the significance of effect on receptors that has been calculated, which in terms of daily traffic impact is minor for all links other than Gavray Drive, which is moderate, a residential TP will be implemented to ensure there is no increase in the number of vehicle movements to/from the Site as well as well as encouraging modal shift. In particular, single occupancy vehicle trips will be discouraged in favour of promoting more sustainable modes of travel.

5.6.4 TP measures will include:

- All new residents will be provided with a 'Sustainable Travel Information Pack', which will include various mapping, timetable and contact information to encourage sustainable travel;
- Personalised Travel Planning;
- Formation of a Walking Bus to local schools;
- Formation of Bicycle User Group; and
- The implementation of a car sharing database;

## 5.7 RESIDUAL EFFECTS

### Construction stage

5.7.1 It is suggested that in real terms the impact of additional construction traffic during a full working day will be insignificant. This will be supported by the range of mitigation measures that have been identified to ensure there is not a concentrated impact within a short period of time such as traditional peak hours.

### Post-completion stage

5.7.2 The residual effect during operation of the Proposed Development will be minor to moderate adverse and so for some effects will remain significant.

### Summary of effects

5.7.3 The effects identified are summarised in Table 5.10 below:

**Table 5.10: Summary of effects**

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Change in HGV Proportions During Construction – Gavray Drive	Moderate Adverse	Construction Environmental Management Plan will be implemented with measures including agreeing a vehicle route, consolidating deliveries as much as possible and scheduling deliveries.	Moderate Adverse  The specific effect relates to the increase in proportion of daily flows. Existing daily HGV proportions are low on Gavray Drive, therefore any additional HGV movements will result in the adverse effect. The mitigation will ensure there is not a concentrated impact, but it will not remove the effect.
Change in HGV Proportions During Construction – rest of highway network study area	Minor Adverse	Construction Environmental Management Plan will be implemented with measures including agreeing a vehicle route, consolidating deliveries as much as possible and scheduling deliveries.	Minor Adverse  The mitigation will ensure there is not a concentrated impact, but it will not remove the effect a.

Reduction in amenity and safety for pedestrian and cyclists	Minor Adverse	There will be strict monitoring and control of any potential pedestrian/construction vehicle point of conflict	Minor Adverse
<b>Post-completion stage</b>			
Change in average daily link flows during operation on Gavray Drive	Moderate adverse	A Travel Plan will be implemented to ensure that the anticipated number of vehicle movements are maintained.	Moderate Adverse
Change in average daily link flows during operation on remainder of highway network	Minor Adverse	A Travel Plan will be implemented to ensure that the anticipated number of vehicle movements are maintained.	Minor Adverse
Change in AM peak hour public bus patronage	Minor adverse	A Travel Plan will be implemented to ensure that residents are aware of all travel options to access the site.	Minor Adverse
Reduction in amenity and safety for pedestrian and cyclists	Minor adverse	The development proposal is not anticipated to have any perceptible change to pedestrian or cyclist amenity.	Minor Adverse

**5.8 CUMULATIVE EFFECTS**

5.8.9 The Scoping Opinion Response to application reference 14/00009/SCOP stated that as part of the EIA, cumulative effects are considered, ‘not only of recently completed developments but of those ‘in planning’ or envisaged as part of CDC’s Bicester Masterplan.’

5.8.10 Additional allocated sites within the emerging CDC Local Plan have therefore been considered as part of a separate cumulative impact scenario. This includes an additional 120 units for the remainder of the Gavray Drive allocated site, located immediately east of the allocation site.

5.8.11 The Table below identifies the additional allocated sites that have been considered as part of this cumulative scenario.



Table 5.11: Allocated Development Sites

Site (Local Plan reference)
South East Bicester (Bicester 12)
Bicester Gateway (Bicester 10)
Land at North East Bicester (Bicester 11)
Other/Windfall Residential Sites
Gavray Drive (Bicester 13)

5.5.25 Table 5.12 below then details the change in traffic flows with the introduction of both the development proposal and the cumulative development site compared to the baseline scenario with just the committed development sites.

Table 5.12: Change in Average Daily Link Flows Cumulative Assessment

Count location	Receptor Sensitivity	2020 Future Baseline Traffic Flows	Cumulative Development Traffic Flows	Total Traffic Flows	Percentage Change %	Magnitude of Change	Significance
A4421 Charbridge Lane	Low	14025	2130	15916	15%	Negligible	Minor
Gavray Drive	Low	1856	1708	3546	92%	Major	Moderate
A4421 Wretchwick Way	Low	13035	468	13208	4%	Negligible	Minor
A4421 Neunkirchen Way	Low	16930	-521	16013	-3%	Negligible	Minor
A41 South	Low	25333	-1981	22668	-8%	Negligible	Minor
A41 North	Low	29838	5539	34093	18%	Negligible	Minor
London Road	Low	11366	513	11880	5%	Negligible	Minor

5.5.26 Table 5.12 confirms that as a result of the introduction of the relief road through South East Bicester, there is a reduction in vehicle movements on the A4421 Neunkirchen Way and A41 South arms on approach to the roundabout junction, with the remaining arms experiencing an increase in traffic flows.

5.5.27 Using the Significance Matrix in Table 5.5, it can be seen that, whilst there is a major magnitude of change, the additional traffic during the cumulative scenario will result in a moderate long term adverse effect on Gavray Drive, with all other receptors continuing to have a minor adverse effect.

5.8.12 Again however, this impact can be attributed to the fact that Gavray Drive currently serves a limited number of residential units.

## GLOSSARY

1. TRICS – (Trip Rate Information Computer System) is a database of trip generation information used for development planning

2. TEMPRO – (Trip end Model Presentation Program) is used to estimate traffic growth across an assessment period and location





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## **6.1 INTRODUCTION**

- 6.1.1 Ove Arup & Partners Limited (Arup) has been commissioned by Gallagher Developments to undertake an air quality assessment to accompany the outline planning application for the proposed residential development at Gavray Drive in Bicester, Oxfordshire.
- 6.1.2 Air quality studies are concerned with the presence of airborne pollutants in the atmosphere. This chapter outlines relevant air quality management policy and legislation, describes the existing air quality conditions in the vicinity of the Application Site and outlines the nature of the development and the likely significant air quality effects as a result of its construction and operation. Mitigation measures are also proposed, where necessary, which would be implemented to reduce the effects of the proposed development on air quality as far as practicable.
- 6.1.3 The current use of the Site is green space and it is located on the outskirts of Bicester town, within Cherwell District Council (CDC). The Site is bounded by two railway lines, the Birmingham to Marylebone rail line (Chiltern Line) to the north and the Oxford to Bletchley rail line to the west. Gavray Drive runs to the south-west of the Site and green space occupies the area to the east.

## 6.2 ASSESSMENT METHODOLOGY

### Scope

- 6.2.1 This study assesses the likely significant air quality effects from the construction and operation of the proposed development, focusing on emissions of nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and dust. Emissions of these pollutants are associated with construction activities on the Site, as well as emissions generated by additional traffic travelling to and from the development.
- 6.2.2 The Study Area for assessment of dust impacts during construction extends approximately 350m from the Site boundary and 50m from the traffic access routes based on the recommendations of the IAQM guidance document.
- 6.2.3 For the assessment of traffic emissions, sensitive receptors have been selected at worst case locations along the local road network as seen in Figure 6.2.

### Data sources

- 6.2.4 The following data sources have been used throughout this air quality assessment:
- CDC scoping response;
  - CDC review and assessment reports and local air quality monitoring data<sup>1</sup>;
  - Traffic data provided by the Transport Consultants;
  - The UK-Air Information Resource website<sup>2</sup>; and
  - The Environment Agency (EA) website<sup>3</sup>.

### Assessment approach

- 6.2.5 The overall approach to the air quality assessment comprises:
- A review of the existing air quality conditions at, and in the vicinity of the proposed Site;
  - An assessment of the likely significant effect of changes in air quality arising from the construction and operation of the proposed development; and
  - Formulation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

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<sup>1</sup> CDC, <http://www.cherwell.gov.uk/index.cfm?articleID=4080>, Accessed October 2014

<sup>2</sup> Defra, <http://uk-air.Defra.gov.uk>, Accessed October 2014

<sup>3</sup> Environment Agency, <https://www.gov.uk/government/organisations/environment-agency>, Accessed October 2014



### **Baseline Assessment Methodology**

- 6.2.6 Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment – these are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.
- 6.2.7 A desk-based review of the data sources has been undertaken to determine baseline conditions of air quality in this assessment.

### **Construction Assessment Methodology**

- 6.2.8 The construction effects have been assessed using the qualitative approach described in the latest IAQM guidance<sup>4</sup> in relation to dust emissions. Road traffic emissions have been assessed against the criteria set in the Environmental Protection UK (EPUK) guidance<sup>5</sup>.

#### **Road traffic emissions**

- 6.2.9 The EPUK guidance provides criteria to help establish when an air quality assessment is likely to be considered necessary. This includes the following:

*“Proposals that would significantly alter the traffic composition on local roads, for instance, increase the number of HDVs by 200 movements or more per day.”*

- 6.2.10 Information provided by the transport consultants for the project, indicates that there will be an additional 30 HDVs on the road network in 2018 as part of the construction works. As 30 HDVs is less than the 200 HDV movements stated in the EPUK guidance document, emissions from construction road vehicle traffic are considered to be of negligible significance and have been scoped out of this assessment.

#### **Dust emissions**

- 6.2.11 The IAQM guidance applies to the assessment of dust from construction/demolition activities. An ‘impact’ is described as a change in pollutants concentrations or dust deposition, while an ‘effect’ is described as the consequence of an impact. The main impacts that may arise during construction of the proposed development are:
- Dust deposition, resulting in the soiling of surfaces;
  - Visible dust plumes;
  - Elevated PM<sub>10</sub> concentrations as a result of dust generating activities on site; and

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<sup>4</sup> IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction

<sup>5</sup> EPUK (2010) Development Control: Planning for Air Quality

- An increase in NO<sub>2</sub> and PM<sub>10</sub> concentrations due to exhaust emissions from non-road mobile machinery (NRMM) and vehicles accessing the site.

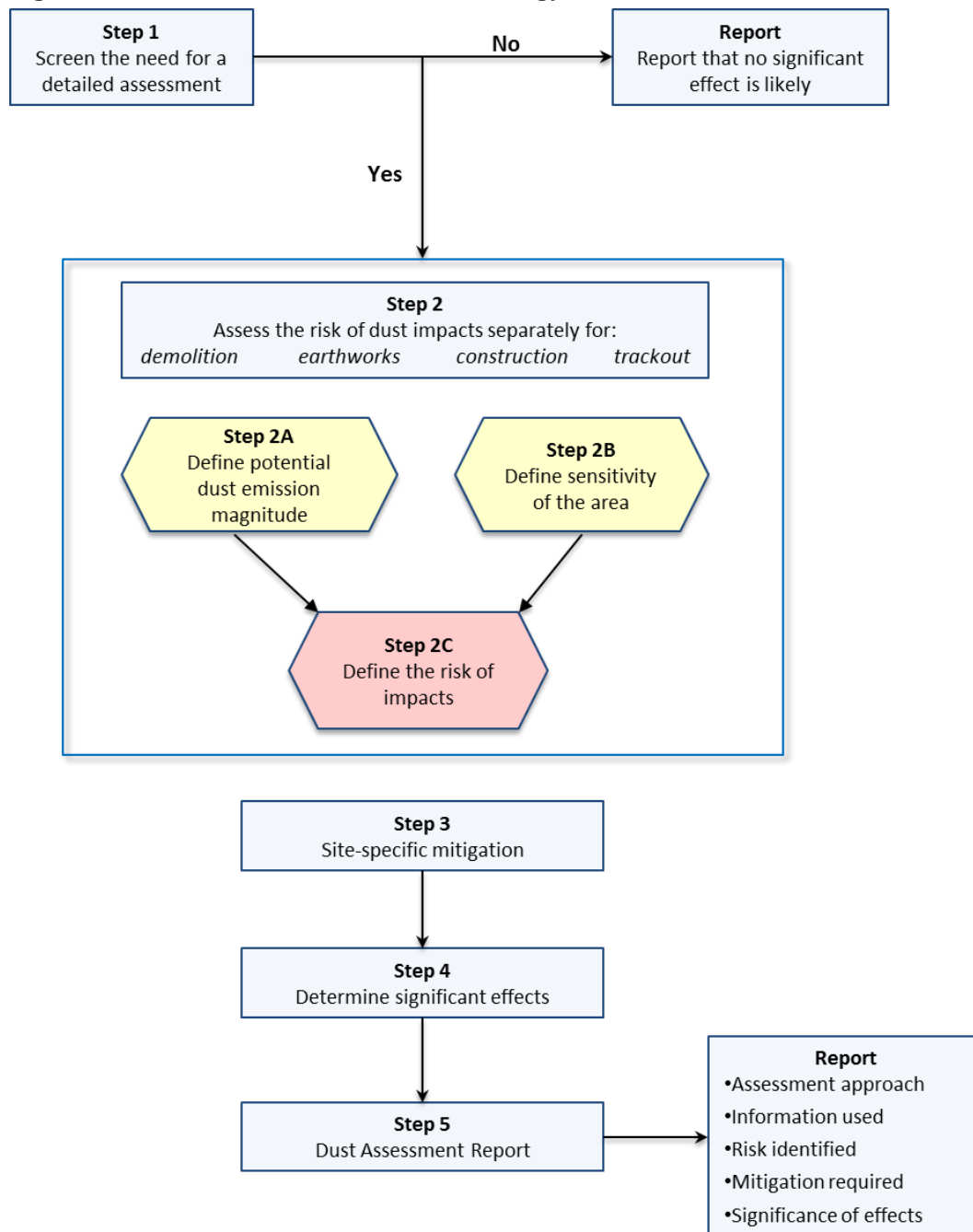
6.2.12 The IAQM guidance considers the potential for dust emissions from dust-generating activities, such as demolition of existing structures, earthworks, construction of new structures and trackout. Earthworks refer to the processes of soil stripping, ground levelling, excavation and land capping, while trackout is the transport of dust and dirt from the Site onto the public road network where it may be deposited and then re-suspended by vehicles using the network. This arises when vehicles leave the Site with dusty materials, which may then spill onto the road, or when they travel over muddy ground on Site and then transfer dust and dirt onto the road network. Certain assumptions have been made regarding construction activities and these are outlined in the Construction Assessment section.

6.2.13 For each of these dust-generating activities, the guidance considers three separate effects: annoyance due to dust soiling; harm to ecological receptors; and the risk of health effects due to a significant increase in PM<sub>10</sub> exposure. The receptors can be human or ecological and are chosen based on their sensitivity to dust soiling and PM<sub>10</sub> exposure; these are identified in the Construction Assessment section.

6.2.14 The methodology takes into account the scale to which the above effects are likely to be generated (classed as small, medium or large), along with the levels of background PM<sub>10</sub> concentrations and the distance to the closest receptor, in order to determine the sensitivity of the area. This is then taken into consideration when deriving the overall risk for the site. Suitable mitigation measures are also proposed to reduce the risk of the site.

6.2.15 There are five steps in the assessment process described in the IAQM guidance. These are summarised in Figure 6.1 and a further description is provided in the following sections.

**Figure 6.1 IAQM dust assessment methodology**



*Step 1: Need for assessment*

6.2.16 The first step is the initial screening for the need for a detailed assessment. According to the IAQM guidance, an assessment is required where there are sensitive receptors within 350m of the site boundary (for ecological receptors that is 50m) and/or within 50m of the route(s) used by the construction vehicles on the public highway up to 500m from the site entrance(s).

*Step 2: Assess risk of dust impacts*

6.2.17 This step is split into three sections as follows:

- 2A. Define the potential dust emission magnitude;
- 2B. Define the sensitivity of the area; and
- 2C. Define the risk of impacts.

6.2.18 Each of the dust-generating activities is given a dust emission magnitude depending on the scale and nature of the works (step 2A) based on the criteria shown in Table A6.1 (Appendix 6.1).

6.2.19 The sensitivity of the surrounding area is then determined (step 2B) for each dust effect from the above dust-generating activities, based on the proximity and number of receptors, their sensitivity to dust, the local PM<sub>10</sub> background concentrations and any other site-specific factors. Table A6.1 to Table A6.3 (Appendix 6.1) show the criteria for defining the sensitivity of the area to different dust effects.

6.2.20 The overall risk of the impacts for each activity is then determined (step 2C) prior to the application of any mitigation measures (Table A6.4, Appendix 6.1) and an overall risk for the site derived.

*Step 3: Determine the site-specific mitigation*

6.2.21 Once each of the activities is assigned a risk rating, appropriate mitigation measures are identified. Where the risk is negligible, no mitigation measures beyond those required by legislation are necessary.

*Step 4: Determine any significant residual effects*

6.2.22 Once the risk of dust impacts has been determined and the appropriate dust mitigation measures identified, the final step is to determine whether there are any residual significant effects. Experience indicates that once mitigation measures are applied, in most cases the dust effects will be reduced to negligible levels.

*Step 5: Prepare a dust assessment report*

6.2.23 The last step of the assessment is the preparation of a Dust Assessment Report which is covered within this report.

**Operational Assessment Methodology**

***Road Traffic Emissions***

6.2.24 Operational air quality impacts from the proposed development arise principally as a result of traffic changes along the local road network. Effects of traffic generated by

the development have been assessed using the ADMS-Roads atmospheric dispersion model.

6.2.25 Pollutant concentrations are forecast at locations that are in close proximity to the proposed development and the surrounding road network affected by the development. The model calculates one-hour average concentrations with results processed to calculate the annual mean concentration for comparison with the air quality standards. The following sections detail the inputs and processes used in this assessment.

#### *Assessment Scenarios*

6.2.26 The assessment scenarios are summarised as follows:

- 2014 baseline scenario;
- 2020 opening year Do-Minimum (DM) scenario;
- 2020 opening year Do-Something (DS) scenario; and,
- 2020 opening year DS scenario for sensitivity testing.

6.2.27 The 2020 DM scenario represents the future year scenario with committed developments in the area without the proposed development, while the 2020 DS scenario represents the future year scenario with committed developments and the proposed development in place. The 2020 DS scenario for sensitivity testing represents the future year scenario with committed developments, the proposed development and the Gavray Drive East development in place. Further information on these scenarios and the committed developments can be found in Chapter 5: Transport.

#### *Sensitive Receptors*

6.2.28 Pollutant concentrations have been forecast at selected human receptors within the Study Area where exposure to traffic emissions from vehicles travelling to/from the site is potentially the greatest, i.e. properties, schools and hospitals in close proximity to roads/junctions with the greatest predicted changes in traffic flows. No nationally or internationally designated ecological sites are located within 200m of the local road network and therefore no assessment of ecological receptors has been undertaken.

6.2.29 Details of the assessed receptors are given in Table 6.1 and their location shown in Figure 6.2. Assessed receptors include future residential receptors that are to be constructed as part of the proposed development, as well as residential properties across the local road network.

6.2.30 There are also other receptors (commercial and industrial) close to the proposed development site and along the local road network, but these are not considered to represent areas of relevant public exposure, as outlined in LAQM TG.09, and therefore have not been included in this assessment.

**Table 6.1 Receptor Locations**

1	London Road north	Residential	458839	221513
2	London Road centre	Residential	458980	221418
3	London Road/Neunkirchen Way	Residential	459172	221277
4	Neunkirchen Way	Residential	459265	221274
5	Neunkirchen Way roundabout	Residential	459445	221360
6	Wretchwick Way	Residential	459580	221449
7	Wretchwick Way roundabout	Residential	459974	221845
8	Charbidge Lane south	Residential	459881	221942
9	Charbidge Lane north	Residential	459671	222141
10	Gavray Drive/Mallards Way	Residential	459356	222357
11	Wretchwick Way north	Residential	459853	221710
12	Proposed residential north	Residential	459251	222499
13	Proposed residential centre	Residential	459333	222440
14	Proposed residential south	Residential	459467	222331

*Traffic Data*

6.2.31 Traffic data for all scenarios was provided by Odyssey Markides, the Transport Consultants for the project. The data consisted of 24-hour Annual Average Daily Traffic (AADT) flows, percentage of Heavy Duty Vehicles (HDVs) and daily average speed.

6.2.32 Traffic data was provided for a baseline 2014 scenario and a set of future year scenarios. One of set of scenarios included committed developments in the area, while the other set of data included both committed and cumulative developments in the area. The set of traffic scenarios including the cumulative developments are described in Section 6.8 of this chapter.

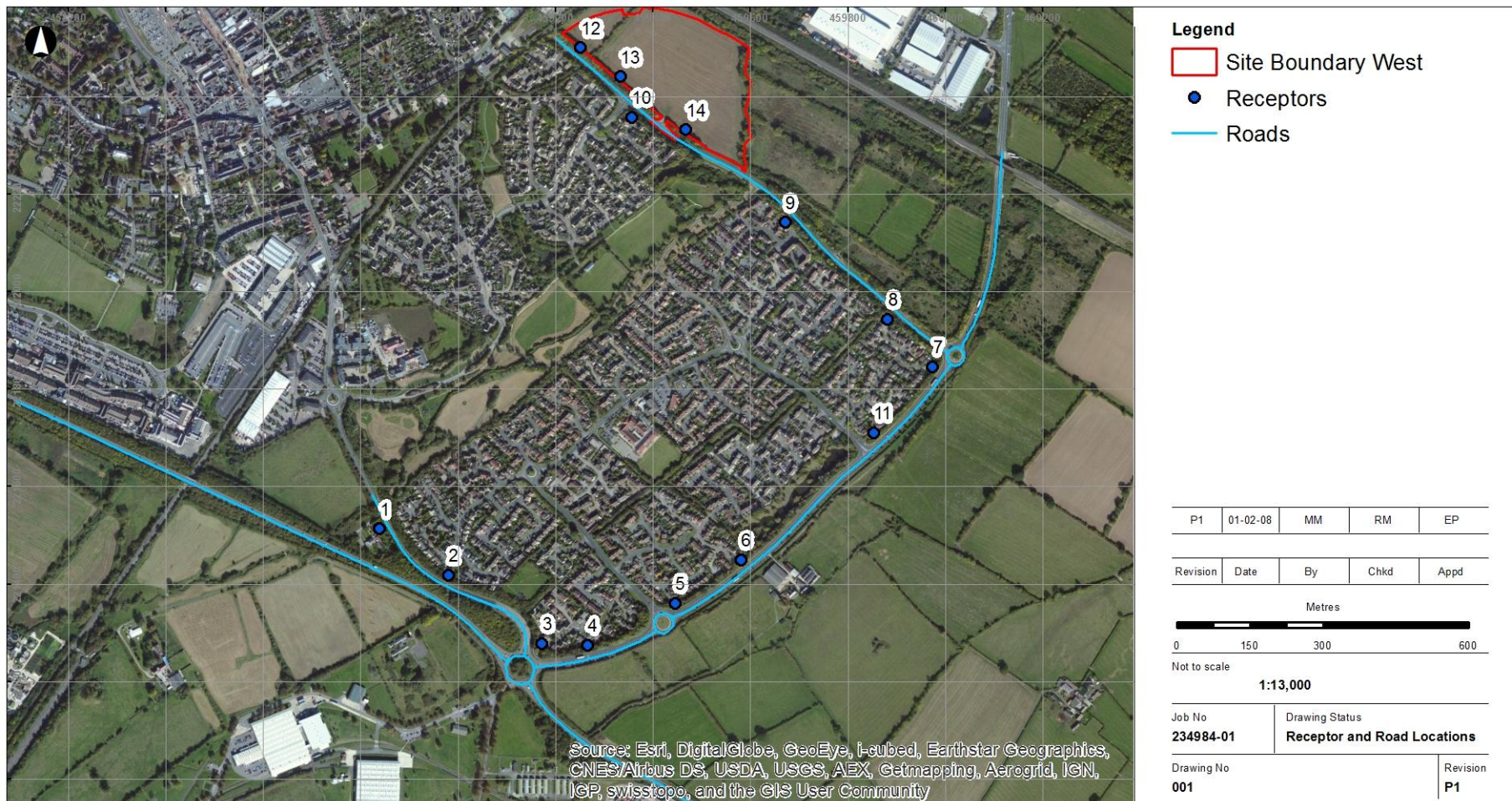
6.2.33 The traffic data included a future DM scenario without the proposed development in place and two future DS scenarios; one representing the operation of the proposed development (Gavray Drive West) and another one representing the operation of both the proposed development and the Gavray Drive East development adjacent to Site as a sensitivity test. As a worst case, traffic data for the future DS scenario in the assessment of likely significant effects was taken for the operation of both Gavray Drive West and Gavray Drive East developments, to account for the maximum change in traffic flows.

6.2.34 Emission rates for all road sources were calculated using the UK Defra Emissions Factor Toolkit (EFT) v6.0.2<sup>6</sup>. Emission rates for 2014 were used in the baseline scenario and emission rates for 2020 for the remaining scenarios. Speeds were reduced to 20kph close to junctions following the Defra TG.09 guidance. Traffic data for the model road network is given in Table A6.5 and Table A6.6 (Appendix 6.2) and the location of these roads shown in Figure 6.2.

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<sup>6</sup> Defra (2014) Emissions Factors Toolkit (EFT)

Figure 6.2 Modelled road network and sensitive receptors





*Model version set up*

6.2.35 Detailed dispersion modelling of NO<sub>x</sub> and PM<sub>10</sub> emissions was undertaken using ADMS-Roads (version 3.2) atmospheric dispersion model from Cambridge Environmental Research Consultants (CERC).

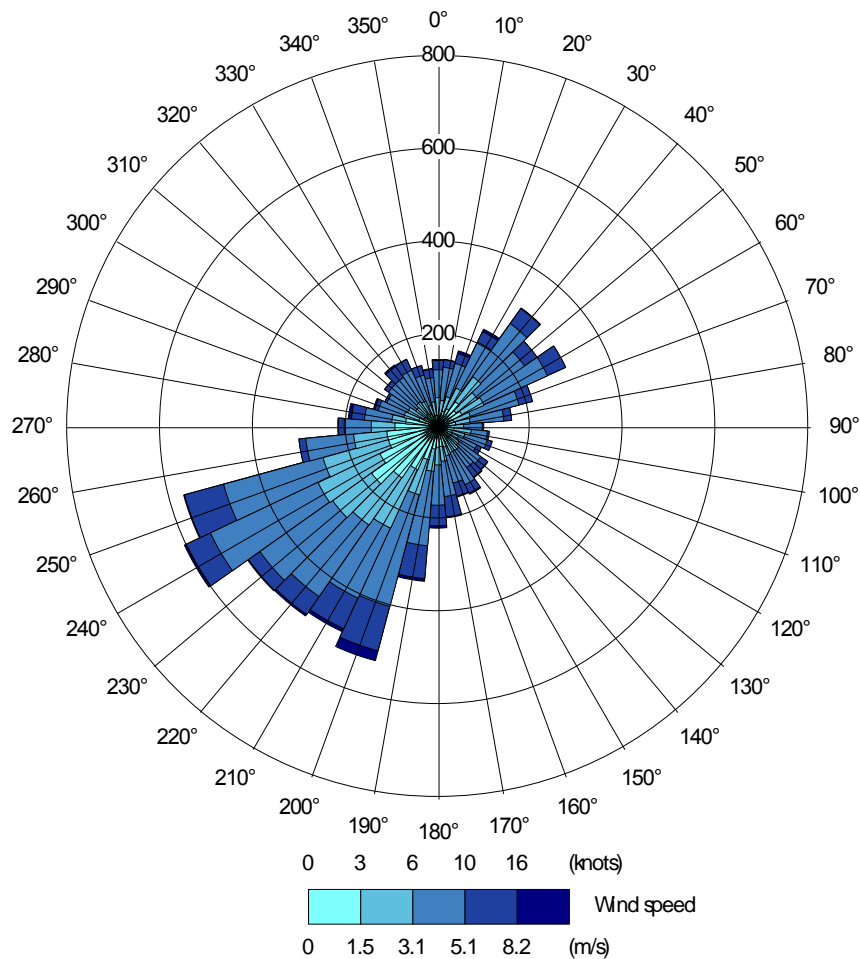
*Meteorological data*

6.2.36 Hourly sequential observation data for 2014 was used in the assessment from the meteorological station at Brize Norton meteorological station. Figure 6.3 shows the relevant windrose derived from this data, where it can be observed that prevailing winds for the area are predominantly south-westerly.

6.2.37 Most dispersion models do not use meteorological data if they relate to calm winds conditions, as dispersion of air pollutants is more difficult to calculate in these circumstances. Defra's TG.09 guidance recommends that the meteorological data file is tested within a dispersion model and the relevant output log file checked to confirm the number of missing hours and calm hours that cannot be used by the dispersion model. This is important when considering predictions of high percentiles and the number of exceedances. The guidance recommends that meteorological data should only be used if the percentage of usable hours is greater than 75% and preferably 90%.

6.2.38 The 2014 meteorological data from Brize Norton meteorological station include 8,720 lines of usable hourly data and 514 lines of calm hours out of the total 8,760 for the year. These correspond to 99.5% of usable data, which is above the 90% threshold advised by the Defra guidance.

Figure 6.3 Windrose for 2014 for Brize Norton meteorological station



#### Other model parameters

6.2.39 The extent of mechanical turbulence (and hence, mixing) in the atmosphere is affected by the surface/ground over which the air is passing. Typical surface roughness values range from 1.5m (for cities, forests and industrial areas) to 0.0001m (for water or sandy deserts). In this assessment, the general land use in the local study area can be described as “parkland, open suburbia” with a corresponding surface roughness of 0.5m.

6.2.40 Another model parameter is the minimum Monin-Obukhov length, which describes the minimum level of turbulence in the atmosphere. Typical values range from 2m to 20m for rural areas. In urban areas though, where traffic and buildings cause the generation of more heat, these values are higher. For this model, a length of 10m was used, representing ‘small towns <50,000’.

*Model verification*

- 6.2.41 Model verification refers to the comparison of modelled pollutant concentrations with measured concentrations at the same points to determine the performance of the model. There are number of uncertainties in both air quality monitoring and modelling therefore the process of verification is undertaken to ensure modelled results are robust and reflect reality. Should the model results for NO<sub>2</sub> be largely within  $\pm 25\%$  of the measured values and there is no systematic over or under-prediction of concentrations, then no adjustment is necessary according to Defra's TG.09 guidance. If this is not the case, then the modelled values are adjusted based on the observed relationship between modelling and measured NO<sub>x</sub> and PM<sub>10</sub> concentrations to provide a better agreement.
- 6.2.42 There is no monitoring undertaken along the modelled road network. The closest two diffusion tube sites are located in Bicester town centre, Market Square and Causeway, as outlined in Section 6.4. As such, model verification was not possible; however, a comparison between modelled and monitored results from comparable areas has been made.
- 6.2.43 Monitored results at the Market Square and Causeway diffusion tubes in 2013 were 37.1 $\mu\text{g}/\text{m}^3$  and 23.1 $\mu\text{g}/\text{m}^3$  respectively. The Market Square monitor is located in the town centre car park and as such, slightly elevated pollution concentrations are to be expected due to slow moving traffic. The Causeway monitor is also at a relatively central location however, this location is more comparable to the geographical context of the sensitive receptors.
- 6.2.44 As outlined in Section 6.5, receptor results range from 15.1 $\mu\text{g}/\text{m}^3$  to 29.2 $\mu\text{g}/\text{m}^3$ . Receptor R2 and R4 are located on a similar type of road to that adjacent to the Causeway monitoring site. The predicted concentration at these receptors is approximately 23 $\mu\text{g}/\text{m}^3$  which is comparable to the monitored concentration at the Causeway site in 2013. Therefore, the model is considered to give a reasonable representation of real-world conditions.

*NO<sub>x</sub> to NO<sub>2</sub> conversion*

- 6.2.45 The model predicts total NO<sub>x</sub> concentrations, which comprises principally a mixture of nitric oxide (NO) and NO<sub>2</sub>. Since only NO<sub>2</sub> has been associated with effects on human health, the air quality standards for the protection of human health are based on NO<sub>2</sub> rather than NO<sub>x</sub> or NO. Thus, a suitable NO<sub>x</sub> to NO<sub>2</sub> conversion rate needs to be applied to the modelled NO<sub>x</sub> concentrations.

6.2.46 Defra's TG.09 guidance details an approach for calculating the roadside conversion of NO<sub>x</sub> to NO<sub>2</sub>, which takes into account the difference between ambient NO<sub>x</sub> concentrations with and without the development, the concentration of ozone and the different proportions of primary NO<sub>2</sub> emissions in different years. This approach is available as a spreadsheet calculator, with the most up to date version (v4.1) having been used in this assessment.

#### *Background concentrations*

6.2.47 Background concentrations refer to the existing levels of pollution in the atmosphere, produced by a variety of sources, such as roads and industrial processes. Defra has produced estimated background air pollution data for each 1x1km OS grid square for each local authority area<sup>7</sup>. Background maps are available for 2011 and projected through to 2030. Background concentrations are reported and discussed in the baseline section of this report.

#### *Significance criteria for traffic emissions*

6.2.48 The EPUK guidance provides an approach to determining the significance of impacts resulting from a proposed development on local air quality for individual receptors. The guidance incorporates the latest position of the IAQM on impact significance. Firstly, descriptors of change are defined as follows:

- predict the absolute change in annual mean pollutant concentrations (in µg/m<sup>3</sup>);
- determine the magnitude of change resulting from the development; and
- use the magnitude of change to determine the impact descriptor (Table 6.2).

6.2.49 The impact descriptor depends on the magnitude of the change in predicted concentrations in relation to the air quality standard. The impact descriptor is then used in the assessment of significance as described further below.

**Table 6.2 EPUK magnitude of change and impact descriptors**

Absolute concentration with proposed development	Magnitude of change (change in annual mean concentrations)			
	Imperceptible	Small	Medium	Large
	< 0.4µg/m <sup>3</sup>	0.4 – 2µg/m <sup>3</sup>	2 – 4µg/m <sup>3</sup>	> 4µg/m <sup>3</sup>
Above air quality standard (> 40µg/m <sup>3</sup> )	<i>Negligible</i>	<i>Slight</i>	<i>Moderate</i>	<i>Substantial</i>
Just below air quality standard (36 – 40µg/m <sup>3</sup> )	<i>Negligible</i>	<i>Slight</i>	<i>Moderate</i>	<i>Moderate</i>
Below air quality standard (30 – 36µg/m <sup>3</sup> )	<i>Negligible</i>	<i>Negligible</i>	<i>Slight</i>	<i>Slight</i>
Well below air quality standard (< 30µg/m <sup>3</sup> )	<i>Negligible</i>	<i>Negligible</i>	<i>Negligible</i>	<i>Slight</i>

<sup>7</sup> <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011>

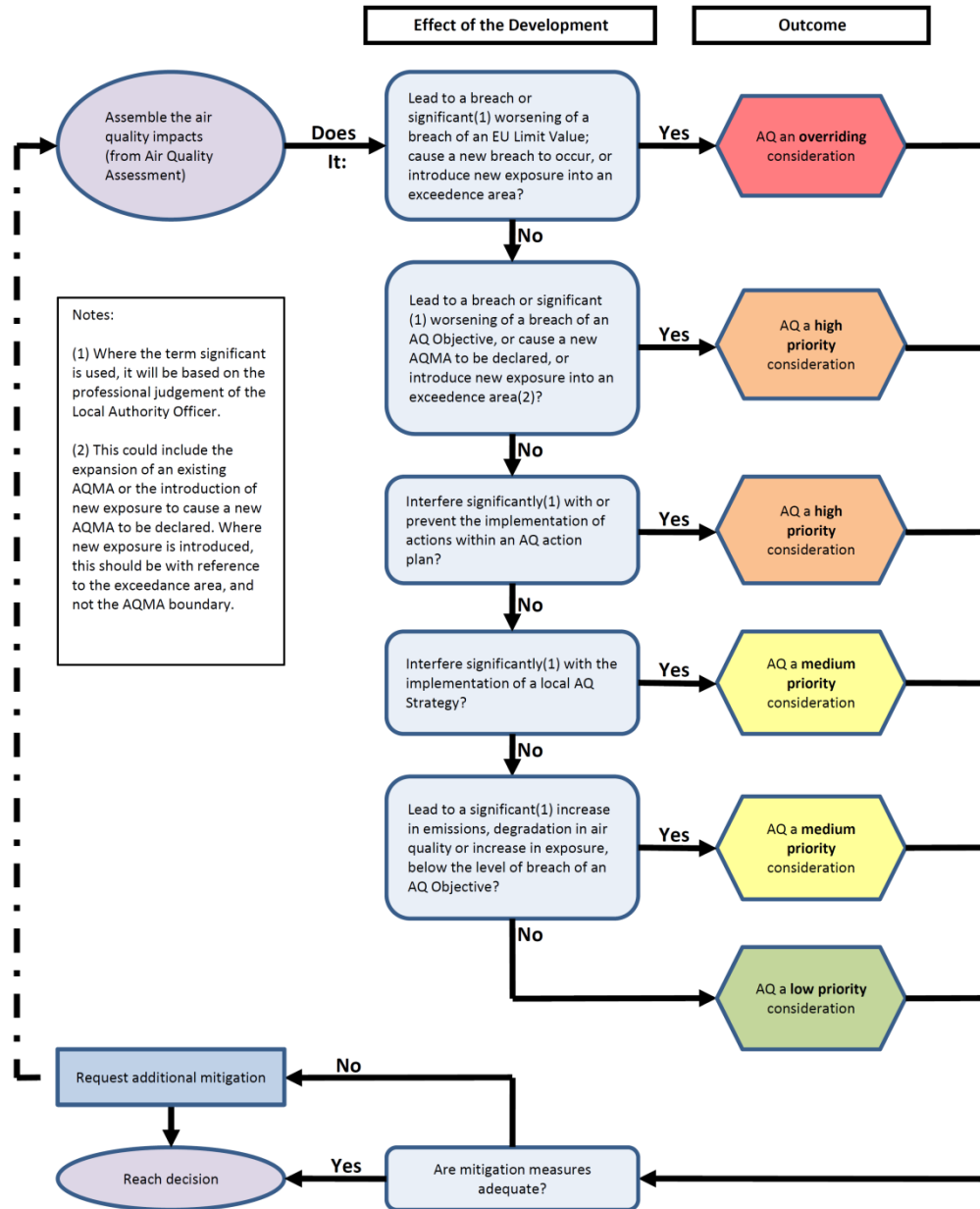
6.2.50 The EPUK guidance provides a set of factors that determine the significance of a proposal in terms of air quality (Table 6.3), stating that these factors (allowing professional judgement to be made) should be given weighting equal to the flowchart determination method described below. These factors should be considered, before a suitably qualified professional can determine with sufficient justification whether the overall significance of a potential development should be termed insignificant, minor, moderate or major. This method is less prescriptive than the flowchart determination method, allowing professional judgement to be made on a case by case basis. Professional judgement is important as rigorous application of a numerical/prescriptive approach can and has resulted in anomalous assessment conclusions.

**Table 6.3 EPUK factors to judge significance**

- Number of people affected by slight, moderate or major air quality impacts and a judgement on the overall balance.
- Where new exposure is being introduced into an existing area of poor air quality, then the number of people exposed to levels above the air quality standard will be relevant.
- The magnitudes of the changes and the descriptions of the impacts at the receptors, i.e. Table 6.2 findings.
- Whether or not an exceedance of an air quality standard is predicted to arise in the study area where none existed before or an exceedance area is substantially increased.
- Whether or not the study area exceeds an air quality standard and this exceedance is removed or the exceedance area is reduced.
- Uncertainty, including the extent to which worst case assumptions have been made.
- The extent to which an air quality standard is exceeded, i.e. an annual mean NO<sub>2</sub> of 41µg/m<sup>3</sup> should attract less significance than an annual mean of 51µg/m<sup>3</sup>.

6.2.51 A second approach is also detailed in the EPUK document that provides guidance on the priority that air quality issues should be given in the planning process. This approach is based around a flowchart (Figure 6.4), as mentioned above, which assumes air quality impacts have been assessed and quantified. The priority which air quality should be afforded in the planning process is then determined through a series of questions with closed (yes/no) answers. Each question is addressed in descending order until the arrow points to one of the outcomes in the right hand column.

Figure 6.4 EPUK flowchart to determine the priority of air quality in the planning process



Uncertainties and limitations

6.2.52 Limitations are described throughout the document where applicable.

### 6.3 RELEVANT POLICY

#### National Planning Policy Framework (March 2012)

- 6.3.1 The National Planning Policy Framework (NPPF)<sup>8</sup> was published in March 2012 with the purpose of using planning to achieve sustainable development. Paragraph 124 of the NPPF on air quality states that:

*“Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.”*

#### National Planning Policy Guidance

- 6.3.2 The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality consideration that relates to land use and its development can be a material planning consideration in the determination of planning applications, dependent upon the details of the proposed development.

#### Local Air Quality Management Policy Guidance (2009)

- 6.3.3 Policy guidance note LAQM.PG(09)<sup>9</sup> provides additional guidance on the links between transport and air quality. LAQM.PG(09) describes how road transport contributes to local air pollution and how transport measures may bring improvements in air quality. Key transport related Government initiatives are set out, including regulatory measures and standards to reduce vehicle emissions and improve fuels, tax-based measures and the development of an integrated transport strategy.
- 6.3.4 LAQM.PG(09) also provides guidance on the links between air quality and the land use planning system. The guidance advises that air quality considerations should be integrated within the planning process at the earliest stage and is intended to aid local authorities in developing action plans to deal with specific air quality problems and create strategies to improve air quality. It summarises the main ways in which the land use planning system can help deliver compliance with the air quality objectives.

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<sup>8</sup> Department for communities and local government (2012) National Planning Policy Framework

<sup>9</sup> Defra (2009) Local Air Quality Management Policy Guidance PG(09)

**Cherwell District Local Plan (1996)**

- 6.3.5 The Cherwell District Local Plan was adopted in November 1996. Review of this document indicated that the following policy is in relation to air quality:

*“ENV1 Development which is likely to cause materially detrimental levels of noise, vibration, smell, smoke, fumes or other type of environmental pollution will not normally be permitted.”*

**The Non-Statutory Cherwell District Local Plan (2004)**

- 6.3.6 The Non Statutory Cherwell Local Plan 2011 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on this plan was discontinued prior to adoption. Review of this document indicated that the following policy is in relation to air quality:

*“EN5 In determining planning applications, the council will have regard to the likely impact of the development on air quality as a result of its operational characteristics and the traffic generated by it. Development which would have a significant adverse impact on air quality will not be permitted. Wherever possible the council will seek to improve air quality through the control of development.”*

**Draft Cherwell Local Plan (2014)**

- 6.3.7 A review of the Local Plan indicated the following two policies in relation to air quality that are relevant to this assessment. These policies have been considered throughout the assessment.

*“Policy ESD 3 Sustainable Construction – Reducing waste and pollution and making adequate provision for the recycling of waste.”*

*“Policy ESD 10 Protection and Enhancement of Biodiversity and the Natural Environment – Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution.”*



**6.4 BASELINE CONDITIONS**

6.4.1 The following section outlines the baseline air quality conditions within the Study Area.

**Sources of air pollution****Industrial processes**

6.4.2 Industrial air pollution sources are regulated through a system of operating permits or authorisations, requiring stringent emission limits to be met and ensuring that any releases are minimised or rendered harmless. Regulated (or prescribed) industrial processes are classified as Part A or Part B processes, regulated through the Pollution Prevention Control (PPC) system<sup>10,11</sup>. Part A processes have the potential to release prescribed substances to air, land and water. Part B processes are smaller in scale and have the potential for release of prescribed substances to air only and are managed by CDC.

6.4.3 There is one Part A process within 2km of the Application Site. The Thames Water Sewage Treatment works is located 1.9km south-west of the site boundary. Due to this distance and the nature of the process, this facility is not considered to have a significant effect on air quality in the vicinity of the Site.

**Road and rail traffic**

6.4.4 In recent decades, transport atmospheric emissions on a national basis have grown to match or exceed other sources in respect of many pollutants, particularly in urban areas. Vehicle emissions, from both the road and railway lines, are likely to be the dominant source of air pollutants in the vicinity of the Site. The main pollutants associated with traffic and considered in this assessment are NO<sub>2</sub> and PM<sub>10</sub>. The Site is bounded by two railway lines, the Birmingham to Marylebone rail line (Chiltern Line) to the north and the Oxford to Bletchley rail line to the west. Gavray Drive runs to the south-west of the development and green space occupies the area to the east of the Site. Charbridge Lane is located to the east of the greenspace and had an AADT of 11,643 in 2013 with a HGV % of 9%<sup>12</sup>. The location of the DfT traffic count is shown in Figure 6.5.

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<sup>10</sup> Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

<sup>11</sup> The Environmental Permitting (England and Wales) (Amendment) Regulations 2013, SI 2013/390

<sup>12</sup> Department for Transport (2014), Traffic Counts: <http://www.dft.gov.uk/traffic-counts/>; Accessed: October 2014

**Figure 6.5 DfT traffic count location**



**Local air quality**

- 6.4.5 As discussed above, the Environment Act 1995 requires local authorities to review and assess air quality with respect to the objectives for seven pollutants specified in the National Air Quality Strategy. Local authorities are required to carry out an Updated and Screening Assessment (USA) of their area every three years. If the USA identifies potential hotspot areas likely to exceed air quality objectives, then a Detailed Assessment of those areas is required. Where it is predicted that an objective will not be met, local authorities must declare the area as an AQMA and produce an Air Quality Action Plan (AQAP), which includes measures to improve air quality within this AQMA.
- 6.4.6 The closest AQMA to the Development Site is the Cherwell District Council Air Quality Management Area no. 3 which is located approximately 13km to the south of the Site. It is not considered that this development will affect air quality within the AQMA.
- 6.4.7 According to the most recent LAQM report<sup>13</sup>, CDC does not currently operate an automatic monitor in their area of jurisdiction.
- 6.4.8 The council carries out monitoring of NO<sub>2</sub> concentrations within Bicester<sup>14</sup> using diffusion tubes. There are two diffusion tube sites within 1km of the Application Site. Details and monitoring data for these are presented in Table 6.4 and their location shown in Figure 6.6. Exceedances of the air quality objective (40µg/m<sup>3</sup>) are displayed in **bold** and measurements with data capture less than 75% are displayed in *italics*.
- 6.4.9 It can be observed that monitored NO<sub>2</sub> concentrations have been below the air quality objective in recent years. In 2012 there was an exceedance at the Market Square site, but this is likely due to local factors or meteorological conditions.

**Table 6.4 NO<sub>2</sub> concentrations (µg/m<sup>3</sup>) from local monitoring sites**

Site	Location type	2009	2010	2011	2012	2013
Market Square	kerbside	31.7	37.2	35.7	<b>45.6</b>	37.1
Causeway	kerbside	–	–	–	–	23.1

<sup>13</sup> Cherwell District Council, Air Quality Progress Report, 2014

<sup>14</sup> Cherwell District Council, Air Quality Progress Report, 2014

**Figure 6.6 Monitoring sites within 1km of the Site**



### Background concentrations

6.4.10 Background concentrations for use in the baseline scenario 2014 have been taken from the Defra background mapping website for the relevant grid squares within the study area. (Table 6.5). It can be observed that background concentrations are well below the air quality objectives in the study area. The development site itself is predominantly located in grid square 459500, 222500.

**Table 6.5 Background concentrations ( $\mu\text{g}/\text{m}^3$ ) for the baseline year 2014**

OS grid reference	NO <sub>x</sub>	NO <sub>2</sub>	PM <sub>10</sub>
458500, 221500	18.9	13.6	17.5
459500, 221500	18.7	13.5	17.2
459500, 222500	20.0	14.3	17.5

6.4.11 There are two urban background diffusion tubes in Bicester; Villiers Road and Tamarisk Gardens. They are located over 1.5km away from the development site however it is worth noting that in 2013 the monitors recorded NO<sub>2</sub> concentrations of 19.8 $\mu\text{g}/\text{m}^3$  and 17.4 $\mu\text{g}/\text{m}^3$  respectively. These are higher than the Defra backgrounds maps for 2014. Therefore, an average of the two local urban background sites (i.e. 18.6 $\mu\text{g}/\text{m}^3$ ) has been used as the background NO<sub>2</sub> concentration for processing the model results in the study area.

### The projected future baseline

6.4.12 Air quality is predicted to improve in future years, mainly due to improvements in vehicle technologies. Background concentrations for the future year scenario 2020 have been taken from the Defra background maps, as shown in Table 6.6.

**Table 6.6 Background concentrations ( $\mu\text{g}/\text{m}^3$ ) for the future year 2020**

OS grid reference	NO <sub>x</sub>	NO <sub>2</sub>	PM <sub>10</sub>
458500, 221500	14.2	10.5	16.6
459500, 221500	14.2	10.5	16.2
459500, 222500	16.1	11.7	16.5

**6.5 LIKELY SIGNIFICANT EFFECTS****Construction stage**

6.5.1 As discussed in the Methodology Section, road traffic emissions during the construction stage have been scoped out of this assessment. Therefore, this section focusses on dust emissions during construction.

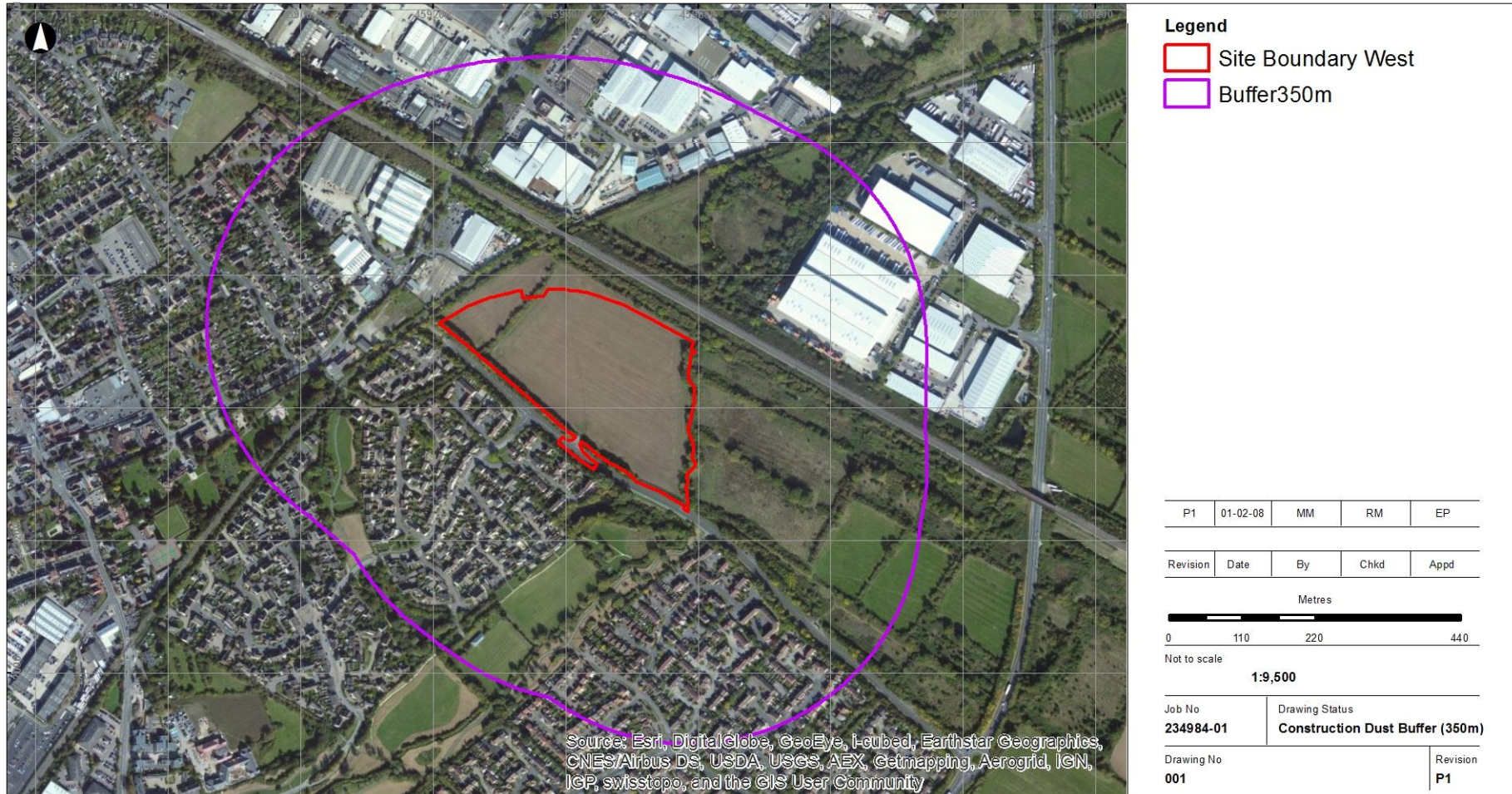
6.5.2 The site of the proposed development covers an area of approximately 6.92 hectares. The site currently comprises green space and as such there will be no demolition works required. It should be noted that a section of the green space will remain untouched. An area of approximately 4.62 hectares will be developed for residential use. The effects of demolition and construction works are considered in the following section.

**Need for Assessment**

6.5.3 Sensitive receptors are defined as those properties/schools/hospitals that are likely to experience a change in pollutant concentrations and/or dust nuisance due to the construction and operation of the proposed development. There are sensitive receptors located within 350m of proposed buildings to be constructed (Figure 6.7); these are mainly residential dwellings. As such, their sensitivity to dust soiling and PM<sub>10</sub> exposure has been classified as *high* according to the IAQM guidance.

6.5.4 There is also one ecological site, the Gavray Drive Local Wildlife Site (LWS), within 50m of the site, which has been included in the assessment of construction dust emissions. Due to its local designation, the sensitivity of the ecological receptor to dust deposition has been classified as *low* following the IAQM guidance. Further details on this site are presented in Chapter 9: Ecology and Biodiversity.

**Figure 6.7 Construction dust buffer of 350m**



**Dust Emission Magnitude**

6.5.5 Following the methodology outlined in Section 6.2 and the criteria presented in Table A6.2 (Appendix 6.1), each dust-generating activity has been assigned a dust emission magnitude as shown in Table 6.7. For earthworks, it has been assumed that these will occur in the proposed building areas. For trackout, it has been assumed that construction vehicles will use Gavray Drive from the east and north and Wretchwick Way from the south.

**Table 6.7 Dust emission magnitude for construction activities**

Activity	Dust emission magnitude	Reasoning
Earthworks	Large	Estimated total site area > 10,000m <sup>2</sup>
Construction	Large	Estimated total building volume > 100,000m <sup>3</sup> Potentially dusty construction material
Trackout	Medium	Estimated number of daily HDV trips between 10 and 50 Surface material with low potential for dust release

**Sensitivity of the Area**

6.5.6 The sensitivity of the area to dust soiling has been assigned as *medium*, due to the presence of sensitive receptors within 50m from any dust generating activity.

6.5.7 The sensitivity of the area to human health impacts has been assigned as *low* due to the presence of sensitive receptors within 50m from any dust generating activity and the low PM<sub>10</sub> background concentrations in the area (17.5µg/m<sup>3</sup>).

6.5.8 The sensitivity of the area to ecological impacts has been assigned as *low* due to the presence of the Gavray Drive LWS within 50m of the site.

**Risk of Impacts**

6.5.9 Using the criteria set out in the risk of dust impacts table in the appendix, the impacts on the area without mitigation are defined. Taking into consideration the dust emission magnitude and the sensitivity of the area, the site has been classified as *medium risk* for all activities at worst (Table 6.8), corresponding to moderate significant effects.

6.5.10 It should be noted that, assuming the relevant mitigation measures outlined in Section 6.6 are implemented, the residual significance of potential impacts from all dust generating activities is *negligible* as outlined in the IAQM guidance.

**Table 6.8 Summary dust risk table prior to mitigation**

Activity	Dust soiling	Human health	Ecological
Earthworks	Medium	Low	Low
Construction	Medium	Low	Low
Trackout	Low	Low	Low



**Post-completion stage****Road Traffic Emissions**

6.5.11 Dispersion modelling was undertaken with the inputs described in Section 6.2, for the following assessment scenarios:

- 2014 baseline scenario;
- 2020 DM scenario without the proposed development including traffic growth and committed developments;
- 2020 DS including traffic growth, committed developments, the proposed development and Gavray Drive East;

6.5.12 The change in concentrations between the DM and DS scenarios has been calculated in order to assess the impact of the proposed development to local air quality.

*Predicted NO<sub>2</sub> Concentrations*

6.5.13 Table 6.9 presents the forecast NO<sub>2</sub> concentrations for the assessed receptors for each assessment scenario. It can be observed that annual mean NO<sub>2</sub> concentrations are predicted to be well below the air quality objective at all receptors with the proposed development and Gavray Drive East. The greatest concentration has been predicted at receptor 3 at the junction of London Road and Neunkirchen Way with 21.4µg/m<sup>3</sup> in 2020.

6.5.14 Changes in modelled concentrations between the DM and DS scenarios have been calculated to determine the impact of the proposed development to local air quality. It can be observed that receptors are anticipated to experience small changes in annual mean NO<sub>2</sub> concentrations at worst. The largest change in concentrations has been forecast at receptor 5 close to Neunkirchen roundabout at 0.5µg/m<sup>3</sup>.

6.5.15 The impact descriptor has also been calculated at each receptor, taking into account the magnitude of change and the forecast concentration at each receptor in the DS scenario. It can be observed that all receptors are anticipated to experience *negligible* impacts as a result of the operation of the proposed development and Gavray Drive East.

*Predicted PM<sub>10</sub> concentrations*

6.5.16 Table 6.10 presents the forecast PM<sub>10</sub> concentrations for the assessed receptors for each assessment scenario. It can be observed that annual mean NO<sub>2</sub> concentrations are predicted to be well below the air quality objective at all receptors with the

proposed development and Gavray Drive East. The greatest concentration has been predicted at receptor 2 on London Road with  $18.3\mu\text{g}/\text{m}^3$  in 2020.

6.5.17 Changes in modelled concentrations between the DM and DS scenarios have been calculated to determine the impact of the proposed development to local air quality. It can be observed that receptors are anticipated to experience imperceptible changes in annual mean  $\text{PM}_{10}$  concentrations at worst. The largest change in concentrations has been forecast at receptor 12 within the proposed development at  $0.1\mu\text{g}/\text{m}^3$ .

6.5.18 The impact descriptor has also been calculated at each receptor, taking into account the magnitude of change and the forecast concentration at each receptor in the DS scenario. It can be observed that all receptors are anticipated to experience *negligible* impacts as a result of the operation of the proposed development and Gavray Drive East.

Table 6.9 Predicted NO<sub>2</sub> concentrations (µg/m<sup>3</sup>) and impact descriptors

ID	Receptor	Base	DM	DS	Absolute Change	Magnitude of change	Impact descriptor
1	London Road north	24.8	14.6	14.7	0.1	Imperceptible	Negligible
2	London Road centre	27.7	16.6	16.7	0.1	Imperceptible	Negligible
3	London Road/Neunkirchen Way	33.8	21.2	21.4	0.2	Imperceptible	Negligible
4	Neunkirchen Way	28.4	17.0	17.3	0.2	Imperceptible	Negligible
5	Neunkirchen Way roundabout	33.7	20.4	20.9	0.5	Small	Negligible
6	Wretchwick Way	25.0	14.5	14.8	0.3	Imperceptible	Negligible
7	Wretchwick Way roundabout	25.6	14.9	15.2	0.3	Imperceptible	Negligible
8	Charbidge Lane south	20.4	11.6	11.9	0.2	Imperceptible	Negligible
9	Charbidge Lane north	19.7	12.4	12.6	0.2	Imperceptible	Negligible
10	Gavray Drive/Mallards Way	19.4	12.2	12.4	0.2	Imperceptible	Negligible
11	Wretchwick Way north	23.4	13.4	13.6	0.2	Imperceptible	Negligible
12	Proposed residential north	19.8	12.5	12.9	0.4	Small	Negligible
13	Proposed residential centre	19.6	12.4	12.7	0.3	Imperceptible	Negligible
14	Proposed residential south	19.8	12.5	12.8	0.3	Imperceptible	Negligible

**Table 6.10 Predicted PM<sub>10</sub> concentrations (µg/m<sup>3</sup>) and impact descriptors**

ID	Receptor	Base	DM	DS	Absolute Change	Magnitude of change	Impact descriptor
1	London Road north	18.5	17.7	17.7	0.02	Imperceptible	Negligible
2	London Road centre	19.1	18.3	18.3	0.03	Imperceptible	Negligible
3	London Road/Neunkirchen Way	18.9	18.0	18.1	0.04	Imperceptible	Negligible
4	Neunkirchen Way	18.5	17.6	17.7	0.06	Imperceptible	Negligible
5	Neunkirchen Way roundabout	18.8	17.9	18.0	0.09	Imperceptible	Negligible
6	Wretchwick Way	18.1	17.2	17.3	0.06	Imperceptible	Negligible
7	Wretchwick Way roundabout	18.0	17.1	17.2	0.07	Imperceptible	Negligible
8	Charbidge Lane south	17.4	16.5	16.6	0.05	Imperceptible	Negligible
9	Charbidge Lane north	17.6	16.6	16.7	0.05	Imperceptible	Negligible
10	Gavray Drive/Mallards Way	17.6	16.6	16.6	0.05	Imperceptible	Negligible
11	Wretchwick Way north	17.9	17.0	17.1	0.05	Imperceptible	Negligible
12	Proposed residential north	17.7	16.6	16.7	0.10	Imperceptible	Negligible
13	Proposed residential centre	17.6	16.6	16.7	0.08	Imperceptible	Negligible
14	Proposed residential south	17.6	16.6	16.7	0.09	Imperceptible	Negligible

***Railway Emissions***

6.5.19 The proposed site is bounded by two railway lines, the Birmingham to Marylebone rail line (Chiltern Line) to the north and the Oxford to Bletchley rail line to the west. Stationary diesel locomotives can give rise to high levels of SO<sub>2</sub> close to the point of emission. Recent evidence suggests that moving diesel locomotives, in sufficient numbers, can also give rise to high NO<sub>2</sub> concentrations close to the track. DEFRA guidance LAQM.TG(09) provides a staged assessment methodology for determining potential air quality impacts associated with locomotive emissions. This has been considered separately for stationary and moving trains.

***Stationary Locomotives***

6.5.20 DEFRA guidance LAQM.TG(09) identifies any receptor within 15m of a location where locomotives are regularly stationary for 15-minute periods or longer as being at risk of exposure to exceedances of the air quality limit values for SO<sub>2</sub>. Review of the rail track in the vicinity of the development indicated that the Bicester North station is located approximately 900m north-west of the development site. This is a distance of over 15m and as such, in accordance with the guidance presented within LAQM.TG(09), any stationary locomotives present on the track closest to the site are not considered likely to cause exceedances of the air quality objective at this location. Potential air quality impacts associated with stationary trains at the development site are therefore predicted to be not significant.

***Moving Locomotives***

6.5.21 DEFRA has provided a list of rail routes with heavy traffic of diesel passenger trains which may result in elevated NO<sub>2</sub> concentrations in the vicinity of the line. Review of this information indicated that the Chiltern Line and Oxford to Bletchley rail lines have not been identified as requiring further consideration. As such, potential air quality impacts associated with moving locomotives near the Site are not predicted to be significant.

***Assessment of significance******EPUK factors to judge significance***

6.5.22 As shown above, the impact descriptors for annual mean NO<sub>2</sub> and PM<sub>10</sub> concentrations as a result of the development were predicted to be negligible at all sensitive receptors in all assessment scenarios.

6.5.23 Considering the significance of the air quality impacts according to the EPUK significance criteria, the following points are noted in relation to the operational phase assessment:

- The magnitude of change for annual mean NO<sub>2</sub> is predicted to be small at worst;
- The magnitude of change for annual mean PM<sub>10</sub> is predicted to be imperceptible;
- The impact descriptor for the proposed opening year is negligible at all locations and for all pollutants assessed; and
- Pollutant concentrations at all modelled locations situated across the existing road network are predicted to be below the UK air quality objective and EU limit value for NO<sub>2</sub> and PM<sub>10</sub>.

6.5.24 Based on the above, the significance of the predicted change in air quality as a result of the proposed development is judged to be *insignificant*.

*EPUK flowchart to determine the priority of air quality in the planning process*

6.5.25 Using the EPUK flowchart method, the following points are noted:

- No breach of an EU limit value is observed for either NO<sub>2</sub> or PM<sub>10</sub> concentrations;
- No breach of an air quality objective is observed for either NO<sub>2</sub> or PM<sub>10</sub> concentrations;
- The proposed development is not judged to interfere with the implementation of any local plans and strategies; and
- The proposed development leads to a small increase in NO<sub>2</sub> concentrations at worst.

6.5.26 Based on the above, air quality is considered to be a *low priority* in the planning process.

**6.6 MITIGATION MEASURES****Construction stage**

6.6.1 The dust emitting activities assessed in section 6.5 can be greatly reduced or eliminated by applying the site specific mitigation measures for medium risk sites according to the IAQM guidance. The following measures from the guidance are relevant and should be included in the Construction Environmental Management Plan (CEMP) for the site. With effective mitigation implemented as part of the CEMP, effects associated with the construction phase are likely to be insignificant.

**General**

- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan, which will include measures to control other emissions, approved by the local authority.

**Site management**

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site and the action taken to resolve the situation in the log book.

**Monitoring**

- Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results and make an inspection log available to the local authority, when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

**Site maintenance**

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.

- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out.

**Operating vehicle/machinery and sustainable travel**

- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas.
- Implement a Travel Plan than supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).
- Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport.

**Operations**

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques, such as water sprays or local extraction.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use the fine water sprays on such equipment wherever appropriate.
- Avoid scabbling (roughening of concrete surfaces) if possible.

**Waste management**

- Avoid bonfires and burning of waste materials.

**Post-completion stage**

- 6.6.2 As the proposed development does not result in any significant effects for local air quality no mitigation for the operational phase is required.



**6.7 RESIDUAL EFFECTS****Construction stage**

6.7.1 As indicated in section 6.5 the receiving environment is considered to be of high sensitivity to potential dust impacts. Assuming the relevant mitigation measures outlined in section 6.6 are implemented, the residual significance of potential impacts from all dust generating activities is not significant at receptor locations.

**Post-completion stage**

6.7.2 The residual effects on air quality from the completed development are negligible and not significant.

**Summary of effects**

6.7.3 The effects identified in relation to local air quality are summarised in Table 6.11.

**Table 6.11 Summary of effects**

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Fugitive dust emissions from demolition, earthworks, and construction.	<b>Moderate adverse</b> <i>(based on a site with medium risk to dust impacts)</i>	Site specific mitigation measures for high risk sites according to the IAQM guidance as outlined in section 6.6	<b>Negligible</b>
<b>Post-completion stage</b>			
Effects on air quality from completed Development traffic	<b>Negligible</b>	None required	<b>Negligible</b>
Effects on air quality from railway emissions	<b>Negligible</b>	None required	<b>Negligible</b>

## 6.8 CUMULATIVE EFFECTS

### Construction stage

6.8.1 Should the construction phase programmes of other committed developments in the vicinity of the proposed development overlap then there is the potential for increases in dust impacts at sensitive locations. However, it is not anticipated these will be significant and the implementation of suitable mitigation options, as outlined within this chapter, should control impacts to an acceptable level.

### Post-completion stage

6.8.2 Dispersion modelling was undertaken with the inputs described in Section 6.2. The assessment scenarios for the cumulative assessment are the following:

- 2020 DM scenario without the proposed development, including traffic growth, committed and cumulative developments; and
- 2020 DS scenario including traffic growth, committed and cumulative developments, the proposed development and Gavray Drive East.

6.8.3 The absolute change in concentrations between the DM and DS scenarios has been calculated in order to assess the cumulative impact of the proposed development to local air quality.

### *Predicted NO<sub>2</sub> Concentrations*

6.8.4 Table 6.12 presents the forecast NO<sub>2</sub> concentrations for the assessed receptors for each cumulative assessment scenario. It can be observed that annual mean NO<sub>2</sub> concentrations are predicted to be well below the air quality objective at all receptors with the proposed development and Gavray Drive East. The greatest concentration has been predicted at receptor 3 at the junction of London Road and Neunkirchen Way with 21.4µg/m<sup>3</sup> in 2020.

6.8.5 Changes in modelled concentrations between the DM and DS scenarios have been calculated to determine the impact of the proposed development to local air quality. It can be observed that receptors are anticipated to experience small changes in annual mean NO<sub>2</sub> concentrations at worst. The largest change in concentrations has been forecast at receptor 5 close to Neunkirchen roundabout at 0.4µg/m<sup>3</sup>.

6.8.6 The impact descriptor has also been calculated at each receptor, taking into account the magnitude of change and the forecast concentration at each receptor in the DS scenario. It can be observed that all receptors are anticipated to experience *negligible* impacts as a result of the operation of the proposed development and Gavray Drive East.

*Predicted PM<sub>10</sub> Concentrations*

- 6.8.7 Table 6.13 presents the forecast PM<sub>10</sub> concentrations for the assessed receptors for each assessment scenario. It can be observed that annual mean NO<sub>2</sub> concentrations are predicted to be well below the air quality objective at all receptors with the proposed development and Gavray Drive East. The greatest concentration has been predicted at receptor 2 on London Road with 18.4µg/m<sup>3</sup> in 2020.
- 6.8.8 Changes in modelled concentrations between the DM and DS scenarios have been calculated to determine the impact of the proposed development to local air quality. It can be observed that receptors are anticipated to experience imperceptible changes in annual mean PM<sub>10</sub> concentrations at worst. The largest change in concentrations has been forecast at receptor 12 within the proposed development at 0.1µg/m<sup>3</sup>.
- 6.8.9 The impact descriptor has also been calculated at each receptor, taking into account the magnitude of change and the forecast concentration at each receptor in the DS scenario. It can be observed that all receptors are anticipated to experience *negligible* impacts as a result of the operation of the proposed development and Gavray Drive East.

Table 6.12 Predicted NO<sub>2</sub> concentrations (µg/m<sup>3</sup>) and impact descriptors for cumulative assessment

ID	Receptor	DM	DS	Absolute Change	Magnitude of change	Impact descriptor
1	London Road north	15.0	15.0	0.1	Imperceptible	Negligible
2	London Road centre	17.1	17.2	0.1	Imperceptible	Negligible
3	London Road/Neunkirchen Way	21.2	21.4	0.2	Imperceptible	Negligible
4	Neunkirchen Way	16.7	16.9	0.2	Imperceptible	Negligible
5	Neunkirchen Way roundabout	19.6	20.0	0.4	Small	Negligible
6	Wretchwick Way	14.3	14.5	0.2	Imperceptible	Negligible
7	Wretchwick Way roundabout	14.8	15.1	0.3	Imperceptible	Negligible
8	Charbidge Lane south	11.7	11.9	0.2	Imperceptible	Negligible
9	Charbidge Lane north	12.4	12.6	0.2	Imperceptible	Negligible
10	Gavray Drive/Mallards Way	12.3	12.5	0.2	Imperceptible	Negligible
11	Wretchwick Way north	13.3	13.5	0.2	Imperceptible	Negligible
12	Proposed residential north	12.5	12.9	0.4	Imperceptible	Negligible
13	Proposed residential centre	12.4	12.7	0.3	Imperceptible	Negligible
14	Proposed residential south	12.5	12.8	0.3	Imperceptible	Negligible

**Table 6.13 Predicted PM<sub>10</sub> concentrations (µg/m<sup>3</sup>) and impact descriptors for cumulative assessment**

ID	Receptor	DM	DS	Absolute Change	Magnitude of change	Impact descriptor
1	London Road north	17.8	17.8	0.02	Imperceptible	Negligible
2	London Road centre	18.4	18.4	0.03	Imperceptible	Negligible
3	London Road/Neunkirchen Way	18.1	18.1	0.04	Imperceptible	Negligible
4	Neunkirchen Way	17.6	17.6	0.05	Imperceptible	Negligible
5	Neunkirchen Way roundabout	17.8	17.8	0.08	Imperceptible	Negligible
6	Wretchwick Way	17.2	17.2	0.05	Imperceptible	Negligible
7	Wretchwick Way roundabout	17.1	17.1	0.06	Imperceptible	Negligible
8	Charbidge Lane south	16.5	16.6	0.05	Imperceptible	Negligible
9	Charbidge Lane north	16.6	16.7	0.05	Imperceptible	Negligible
10	Gavray Drive/Mallards Way	16.6	16.6	0.05	Imperceptible	Negligible
11	Wretchwick Way north	17.0	17.0	0.05	Imperceptible	Negligible
12	Proposed residential north	16.6	16.7	0.10	Imperceptible	Negligible
13	Proposed residential centre	16.6	16.7	0.08	Imperceptible	Negligible
14	Proposed residential south	16.6	16.7	0.09	Imperceptible	Negligible





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## **7.1 INTRODUCTION**

- 7.1.1 Ove Arup & Partners Limited (Arup) has been commissioned by Gallagher Estates Limited to undertake an Environmental Impact Assessment (EIA) of the likely significant effects on the environment from the noise arising from construction and operation of the proposed residential development at Gavray Drive West site, Bicester.
- 7.1.2 This chapter outlines relevant national and local noise policy and legislation, describes the existing noise conditions in the vicinity of the Application Site and the methodology used for the assessment. It outlines the nature of the development and the likely significant noise effects of its construction and operation. Mitigation measures are also proposed, where appropriate, and the likely residual effects after any mitigation measures are implemented, are described. A full site suitability assessment is appended to this report and the results of this work are summarised in sections 7.4.12 to 7.4.20.
- 7.1.3 The Site is bounded by two railway lines, the Birmingham to Marylebone rail line (Chiltern Line) to the north and the Oxford to Bletchley rail line to the west. Gavray Drive runs to the south-west of the development and undeveloped land occupies the area to the east of the site. The proposed development comprises up to 180 residential units.
- 7.1.4 Construction assumptions and the basis for calculations are given in Appendix 7.1. Road traffic noise assumptions are presented in Appendix 7.2. An assessment of the suitability of the site for residential development and potential intra-development noise issues, is presented in Appendix 7.3. Noise mapping assumptions are presented in Appendix 7.4. The full detail of the Assessment Methodologies and how they comply with current Government Noise Policy, are presented in Appendix 7.5.

## 7.2 ASSESSMENT METHODOLOGY

### Scope

7.2.1 For the purposes of the EIA, “noise” is defined as any unwanted sound generated by the construction and operational phases of the development. There is a requirement to evaluate its potential effect on sensitive receivers within the vicinity of the proposed development. The proposed development has the potential to give rise to noise during construction and operation. The assessment will consider the likely noise generated by the proposed development and the likely significant effects on nearest surrounding sensitive receptors defined in section 7.4.5. It will include:

- Construction noise (including traffic) and vibration;
- Operational noise associated with the operational road traffic flows.

7.2.2 As there is no commercial or industrial element to the scheme proposals it is unlikely that there will be any operational building services plant noise sources within the development. Residential properties are usually served by small domestic heating and ventilation extracts. Operational plant noise is therefore scoped out of this assessment.

7.2.3 The assessments will be undertaken in accordance with objective criteria contained in national guidance documents.

7.2.4 In the case of the noise assessment of site preparation and construction work, the likely significant effects would be temporary, whereas operational noise could potentially cause permanent noise issues.

7.2.5 For construction and traffic noise effects, prescribed prediction methodologies have been described below to predict the likely noise exposures based on construction activities and forecast traffic data.

7.2.6 For the purposes of the noise and vibration assessment, direct effects are considered to be those arising from construction or operation within 600m of the proposed development. 600 metres is the recommended buffer distance given in Department of Transport (2008). Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3 Part 7 HD 213/11 Environmental Assessment when assessing the noise impact of road traffic. Beyond these distances, noise impacts would be less significant due to distance from the development, the masking effect of other noise sources, and screening by buildings. Indirect effects are considered to be those arising at greater distances. Any such effects are likely to be as a result of changes in traffic flow on roads around the proposed development.

### Assessment approach

#### Construction noise

7.2.7 .

*Significance Thresholds*

- 7.5.1 The threshold for significant effects for construction noise have been established using the BS 5228-1:2009+A1:2014 ABC methodology based upon measured ambient noise levels ( $L_{Aeq}$ ) measured by ERM in 2010 as shown in **Error! Reference source not found.**:

**Table 1 Threshold of significant effects**

Noise sensitive receptor (see Figure 1)	Threshold values in decibels (dB), $L_{Aeq,T}$		
	Day (07:00 – 19:00)	Evenings (19:00 – 23:00)	Night (23:00 – 07:00)
<b>NML (ES) 1 – Gavray Drive</b>	65	55	45

*Effects*

- 7.5.2 For the purpose of this EIA, construction of the development is anticipated to take approximately 3 years expecting completion in 2020 including a 29 week period for earthworks. Once planning conditions and RM applications are dealt with, first completions are expected to be in late 2016/17.
- 7.5.3 General construction site operations will be undertaken within the following hours:
- Monday to Friday: 08:00 – 18:00
  - Saturday: 08:00 – 13:00
  - Sunday/Bank Holiday: No noisy working (other than occasional special works subject to agreement with the local planning authority).
- 7.5.4 Outside of these hours, there will be no significant work undertaken, unless otherwise agreed with the local planning authority.
- 7.5.5 The appointed contractor will be required to produce and agree a CEMP to describe how construction will be managed to avoid, minimise and mitigate any construction effects on the environment, existing surrounding communities and residents.
- 7.5.6 As well as an outline CEMP to define the general approach to the project and to describe the overall environmental management system for the site, the contractor will prepare a site/Phase Specific CEMP to detail the specific environmental obligations and constraints of the site.
- 7.5.7 A summary of the daytime construction activities assessed is included below:
- Activity 1 - Site enabling works - tracked excavators, continuous movements of tipper trucks removing material and a compacting roller. (This type of activity is considered applicable to all areas of the proposed construction works)
  - Activity 2 - Piling - rotary bored piling, cast in situ.
  - Activity 3 - Concrete pours - foundation and basement works for buildings, including any piling activities. Concrete pouring using truck mixers and lorry mounted concrete pumps.

- Activity 4 - Construction to roof level - fabrication of steel structures, potentially some concrete pours, craning of materials and wall sections to buildings, bricklaying.

Construction assumptions, including the CEMP inbuilt mitigation measures, and the basis for calculations are given in Appendix 7.

7.2.8 Noise levels (and where appropriate, vibration) have been predicted in accordance with guidance provided in BS5228. For construction plant, source noise levels have been taken from BS5228, or from information within Arup's database of construction site levels.

#### **Residential property**

7.2.9 The 'ABC' assessment method described in BS 5228-1:2009+A1:2014 has been used to establish the threshold of potential significant effect at residential receptors.

7.2.10 Under this approach, the adverse impact threshold is determined at a dwelling using the existing ambient noise level, rounded to the nearest 5dB. This is then used to determine the assessment category: A, B or C, which then defines the adverse noise impact threshold.

7.2.11 The predicted construction site noise level is then compared to the appropriate noise impact threshold level. A potential significant effect is indicated where the construction site noise ( $L_{Aeq}$ ) level exceeds the threshold level for the category appropriate to the ambient noise level. If the ambient noise level exceeds the highest threshold values given i.e. the ambient noise level is higher than the Category C values), then a potential significant effect is deemed to occur if the construction site noise ( $L_{Aeq}$ ) level for the period is greater than the ambient noise level.

#### **Significance criteria - Construction noise**

7.2.13 BS 5228-1:2009+A1:2014 is the recommended guidance relevant to construction noise. It provides a number of example methodologies for the assessment of significant effects from construction noise. Annex E describes the 'ABC' method of assessment, based upon which it is proposed to establish the threshold of potential significant effect at residential receptors.

7.2.14 Under this approach, the adverse impact threshold is determined at an existing residential dwelling using the existing ambient noise level, rounded to the nearest 5dB and evaluated in relation to the thresholds set out in Table 2.

**Table 2 Likely significant effects at dwellings from on-site noise sources (from BS 5228-1:2009 + A1:2014)**

Assessment category and threshold value period	Threshold values in decibels (dB), $L_{Aeq,T}$		
	Category A	Category B	Category C
Night time (23:00 – 07:00)	45	50	55
Daytime (07:00 – 19:00) Saturdays (07:00 – 13:00)	65	70	75
Other: Weekday evenings (19:00 – 23:00) Saturdays (13:00 – 23:00) Sundays* (07:00 – 23:00)	55	60	65
<p><i>Where:</i>  Category A: are threshold values to use when ambient noise levels (rounded to the nearest 5dB) are less than these values.  Category B: are values to use when ambient noise levels (rounded to the nearest 5dB) are the same as category A values.  Category C: are values to use when ambient noise levels (rounded to the nearest 5dB) are higher than category A values.</p>			

- 7.2.15 A likely significant effect is indicated where the construction site noise ( $L_{Aeq}$ ) level exceeds the threshold level for the category appropriate to the ambient noise level. If the ambient noise level exceeds the highest threshold values given in Table 2, i.e. the ambient noise level is higher than the Category C values), then a potential significant effect is deemed to occur if the construction site noise ( $L_{Aeq}$ ) level for the period is greater than the ambient noise level.
- 7.2.16 Having established if there is a likely significant effect using the ABC method, the final assessment of significance is made using professional judgement. This is evaluated by considering various other factors such as the number of properties affected, and any potential longer term benefits that may arise due to short term disturbance.
- 7.2.17 For this assessment, the BS 5228-1:2009+A1:2014 category C values are considered to represent a SOAEL (refer to Table 4 Noise exposure hierarchy from PPG-N). Below these levels, “noise can be heard and causes small changes in behaviour and/or attitude”. The action would be to “Mitigate and reduce to a minimum” consistent with the concepts of Best Practicable Means (BPM). Above a SOAEL noise is “Noticeable and disruptive” and the action would be to avoid.

**Operational and Construction Road Traffic Noise**

- 7.2.18 The DMRB HD 213/11 approach to assessing the noise impact is to compare the noise levels for the ‘do something’ (with scheme) scenario against noise levels for the ‘do minimum’ (without scheme) scenario. This procedure has been used in this assessment by examining the changes in levels of road traffic noise that would result

from the implementation of the proposed development in 2020 for the operational scenario and 2018 for the construction traffic scenario.

- 7.2.19 The scale or severity of any road traffic noise change, beneficial or adverse, requires description to indicate the degree of impact where possible. Significance criteria are then applied to categories of change.
- 7.2.20 DMRB HD 213/11 states that a long term change in traffic noise of less than 3dB(A) is not generally noticeable and therefore would be considered imperceptible. A change threshold of 3dB(A) has commonly been used in traffic noise assessments in the UK to approximate the threshold of significance.
- 7.2.21 The significance criteria in Table 3 have been developed based upon DMRB, to assess noise effects arising from the operation of the proposed development

**Table 3 Proposed magnitude criteria for assessing road traffic noise effects (from DMRB)**

Change in noise level dBL <sub>A10,18h</sub>	Magnitude criteria
>5.0	Major adverse
3.0 to 4.9	Moderate adverse
1.0 to 2.9	Minor adverse
0.1 to 0.9	Insignificant
0	No change
-0.9 to -0.1	Insignificant
-2.9 to -0.1	Minor beneficial
-4.9 to -3.0	Moderate beneficial
> -5.0	Major beneficial

- 7.2.22 For this assessment, 68dBL<sub>A10(18-hour)</sub> or a change in traffic noise greater than 3dB LA10(18-hour) at an affected residential dwelling is considered to represent a SOAEL.

### Consultation

- 7.2.23 Mr Rob Lowther the Anti-social Behaviour team Manager in Environmental Health at Cherwell District Council was consulted in March 2014 about a potential noise survey methodology. He was satisfied that the proposed noise monitoring locations were suitable to assess likely effects on the identified nearest sensitive receivers and that the proposed schedule was appropriate to assess the site in terms of noise. He also informed that there were engineering works ongoing on the Bicester Chord rail link development, which might contaminate survey measurements, but that the Bicester Chord Environmental assessment carried out by ERM was available and contained noise data which might be useful if our survey was compromised. Following some delay being experienced in getting on site to do surveys due to the noisy engineering works, the possibility of using the ERM data and a noise model to determine the noise climate on site was discussed. In May 2014 Mr Lowther stated the following:

*“I attach a copy of the noise assessment report submitted Network Rail for the construction of the rail chord. This may contains some helpful data regarding backgrounds and post completion noise levels.”*

*“I would not fundamentally object to the use of a noise model to predict conditions on site. What would be needed would be a scoping report submitted before the exercise was carried out detailing the data sources used and any software. It would also need to include some observations is to the level of confidence provided by the model”.*

The modelling was carried out after the Scoping exercise was completed and the information Mr Lowther requested has been incorporated in this assessment.

### **Uncertainties and limitations**

7.2.12 Any limitations and uncertainties are recorded in the relevant section of the Report.

### 7.3 RELEVANT POLICY

7.3.1 This section provides an overview of planning policy and other legislation relevant to noise and vibration.

#### **National Planning Policy Framework (March 2012)**

7.3.2 The National Planning Policy Framework<sup>1</sup> (NPPF) is a key part of the Government's reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

7.3.3 The NPPF constitutes guidance for local planning authorities and decision makers when drawing up plans and as a material consideration in determining applications. For the purposes of noise it replaces Planning Policy Guidance 24.

7.3.4 Its core principle is to advocate a presumption in favour of sustainable development, which, in literal terms, means that if the adverse impacts of a development are outweighed by the benefits, when assessed as a whole, then the development should be approved. Local policy should reflect this principle and therefore the Local Authority has a key role in determining within its Local Plan and noise policies, what is acceptable in terms of any adverse noise effects within its area.

7.3.5 The NPPF sets out the Governmental requirements for the planning system in England and must be considered in conjunction with local development plans during planning decisions.

7.3.6 In reference to noise, the Framework states (Section 123):

Planning policies and decisions should aim to:

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason

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<sup>1</sup> *National Planning Policy Framework*, Department for Communities and Local Government, 27 March 2012



**National Planning Policy Guidance – NOISE (PPG-N)**

7.3.7 The Planning Practice Guidance (PPG) for Noise<sup>2</sup> draws on the principles of the Noise Policy Statement for England (NPSE)<sup>3</sup> in particular the concepts of NOEL, LOAEL and SOAEL as described below:

- Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
- Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected.
- No observed effect level (NOEL): this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

7.3.8 The noise exposure hierarchy proposed by the PPG is summarised in the following Table 4.

**Table 4 Noise exposure hierarchy from PPG-N**

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No observed adverse effect	No specific measures required
<b>Lowest Observed Adverse Effect Level</b>			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
<b>Significant Observed Adverse Effect Level</b>			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during	Significant observed adverse effect	Avoid

<sup>2</sup> Planning Practice Guidance – Noise Department for Communities and Local Government, March 2013

<sup>3</sup> Noisy Policy Statement for England (NPSE) – Defra, March 2010

	periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

7.3.9 Importantly the PPG-N does not provide numerical values for the different effect levels, instead recognising that “The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation”. These factors include:

- The source and absolute level of the noise together with the time of day it occurs. Some types and levels of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night.
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise.
- The spectral content of the noise (ie whether or not the noise contains particular high or low frequency content) and the general character of the noise (ie whether or not the noise contains particular tonal characteristics or other particular features). The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.
- Consideration should also be given to whether adverse internal effects can be completely removed by closing 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

- 7.3.10 Importantly EIA and Government noise policy are interlinked but separate processes. In this regard a 'likely significant effect' would be reported in an EIA where a SOAEL is exceeded. However, depending on the context, an EIA may also report a likely significant effect where the exposure is between the LOAEL and SOAEL in terms of policy. This could be in response to matters such as the magnitude of noise change caused by the development, the number of receptors affected, the duration of the effect etc. The term 'significant' has different meanings in Policy and EIA terms.
- 7.3.11 It therefore remains for professional practitioners to carefully consider the PPG noise exposure hierarchy and where appropriate seek to align it with EIA significance criteria, having regard to British Standards, World Health Organization guidance, and other relevant sources of information. Full details of the assessment methodology compliance with Government Policy are contained in Appendix 7.5

#### **Cherwell District Local Plan (1996)**

- 7.3.12 The Cherwell District Local Plan was adopted in November 1996. Review of this document indicated that the following policies are in relation to noise and vibration:
- **ENV1** "Development which is likely to cause materially detrimental levels of noise, vibration, smell, smoke, fumes or other type of environmental pollution will not normally be permitted." and
  - **ENV 3** "Development sensitive to noise generated by road traffic will be:
    - (i) Refused where external noise levels exceed  $L_{Aeq,16hr}=72dB$  and  $L_{Aeq,8hr}=66dB$  between 07:00-23:00 hrs and 23:00-7:00 hrs respectively.
    - (ii) Generally resisted where external noise levels between 07:00-23:00 hrs and 23:00-07:00 hrs fall into the ranges  $L_{Aeq,16hr}=63$  to  $72dB$  and  $L_{Aeq,8hr}=57$  to  $66dB$  respectively.
    - (iii) Expected to achieve a specified internal acoustic environment when the external noise levels between 07:00-23:00 hrs and 23:00-07:00 hrs fall into the ranges  $L_{Aeq,16hr}=55$  to  $63dB$  and  $L_{Aeq,8hr}=45$  to  $57dB$  respectively."
  - **ENV 4** "Development sensitive to noise generated by rail traffic will be:
    - (i) Refused where external noise levels exceed  $L_{Aeq,16hr}=74dB$  between 07:00 - 23:00 hrs and  $L_{Aeq,8hr} = 66dB$  between 23:00 and 07:00 hrs.
    - (ii) Generally resisted where external noise levels between 07:00 - 23:00 and 23:00 - 07:00 fall into the ranges  $L_{Aeq,16hr}=66$  to  $74dB$  and  $L_{Aeq,8hr}=59$  to  $66dB$  respectively.
    - (iii) Expected to achieve a specified internal acoustic environment when external noise levels between 07:00 - 23:00 and 23:00 - 07:00 hrs fall into the ranges  $L_{Aeq,16hr} = 55$  to  $66dB$  and  $L_{Aeq,8hr}=45$  to  $59dB$  respectively."

- **ENV5** “Notwithstanding policies ENV3 and ENV4, development sensitive to vibration will be resisted in locations where vibration levels are likely to affect the material comfort of end users”

#### **The Non-Statutory Cherwell District Local Plan 2011 (2004)**

7.3.13 The Non Statutory Cherwell Local Plan 2011 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, in December 2004, the Council decided to discontinue work on the draft Cherwell Local Plan 2011 and has begun preparing a Local Development Framework (LDF) under the new planning system.

7.3.14 The Council also decided on this date to approve the draft Cherwell Local Plan 2011 as interim policy. Review of this document indicated that the following policy is in relation to noise :

- **EN 7** which reiterates Policy ENV3 of the Cherwell District Local Plan (1996).
- **EN 8** which reiterates Policy ENV4 of the Cherwell District Local Plan (1996).
- **EN 9** which reiterates Policy ENV 5 of the Cherwell District Local Plan in relation to EN7 and EN8 (1996).

#### **Draft Cherwell Local Plan (2014)**

7.3.15 A review of the Local Plan indicated that the following policies “Policies ENV1 and ENV 2” from the Cherwell Local Plan 1996 have been retained in the Draft Cherwell Local Plan 2014. In addition, the following policies are relevant to this assessment:

- **Policy ESD 3** “Sustainable Construction - Reducing waste and pollution and making adequate provision for the recycling of waste.” And
- **ESD16** “The Character of the Built and Historic Environment”  
“New development proposals should:  
Be designed to deliver high quality safe, attractive, durable and healthy places to live and work in.”

7.3.16 All of these policies have been considered throughout the production of this report.

#### **The Control of Pollution Act 1974<sup>4</sup>**

7.3.17 The Control of Pollution Act provides Local Authorities with the power to control noise from construction sites. This may include specific controls to restrict certain activities identified as causing particular problems. Also, conditions regarding hours of operation

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<sup>4</sup>Control of Pollution Act, 1974, TSO

will generally be specified and noise and vibration limits at certain locations may be applied in some cases.

- 7.3.18 The powers include prosecution for failure to comply with the requirements of a notice served under the act, and a system of providing prior consents for works to be carried out in a specified manner so as to reduce the likelihood of causing disturbance ('s.61 consents'). Noise generators can use the defence that best practicable means have been employed to control noise emissions.

#### **Environmental Protection Act 1990<sup>5</sup>**

- 7.3.19 The Environmental Protection Act provides local authorities and individuals with powers to serve, or request a magistrate to serve, abatement notices against noise (including vibration) from premises that are considered to be a nuisance. Noise generators can use the defence that best practicable means have been used to control noise emissions or (in relation to construction noise) that the alleged nuisance arose from activities that were compliant with an extant consent under s.61 of the Control of Pollution Act (prior consent).

#### **National Best Practice Guidance**

##### **British Standard BS 5228**

- 7.3.20 BS5228 Part 1: 2009+A1:2014 - Noise provides practical guidance on the control of noise from construction sites. The legislative background to noise control is described and recommendations are given regarding procedures for creating effective liaison between developers, site operators and local authorities. Methods for predicting and measuring noise are presented and guidance is given concerning the measurement of noise. Annex E of BS5228 introduces the 'ABC' assessment method, which defines the threshold of likely significant effects at receivers.
- 7.3.21 BS5228 Part 2: 2009+A1: 2014 - Vibration provides practical guidance on the control of vibration from construction sites. The legislative background to vibration control is described and recommendations are given regarding procedures for creating effective liaison between developers, site operators and local authorities. Methods for predicting and measuring vibration are presented and guidance is given concerning the measurement of vibration.

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<sup>5</sup> Environmental Protection Act, 1990, TSO.

#### **British Standard BS 6472**

7.3.22 BS 6472-1:2008 provides guidance on the evaluation of human exposure to vibration in buildings. This standard describes how to determine the vibration dose value (VDV). The vibration dose value is used to estimate the probability of adverse comment which might be expected from people experiencing vibration in buildings. BS5228 Part 2 also references BS 6472 with regard to human response to vibration.

#### **British Standard BS 8233**

7.3.23 BS8233: 2014 provides guidance on sound insulation and noise reduction for buildings. The standard provides advice, and ranges of design criteria for noise levels within buildings. These include advice on appropriate steady noise levels within offices, and in other spaces where speech / telephone communication are important.

#### **Design Manual for Roads and Bridges<sup>6</sup>**

7.3.24 An approach to assessing noise and vibration effects from roads is described in Design Manual for Roads and Bridges (DMRB) relating to environmental assessment. The DMRB approach to assessing noise and vibration impact is to compare the noise levels for the 'do something' (with scheme) scenario against noise levels for the 'do minimum' (without scheme) scenario.

#### **Calculation of Road Traffic Noise<sup>7</sup>**

7.3.25 The road traffic noise generated by new or altered roads associated with a proposed development can be calculated using the Calculation of Road Traffic Noise (CRTN) methodology. The noise levels generated by the road are based on the volume, average speed, road surface type and composition of the traffic. The resulting noise levels at selected receiver locations can then be calculated taking into account the propagation distance, intervening screening and other effects.

### **7.4 BASELINE CONDITIONS**

7.4.1 The proposed development is located adjacent to Gavray Drive and will be comprised mainly of residential dwellings and public spaces. The development is bounded by the Gavray Drive to the south-west, and its north perimeter is defined by the Bicester Chord Railway.

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<sup>6</sup> Department of Transport (2008). Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3 Part 7 HD 213/11 Environmental Assessment

<sup>7</sup> Department of Transport Welsh Office (1988), Calculation of Road Traffic Noise, The Stationery Office

- 7.4.2 There are residential areas surrounding the proposed site to the west and south and there are warehouses to the north and east. The residential properties on Gavray Drive are the closest sensitive receivers to the development as agreed with the Local Authority.

**Baseline noise survey**

- 7.4.4 There are currently construction works ongoing on the Bicester Chord which have prevented survey measurements being taken on site in the last three months. Given the difficulties in carrying out noise surveys, a baseline noise map model has been prepared instead, using rail noise source data and road traffic source data, calibrated to noise survey measurements taken by Environmental Resources Management (ERM) at the site to accompany the Chiltern Railways application for the Bicester Chord development works. The data is found in "Scheme of Assessment for Route Section A", reference 0221083/11/04 as issued in January 2014. This data has been used to calibrate the model and predictions of ambient noise on the site to the measured survey data. The model outputs are used here to determine the baseline noise climate on the site. This approach is robust in that it uses recent representative survey data and data derived from rail movement data for the local rail track infrastructure to provide a baseline assessment. The recognized national calculation method for airborne noise from railways which was used here is given in *Calculation of Railway Noise (CRN)*<sup>8</sup>, with additional source terms given in *Additional railway noise source terms for "Calculation of Railway Noise 1995"*<sup>9</sup>. This approach was agreed with the Local Authority and was also used in the ERM assessment to inform the Chiltern Railways application for the Bicester Chord, which was accepted by the Local Authority.
- 7.4.5 The baseline noise survey was conducted by ERM from 4 to 9 of August 2010 to establish the existing noise climate in the area. Measurements have been taken to enable the assessment of proposed new sources forming part of the development affecting existing sensitive receptors and noise from existing sources affecting the proposed development. The measurement locations are represented by green circle and noise sensitive receptors are highlighted in shaded blue.

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<sup>8</sup> Department of Transport *Calculation of railway noise 1995*. London: The Stationery Office.

<sup>9</sup> Department for Environment, Food and Rural Affairs (Defra). *Additional railway noise source terms for "Calculation of Railway Noise 1995"*. London: Defra. 2007



Figure 1 Noise survey measurement locations

7.4.6 There were two measurements locations in total, reported in Table 5 below:

Table 5 Noise Survey Locations

Location Number	Measurement Type	Location Description
<b>NML (ES) 1 – Gavray Drive</b>	Attended	Measurement taken next to Gavray Drive to assess Road Traffic Noise. None of the measurements include noise from existing trains. Representative of the NSR along the road.
<b>NML (P1) – Whimbrel Close</b>	Unattended	Carried out in the rear garden of 14 Whimbrel Close representative of a NSR near to the railway line.

**Baseline noise results**

7.4.7 Measurements at location NML-ES1 were attended and are representative of the road traffic noise emitted by Gavray Drive. Location NML-P1 was unattended logger and it measured the trains which passed by the Bicester railway to the north as well as road traffic from A34.

7.4.8 The baseline levels at measurement locations are summarised in Table 6 and Table 7 for daytime and night time respectively:



**Table 6 Summary of measured daytime noise levels**

Measurement Location	Measured Noise level, dB			
	L <sub>A90,T</sub>	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>Amax,F</sub>
<b>NML (ES) 1 – Gavray Drive</b>	39 - 40	47 - 48	50 - 51	66 - 72
<b>NML (P1) – Whimbrel Close</b>	32 – 45	40 – 52	43 – 57	51 - 74

**Table 7 Summary of measured night time noise levels**

Measurement Location	Measured Noise level, dB			
	L <sub>A90,T</sub>	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>Amax,F</sub>
<b>NML (ES) 1 – Gavray Drive</b>	37 - 38	41 - 42	41 - 42	57 – 64
<b>NML (P1) – Whimbrel Close</b>	27 - 44	33 - 48	35 - 50	48 - 69

- 7.4.9 Levels recorded at NML-ES1 do not include trains, but because these levels are higher than the L<sub>Aeq,16h</sub> recorded at NML-P1 it is assumed that NML-ES1 is representative of the worst case scenario.
- 7.4.10 Noise mapping has been conducted (Figure 2) to show the predicted daytime sound level across the site at a height of 1.5m above ground. The noise map is calibrated to the measurements obtained at locations NML-ES1 and NML-P1 to provide significant confidence in the accuracy of the predictions. Details of noise mapping are described in Appendix 7.4.

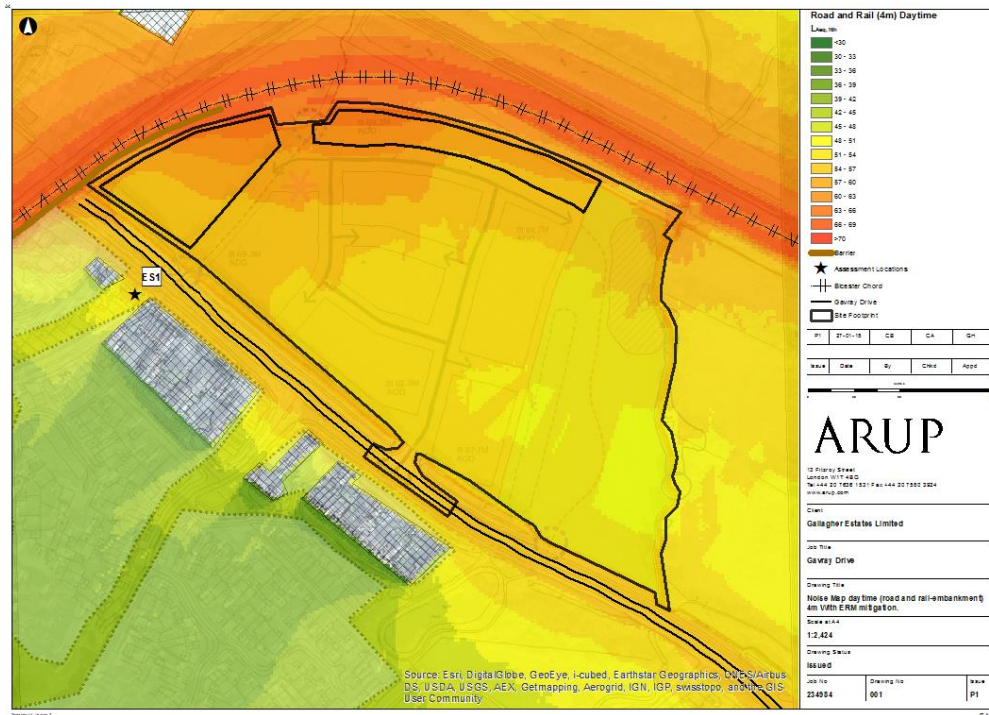


Figure 2 Noise map of current noise climate during daytime (with Bicester Chord Railway specified by ERM).

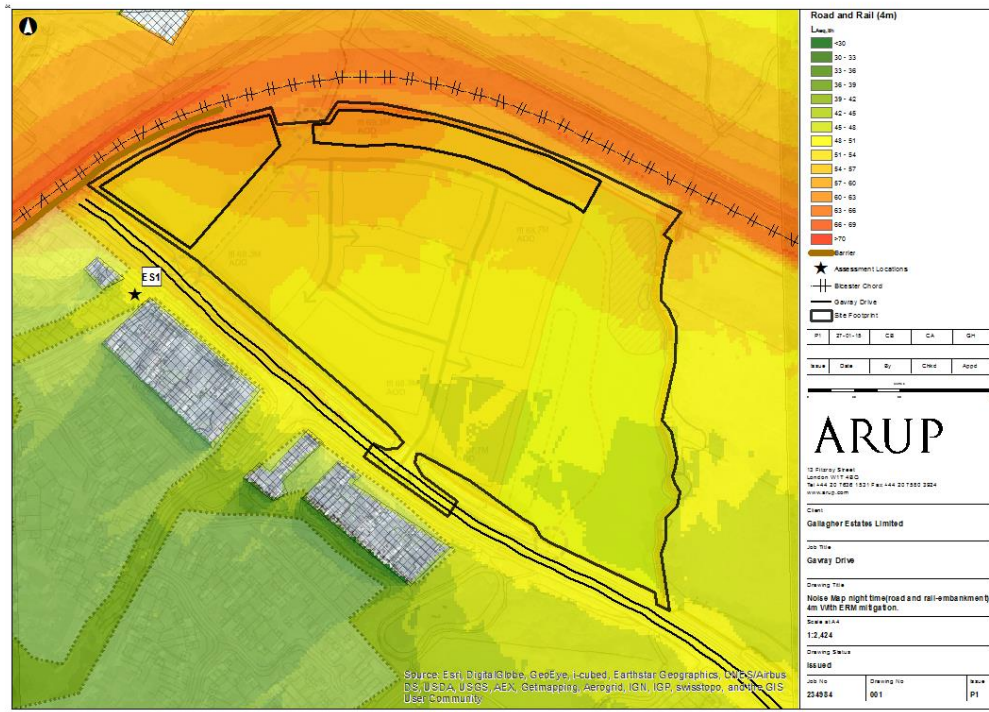


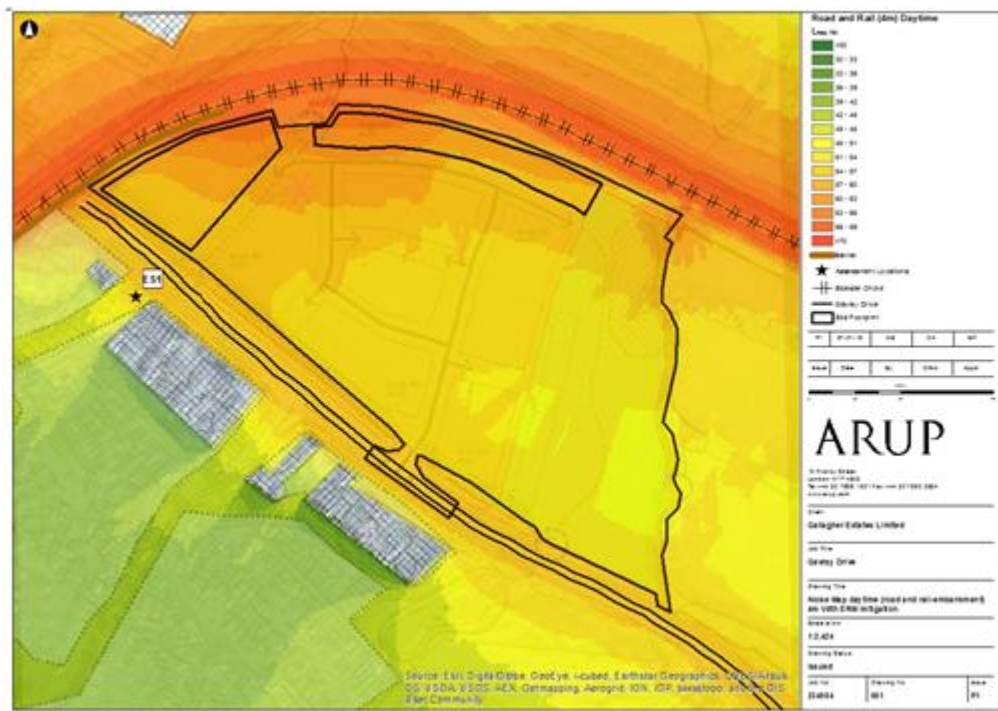
Figure 3 Noise map of current noise climate during night time (with Bicester Chord Railway specified by ERM).

7.4.11 Noise map shows that the levels along the road are solid and reside on the contour of 48-51dB (bright yellow). Therefore, measurement NML-ES1 can be assumed to be representative of the worst case scenario of all the residences located to the east of Gavray Drive.

**SITE SUITABILITY ASSESSMENT**

7.4.12 Noise mapping has been conducted (Figure 4) to show the predicted daytime sound levels across the site at a height of 4m above ground to represent worst case scenario at an elevated window.

**Figure 4**



7.4.13

7.4.14 The noise map is calibrated to the measurements obtained at NML-ES1 for road noise and to levels given by ERM summarised in Table 8 .

**Table 8**

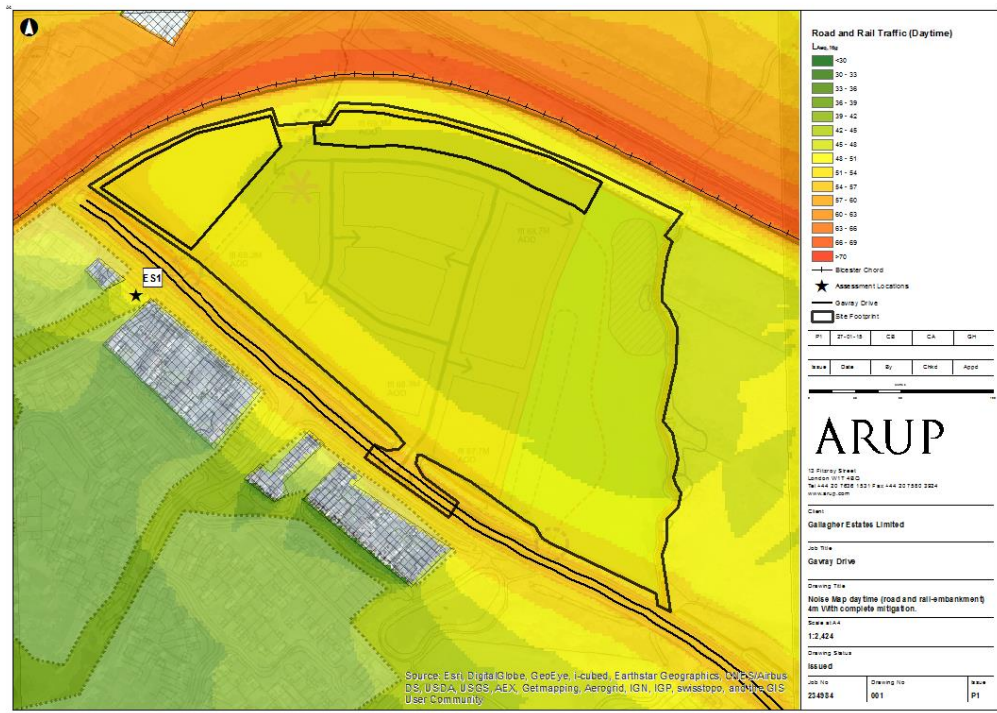
Measurement Location	Predicted Train Noise level without mitigation*, dB		Predicted Train Noise level with mitigation*, dB	
	L <sub>Aeq,16h</sub>	L <sub>Aeq,8h</sub>	L <sub>Aeq,16h</sub>	L <sub>Aeq,8h</sub>
NML (ES) 1 – Gavray Drive (First floor)	60	58	49	48
NML (P1) – Whimbrel Close (First floor)	67	66	65	64

7.4.15 The Scheme of Assessment for Route Section A advises on an acoustic barrier of 2.5m. However, the acoustic barrier would only protect existing noise sensitive

receptors and proposed development would be exposed to high levels during both daytime and night time.

7.4.16 Figure 5 shows a noise map with an indicative 2.5m high noise barrier to the northern boundary.

Figure 5



7.4.17 This barrier is based on the design of the proposed ERM mitigation, so instead of having an incomplete barrier that only protects existing noise sensitive receptors, it would extend to the perimeter of the proposed site, achieving 55dBL<sub>Aeq,T</sub> (at 1.5m above the ground) at the edge of the red line boundary during the daytime. At night the barrier would reduce noise levels to 54dBL<sub>Aeq,8h</sub> at 4m above ground, as a facade level. The resulting equivalent internal noise level would be 39-44dB(A).

7.4.18 To achieve the more onerous requirements of 35dBL<sub>Aeq,16h</sub> night time criterion, the residences would require enhanced glazing and acoustically treated ventilation provision.

7.4.19 In summary, the proposed development may be considered to be suitable for residential uses, with the provision of enhanced glazing and acoustically treated ventilation such that windows may remain closed. This also considers the railway mitigation outlined by ERM.

7.4.20 For this assessment the proposed approach is considered to result in noise levels inside buildings below a LOAEL. At these levels "Noise can be heard, but does not cause any changes in behaviour or attitude. Can slightly affect the acoustic character

of the area but not such that there is a perceived change in the quality of life". No specific additional actions would be required.

## 7.5 LIKELY SIGNIFICANT EFFECTS

### Introduction

7.5.8 This section considers the likely significant noise effects associated with the construction and operation of the proposed development, on existing sensitive receptors.

### Construction stage

7.5.9 The predicted daytime construction noise levels at noise sensitive receptors, for the different stages of construction are presented in Table 9.

**Table 9 Predicted daytime construction noise levels**

Noise sensitive receptor (see Figure 1)	Daytime threshold (dBL <sub>Aeq,T</sub> )	Construction noise level (dBL <sub>Aeq,T</sub> )			
		Activity 1 Site enabling	Activity 2 Piling	Activity 3 Foundations	Activity 4 To roof level
<b>NML (ES) 1 – Gavray Drive</b>	65	54	51	53	53

7.5.10 The following mitigation measures, which will be detailed in the CEMP, are considered to be in built mitigation and form part of the assessment calculations of construction noise.

7.5.11 Hoarding will be erected around the perimeter of the as site as in-built mitigation. In order to be effective at screening noise, this material will have a mass per unit of surface area in excess of 7 kg/m<sup>2</sup>. Plywood sheets attached to a suitable scaffold frame are often used to create temporary screening for this purpose. If appropriate further screening will also be used to provide additional screening around long-term static plant (e.g. generators) at locations where the boundary screening might not be effective such as areas of raised ground where there might be a line of sight between source and receiver. For example when construction takes place close to the noise sensitive receptor location NML-ES1. An attenuation of -10dB is assumed for this type of barrier and has been included in the calculations.

7.5.12 Importantly the calculated construction noise levels presented are ‘worst case’ insofar as they represent the entirety of the activity being located at the nearest part of the site perimeter to the noise sensitive receptors and operating simultaneously.

7.5.13 When this is not the case, construction noise levels are likely to be lower because of additional distance attenuation and screening from other buildings, however throughout the duration of the construction phase there may be periods of more intensive activity. In summary the results presented represent a reasonable worst case, but construction noise will be variable when considered over shorter periods of time.

- 7.5.14 Daytime construction noise levels at all noise sensitive receptors are below the daytime significance criteria of 65dB<sub>LAeq,T</sub>. For these locations the effects are considered to be **insignificant**.
- 7.5.15 No construction noise calculations have been conducted for evening and night time working because evening and night time working is not proposed. However, should it be required limited evening construction works could potentially be accommodated if needed whilst keeping below the evening noise significance criteria of 55dB<sub>LAeq,T</sub>, these would require separate assessment prior to commencement based on the site need. Night time construction working is likely to result in substantial adverse noise effects. The night time noise significance threshold of 45dB<sub>LAeq,T</sub> should accommodate smaller items of equipment that maybe required for site operation and safety such as de-watering pumps and small generators provided that they are suitably attenuated, located away from the site boundary or are otherwise screened from nearby dwellings.
- 7.5.16 Based on the current construction assumptions there is the potential for vibration effects at sensitive receivers during demolition, foundation works, and superstructure construction. The identification of significant vibration effects at residential properties is complex due to the highly variable nature and durations of vibration impacts arising from construction work. It is considered that the significance of vibration effects from construction work cannot be assessed quantitatively and should be determined using professional judgement. As each phase of construction is planned in detail it will be possible to establish more detailed method statements. Where methods are considered likely to cause increased noise and vibration best practicable means should be used to control noise and vibration, including the provision of appropriate monitoring where deemed necessary. The details will be discussed and agreed with the Local Authority and an appropriate Code of Construction Practice will be developed.

#### **Post-completion stage – Road Traffic Noise**

- 7.5.17 An assessment of the likely noise effects has been conducted by considering the difference between the 'do something' (DS) and 'do minimum' (DM) scenarios.
- 7.5.18 Two potential DM scenarios are used for assessing likely noise effects of the proposed development. The first includes only the committed developments for which a planning approval is in place, and the second includes all committed developments along with additional sites which may come forward within the period of assessment.
- 7.5.19 Development sites included for each DM scenario are listed below:
- Committed Development = Bicester Business Park and Tesco Expansion, North West Bicester, Graven Hill, South West Bicester, Talisman Road
  - Cumulative Development = Committed Development + South East Bicester, Bicester Gateway, North East Bicester, Windfall

7.5.20 For each DM scenario, both the Proposed Development (Gavray Drive west parcel) and Sensitivity Development (west and east parcels) are assessed as DS scenarios.

7.5.21 A summary of the assessed roads for baseline noise predictions is shown in Figure 6.

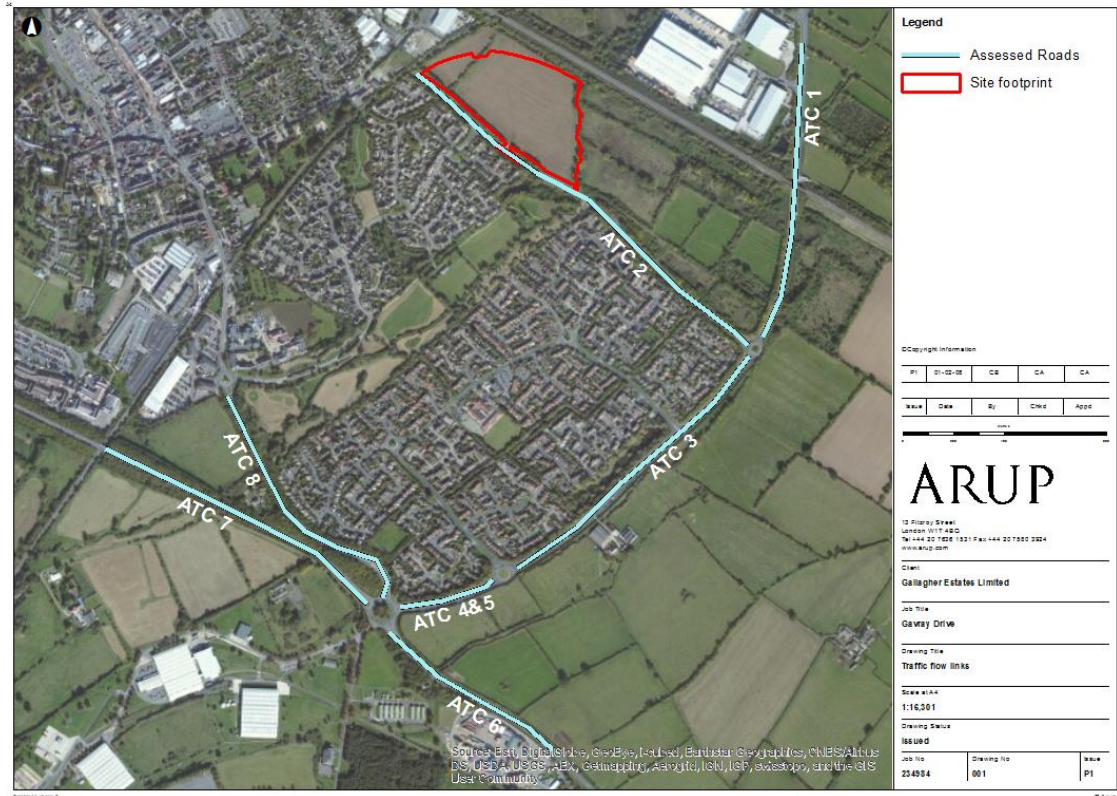


Figure 6 Summary of assessed roads for road traffic noise (BNL) predictions

### Committed Development

The tables below show the predicted basic noise level (BNL) for the Baseline (B) and Committed Development DM scenarios, compared to the Proposed and Sensitive DS development scenarios (Table 10 and Table 11 respectively) and for the construction traffic assessment year of 2018 in Table 12.

Table 10 Summary of predicted road traffic noise impacts with Proposed Development (Gavray Drive west parcel)

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC1 – Charbridge Ln	69.1	70.0	0.9	70.1	0.9	0.1
ATC2 – Gavray Drive	58.7	59.2	0.5	61.0	2.3	1.8
ATC3 – Wretchwick Way	69.8	70.8	1.0	71.0	1.2	0.2



Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC4&5 – Neunkirchen Way	69.0	69.9	0.9	70.1	1.1	<b>0.2</b>
ATC6 – A41 South	70.8	71.9	1.0	71.9	1.0	<b>0.0</b>
ATC7 – A41 North	72.0	73.3	1.3	73.4	1.4	<b>0.1</b>
ATC8 – London Road	67.8	68.5	0.6	68.5	0.6	<b>0.0</b>

**Table 11 Summary of predicted road traffic noise impacts with Sensitivity Development (west and east parcels)**

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC1 – Charbridge Ln	69.1	70.0	0.9	70.1	1.0	<b>0.1</b>
ATC2 – Gavray Drive	58.7	59.2	0.5	61.9	3.2	<b>2.7</b>
ATC3 – Wretchwick Way	69.8	70.8	1.0	71.2	1.3	<b>0.4</b>
ATC4&5 – Neunkirchen Way	69.0	69.9	0.9	70.2	1.2	<b>0.3</b>
ATC6 – A41 South	70.8	71.9	1.0	71.9	1.0	<b>0.0</b>
ATC7 – A41 North	72.0	73.3	1.3	73.4	1.5	<b>0.1</b>
ATC8 – London Road	67.8	68.5	0.6	68.5	0.6	<b>0.0</b>

**Table 12 Summary of predicted construction traffic noise impacts with Sensitivity Development (west and east parcels)**

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC1 – Charbridge Ln	69.1	69.9	0.8	69.9	0.8	<b>0.0</b>
ATC2 – Gavray Drive	58.7	59.1	0.4	59.3	0.6	<b>0.2</b>
ATC3 – Wretchwick Way	69.8	70.7	0.9	70.7	0.9	<b>0.0</b>
ATC4&5 – Neunkirchen Way	69.0	69.8	0.8	69.9	0.8	<b>0.0</b>
ATC6 – A41 South	70.8	71.8	0.9	71.8	0.9	<b>0.0</b>
ATC7 – A41 North	72.0	73.2	1.2	73.2	1.3	<b>0.0</b>
ATC8 – London Road	67.8	68.4	0.5	68.4	0.5	<b>0.0</b>

### Cumulative Development

The tables below show the predicted basic noise level (BNL) for the Baseline (B) and Cumulative Development DM scenarios, compared to the Proposed and Sensitive DS development scenarios (respectively).

**Table 13 Summary of predicted road traffic noise impacts with Proposed Development (Gavray Drive west parcel)**

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC1 – Charbridge Ln	69.1	70.4	1.3	70.5	1.4	0.1
ATC2 – Gavray Drive	58.7	59.2	0.5	61.0	2.3	1.8
ATC3 – Wretchwick Way	69.8	71.3	1.5	71.5	1.7	0.2
ATC4&5 – Neunkirchen Way	69.0	70.4	1.4	70.5	1.5	0.1
ATC6 – A41 South	70.8	72.1	1.3	72.1	1.3	0.0

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC7 – A41 North	72.0	73.9	1.9	74.0	2.0	0.1
ATC8 – London Road	67.8	68.6	0.8	68.6	0.8	0.0

**Table 14 Summary of predicted road traffic noise impacts with Sensitivity Development (west and east parcels)**

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC1 – Charbridge Ln	69.1	70.4	1.3	70.6	1.4	0.1
ATC2 – Gavray Drive	58.7	59.2	0.5	61.9	3.2	2.6
ATC3 – Wretchwick Way	69.8	71.3	1.5	71.6	1.8	0.3
ATC4&5 – Neunkirchen Way	69.0	70.4	1.4	70.6	1.6	0.2
ATC6 – A41 South	70.8	72.1	1.3	72.1	1.3	0.0
ATC7 – A41 North	72.0	73.9	1.9	74.0	2.0	0.1
ATC8 – London Road	67.8	68.6	0.8	68.7	0.8	0.0

**Table 15 Summary of predicted construction traffic noise impacts with Sensitivity Development (west and east parcels)**

Road link	Noise level dBLA10,18h					
	B	DM	DM - B	DS	DS - B	DS - DM
ATC1 – Charbridge Ln	69.1	70.3	1.2	70.3	1.2	0.0
ATC2 – Gavray Drive	58.7	59.1	0.4	59.3	0.6	0.2
ATC3 – Wretchwick Way	69.8	71.3	1.4	71.3	1.4	0.0
ATC4&5 – Neunkirchen Way	69.0	70.3	1.3	70.3	1.3	0.0
ATC6 – A41 South	70.8	72.0	1.2	72	1.2	0.0
ATC7 – A41 North	72.0	73.8	1.8	73.8	1.8	0.0
ATC8 – London Road	67.8	68.5	0.7	68.5	0.7	0.0

7.5.22 For the future operational assessment year (2020) and the construction traffic assessment year of 2018 the entirety of the nearby road network experiences a **neutral/insignificant** noise increase (i.e. an increase of less than 1dB) in all scenarios with the exception of link ATC2 – Gavray Drive during the future operational scenario, which experiences a minor adverse increase in noise.

7.5.23 The increase in traffic noise for operation on Gavray Drive is between 1.4dB and 2dB, as shown in Tables 10, 11, 13 and Table 14 for “committed” and the proposed development, and “committed”(our proposed) and both west and east land parcels i.e. sensitive development without the south east Bicester development.

7.5.24 The assessed levels represent the committed, and the site proposed development with the south east Bicester. If the southeast Bicester development is in place, as well as the committed, proposed and sensitive development, along Gavray Drive, noise levels reduce as traffic is distributed onto other roads servicing south east Bicester.

7.5.25 As traffic noise changes would not be significant it follows that any changes in air-borne vibration effects from traffic would also be not significant. Any new internal traffic routes would not be expected to generate detectable ground-borne vibration as new roads would be smooth and free from potholes or any other discontinuities. Also, the distances to existing properties from new internal roads would be too great for there to be any possibility of significant effects.

## **7.6 MITIGATION MEASURES**

### **Introduction**

- 7.6.1 This section considers the potential mitigation of noise effects associated with the construction and operation of the proposed development, on existing sensitive receptors.

### **During construction**

- 7.6.2 To minimise the level of noise to which sensitive receptors will be exposed, the construction work will be conducted in accordance with a Construction Environmental Management Plan (CEMP) including in-built mitigation and any additional mitigation identified by the appointed contractor.
- 7.6.3 The CEMP will contain established control measures for environmental protection that will be adopted during construction. These measures will be based upon BS 5228 Part 1: Noise in order to achieve best practicable means (BPM).
- 7.6.4 For the majority of receptors no specific additional mitigation measures beyond the CEMP are proposed to address construction noise impacts. This is because the net effect of the proposed development on these properties is considered to be neutral/insignificant.
- 7.6.5 Additionally it should be noted the local authority has powers under the Control of Pollution Act (1974) to control noise from construction sites.

### **Operational - Commercial/Industrial Noise**

- 7.6.6 No commercial or industrial development is proposed as part of this development. Therefore no specific additional mitigation measures are required.

### **Operational - Road Traffic Noise**

- 7.6.7 No specific additional mitigation measures are proposed to address the impacts of increased numbers of vehicles using the existing road network. This is because the net effect of the proposed development on road traffic noise levels is considered to be neutral / insignificant for the entirety of the road network.

## 7.7 RESIDUAL EFFECTS

### Introduction

7.7.1 This section considers the potential residual noise effects associated with the construction and operation of the proposed development, on existing sensitive receptors.

### During construction

7.7.2 The assessment has concluded that, with the implementation of best practical means, captured within a CEMP, there will be neutral/insignificant residual noise effects at the receptors outside the application boundary as a result of the construction activity.

### After Completion – Road Traffic Noise

7.7.3 The residual indirect effects for existing roads would be **neutral/insignificant**.

### Summary of effects

7.7.4 The effects identified are summarised in Table 16 below:

**Table 16 Summary of effects**

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Noise from construction activity	Neutral/ Insignificant	Use Best Practicable Means. Enforcement of noise control measures way of a CEMP. Hoarding use when close to sensitive receptors	Neutral/ Insignificant
<b>Post-completion stage</b>			
Road traffic noise on wider road network	Neutral/ Insignificant	None proposed	Neutral/ Insignificant

## 7.8 CUMULATIVE EFFECTS

### Introduction

- 7.8.1 This section provides an overview of cumulative effects as assessed resulting from nearby committed development. Some effects such as construction noise would be temporary and some permanent.

### Baseline conditions

- 7.8.2 Existing baseline noise levels have been incorporated into the assessment, which include road traffic noise and rail traffic noise. Other developments in the area may result in very slight changes to the noise climate, some beneficial and some adverse. Overall the changes to baseline conditions are expected to be **neutral/insignificant**.
- 7.8.3 Notably for the construction noise assessments, where significance criteria are derived from the baseline conditions; if the baseline noise climate subsequently increases as a result of other developments, this will actually reduce the perceived impacts of the proposed development.

### During construction

- 7.8.4 With regards to construction noise effects, the timing for construction of surrounding committed development is unknown and as such not quantifiable, however, there is the potential to contribute to cumulative effects should construction of other committed development coincide with the proposed scheme.
- 7.8.5 Even under such a scenario, the cumulative impact of two sites cannot result in a noise level more than 3dB greater than that from a single development assuming that the same assessment criteria and constraints are applied to both sites.
- 7.8.6 The assessment of construction activity for the proposed development has been based upon worst case assumptions and effects still remain well below the adopted significance thresholds. Cumulative construction noise effects resulting from committed development are therefore not considered to materially influence the outcome of this assessment.

### After completion - Road Traffic Noise

- 7.8.7 With regards to the indirect effects from road traffic on the wider road network, nearby committed development has been included within the traffic flow figures used and therefore the assessment already takes account of committed development in the area.







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## **8.1 INTRODUCTION**

8.1.1 This chapter of the ES assesses the likely significant effects of the proposed development in terms of landscape and visual amenity, and incorporates a summary of the Landscape and Visual Baseline included in full at ES Appendix 8.1. A summary of the Arboricultural Assessment undertaken for the proposed development can be found at Chapter 10.

8.1.2 The chapter describes the assessment methodology, the baseline conditions at the development site and surroundings, the likely significant environmental effects, the mitigation measures required to prevent, reduce or offset any significant adverse effects and the likely residual effects after these measures have been employed. This chapter has been prepared by The Environmental Dimension Partnership (EDP).

8.1.3 The chapter should be read in conjunction with the following ES Appendices:

- ES Appendix 8.1 Landscape and Visual Baseline Appraisal.
- ES Appendix 8.2: Schedule of Landscape and Visual Effects during Construction and Operation Phases (Tables EDP 8.7, 8.8 and 8.9).
- ES Appendix 8.3: Context Appraisal (Figures EDP 1-4)
- ES Appendix 8.4: Photoviewpoint Appraisal (Figures EDP 5 - 12).
- ES Appendix 8.5: Methodology.
- ES Appendix 8.6: Glossary of Terms.
- ES Appendix 8.7: Evidence of LPA Consultation.
- ES Appendix 8.8: Extract of online document at Oxfordshire County Council “Bicester Area Local Plan Housing (2011-2031).

## 8.2 ASSESSMENT METHODOLOGY

### **Introduction**

8.2.1 Provided within this section is an abridged methodology for the LVIA. An unabridged version can be found at ES Appendix 8.5, and a glossary of terms can be found at ES Appendix 8.6.

### **Study Areas**

8.2.2 As a result of baseline analysis and an understanding of the nature and scale of the development, and the likely extent and distribution of effects, the assessment defines the following study areas:

- General Study Area – of up to 5km distance from the Site (providing the broad geographical context), represented in Figure EDP 2, ES Appendix 8.3; and
- Detailed study area – of up to 2km from the Site (the area within which any significant effects are likely to fall), represented in Figures EDP 3 and EDP 4, ES Appendix 8.3.

### **Methodology**

8.2.3 The assessment methodology for assessing landscape and visual effects prepared by EDP is principally based on the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment – Third Edition (LI/IEMA, 2013);
- Landscape Character Assessment – Guidance for England and Scotland (Swanick & LUC, 2002) produced on behalf of the Countryside Agency and Scottish Natural Heritage;
- Photography and photomontage in landscape and visual impact assessment (Landscape Institute Advice Note 01/11); and
- BS5837:2012 Trees in Relation to Design, Demolition and Construction (BSI, 2012).

8.2.4 The assessment methodology has been agreed with the Local Planning Authority and the appraisal of visual receptors was also developed through prior consultation with Cherwell District Council through the EIA Scoping process.

8.2.5 The nature of landscape and visual assessment requires both objective analysis and subjective professional judgement. Accordingly, the following assessment is based

on the best practice guidance listed above, and information and data analysis techniques recognised by the Landscape Institute and the Institute of Environmental Management and Assessment. It uses subjective professional judgement in combination with quantifiable factors wherever possible and is based on clearly defined terms (see ES Appendix 8.6: Glossary of Terms).

### ***Landscape and Visual Assessment***

8.2.6 Landscape effects derive from changes in the physical landscape fabric which may contribute to changes in its character and how this is experienced. These effects need to be considered in line with changes already occurring within the landscape and which help define the character of it.

8.2.7 Effects upon the wider landscape resource, i.e. the landscape surrounding the development, requires an assessment of visibility of the proposed development from adjacent landscape character areas, but remains an assessment of landscape character and not visual amenity.

8.2.8 The assessment of effects on visual amenity draws on the predicted effects of the development, the landscape and visual context, and the visibility and viewpoint analysis, and considers the significance of the overall effects of the proposed development on the visual amenity of the main visual receptor types in the study area.

### ***Identifying Landscape and Visual Receptors***

8.2.9 This assessment has sought to identify the key landscape and visual receptors that may be affected by the changes proposed.

8.2.10 The assessment of effects on landscape as a resource in its own right draws on the description of the development, the landscape context and the visibility and viewpoint analysis to identify receptors, which, for the proposed development may include, but not be limited to, the following:

- The landscape fabric of the development site;
- The key landscape characteristics of the local context;
- The 'host' landscape character area which contains the proposed development;
- The 'non-host' landscape character areas where there is the potential for secondary effects beyond the host landscape character area (this is only undertaken where effects may extend beyond the host character area); and

- Landscape designations on a national, regional or local level (where relevant).

8.2.11 The locations and types of visual receptors within the defined study areas are identified from Ordnance Survey (OS) maps and other published information (such as walking guides), from fieldwork observations and from local knowledge provided during the consultation process. Examples of visual receptors may include, but not be limited to, the following:

- Settlements and private residences\*;
- Users of National Cycle Routes and National Trails;
- Users of local/regional cycle and walking routes;
- Those using local rights of way – walkers, horse riders, cyclists;
- Users of open spaces with public access;
- People using major (Motorways, A and B) roads;
- People using minor roads; and
- People using railways.

*\*N.B. Assessment of settlements are taken from publicly accessible locations only as representative viewpoints for the likely affect of the proposal. Any assessment for private residences is taken only from publicly accessible locations as a representative indication of effects. No access was gained to private land or within private residences.*

### **Assessment of Landscape and Visual Effects**

8.2.12 The assessment of effects on the landscape resource includes consideration of the potential changes to those key elements and components which contribute towards recognised landscape character or the quality of designated landscape areas; these features are termed a landscape receptor. The assessment of visual amenity requires the identification of potential visual receptors that may be affected by the development. As noted, following the identification of each of these various landscape and visual receptors, the effect of the development on each of them is assessed through consideration of a combination of:

- Their overall sensitivity to the proposed form of development that includes the value attached to the receptor following the baseline appraisal, combined with the susceptibility of the receptor to the change proposed, determined during the assessment stage; and
- The overall magnitude of change that will occur - based on the size and scale of the change, its duration and reversibility.

### **Defining Receptor Sensitivity**

8.2.13 A number of factors influence professional judgment when assessing the degree to which a particular landscape or visual receptor can accommodate change arising from a particular development. Sensitivity is made up of judgements regarding the 'value' attached to the receptor, which is determined at baseline stage, and the 'susceptibility' of the receptor, which is determined at the assessment stage when the nature of the proposals, and therefore the susceptibility of the landscape and visual resource to change, is better understood.

8.2.14 Susceptibility indicates 'the ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences'<sup>1</sup>. Susceptibility of visual receptors is primarily a function of the expectations and occupation or activity of the receptor. A degree of professional judgement applies in arriving at the susceptibility for both landscape and visual receptors and this is clearly set out in the technical annexes to this assessment.

8.2.15 A location may have different levels of sensitivity according to the types of visual receptors at that location and any one receptor type may be accorded different levels of sensitivity at different locations.

8.2.16 Therefore, where the susceptibility of a receptor to the type of development proposed may result in a change to the 'inherent' value of that receptor or location, this is made explicit within the assessment text contained with ES Appendix 8.2.

8.2.17 Table 8.1 below provides an indication of the criteria by which the overall sensitivity of a landscape receptor is judged within this assessment, and considers both value and susceptibility independently.

**Table 8.1: Landscape Sensitivity Criteria**

<b>Category</b>	<b>Landscape Receptor Value Criteria</b>	<b>Landscape Susceptibility to Change Criteria</b>
Very High	Nationally/Internationally designated/valued countryside and landscape features; strong/distinctive landscape characteristics; absence of landscape detractors.	Strong / distinctive landscape elements / aesthetic / perceptual aspects; absence of landscape detractors; landscape receptors in excellent condition. Landscapes with clear and widely recognised cultural value. Landscapes with a high level of tranquillity.
High	Locally designated/valued	Many distinctive landscape

<sup>1</sup> Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, Third Edition Page 158.



	countryside (e.g. Areas of High Landscape Value, Regional Scenic Areas) and landscape features; many distinctive landscape characteristics; very few landscape detractors.	elements / aesthetic / perceptual aspects; very few landscape detractors; landscape receptors in good condition. The landscape has a low capacity for change as a result of potential changes to defining character.
Medium	Undesignated countryside and landscape features; some distinctive landscape characteristics; few landscape detractors.	Some distinctive landscape elements / aesthetic / perceptual aspects; few landscape detractors; landscape receptors in fair condition. Landscape is able to accommodate some change as a result.
Low	Undesignated countryside and landscape features; few distinctive landscape characteristics; presence of landscape detractors.	Few distinctive landscape elements / aesthetic / perceptual aspects; presence of landscape detractors; landscape receptors in poor condition. Landscape is able to accommodate large amounts of change without changing these characteristics fundamentally.
Very Low	Undesignated countryside and landscape features; absence of distinctive landscape characteristics; despoiled / degraded by the presence of many landscape detractors.	Absence of distinctive landscape elements / aesthetic / perceptual aspects; presence of many landscape detractors; landscape receptors in very poor condition. As such landscape is able to accommodate considerable change.

8.2.18 For visual receptors, judgements of susceptibility and value are closely interlinked considerations. For example, the most valued views are those which people go and visit because of the available view – and it is at those viewpoints that their expectations will be highest and thus most susceptible to change.

8.2.19 For this reason the sensitivity of visual receptors is rated in a single step process which combines both susceptibility and value as indicated by the criteria in Table T8.2 below:

**Table 8.2: Visual Receptor Sensitivity**

Category	Visual Receptor Criteria
Very High	Designed (i.e. deliberately created) view (which may be to or from a recognised heritage asset or other important viewpoint), or where views of the surroundings are an important contributor to the experience. Key promoted viewpoint e.g. interpretative signs. References in literature and art and/or guidebooks tourist maps. Protected view recognised in planning policy designation. Examples may include views from residential properties, especially from rooms normally occupied in waking or daylight hours; national

	public rights of way e.g. National Trails and nationally designated countryside/landscape features with public access which people might visit purely to experience the view; and visitors to heritage assets of national importance.
High	View of clear value but may not be formally recognised e.g. framed view of high scenic value, or destination hill summits. It may also be inferred that the view is likely to have value e.g. to local residents. Examples may include views from recreational receptors where there is some appreciation of the landscape e.g. golf and fishing; local public rights of way, access land and National Trust land, also panoramic viewpoints marked on maps; road routes promoted in tourist guides for their scenic value, plus main roads within nationally important landscapes (e.g. AONBs or National Parks).
Medium	View is not promoted or recorded in any published sources and may be typical of the views experienced from a given receptor. Examples may include people engaged in outdoor sport other than appreciation of the landscape e.g. football and rugby or road users on minor routes passing through rural or scenic areas.
Low	View of clearly lesser value than similar views experienced from nearby visual receptors that may be more accessible. Examples may include road users on main road routes (motorways/A roads) and users of rail routes or people at their place of work (where the place of work may be in a sensitive location). Also views from commercial buildings where views of the surrounding landscape may have some limited importance.
Very Low	View affected by many landscape detractors and unlikely to be valued. Examples may include people at their place of work, indoor recreational or leisure facilities or other locations where views of the wider landscape have little or no importance.

8.2.20 For visual receptors, judgements of susceptibility and value are closely interlinked considerations. For example, the most valued views are those which people go and visit because of the available view – and it is at those viewpoints that their expectations will be highest and thus most susceptible to change

8.2.21 The tables above offer a template for assessing overall sensitivity of any landscape or visual receptor as determined by combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape or view as set out at paragraph 5.38 of GLVIA 3rd Edition (2013). However, the narrative in this report may demonstrate that assessment of overall sensitivity can change on a case-by-case basis. For example a high susceptibility to change and a low value may result in a medium overall sensitivity, unless it can be demonstrated that the receptor is unusually susceptible or is in some particular way more valuable. A degree of professional judgement applies in arriving at the overall sensitivity for both landscape and visual receptors

### **Magnitude of Change**

8.2.22 The magnitude of any landscape or visual change is determined through a range of considerations particular to each receptor. The three attributes considered in defining the magnitude are:

- Scale of Change;
- Geographical Extent; and
- Duration and Reversibility/Proportion.

8.2.23 Receptor locations from which views of the proposed development are not likely to occur will receive no change and therefore no effect. With reference to the Zone of Theoretical Visibility (ZTV) and site survey, the magnitude of change is defined for receptor locations from where visibility of the proposed development is predicted to occur.

8.2.24 Table 8.3 provides an indication of the criteria by which the size/scale of change at a landscape or visual receptor is judged within this assessment.

**Table 8.3: Scale of Change Criteria**

<b>Category</b>	<b>Landscape Receptor Criteria</b>	<b>Visual Receptor Criteria</b>
Very High	Total loss of or major alteration to key elements/features/characteristics of the baseline condition. Addition of elements which strongly conflict with the key characteristics of the existing landscape.	There would be a substantial change to the baseline, with the proposed development creating a new focus and having a defining influence on the view.
High	Notable loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that are prominent and may conflict with the key characteristics of the existing landscape.	The proposed development will be clearly noticeable and the view would be fundamentally altered by its presence.
Medium	Partial loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that may be evident but do not necessarily conflict with the key characteristics of the existing landscape.	The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor.
Low	Minor loss or alteration to one or more key elements/features/characteristics of the baseline landscape. Addition of elements that may not be uncharacteristic	The proposed development will form a minor constituent of the view being partially visible or at sufficient distance to be a small component.

	within the existing landscape.	
Very Low	Barely discernible loss or alteration to key elements / features / characteristics of the baseline landscape. Addition of elements not uncharacteristic within the existing landscape.	The proposed development will form a barely noticeable component of the view, and the view whilst slightly altered would be similar to the baseline situation.

8.2.25 Table 8.4 provides an indication of the criteria by which the geographical extent of the area will be affected within this assessment.

**Table 8.4: Geographical Extent Criteria**

Category	Landscape Receptors	Visual Receptor Criteria
Significant	Large scale effects influencing several landscape types or character areas.	Direct views at close range with changes over a wide horizontal and vertical extent.
Predominant	Effects at the scale of the landscape type or character areas within which the proposal lies.	Direct or oblique views at close range with changes over a notable horizontal and/or vertical extent.
Moderate	Effects within the immediate landscape setting of the site.	Direct or oblique views at medium range with a moderate horizontal and/or vertical extent of the view affected.
Low	Effects at the site level (within the development site itself).	Oblique views at medium or long range with a small horizontal/vertical extent of the view affected.
Very Low	Effects only experienced on parts of the site at a much localised level.	Long range views with a negligible part of the view affected.

8.2.26 The third, and final, factor, in determining the predicted magnitude of change is duration and reversibility. Duration and reversibility are separate but linked considerations. Duration is judged according to the defined terms set out below, whereas reversibility is a judgement about the prospects and practicality of the particular effect being reversed in, for example, a generation. The categories used in this assessment are set out below:

**Duration**

- Long term (20 years+);
- Medium to Long term (10 to 20 years);
- Medium term (5 to 10 years);
- Short term (1 year to 5 years); and
- Temporary (less than 12 months).

**Reversibility**

- Permanent with unlikely restoration to original state, e.g. major road corridor, power station, urban extension etc.;

- Permanent with possible conversion to original state, e.g. agricultural buildings, retail units;
- Partially reversible to a different state, e.g. mineral workings;
- Reversible after decommissioning to a similar original state, e.g. wind energy development; and
- Quickly reversible, e.g. temporary structures.

### **Significance of Effect**

8.2.27 The purpose of the EIA process is to identify the significant environmental effects (both beneficial and adverse) of development proposed development. Schedule 4 to the EIA Regulations specifies the information to be included in all environmental statements, which should include a description of:

“...the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development...”

8.2.28 In order to consider the likely level of any effect, the sensitivity of each receptor is combined with the predicted magnitude of change to determine the level of effect, with reference also made to the geographical extent, duration and reversibility of the effect within the assessment. Having taken such a wide range of factors into account when assessing sensitivity and magnitude at each receptor, the level of effect can be derived by combining the sensitivity and magnitude in accordance with the matrix in Table 8.5.

**Table 8.5 Level of Effects Matrix**

Overall Sensitivity	Overall Magnitude of Change				
	Very High	High	Medium	Low	Very Low
<b>Very High</b>	<b>Substantial</b>	<b>Major</b>	<b>Major/ Moderate</b>	<b>Moderate</b>	Moderate/ Minor
<b>High</b>	<b>Major</b>	<b>Major/ Moderate</b>	<b>Moderate</b>	Moderate/ Minor	Minor
<b>Medium</b>	<b>Major/ Moderate</b>	<b>Moderate</b>	Moderate/ Minor	Minor	Minor/ Negligible
<b>Low</b>	<b>Moderate</b>	Moderate/Minor	Minor	Minor/ Negligible	Negligible
<b>Very Low</b>	Moderate/ Minor	Minor	Minor/ Negligible	Negligible	Negligible/ None

8.2.29 Each effect is described and evaluated individually through the combination of all of the relevant factors and assessed as either **significant** or **not significant**. For landscape and visual effects, those effects identified at a substantial, major, major/moderate or moderate level (bold type within matrix above) are generally

considered to be **significant** and those effects assessed at a moderate/minor, minor, minor/negligible or negligible level are considered to be **not significant**.

8.2.30 In certain cases, where additional factors may arise, a further degree of professional judgement may be applied when determining whether the overall change in the view will be significant or not and, where this occurs, this is explained in the assessment.

### **Definition of Effects**

8.2.31 Taking into account the levels of effect described above, and with regard to effects being either adverse or beneficial, the following table (Table 8.6) represents a description of the range of effects likely at any one receptor.

**Table 8.6 Definition of Effect**

<b>Effect</b>	<b>Definition</b>
Substantial	Changes resulting in a complete variance with the landscape resource or visual amenity.
Major	Changes resulting in a fundamental change to the landscape resource or visual amenity.
Moderate	A material but non-fundamental change to the landscape resource or visual amenity.
Minor	A slight but non-material change to the landscape resource or visual amenity.
Negligible	A detectable but non-material change to the landscape resource of visual amenity.
None	No detectable change to the landscape resource or visual amenity.

### **Nature of Effect**

8.2.32 Effects can be adverse (negative), beneficial (positive) or neutral. The landscape effects will be considered against the landscape baseline, which includes published landscape strategies or policies if they exist. Changes involving the addition of large scale man-made objects are typically considered to be adverse as they are not usually actively promoted as part of published landscape strategies. Accordingly, landscape effects as a result of these aspects of the proposed development will be assumed to be adverse, unless otherwise stated within the assessment.

8.2.33 Visual effects are more subjective as people's perception of development varies through the spectrum of negative, neutral and positive attitudes. In the assessment of visual effects the assessor will exercise objective professional judgement in assessing the level of effects and, unless otherwise stated, will assume that all effects are adverse, thus representing the worst case scenario.

8.2.34 Receptor locations from which views of the proposed development are not likely to occur will receive no change and therefore no effect. With reference to the Zone of

Theoretical Visibility (ZTV) and site survey, the magnitude of change is defined for receptor locations from where visibility of the proposed development is predicted to occur.

### **Cumulative Effects**

8.2.35 Cumulative effects generally occur where there may be combined or sequential visibility of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified. Where other similar schemes are in the planning system and made known to the applicant, or are under construction, these are considered in conjunction with the proposed scheme. The cumulative effects of this development are considered within this ES Chapter.

### **Field Surveys**

8.2.36 A number of field assessments of local site circumstances, including photographic survey of the character and visual context of the development site and its surroundings, and an assessment of Rights of Way, have been undertaken between April 2014 and mid-October 2014 in order to gather robust baseline information. Field assessments were undertaken in near-winter conditions and have, therefore, been undertaken, as far as is practicable, in accordance with best practice guidance which states that such assessments should be undertaken when the leaves are absent from the majority of trees/vegetation and visibility is at its greatest.

### **Limitations and Assumptions**

8.2.37 Baseline conditions have been established using existing assessments, available documentation and field assessment; it is important to note that this information may change before or during the construction and operation of the proposed development.

8.2.38 Within reasonable limits, the assessment is undertaken in consideration of the 'worst case' scenario for the development, i.e. those potential outcomes, situations or locations which would result in the most profound effect on landscape and visual receptors. It therefore identifies the greatest degree of change likely to accrue, and may be subject to mitigating factors or alternative conditions which might reduce those effects. For example, visual effects are considered in both summer and winter context; although the magnitude of effect is expressed for winter landscape conditions when trees are bare of leaf cover and the visibility of development is at its greatest. Where this is the case, the assessment identifies alternative conditions or further mitigation which might result in impacts being less pronounced.

8.2.39 The assessment applies a pre-determined methodology to arrive at conclusions (ES Appendix 8.5). This procedure brings a degree of objective, procedural rigour into what otherwise might be judged to be 'personal opinion'. Certainly, professional judgement still plays its part, but the purpose of adopting a methodology is to make the process as clear and logical as possible.

### **Consultations**

8.2.40 In response to a Scoping Opinion provided by Cherwell District Council (Ref. No: RH/14/00009/SCOP dated: 06.11.14) an appropriately framed and thorough Landscape and Visual Impact Assessment was undertaken for the proposed development

8.2.41 As part of preparing the landscape and visual impact assessment, consultation with Cherwell District Council's Landscape Architect (Mr Tim Screen) was undertaken to agree viewpoint locations. This consultation was completed via E-mail during October 2014 (at baseline stage / prior to field assessment). Mr Tim Screen; agreed the final selection of viewpoint locations; confirmation of the Council's agreement was issued in an email. See ES Appendix 8.6 for copies of key correspondence.

8.2.42 During the EIA scoping process, the Local Planning Authority was consulted on the methodology and associated terminology for undertaking the Landscape Visual Impact Assessment. This correspondence included the best practice by which EDP prepares all its assessments; the Local Planning Authority did not raise any comment or concern and approved this methodology in their Scoping Opinion (Appl. No. 14/00009/SCOP).

8.2.43 With regard to wider consultation with English Heritage on specific viewpoints for assessment, with consideration of the baseline assessment and field assessment (informed by plotted ZTV) including appraisal from Viewpoint 5 (see Table EDP 8.8) situated on a PRow / Scheduled Monument (Site of Medieval Village of Wrethwick). It was considered that the Site is inherently mitigated within the wider landscape and the likely affect of the proposed development on landscape effect or visual amenity from any heritage designations would be negligible if any and therefore, further consultation on viewpoints was "scoped out" of this appraisal. This LVIA will defer to the Heritage Assessment chapter of this Environmental Statement on these matters for further evidence.



### 8.3 RELEVANT POLICY

#### **National Planning Policy Framework (March 2012)**

8.3.1 At a national level, the National Planning Policy Framework (NPPF) provides a framework within which planning decisions should be made. The purpose of the NPPF is to 'help achieve sustainable development' (NPPF Introduction). The Framework sets out the overall planning policies for England and how these should be applied at a local scale giving a framework within which local authorities should operate.

#### **National Planning Policy Guidance**

8.3.2 Government guidance contained within the NPPF attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people. Planning decisions should aim to ensure that development will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development.

8.3.3 These policies direct and guide local policy making, for which a number are pertinent to the site and the proposed development including the following:

8.3.4 At paragraph 14 of the National Planning Policy Framework (NPPF) it is stated that *"At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking"*.

8.3.5 Section 7 (Requiring Good Design) of the NPPF sets out a number of criteria that relate to the need to consider and incorporate good design principles in development including:

8.3.6 Paragraph 56 – 58 of this section: The Government attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people. Paragraph 57 emphasises the need to achieve high quality design in development and Paragraph 58 highlights the need to respond to local character and that new development should be visually attractive through both good architecture and appropriate landscaping as follows:

- *Function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;*

- *Establish a strong sense of place, using streetscapes and buildings to create attractive and comfortable places to live, work and visit; optimise the potential of the site to accommodate development, create and sustain an appropriate mix of uses (including incorporation of green spaces) and other public space as part of developments) and support local facilities and transport networks;*
- *Respond to local character and history, and reflect the identity of local surroundings and materials, while not preventing or discouraging appropriate innovation;*
- *Create safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and*
- *Are visually attractive as a result of good architecture and appropriate landscaping.*

8.3.7 Whilst in paragraph 64 it is stated that development should improve the “...character and quality of the area and the way that it functions”.

8.3.8 Paragraph 65 of the NPPF states that “Local planning authorities should not refuse planning permission for buildings or infrastructure which promote high levels of sustainability because of concerns about incompatibility with an existing townscape, if those concerns have been mitigated by good design (unless the concern relates to a designated heritage asset and the impact would cause material harm to the asset or its setting which is not outweighed by the proposal’s economic, social and environmental benefits)”.

8.3.9 Guidance at paragraph 98 of the NPPF states that Local Planning Authorities when determining planning applications should “approve the application unless material considerations indicate otherwise and if its impacts are (or can be made) acceptable”.

### **Local Planning Policy**

#### ***Cherwell District Local Plan (1996)***

8.3.10 The Cherwell District Local Plan was adopted in 1996 and policies within this plan are used for decision making. In respect of landscape and visual matters, there are a number saved policies relative to the site and the nature of the proposed development.

8.3.11 Chapter 9 sets out the Council’s land use planning policies relating to the environment and its natural resources. The aim of these policies is therefore to protect and enhance the environment and prevent pollution through the control of

development. These policies were saved and taken forward into the Non-Statutory Cherwell District Local Plan (2004).

The Cherwell District Local Plan (1996) will remain part of the statutory Development Plan.

***The Non-Statutory Cherwell District Local Plan (2004)***

8.3.12 The Non-Statutory Cherwell Local Plan 2004 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on this plan was discontinued prior to adoption.

8.3.13 The Non-Statutory Local Plan 2004 is not part of the statutory development plan but it has been approved as interim planning policy for development control purposes and includes saved policies from the Local Plan 1996.

***Site Specific Policies***

8.3.14 A narrow section of the site running parallel to the watercourse has been designated as Policy R1 and R3. Policy R1 supports the provision of future recreation facilities including formal sports, and Policy R3 *“...seeks to maximise the value of the open spaces that exist by increasing their accessibility and linking them to each other by a network of public footpath/cycleways. Additionally there are opportunities to create new areas of open space through allocations in the Plan.”*

8.3.15 The eastern half of the remaining site area and along Gavray Drive has been designated by the Local Planning Authority for B1 employment generating development (Policy EMP1) and was allocated originally in the Cherwell Local Plan 1996. The Council considers that this allocation continues to be appropriate as confirmed by Paragraph 4.5.2

8.3.16 The remainder of the site has been designated under Policy H13 Housing, supporting the allocation of a new urban extension.

8.3.17 Outside of the north western to northern site area is bounded by the Oxford-Bicester railway line (running along western site boundary) and the London-Birmingham railway line (running along northern site boundary) has been designated under Policy TR29 which seeks to *“reserve land for connecting railway and rail based public transport interchange at Gavray Drive...”*

***Immediate Site Context***

8.3.18 To the eastern boundary of the site bounds existing undeveloped land which has been identified as a retained key wildlife site which is identified on the local authority interactive mapping system, as a County Wildlife Site. The wildlife site is called

“Gavray Drive Meadows”, which in paragraph section 4.53.2 of their document the authority describes this section of the site as:

*“Much of the land north of Gavray Drive is semi-improved and unimproved grassland which supports a particularly rich population of species some of which are notable or have a restricted distribution in the county. This area has been designated as a County Wildlife Site by the County Wildlife Site Selection Panel. The most ecologically valuable part of this is to be retained without development and is shown on the proposals map as a retained wildlife site. It would be suitable for informal recreation use that is compatible with its ecological value.”*

8.3.19 There is a number of conservation areas within the assessment area, with the Bicester Conservation Area situated to the south west of the site. Policy EN39 deals directly with the conservation and enhancement of conservation areas. Policy EN40 states: *“...planning control will be exercised to ensure, inter alia, that the character or appearance of the area so designated is preserved or enhanced.”*

**Wider Relevant Policies**

8.3.20 There are a number of policies relative to landscape and visual impact matters with regard to the nature of the proposed development. These include the following:

8.3.21 Saved Policy C8 seeks to resist development that would harm the character of the countryside. Policy C13 deals with the North Ploughley Area of High Landscape Value (AHLV) which is situated to the north of Bicester and within the assessment survey area. This policy seeks to conserve and enhance the environment within Areas of High Landscape Value. Saved Policies C28 and C30 of the adopted Cherwell Local Plan states *“...that control will be exercised over all new development to ensure that it is sympathetic to the character of its context. Further, all new housing development should be compatible with the appearance, character, layout, scale and density of existing dwellings in the vicinity.”*

8.3.22 Policy EN34 also seeks to *“...conserve and enhance the character and appearance of the landscape through the control of development proposals”*. Specifically, development would not be permitted if they:

- Cause undue visual intrusion into the open countryside;
- Cause undue harm to important natural landscape features and topography;
- Be inconsistent with local character;
- Harm the setting of settlements, buildings, structures and other landmark features; or, Harm the historic value of the landscape.

8.3.23 Furthermore, Policy EN35 seeks to protect the value of the landscape by seeking the retention of woodlands, trees, hedges, ponds, walls and any other characterful features found typically within the landscape. Additionally, this policy is considered with Policy EN22 and EN24.

8.3.24 Specifically Policy EN22 places importance on retaining and incorporating landscape features of high value and Policy EN24 places importance on nature conservation and protecting site of either ecological or geological value.

8.3.25 Policy EN36 seeks to secure and enhance the character and appearance of the landscape, particularly in urban fringe locations, which is pertinent to the Site.

8.3.26 At the time of writing this assessment it is considered the above policies are of material consideration for assessing the proposed development at the site.

***Draft Cherwell Local Plan (2011-2031)***

8.3.27 The Submission Cherwell Local Plan including modified Policies Maps and an update to a Sustainability Appraisal is being examined.

8.3.28 The Local Plan was submitted to the Planning Inspectorate (PINs) in January 2014 for Examination in May of this year (2015), consultation has already been undertaken and it is anticipated this local plan will be adopted in May 2015.

8.3.29 This Submission Local Plan does not have Development Plan status but is a material planning consideration. The Plan sets out the Council's strategy for the District to 2031.

8.3.30 Policy ESD 13: Local Landscape Protection and Enhancement is considered to be of material consideration to the proposed development. Policy ESD 13 will continue the general thrust of Government guidance contained within the NPPF and the adopted Cherwell Local Plan.

***Cherwell Local Plan (2014) - Bicester Landscape Sensitivity and Capacity Assessment (2014)***

8.3.31 The Authority has also included new Landscape Sensitivity and Capacity Assessments (Final Draft 18.08.2014). These documents are currently at draft stage providing supplementary planning guidance for new development within key strategic areas for intended residential, employment, recreation and woodland development.

8.3.32 In this guidance, the Authority identifies the site as 'Site 118' which it appraises as follows:

*“There is a Medium capacity for residential development in the north of the area but a low capacity in south due to the ecological value; the delineating boundary on site of the two areas is the watercourse passing through the site. The north west of the area comprises arable land which is currently being used for the adjacent railway works and could, in the future lend itself as an extension to the residential area to the south west of the site.”*

8.3.33 With this assessment, the Authority has also appraised the site as having a medium-to - low capacity to accommodate the nature of the proposed development.

***Heritage Policies***

8.3.34 There are a number of policies relating to the protection of historic parks and gardens, and to conservation areas as summarised in ES Chapter 11. Although classified as heritage features, their contribution to landscape character is also considered within this assessment.

## 8.4 BASELINE CONDITIONS

### Landscape Character

#### *Regional Landscape Character*

8.4.1 The site is situated within National Character Area NCA 108: Upper Thames Clay Vales.

#### *Sub-regional Landscape Character*

8.4.2 The Oxfordshire Wildlife and Landscape Study (OWLS) classify the site being situated in the Vale of Aylesbury regional landscape character area within the urban area of Bicester, adjacent to the Clay Vale landscape type.

#### *District Landscape Character*

8.4.3 At a local level, Cherwell District Council identifies the site as being located in the Otmoor Lowlands landscape character area, and within transitional landscape type T5 Urban Fringe

8.4.4 Overall it is considered that the site has a medium value.

#### **Key Features at the Site**

8.4.5 The site for the proposed development is of small scale with varying degrees of visual cover provided by boundary vegetation; this is more dense in the south of the site and open in the north of the site.

8.4.6 Within the site the topography is relatively flat with shallow earthwork bunds to the southern boundary containing robust trees and hedge planting.

8.4.7 Key features include the following:

- Arable open field;
- Tree groups and mature trees to field boundary
- Hedgerows and scrub; and
- Seasonal small pond and wet ditches.

8.4.8 The site comprises of 1 No. medium scale field and 1 No. small scale field enclosed by dense hedgerow and robust groups of trees to the eastern and southern boundary. The northern site boundary is relatively open presently with Network Rail undertaking significant railway engineering works to the adjacent embankment.

8.4.9 The site area is managed for agricultural provision, and there is a stream passing along the eastern site boundary.

8.4.10 The condition of the landscape features across the site is considered to be generally good.

#### **Landscape Value**

8.4.11 Overall, it is considered that the landscape character of the development site has a low value.

#### **Landscape Sensitivity**

8.4.12 The Cherwell Local Plan - Bicester Landscape Sensitivity and Capacity Assessment (2014) has concluded that an overall landscape sensitivity of medium – to – low at the site and a low susceptibility to landscape change.

#### **Landscape Capacity**

8.4.13 The Cherwell Local Plan - Bicester Landscape Sensitivity and Capacity Assessment (2014) has concluded that an overall landscape capacity of medium for residential development. In this study the Authority also noted that the site “in the future lends itself as an extension to the residential area...”

#### **Landscape Designations**

8.4.14 The site is not situated or adjoining designated landscape areas. Therefore, it is considered the site is not of a particularly high sensitivity.

8.4.15 The Cherwell Local Plan (1996) identifies an Area of High Landscape Value situated approximately 2.5km north east of the site (at its closest point).

8.4.16 There are no further landscape designations within the assessment survey area.

#### **Arboricultural Resources and Tree Preservation Orders**

8.4.17 There are currently no Tree Preservation Orders within the extent of the site; see ES Chapter 10 for arboricultural resources.

#### **Designated and Undesignated Heritage Assets**

8.4.18 There are no heritage designations within or adjoining the site for the proposed development.

8.4.19 There is a Scheduled Monument approximately 0.4km south east of the site (at its closest point). There are further listed buildings situated at Bicester Conservation Area.

8.4.20 Within the site there are no undesignated heritage assets. See ES Chapter 11 with supporting Appendices for Archaeological and Heritage Assessment.



8.4.21 As confirmed by the Archaeological and Heritage Assessment ES Chapter 11 the Site is of negligible sensitivity in terms of historic landscape value; therefore, it is assumed the proposed development would have little if any effect.

#### **Historic Landscape Character**

8.4.22 The Archaeological and Heritage Assessment within ES Chapter 11 has confirmed that: *"...the historic landscape character of the Site can be characterised as irregular (piecemeal) enclosure. The site has undergone sustained attrition by modern impacts, including the potential loss of ridge and furrow found to the east of the Site. Therefore, the site is considered to possess low/local Historic Landscape Value."*

#### **Country Parks**

8.4.23 There are no Country Parks within the assessment survey area.

#### **Conservation Areas**

8.4.24 The site is not situated in or adjoining a conservation area. There are a number of conservation areas surrounding the wider area of the site; Bicester Conservation Area (0.45km south west of the site), RAF Bicester Conservation Area (2km north of the site) and Straton Audely and Chesterton (3.75km north east and south west respectively).

#### **Key Settlements and Residences**

8.4.25 There are a number of areas of existing settlement, or individual residences, in proximity to the site and can be grouped as follows; see Plan EDP 8.4, ES Appendix 8.3:

- Group A – Residential areas to the south of Gavray Drive;
- Group B – Residential areas immediately west of the railway extension to Bedford;
- Group C – The remainder of residential areas within Bicester;
- Group D – Satellite villages surrounding Bicester; and
- Group E – Isolated individual or small groups of dwellings outside Bicester.

#### **Primary and Secondary Public Roads**

8.4.26 The Site sits to the north of the western end of Gavray Drive, a local distributor road, from which the proposed development would be accessed. Development to the south of this road comprises residential dwellings and a linear open space.

8.4.27 The A4421 forms the eastern arc of the Bicester ring road, feeding the major radial routes emanating from Bicester. Bicester is neatly contained by this and the other routes forming the ring road (A4095, A41 and B4030), such that there is a clear

distinction between urban development on the 'inside' of the ring, and a largely rural landscape on the 'outside'. Although there are two large villages 'attached' to the outer edge of the ring road, the ring road forms a logical limit to development within Bicester.

8.4.28 The A41 links the M40 (to the south-west of Bicester) with London, via Aylesbury to the east, following the Roman Road known as Akeman Street. To the north, the A4421 leaves the ring road to join the A421 near Buckingham, also following the route of a Roman Road.

#### **Railway Routes**

8.4.29 There are two railway lines that pass through the general study area, and both within close proximity of the Site; the primary link (London – Birmingham line) is situated to the northern site boundary on an elevated embankment. The embankment is currently undergoing engineering works and has become de-nuded through the removal of all vegetation, which affords direct views towards the Site (albeit transient and short term).

8.4.30 The secondary rail link is the Oxford-Bicester line which is to the west of the site boundary. This rail line is situated at a similar topography to the Site.

#### **Public Rights of Way**

8.5.1 The general study area is covered by a comprehensive network of Public Rights of Way (PRoW) surrounding Bicester. A single public footpath (PRoW 129/3) crosses the Site close to its western boundary, which connects to routes to the north and south, including public footpath (PRoW 129/4) heading along the southern boundary of the site on Gavray Drive.

8.4.31 There are public rights of way within the wider area surrounding the Site which as a local resource have a high value.

8.4.32 There are no areas of Access Land within the general study area.

#### **National Trails / Long Distance Walking Routes**

8.4.33 The nearest National Trail is the Cross Bucks Way (National Trail) which is situated approximately 3.75km north east of the site (at its closest point). The site is not readily discernible in the wider view due to inherent screening by the mature landscape setting.

#### **National Cycle Routes and Other Long Distance Recreational Routes**

8.4.34 National Cycle Route 51 passes through the wider, general, study area in a north-east to south-west alignment between Pounden and Wendlebury, via Bicester town

centre. For the most part, this route follows minor rural roads, but passes the site along Gavrey Drive and the A4421.

### **Visual Amenity Baseline**

8.4.35 With reference to Plan EDP 4, ES Appendix 8.3, it is considered that it would be inevitable within the immediate area of the Site that there would be some degree of visibility from the wider area. Being a potential urban extension development, it is also inevitable that there are a number of areas of existing settlement, or individual residences, in proximity.

8.4.36 Following a thorough site assessment, it is considered the site is largely self contained and enclosed visually from the wider surrounding area of Bicester as follows:

- The northern site boundary adjoins an existing railway 'stand-off' with an embankment. The rail line is currently being improved by Network Rail (including landscaping). The railway embankment rises in excess of 5 metres above the existing topography of the site and screens wider views. Nonetheless the view would be seen from the users of the railway when looking south from this elevated position.
- Beyond the railway track is a further railway embankment with the existing large commercial buildings and distribution centre which further screen views of the site to the north.
- The eastern site boundary is enclosed by a robust hedgerow and mature group of trees which significantly filter views into and out of the site. The A4421 Charbridge Road to the east is in excess of 0.5km to the east of the site and is significantly screened by interlying mature landscape features.
- There are dense tree groupings (some arranged on raised earthworks) along the southern site boundary with Gavray Drive. Glimpsed views into the site are only permissible at the existing gateways from Gavray Drive.
- The western perimeter to the open field area is enclosed by robust hedgerow and mature tree planting significantly filtering views into and out of the site.
- The western site boundary remains open and is subject to work by Network Rail associated with the wider engineering works on the railway embankment.

8.4.37 With regard to key settlements and residences, the following baseline situation is noted.

### **Group A – Residential Areas to the South of Gavray Drive**

8.4.38 This group represents a significant area of new residential development which spans from 1990's to mid 2000's which are predominantly two storey semi-detached and detached properties with a multitude of orientations.

**Group B - Residential Areas immediately West of the Railway Extension to Bedford**

8.4.39 This group represents established urban areas along Loudon Road and its existing residential streets which are connected to this route. These dwellings are predominantly semi-detached and detached and have a multitude of orientations.

**Group C - The Remainder of Residential Areas within Bicester**

8.4.40 This group represents established urban areas and the main urban town centre of Bicester situated to the south of the Site and Group A. These dwellings and built form are mainly of two – three storey in height. The area does not contain any high rise developments.

**Group D - Satellite Villages Surrounding Bicester**

8.4.41 This group comprises the principal villages that surround Bicester. Views of the site are likely to be screened by local scrub woodland, the well-wooded parcel of land to the immediate east of the site, the London-Birmingham railway embankment to the north and commercial buildings to the north-east of the site.

**Group E - Isolated Individual or Small Groups of Dwellings outside Bicester**

8.4.42 There are individual properties/farms to the east of the site which are situated within well-wooded parcels and a small to medium field system predominantly used for agriculture with dominant mature hedgerows and robust tree components.

**Visual Sensitivity**

8.4.43 Being a hinterland landscape, the influence of existing urban development is to be expected. In this respect, the Site appears well connected visually and perceptually to the existing residential area, south of Gavray Drive. Although the undeveloped landscape to the immediate east of the site has a wooded character, the site's own vegetated boundary limits views from within the neighbouring parcel, while it and the A4421 act to limit intervisibility between the site and Bicester's hinterland to the east.

8.4.44 It is considered that the site has a medium sensitivity and medium susceptibility to visual amenity; it also anticipated that the surrounding residential groups would have a high to very high visual sensitivity (depending on the nature of their views).

## 8.5 MITIGATION MEASURES

8.5.1 Mitigation measures to overcome, reduce or offset potential landscape and visual impacts include the following at each stage of the proposed development:

### **Construction Stage**

8.5.2 The following measures would be adhered to during construction:

- The adoption of an approved Construction Environmental Management Plan (CEMP) with allowance for appropriate road sweeping action to ensure any deleterious material is cleansed;
- The adoption of an approved Arboricultural Method Statement (AMS) incorporating best practice guidance set out in British Standard 5837: 2012 Trees in Relation to Design, Demolition and Construction which will ensure retained trees and other vegetation are not adversely affected during the construction process;
- The adoption of an approved topsoil and earthworks management plan (Soil Management Plan) including dust control measures;
- The use of visual screening, such as hoardings for more sensitive visual receptors in proximity to the development site, including residential receptors that have the greatest potential to be affected by the proposed development; and
- Existing residents that live within close range of the site would be more sensitive to construction lighting due to the proximity, direction and type of receptor. Mitigation measures for construction lighting are likely to include directional fittings and restricted hours of operation.

### **Post-completion stage**

8.5.3 The proposed masterplan has been developed iteratively through the development of a Landscape Visual Impact Assessment. This approach has been key to ensure the proposed development succinctly integrates with its setting and landscape character area. The masterplan has incorporated existing landscape features for inherent mitigation, as well as facilitating additional mitigation measures as detailed below.

### **Inherent Mitigation**

8.5.4 Despite the unavoidable loss of an open landscape area, the current condition and key characteristics of the landscape have been considered throughout the design of the proposed development and integrated into the layout where permissible. These measures include the following:

- The retention and enhancement (where possible) of existing trees and hedgerows to the site perimeter with preference for those of greatest value;

- Detailed masterplanning of the site to retain and integrate existing hedgerows and trees succinctly in to the residential and / or public open space area with preference for those of greatest value and connectivity; and
- The design of the proposed development to reflect the current topography of the site to ensure that any new built form is either screened or filtered by the existing mature landscape setting as far as practicable.

### **Additional Mitigation**

8.5.5 The following mitigation measures have been integrated within the layout of the proposed masterplan and the likely vernacular of the new built form:

- The design of the masterplan to establish 2.5 storey dwellings within the core of the site with 2 storey dwellings around the outer edge of the proposed development; the lower height of new built form to the outer edge of the site would be afforded visual filtering / screening by the mature landscape features around the boundary (and / or earthworks to the northern area) effectively reducing the opportunity to see new built form over and above these elements;
- Formation of green corridors along main arterial routes from Gavray Drive with ancillary and buffer planting;
- Utility of existing access points used for main vehicular routes into the site negating the need to remove existing tree groups and hedgerows to the southern site boundary (retaining mitigation and mature landscape setting);
- Provision of stand off areas to protect and retain existing tree groups and vegetation along the southern site boundary;
- Provision of access to new dwellings from access routes running inside the existing southern boundary to reduce the need for installing new access points within the existing tree groups and vegetation (retaining mitigation and mature landscape setting);
- Provision of sight lines from Gavray Drive to focus on new public open space within the proposed development with ancillary and mitigation planting;
- The establishment of new landscape mitigation planting which would become expediently established over the initial 15 years of the proposed development.; and,
- Landscape planting including buffer shrub and tree planting to the northern site boundary where applicable to further filter and eventually screen views from the adjacent railway line.

8.5.6 In summary, the landscape elements specific to the detailed design of the proposed development would be the retention and enhancement of existing features as well as the establishment of new measures that would provide:

- Retention and continuity of typical landscape features to reinforce landscape character and provide a distinctive sense of place;
- Visual screening of the proposed development;
- Creation of new public and private amenity; and
- Contribution to green networks and enhancement of habitat connectivity and ecological value.

## 8.6 LIKELY SIGNIFICANT EFFECTS

### Construction stage

- 8.6.1 This section details the likely significant effects which are un-mitigated and arise from either construction activities on site or from the proposed development itself.
- 8.6.2 As a consequence of the wholesale change in land use, construction activities will result in adverse landscape and visual effects on the fabric and character of the landscape and on visual amenity within a limited local area. Construction activities introduce direct and indirect disturbance to both the fabric of the landscape and the surrounding area. These effects could potentially be perceived by people living, working or travelling through the area, while these effects are temporary in nature, and can be partially mitigated against.
- 8.6.3 At this outline planning application stage, generic construction methods and timescales are suggested in ES Chapter 5; details cannot be defined at this stage. The main elements of the construction operations considered being of importance to the landscape and visual assessment are described below:
- Demolitions. There are no existing structures currently on the site; therefore, there would be no effects from demolition;
  - Construction-related Traffic. This includes vehicle movements associated with the import of building materials, machinery and labour. Construction traffic is likely to access the site from the A4421 (Charbridge Lane) via Gavray Drive with traffic being directed from further along the A4421 to the north and east, A41 roadway to the south and M40 motorway to the west. Transportation issues are discussed fully in ES Chapter 5 Transportation;
  - Earthworks. Noise effects (discussed in ES Chapter 7 Noise and Vibration) have the potential to affect landscape character and residential amenity;
  - Construction Activities. Subject to the preferences of individual contractors, it is expected that generic methods will be employed in the implementation of the scheme. Traditional residential building methods are anticipated although the periodic use of large cranes and construction platforms (rising above the height of buildings) may be necessary; and
  - Construction related effects: temporary on site lighting for illumination outside of daylight or in poor weather conditions, noise, dust and vibration from the movement of plant and vehicles.
- 8.6.4 The Construction Programme is referred to in ES Chapter 5 and it is anticipated it will include a number of primary mitigation measures recognising best practice in modern construction techniques. Further details will be provided in a Phasing Plan and



Construction Environmental Management Plan (CEMP) which will also be subject to a condition.

8.6.5 It is inherent in the use of conditions that issues specific to landscape and visual effects, such as screening and retention of landscape features, best practice site management, maintenance and housekeeping will be implemented to minimise effects during the demolition and construction works. Such measures may include the erection of suitable site hoarding and protective tree/hedgerow fencing, although the incongruous (but temporary) sight of scaffolding is an unavoidable consequence of modern construction practices and mitigation of such effects is not anticipated.

8.6.6 It is not possible at this stage to make any definitive statement of where such mitigation would be required, nor what the specific reduction in effect would be at individual locations.

8.6.7 Landscape and visual amenity effects resulting from the construction stages are considered to be consistently adverse. However, these effects would be temporary, short term, not long lasting and consistent with the phasing set out in ES Chapter 5 the CEMP/Phasing Plan.

8.6.8 Tables T8.7, T8.8 and T8.9 in ES Appendix 8.2 describe the effects of the construction phase of the proposed development on landscape character, visual amenity and residential visual amenity respectively, with these summarised below. Effects on PRoWs, other recreational routes and public highways are also described below.

#### ***Landscape Character***

8.6.9 Cherwell District Council have assessed the site as having a medium – to – low sensitivity as per the Authority's 'Bicester Landscape Sensitivity and Capacity assessment: Assessment Addendum' (August 2014).

8.6.10 Within the context of the site, the likely significance of the construction effects on the landscape character is described in Tables T8.7, T8.8 and T8.9 in ES Appendix 8.2 and direct effects summarised below:

- Construction of new built form;
- Construction related traffic, noise, vibration, dust and lighting;
- Stockpiling of excavated soil from earthworks;
- Storage of plant, machinery and building supplies;
- Perimeter fencing / hoarding.

8.6.11 Indirect effects would relate to the changes to the wider landscape character area during this temporary, short term period. However, given the wider scale of the surrounding landscape character areas and the only moderate size of the site, the likely effect would not be significant in its effect to this wider area.

8.6.12 These direct and indirect effects on landscape character would only be within the Site an area localised to the site. These effects would arise as a consequence of the loss of open landscape adjacent to an existing urban area. Principally, these effects would represent a new residential development and extension to the existing urban area which is the immediate context of the site.

8.6.13 Within the wider area the likely effect of the proposed development would be, at worse, moderate / minor (but not significant). These effects are anticipated to rapidly diminish as distance from the site increases due to the inherent mitigation of interlying landscape features, mature and robust vegetation, existing built form and topography.

#### ***Designated Landscapes***

8.6.14 Effects on designated landscape receptors are described in Tables T8.7, T8.8 and T8.9 in ES Appendix 8.2. It is considered the proposed development would not have any significant effect on these receptors due to the interlying distance and the effect of inherent mitigation within the interlying landscape with mature and robust vegetation, existing built form and undulating topography. For instance; the site is situated in excess of 2.5km south west of an Area of High Landscape Value (at its closest point), and following a thorough field assessment, it is considered there would be no discernible effect from the proposed development during the construction phase.

#### ***Arboricultural Resources***

8.6.15 Tree loss would be minimal to facilitate good urban design. A significant amount of existing trees and tree groups would be retained and protected in line with best national practice BS5837:2012.

8.6.16 Trees which are removed are very limited in number and would not adversely affect the integrity and continuity of the landscape infrastructure. Therefore it is anticipated the proposed development would retain the existing inherent benefits of landscape mitigation during the construction phase.

#### ***Designated and Undesignated Heritage Assets***

8.6.17 As confirmed by the Archaeological and Heritage Assessment, ES Chapter 11:

*“The Site does not form part of the setting of, or contribute to the significance of, any of the designated heritage assets in the study area. Therefore, the construction stage will not affect any designated heritage assets.”*

8.6.18 Therefore, no discernible effect would be experienced during the construction phase.

**Historic Landscape Character**

8.6.19 As confirmed by the Archaeological and Heritage Assessment, ES Chapter 11:

*“The historic landscape character of the Site is identified as being of negligible sensitivity. Therefore, the temporary, high, direct and negative impact, resulting from the complete land use and character change from agricultural land to construction site, will be of minor adverse significance.”*

8.6.20 Therefore, no discernible effect would be experienced during the construction phase.

**Conservation Areas**

8.6.21 It is considered that construction effects would not be discernible within the surrounding conservation areas due to the interlying distance and the intervening built form which would inherently mitigate effects. For instance:

- Bicester Conservation Area (approximately 0.5km intervening distance to the west); effects would be reduced or offset by existing built form, rail link and the interlying mature landscape features; and,
- RAF Bicester Conservation Area (over 1km intervening distance to the south); effects would be offset or reduced by the railway link (including elevated embankment), A4421 Charbridge Road the intervening large scale buildings at Charbridge Way.

8.6.22 There are further conservation areas situated outside of the main town of Bicester including Straton Audely and Chesterton (3.75km north east and south west respectively). Effects during the construction phase would be inherently screened by intervening built form and also mature landscape features.

**Key Settlements and Residences**

8.6.23 See Tables T8.7, T8.8 and T8.9, ES Appendix 8.2; this assessment has demonstrated that the effect on residence would be at worst localised. It is anticipated these effects would vary from (adverse) major – to – (adverse) minor during the construction phase. Inevitably the worst case would be experienced at residences which are localised to the proposed development i.e. Herons Drive, Mergansar Drive and Sheerwater Drive. It is likely these effects would be temporary and short term resulting from the movement and activities of construction vehicles and operations.

8.6.24 The construction effects would be less adversely experienced in the wider settlements and residences which are inherently mitigated by the mature landscape setting and intervening built form and rail link (with embankment). For instance; views from outlying villages such as Lauton to the north east of the site are also screened by the existing mature landscape setting, railway embankment and existing built form north of the site at Charbridge way.

***Primary and Secondary Public Roadways***

8.6.25 The primary public roadways that have the potential to be affected by constructing the proposed development are set out in Figure EDP 2, ES Appendix 8.3. Construction effects would not be unacceptably adverse on these routes due to the inherent mitigation afforded by the setting of the Site which offsets or reduces impacts. For instance; the nearest primary public route A4421 Charbridge Road is inherently mitigated by the mature landscape setting, residual lighting and noise generated from the vehicle route. Additionally, along this route to the north direct views of the site are inherently screened by the existing railway embankment (in excess of 8 metres in height) and large scale buildings on Charbridge Way.

8.6.26 Gavray Drive to the south of the site would be affected by the proposed development during the construction phase as the main site access would be located along this route. Nonetheless, views of the wider site area would be heavily filtered, if not fully screened (during summer) through the retention of existing mature landscape features to the site boundary. It is anticipated these effects would vary from (adverse) moderate – to – (adverse) minor during the construction phase where views are possible.

8.6.27 Elsewhere (and particularly along secondary routes) the intervening landform, urban development and a mature landscape setting combine with the overall distance to filter and screen views. This inherent screening restricts visual effect to (adverse) minor or less with no discernible effect experienced from the wider area in many situations.

***Railway Lines***

8.6.28 It is anticipated there would be glimpsed views across to the site from the Oxford-Bicester line during the construction phase, within which effects would be discernible but fleeting during this temporary phase. The existing scrubby vegetation along the line would filter views.

8.6.29 There would be more direct views of the site during construction from the London-Birmingham line with views from the embankment across the site. As part of the current railway improvement works (ongoing during 2014-2015) the embankment

would be planted with landscape buffer planting which would take time to establish not affording benefit during this stage of the proposed development.

**Public Rights of Way**

8.6.30 The construction effects experienced on the public footpath running through the Site would be major, adverse. However, the significance of these effects would diminish the further from the site a public right of way is located. PRow along Gavray Drive within close range of the site would be afforded inherent mitigation by the existing robust hedge and groups of mature trees which enclose the site boundary to the east – west perimeter. Additionally, the effects of noise and lighting on the application site (during construction) would be inherently mitigated by the baseline conditions of vehicle movements along an illuminated vehicle route (Gavray Drive) which would offset to an extent the affects of the construction phase i.e. background noise and lighting.

8.6.31 There are a number of public rights of way in the wider landscape to the east, the north, north east and east of the site around the settlements of Straton Audley and Lauton. Impact to these routes would be negligible due to inherent screening by the mature landscape setting, railway embankment earthworks and also the relatively flat topography surrounding the site. Additionally, the baseline conditions of intervening vehicle routes would offset construction lighting, noise and vibration i.e. background noise and lighting from intervening routes.

8.6.32 Overall, it is considered the proposed development would not have any significant effect on these receptors during the temporary construction phase (see Schedule of Effects Table 8.8; close range receptors are considered at Viewpoint 6 and 7 along Gavray Drive and in the wider landscape scene at Viewpoint 1,2,3 and 5).

**National Trail**

8.6.33 It is considered that the effects of the construction phase would not be readily discernible from the National Trail as views towards the site are predominantly screened by a mature landscape setting, undulating topography and existing built form.

**National Cycle Routes and Long Distance Recreational Routes**

8.6.34 It is unlikely that the proposed development would be readily discernible from long distance recreational routes, including national cycle routes within the wider area of Bicester and the surrounding landscape due to the interlying distance and the intervening mature landscape setting.

8.6.35 National Cycle Route 51 passes along the eastern and southern site boundary (along Charbridge Road and Gavray Drive respectively). The intervening mature landscape

features to these boundaries would significantly offset or reduce construction effects such as lighting, noise and vibration to a minor, adverse level. However, where views are possible and interlying vegetation less established, it is anticipated these effects would vary from (adverse) moderate – to – (adverse) minor during the construction phase and these effects are short term and temporary.

**Summary**

8.6.36 In summary, building out the proposed development would not be represent unacceptably adverse on designated landscape resources, conservation areas, communication routes, PRow and also surrounding settlements and residences.

8.6.37 The most significant effect would be experienced by the removal the existing greenfield / agricultural landscape for a new residential land use with the associated built form and ancillary development. This direct effect would inevitably be major – moderate, adverse which would be largely limited to the Site area through the retention of mature landscape features for inherent mitigation and operational mitigation measures to offset and reduce potential indirect effects to the wider landscape area and visual receptors.

## 8.7 POST COMPLETION STAGE

- 8.7.1 This section details the anticipated effect of the proposed development from Year 1 to Year 15 to demonstrate how the likely effect of the scheme would diminish over the short to medium term.
- 8.7.2 In practical terms, the 'operational lifetime' of the proposed development is measured in decades, as it will result in a permanent change to the character of Site. Given that the proposed development includes landscape proposals which will take time to mature and that all new development can seem 'raw' until it has softened into its landscape context, the assessment of operational effects for specific areas and views will consider the effects at two distinct points in time:
- At the completion of the proposed development (referred to here as Year 1); and
  - At 15 years after completion of the proposed development (such that mitigation planting may have matured and materials weathered).
- 8.7.3 It is often the case that initial (Year 1) effects will be more considerable than those at Year 15 due to the limited initial effect of the strategic landscape proposals incorporated into the proposed development during the design process.
- 8.7.4 It is anticipated, that by Year 15 substantial growth should have occurred and these features should be fulfilling their roles more effectively. Furthermore, enhanced mitigation should be achieved in future years as trees, in particular, reach mature size.

### ***Landscape Character***

- 8.7.5 The overall effect on landscape character would be (adverse) moderate and direct due to the loss of currently open landscape. This effect would be more adverse at completion / Year 1 as detailed above and awaiting the effect of mitigation measures, but would not be unacceptably adverse as the proposed development would be an extension of residential built form from an existing urban edge of Bicester.
- 8.7.6 Indirect landscape effects would diminish over the time of the proposed development through the maturity of the site setting and the effectiveness of mitigation measures. Furthermore, it is evident from the assessment that these effects would rapidly diminish with distance from the site where interlying topography, mature landscape setting and existing built form afford inherent mitigation in the wider landscape setting.

### **Designated Landscapes**

8.7.7 Effects on designated landscapes at Year 1 and Year 15 are described in Tables T8.7, T8.8 and T8.9, ES Appendix 8.2. The effect on these receptor has been assessed as is considered not to be significantly adverse.

### **Designated and Undesignated Heritage Assets**

8.7.8 As confirmed by the Archaeological and Heritage Assessment, ES Chapter 11:  
*“The Site does not form part of the setting of, or contribute to the significance of, any of the designated heritage assets in the study area. As such, there will be no effects arising from the completed development on any of the identified designated heritage assets.”*

8.7.9 Therefore, the proposed development would not represent a long term impact to heritage assets relative to the Site.

### **Historic Landscape Character**

8.7.10 As confirmed by the Archaeological and Heritage Assessment, ES Chapter 11:  
*“The historic landscape character of the Site is identified as being of negligible sensitivity. Therefore, the permanent, high, direct and negative impact, resulting from the complete land use and character change from agricultural land to residential site, will be of minor adverse significance.”*

8.7.11 Therefore, the proposed development would not represent a long term impact to historic landscape character relative to the Site.

### **Country Parks**

8.7.12 There are no Country Parks situated within the assessment survey area.

### **Conservation Areas**

8.7.13 It is considered that the proposed development would not significantly impact (adversely) the surrounding conservation areas. For instance; the Bicester and RAF Bicester conservation areas would be inherently screened by interlying landscape features such as mature trees and built form within the town. Whilst the intervening distance between the Site and the Straton Audely and Chesterton conservation areas would also inherently screen the proposed development. Therefore it is anticipated that the proposed development would not have any significant effect on the surrounding conservation areas which would be considered to be permanent i.e. for the lifetime of the proposed development's occupation / beyond 20+years.

### **Arboricultural Resources**

8.7.14 Over the intervening time period from Year 1, the retention of mature trees and hedges, the maturing of mitigation landscape planting and other green enhancement



would culminate in a positive or beneficial change from Year 1. The 'setting' of the site would mature bring with it further mitigation benefits whilst reinforcing landscape character where possible.

**Key Settlements and Residences**

8.7.15 **Residences:** It is anticipated that following the 'build out' of the proposed development, the magnitude of change would not significantly alter until after the establishment and maturity of landscape mitigation and ancillary planting (undertaken at construction stage). Establishment would be within the short term i.e. initial year after completion, and through appropriate landscape management maturity would progress expediently thereafter. It is anticipated by Year 15 landscape planting would be sufficient to buffer and filter / screen views from the wider area, i.e. young mature shrubs and trees.

8.7.16 Through appropriate design and responsive mitigation measures it is considered unlikely that the proposed development would have a significantly adverse (or overbearing) influence on the amenity of the surrounding residential settlements and residences. Therefore, the new land use within the Site would be experienced as compatible with the surrounding residential land use within the urban edge setting of Bicester.

8.7.17 The permanent effect of the proposed development would not be unacceptably adverse for the following reasons:

- Residential development closest to the site to the south off Gavray Drive (i.e. Heron Drive and Peregrine Way) would be afforded views, albeit filtered by intervening built form and mature tree cover along Gavray Drive and to the southern site boundary;
- Views from the residential development to the west (i.e. along Laughton Road) are heavily filtered, if not screened by the intervening built form and mature landscape setting including mature tree planting; and
- Where views are possible, these would be limited in magnitude by inherent screening and not unacceptably adverse in significance, which would reduce over time through the effect of maturing landscape mitigation and would remain generally not significant.

8.7.18 See EDP Table 8.8 Schedule of Effects Viewpoints 7, 8, 9 and 14, ES Appendix 8.2 for residences situated within Bicester and the immediate urban areas of the site i.e. within close range of the Site (0.5km of the site boundary). These representative viewpoints (assessed from ground level within public open space) demonstrate the anticipated effect is moderate – to - minor (adverse) during construction, diminishing

to minor (adverse) at Year 1 and diminishing to (adverse) minor – negligible residually at Year 15.

8.7.19 EDP Table 8.9, ES Appendix 8.2, also includes an assessment of further residences within close range of the Site including residential dwellings situated south of Gavray Drive. It is anticipated this residential area of predominantly two storey dwellings would receive moderate – to - minor (adverse) during construction, diminishing to minor (adverse) at Year 1 and diminishing to (adverse) minor – negligible residually at Year 15. However, in this area the density of built and non-direct / oblique orientation of dwellings would contain visual effects to those dwellings closest to the Site.

8.7.20 In summary, the anticipated effect of the proposed development on residences surrounding the Site (within close range) would be insignificant for the lifetime of the proposed development (including construction stage and residually after 15 years).

8.7.21 **Settlements:** Settlements surrounding the Site within the wider assessment area either to the northern suburbs of Bicester or outlying satellite settlements outside of the urban area of Bicester. See EDP Table 8.9, ES Appendix 8.2, demonstrates that the Site is particularly well screened (inherently) so as to mitigate any anticipated effects at construction phase, Year 1 or residually for the lifetime of the proposed development i.e. 15 years. It is considered the level of effect throughout the lifetime of the proposed development would be negligible (adverse) if any at all (including the construction phase). ES Appendix 8.2, EDP Table 8.8, Viewpoints 1, 2, 3 and 4 in particular demonstrate the inherent mitigation afforded to the Site.

8.7.22 In summary, the anticipated effect of the proposed development on settlements surrounding the Site (within the wider landscape) would be insignificant for the lifetime of the proposed development (including construction stage and residually after 15 years).

#### **Primary and Secondary Public Roadways**

8.7.23 It is considered the permanent effect of the proposed development would not be discernible from the surrounding primary road network as the site inherently screened by mature tree groups and existing vegetation on the boundary of the Site i.e. A4421 Charbridge Road.

8.7.24 Similarly there would be no discernible views along primary and secondary vehicle routes in the urban area of Bicester. Whilst effects to the wider area are offset or mitigated inherently by the combination of the rail link embankment (London –

Birmingham line), intervening built form or the lack of a significant topographic vantage point.

8.7.25 It is anticipated that permanent effects on Gavray Drive would be adverse at Year 1 due to the effect of new built form and a largely immature / almost nude landscape within the existing mature setting. However, by Year 15 mitigation planting and ancillary landscaping would establish a more beneficial situation and effects would be significantly reduced through inherent mitigation and the establishment of mitigation measures embedded within the design of the proposed development.

8.7.26 In summary, the anticipated effect of the proposed development on primary and secondary roadways surrounding the Site (within close range of the site and the wider landscape) would be insignificant for the lifetime of the proposed development (including construction stage and residually after 15 years); for instance, see ES Appendix 8.2, EDP Table 8.8 Viewpoint 9 and 14.

#### **Railway Routes**

8.7.27 Adverse effects would be experienced by visual receptors on the elevated rail link (London – Birmingham line) adjoining or within close range of the Site. This rail line is currently undergoing work and all interlying vegetation has been removed. New planting would take time to establish and mature; and the effect of new built form with an immature / almost nude landscape within the existing mature setting would appear incongruous at Year 1. However, by Year 15 mitigation planting and ancillary landscaping would establish a more beneficial situation and effects would be significantly reduced to an acceptable level.

8.7.28 Visual receptors on this rail route would be transient and only afford glimpsed views. Overall, it is considered the effect of the proposed development at Year 1 and its long term effect at Year 15 and beyond would not be unacceptably adverse.

8.7.29 There would be no anticipated adverse effects to the wider rail link outside of the Site area or as it travels through the wider urban area of Bicester and the surrounding landscape area. Similarly, due to inherent screening there would be no adverse effects experienced on the secondary rail link (Oxford – Bicester line) from Year 1 or over the lifetime of the scheme.

#### **Public Rights of Way**

8.7.30 Public footpath (PRoW 129/3) which crosses the Site would be integrated within the proposed development from Year 1 permanently. This PRoW would experience moderate, adverse effects permanently over the lifetime of the development. The effect of new built form with an immature / almost nude landscape within the existing

mature setting would appear incongruous at Year 1. However, by Year 15 mitigation planting and ancillary landscaping would establish a more beneficial situation and effects would be reduced to an acceptable level.

8.7.31 It is anticipated there would be adverse impact to the public right of way along Gavray Drive south of the site. However, this effect would not be significant from Year 1 due to the retention of existing mature landscape features to the site boundary to filter and screen the proposed development at this stage.

8.7.32 Furthermore, the establishment and expedient maturity of landscape mitigation measures within the proposed development would further reduce these minimal effects to a negligible significance after Year 15.

8.7.33 Public rights of way further to the north, east and south east would be mitigated by the existing railway embankment and existing built form along Charbridge Drive.

***National Trail***

8.7.34 It is considered that the effects from the proposed development at Year 1 (and by Year 15) would not be readily discernible as views towards the site are predominantly screened by a mature landscape setting, undulating topography and existing built form.

***National Cycle Routes and Long Distance Recreational Routes***

8.7.35 It is unlikely that the proposed development would be readily discernible from long distance recreational routes; for instance, the Sustrans NCR 51 passes through the wider area of Bicester and the surrounding landscape. This route would be inherently mitigated from effects due to the interlying distance and the intervening mature landscape setting affording little discernible effect of the proposed development at this stage (if any) along its route.

8.7.36 The Sustrans NCR51 does pass the southern site area along Gavray Drive. It is anticipated that permanent effects on this route would be adverse at Year 1 due to the effect of new built form and a largely immature / almost nude landscape where aspects of vegetation along the southern boundary is degraded affording direct views of the site. Further along this route the existing mature – young mature tree groups and vegetation would be sufficient to offset adverse effects to a minor, adverse level in the worse case scenario.

8.7.37 Over the short to medium term the retention of existing planting, and the establishment and maturity of new mitigation planting and ancillary landscaping within the proposed development would significantly reduce any adverse effects to an acceptable level.

**Summary**

8.7.38 In summary, building out the proposed development would not represent unacceptably adverse effects on designated landscape resources, conservation areas, communication routes, PRow and also surrounding settlements and residences.

## 8.8 RESIDUAL EFFECTS

- 8.8.1 This section details the anticipated residual effect of the proposed development in the medium term (i.e. from 15 years) appraising the permanent effect of the proposed development.
- 8.8.2 The building out of the proposed development would inevitably create adverse direct effects within the site and indirect effects within the wider area. These impacts would disturb the fabric of the landscape of the site and potentially the character and amenity of the surrounding area.
- 8.8.3 The most adverse effects would be experienced within the site area through the change of land use from a greenfield / agricultural site to an urban land form with the construction of new built form and ancillary development. These direct effects would be at worse major – moderate, adverse within the Site i.e. along PRoW 129/3.
- 8.8.4 Impacts on designated landscape resources, conservation areas, PRoW and surrounding settlements and residences are not considered to be adverse to an extent that would be considered significant in EIA terms, whilst remaining largely temporary and reversible in nature.
- 8.8.5 Indirect landscape and visual effects would be limited to a small area predominantly south of the site area due to the buffering effect of the existing rail link embankment (London – Birmingham line) which inherently mitigates the proposed development from Year 1 to Year 15 with permanent effect. What indirect impacts are experienced diminish over the time of the proposed development through the maturity of the site setting and the effectiveness of mitigation measures. Furthermore, these effects would rapidly diminish with distance from the site where interlying topography, mature landscape setting and existing built form afford inherent mitigation in the wider landscape setting.

### **Summary of Effects**

- 8.8.6 What indirect impacts are experienced diminish over the time of the proposed development through the maturity of the site setting and the effectiveness of mitigation measures. Effects by Year 15 would significant reduce and would remain insignificant in EIA terms over the lifetime of the proposed scheme.
- 8.8.7 A mitigation strategy has been identified within this ES Chapter to offset or reduce these impacts through pro-active management (during the construction stage), the

application of best national practice, the utility of inherent mitigation and the introduction of new mitigation measures.

- 8.8.8 Overall, these effects present a residual situation which is insignificant and also not significantly adverse in EIA terms. The effects identified are assessed in Table 8.7, 8.8, 8.9 in ES Appendix 8.2 for representative landscape and visual receptors.

## 8.9 CUMULATIVE EFFECTS

8.9.1 Through consultation with the co-ordinating Planning Consultant for this application the following possible future schemes have been considered for potential significant cumulative effects (source information from Cherwell District Council's Local Plan Trajectory (2011-2031)). These schemes are numbered for conciseness, see ES Appendix 8.8 for plan of these possible future schemes relative to existing urban area of Bicester:

- Scheme 1: Gavray Drive East; proposed residential development delivering approximately 160 No. new dwellings. The site is situated adjacent (east) to the proposed development;
- Scheme 2: North West Bicester (Bicester 1); proposed new "Eco-Town" mixed use type development delivering nearly 3,300 No. new residential dwellings across a number of years from 2014/15 for the following decade. The site is situated approximately 2.5km north west of the application site on the outer edge of the existing Bicester urban area;
- Scheme 3: Graven Hill (Bicester 2); proposed new mixed use development (including self build plots) delivering nearly 1,500 No. new residential dwellings from 2014/15 to 2019/20. The site is situated 1.5km south of the application site within the existing RAF Graven Hill area and on the outer edge of the existing Bicester urban area;
- Scheme 4: South West Bicester Phase 1; proposed new residential development of nearly 1,400 No. new dwellings situated approximately 1.5km south west of the application site on the outskirts of the existing Bicester urban area;
- Scheme 5: South West Bicester Phase 2 (Phase 3); proposed new residential development of over 700 No. new dwellings situated approximately 2.0km south west of the application site on the outskirts of the existing Bicester urban area;
- Scheme 6: South East Bicester (Bicester 12); proposed new mixed use development of nearly 1,500 No. new dwellings situated less than 1km south east of the application site on the outskirts of the existing Bicester urban area; and,
- Scheme 7: Talisman; proposed new residential development of nearly 125 No. new dwellings situated within 1km south of the application site on the outskirts of the existing Bicester urban area.



- 8.9.2 There are further smaller “windfall” site situated within the existing urban area of much smaller capacity of less than 50 No. and 10 No. new residential dwellings which due to their scale have been “scoped out” of this appraisal.
- 8.9.3 The Site for the proposed development is situated within an existing urban edge on the eastern edge of Bicester, a context of which is an existing well established residential area. This assessment has already established that the likely intervisibility of the Site is inherently mitigated through the combination of gently undulating topography, mature landscape setting and intervening built form on the outer edge of the existing urban edge of Bicester. For instance; see Viewpoint 1, 2, 3 and 15, ES Appendix 8.4, which illustrate typical medium to long range views towards the site.
- 8.9.4 Similarly within close range of the application site, the site area is currently screened by intervening railway embankment from receptors situated to the north west-north and north east of the site; for instance, see Viewpoint 3, ES Appendix 8.4. Additionally, the current mature landscape features including robust tree groupings and lack of any significantly elevated topography within Bicester or its surrounding area would also inherently screen the proposed development. For instance; see Viewpoint 5 to the east-south east, Viewpoint 6 to the south and Viewpoint 12 to the west-south west within close range of the site (i.e. less than 0.5km). Furthermore, across this distance the intervening built form of the existing urban scene would inherently screen the proposed development to a significant degree; for instance, see Viewpoint 9, 12 and 14.

#### Scheme 1

- 8.9.5 It is proposed to develop the land parcel to the east of the Site which also borders Langford Brook (see Scoping Opinion request as per Cherwell District Council ref; 14/00008/SCOP dated 06.11.14). The combination of these two schemes would develop new residential built form and ancillary development north of Gavray Drive, although the development would not be continuous.
- 8.9.6 It is anticipated that the intervisibility of seeing both of these schemes in combination would be possible but would be limited to a discrete geographical area south east and south of Gavray Drive and immediately along Gavray Drive; see Viewpoint 6 and 7.
- 8.9.7 It is considered that the combined effect of the proposed development and Scheme 1 would be (adverse) minor landscape effects when experienced in combination. Both of these sites, especially the Site for the proposed development would be experienced as new development which is “infilling” the existing residential

development of this eastern aspect of the urban area of Bicester. The fact that the Site and Scheme 1 are situated adjacent to an existing main railway line and further contained to the east by main road (A4421) Charbridge Way and Garvay Drive to the south further underlines the manner in which these schemes would be perceived simultaneously.

- 8.9.8 Withstanding no finalised site layout or landscape mitigation plan for Scheme 1, it is anticipated that the cumulative visual effect of these sites would initially appear (adverse) Moderate at construction stage (diminishing at Year 1) and further diminishing through the initial 15 years of occupancy to a residual cumulative effect of (adverse) Minor-Negligible. The retention of existing site boundary planting and the undertaking of “embedded mitigation” measures within development would offset and reduce the likely visual impacts of these schemes.
- 8.9.9 Overall, it is considered that the cumulative effect of the proposed development with Scheme 1 (Gavray Drive East) would not generate significant cumulative effects over the lifetime of each scheme.
- 8.9.10 With regard to further possible schemes, the following is considered:

Scheme 1, 3 and 4

- 8.9.11 Scheme proposed to the south west – north west including Scheme 1, 3 and 4, it is considered that the intervening built form of the outer urban edges of Bicester would inherently screen views of the proposed development in combination with these possible future schemes. Additionally the lack of an elevated topography within Bicester town and the mature landscape setting surrounding the Site and its immediate context further contains views of the proposed development from interlying locations. As demonstrated by Viewpoint 1 and 2 (situated north and north west of the proposed development) there would be no opportunity for intervisibility across medium to long range of the proposed development and Scheme 1, 2 and 3. Furthermore, as demonstrated by Viewpoint 3 there is no opportunity of seeing the proposed development and Scheme 1, 2 and 3 in combination due to the existing railway embankment which physically limits views, whilst at Viewpoint 12 the mature landscape of public open space within the town contains views to all of these sites.
- 8.9.12 With regard to landscape effects, it is considered that the proposed development would be perceived as an “infill” site and not a series of medium to large scale urban extension (i.e. Scheme 1). Therefore, the likely cumulative effect of these three possible future schemes would be adverse to landscape character i.e. development of existing greenfield areas to new residential and mixed use built form and ancillary

development. However, the effect of the proposed development would be negligible (not significant in EIA terms) as the site area is contained and does not extend irregularly in to the wider landscape whereby it would be experienced as part of an urban extension to Bicester.

#### Scheme 2 and 5

8.9.13 Scheme 2 proposes the redevelopment of an existing developed area, however, given its scale and locality on the outer edge of the Bicester urban area is likely to be perceived as further urban extension which would represent adverse landscape and visual effects (at least during its construction and initial years until “embedded mitigation measures” have become expediently established).

8.9.14 It is considered that given the anticipated containment of the proposed development in terms of landscape and visual effects to within the site boundary or immediate context, there would be no opportunity to experience these two schemes simultaneously (due to inherent screening and intervening distance i.e. 1km). As the proposed development is essentially an “infill” to the existing urban area and the existing robust landscape setting and containment of views on the east of Bicester (i.e. A4421 Charbridge Road, PRow east of A4421 Charbridge Road / Viewpoint 3), is anticipated there would be landscape and visual cumulative effect would be negligible (not significant in EIA terms).

8.9.15 This situation is considered likely for Scheme 5 which is situated further afield to the south west (approximately 2km) and intervisibility between the two sites unlikely.

#### Scheme 6

As demonstrated by Viewpoint 5, see EES Appendix 8.5, it is considered unlikely that the proposed development and Scheme 6 would be intervisible and cumulative effect negligible.

#### Scheme 7

8.9.16 Similarly to the proposed development Scheme 7 is akin to a “infill development” within the existing urban area, but given the interlying distance and intervening mature landscape setting (within public open space south of Gavray Drive), it is considered there would be no significant cumulative effects. Any interveibility would be negligible and the anticipated landscape effect would be adverse within the site areas, but would not extend adversely beyond its boundaries and reflect the current urban setting.

8.9.17 With respect of the existing urban edge environment of Gavray Drive and the surrounding urban form the proposed development would not represent significant cumulative effect. It is considered that the proposed development would represent an acceptable inclusion to the wider setting and would not generate significant cumulative effects due to the benefit of inherent mitigation and interlying distances to possible future schemes.

## **8.10 SUMMARY AND CONCLUSIONS**

8.10.1 The assessment of landscape and visual impacts has been undertaken with an iterative design approach developing the site layout masterplan with the Architectural / Urban Design team to ensure an appropriately considered masterplan.

8.10.2 Through this iterative approach those impacts which do occur can be inherently mitigated, reduced, offset or overcome through additional designed measures. Therefore, it is concluded the proposed development has been well designed to succinctly integrate within its landscape setting and the following are raised in conclusion to support this.

### ***Summary of Landscape Effects***

8.10.3 The direct effects of the proposed development on the Site would be adverse through the establishment of a new land use at the site; these effects are adverse and significant in EIA terms.

8.10.4 Some weight should be attributed in the planning process to the levels of effect directly within the Site itself. However, it is inevitable given the utility of a greenfield site for a new residential development with built form and ancillary features. These effects should not be seen as an obstacle to development as the mature landscape setting of the site contains effects so as to reduce, offset and mitigate otherwise adverse indirect effects from extending across the immediate and surrounding landscape to the Site.

8.10.5 The protection, retention and enhancement of the site's native tree and hedgerow boundaries would afford inherent mitigation. Whilst the landscape mitigation proposed as part of the proposed development would retain and enhance the landscape character surrounding the site and give opportunity for new characterful planting within the Site. However, it is considered that the proposed development would not significantly alter the character of the wider surrounding landscape, which is classified as urban edge/fringe, due to the discrete geographical area over which effects will be experienced.

8.10.6 The relatively contained nature of the development site ensures that effects are predominantly limited to within the site or to the immediate localised area. The immediate context of the site is one which is urban and any indirect effect would reduce quickly with distance from the site so that indirect landscape effects are insignificant in EIA terms. Over time, such effects will further reduce such that the

development would become an accepted part of the eastern edge of Bicester and its urban setting.

### ***Summary of Visual Effects***

8.10.7 The most adverse visual effects are likely to be experienced along public footpath (PRoW 129/3) which is situated within the Site area. This level of effect diminishes from major-moderate, adverse (construction phase) to moderate – minor, adverse (Year 1 – Year 15) which is inevitable given the change of land use from greenfield / agriculture to residential with ancillary development.

8.10.8 This level of effect is only experienced within the extent of the Site and does not extend incongruously outwards in to the wider area leading to a substantial discordancy. Consideration of this effect should be made in the planning process with supplementary design at detailed planning stage to further reduce impacts.

8.10.9 Based on the assessed viewpoints, the overall visibility of the development site is relatively well-contained due to the existing landscape features including mature trees, tree groups and robust hedgerows.

8.10.10 The combination of an elevated railway embankment and large scale built form to the north of the site significantly screen direct views. Furthermore, there is modern residential development to the southern boundary and Bicester town to the west which reduces the general visibility and limits the distribution of effects dramatically to a narrow zone at the urban edge.

8.10.11 The visual effects predicted to arise as a result of the introduction of the proposed development follow a similar pattern to effects upon landscape character, in that generally significant effects are likely to occur only within and in very close proximity to the proposed development; the magnitude of change to views decreases rapidly with distance from the development site.

### ***Compliance with National Policy***

8.10.12 The proposed residential development scheme will utilise high quality materials and design features and bring with it opportunities to improve the quality and, in this case, the quantity of local landscape features that contribute to the overall character of the landscape. During the course of maturation, this will bring a beneficial effect in terms of their function in the broader, coherent vegetation framework. In that regard, the proposed residential development with mitigation will remain compliant with the relevant sections of the NPPF, in particular section 7 and paragraph 58 and

mitigation of anticipated landscape and visual effects compliant with paragraph 65 paragraph 14, 57, 58, 65 and 98.

***Compliance with Local Policy***

8.10.13 The limitation in both landscape and visual residual effects determined through an appropriate landscape and visual impact assessment ensures the proposed development is compliant with Cherwell District Local Plan (1996) Chapter 9 which focusses on preventing and limiting pollution from new development with effective mitigation measures and sensitive masterplanning.

8.10.14 The proposed development is also reflective and supportive of the Non-Statutory Cherwell District Local Plan (2011 Policy R1 for the provision of new public open space and Policy R3 to maximise the value of the proposed public open space and its interconnectivity with recreation links via public footpaths and cycleways creating a green network of public open spaces.

8.10.15 The proposed development supports Policy H13 for the allocation of a new urban extension within the Site boundary as part of the existing urban edge environment.

8.10.16 Notwithstanding the location of the Site the proposed development has been developed through an iterative design process with the proposed masterplan supporting Policy C8 to limit potential impacts whilst enhancing landscape character of the countryside.

8.10.17 The development of an appropriate mitigation strategy serves to ensure the proposed development would protect the integrity, quality and character of the Areas of High landscape Value which supports and reflects Policy C13, Policy C28 and C30. It is considered that the proposed development is sympathetic to landscape character through its limiting of potential adverse effects through appropriate design, the retention and enhancement of inherent mitigation and also the establishment of new mitigation measures for the long term and permanent benefit to the proposed development. This approach would also serve to reflect and support Policy C34 as the proposed development also seeks to retain and enhance existing landscape character within the Site through appropriate design measures which have been developed in iterative process by site designer and the undertaking of a thorough and appropriately framed LVIA.

***Cumulative Effect***

8.10.18 It is considered that the proposed development would be experienced as an “infill” to the existing urban area of Bicester and would not be experienced simultaneously with other proposed residential schemes (which being much larger would be perceived as urban extensions rather than “infills”). Inherent mitigation would screen and contain interspersibility through the Site’s mature landscape setting, railway embankment and also existing residential built form. These existing physical characteristics would offset, reduce and mitigate any cumulative effect to a negligible level not significant in EIA terms).

8.10.19 There would inevitably be cumulative effect with the development of the adjacent Gavray Drive East site (referred to as Scheme 1 in the cumulative assessment of this ES Chapter). However, adverse landscape effects would be moderate but would be contained within each of the site’s well defined boundaries. The anticipated cumulative effect would diminish from construction stage to an adverse minor effect due to the expedient establishment of “embedded mitigation measures”. In both cases each of these schemes would be experienced as “infilling” to the existing urban area due to the extent of surrounding residential development (particularly south of Gavray Drive) and the robust physical elements which contain the sites i.e. adjacent railway embankment and A4421 Charbridge Road.

8.10.20 Overall, it is considered that the proposed development would represent an appropriately designed development in the existing environment within and surrounding Bicester development in combination with the potential futures schemes and its affect would not be significant in EIA terms.

### **Conclusion**

8.10.21 This assessment concludes that, from a landscape and visual perspective, the development site development site is suitable for the proposed development. The proposed development with ‘embedded’ mitigation measures will have a limited effect on views from the surrounding areas as it would be well-screened through a combination of retained landscape features integrated into the site masterplan and the provision of responsive landscape mitigation measures.

8.10.22 In conclusion, the proposed development does not represent a significant adverse landscape and visual impact (in EIA terms) during its construction, and benefits from reduced effects from Year 1 to Year 15 to an even lower residual effect through the benefit of inherent mitigation and maturity of designed or embedded mitigation measures becoming expediently established. Over the longer term the proposed development would represent a well-designed and sensitive extension to the wider settlement. Whilst the combination of appropriate site selection, site layout and



design including “embedded mitigation measures” ensures compliance with relevant policy, and the aspirations for landscape and visual enhancement, at a local and national level.

8.10.23 Therefore, the proposed development is commended to the Council as appropriately conceived, respectful of the local landscape context and effective





**Chapter 9: Ecology**

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## **9.1 INTRODUCTION**

9.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development on the Site on ecological receptors (designated sites, habitats and/or species populations). The assessment includes a summary of the current ecological conditions found within and around the Site and identifies measures to avoid, minimise, mitigate and/or compensate, where appropriate, for significant effects that may arise as part of the Proposed Development. This chapter of the Environmental Statement has been produced by the Environmental Dimension Partnership Ltd (EDP).

9.1.2 The chapter has been prepared with reference to The Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment Guidelines. This chapter should be read in conjunction with the detailed Ecological Baseline which is included as **Appendix 9.1**.

## 9.2 ASSESSMENT METHODOLOGY

### Scope

- 9.2.1 The scope of the ecological impact assessment (EclA) has been determined by previous ecological investigations of the Site as outlined in full within **Appendix 9.1**, and through pre-application consultation.

### *Extent of the Study Area*

- 9.2.2 Detailed studies have been undertaken on the Site and on land to the immediate east of the Site (east of Langford Brook) (together for the purposes of this Chapter defined as "the study area"), as illustrated on **Figure 9.1**. However, for some potential ecological receptors, desk studies, field surveys and the assessment of effects have extended beyond this study area to a wider potential zone of influence in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines February 2006. The zone of influence has been determined through a review of the baseline ecological conditions and relative areas and resources that may be affected by the Proposed Development.

### Data sources

- 9.2.2 The scope of consultation undertaken has included a formal EIA Scoping Report submitted to CDC in September 2014. The Scoping Report has been informed by a significant amount of consultation with respect to the Site since 2002. This process informed the identification of Valued Ecological Receptors (VERs) pertinent to the Proposed Development, and the likely scope of potential effects on these receptors. Furthermore, consultation has informed the masterplan in terms of iterative design to accommodate avoidance, mitigation, compensation and enhancement measures.

### Assessment approach

- 9.2.3 The ecology baseline collated during 2013 to 2014 was completed in line with the Scope of Works outlined within EDP's Scoping report and those matters arising from consultee responses including those received from Cherwell District Council, Natural England and Berkshire, Buckingham and Berkshire Wildlife Trust (BBOWT). The scope of works is summarised below, the detailed methodologies employed to collate the updated ecology baseline are discussed in full in **Appendix 9.1**.

### **Updated Desk Study**

- 9.2.4 An updated ecological desk study was undertaken in June 2013 which employed a search radius of 5km from the Study Area boundary for statutory designated sites of international value, 2km for sites of national and local importance and 2km for Protected/UK BAP species/habitat records. A search for Annex II bat species' records within 4km of the Study Area was undertaken.
- 9.2.5 In addition to the above, butterfly records were requested from Butterfly Conservation (accessing both national and local (Thames Valley Branch) databases) for an area within 2km of the Study Area; records of Marsh Fritillary butterfly were requested within a 15km radius of the Study Area.
- 9.2.6 A search of the Multi-Agency Government Information Centre (MAGIC) website was also undertaken in June 2013 to identify statutory designations within 2km for UK sites and 5km for European sites.
- 9.2.7 The search areas employed in completion of the desk study reflect the sensitivity and value of potential ecological receptors and are considered to be sufficient to cover the potential zone of influence of the Proposed Development on these receptors while providing contextual information to assist with determining and evaluating the baseline.

### **Field Surveys**

- 9.2.8 A suite of 'Phase 2' ecological surveys have been completed within the study area, as detailed in full in **Appendix 9.1**. Those considered pertinent to the assessment of effects in respect of the Proposed Development of the Site, by virtue of their coverage and results, are listed below:
- Updated Extended Phase 1 Survey completed in June 2013;
  - Updated bat activity surveys, including manual transect surveys undertaken between June to August 2013;
  - Tree assessments for actual/potential bat roosting and barn owl nesting in June 2013;
  - Wintering bird surveys undertaken monthly throughout October 2013 to March 2014;
  - Breeding bird surveys, including three visits undertaken in spring 2013;
  - Updated badger survey completed in June 2013;
  - Updated water vole and otter survey of Langford Brook undertaken in June 2013;

- Harvest mouse survey of suitable habitat to search for the presence of harvest mouse nests undertaken in mid-November 2013;
- Updated great crested newt survey undertaken between mid-May to mid-June 2013;
- Updated reptile surveys undertaken between June and September 2013 (one survey visit was completed on 1 October 2013); and
- White-letter hairstreak surveys comprising eggs searches (November 2011; updated in February 2013), elm tree habitat suitability assessment (2011; updated in May 2013) and adult searches (late June 2013 and mid-end July 2013).

9.2.9 In addition, a full BS5837:2012 tree survey and arboricultural impact assessment was also undertaken by EDP. The methodology employed and the results are set out in detail in Chapter 10 'Arboriculture' of the Environmental Statement.

#### **Evaluation Methodology**

9.2.10 The evaluation of the Valued Ecological Receptors (VERs) in this assessment reflects the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines February 2006, hereafter referred to as 'the Guidelines'.

9.2.11 The Guidelines propose an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts who know the locality of the Site and/or the distribution and status of the species or features that are being considered.

9.2.12 In consideration of the likely significant effects on VERs as a result of the Proposed Development in relation to the need to comply with national planning policy, Chapter 11 of the National Planning Policy Framework (NPPF) 'Conserving and Enhancing the Natural Environment' and attached ODPM Circular 'Biodiversity and Geological Conservation' has been consulted.

9.2.13 In addition, the following best practice guidance in relation to survey techniques and mitigation measures have been taken into account:

- Joint Nature Conservation Committee, 1993. Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
- English Nature, 2004. Bat Mitigation Guidelines;
- Bat Conservation Trust, 2012. Bat Surveys: Good Practice Guidelines (2<sup>nd</sup> edition). Bat Conservation Trust, London;
- Joint Nature Conservation Committee, 1999. Bat Workers Manual;



- Marchant, J. H. (1983). *Common Birds Census Instructions*. BTO, Tring. 12pp.;
- Marchant, J. H., Hudson, R., Carter, S. P. & Whittington, P. A. (1990) *Population Trends in British Breeding Birds*. BTO, Tring;
- Gilbert, G., Gibbons, D. W. & Evans, J. (1998) *Bird Monitoring Methods*. RSPB, Sandy, Bedfordshire;
- Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. 2000. Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155;
- Harris, S., Cresswell, P., and Jeffries, D.J. 1989. *Surveying Badgers*, Mammal Society, London;
- Froglife. 1999. *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10, Froglife, Halesworth;
- Gent, T., Gibson, S. 1999. *Herpetofauna Workers Manual*. JNCC;
- English Nature, 2004. *Reptiles: Guidelines for Developers*; and
- English Nature, 2001. *Great crested newt mitigation guidelines*

### **Geographical Context**

9.2.14 The Guidelines recommend that the value or potential value of an ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:

- International;
- UK;
- National (England);
- Regional (South East);
- County (Oxfordshire);
- District (Cherwell);
- Local (on site or neighbouring sites); and
- Site level

### **Valuing Designated Sites**

9.2.15 Within the UK, certain valued habitats have been assigned a level of nature conservation value through designation; and the Guidelines referred to above recommend that the reasons for this designation need to be taken into account in the assessment. Such designations include:

- Internationally important Sites such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar Sites;
- Nationally important Sites such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs); and
- Regional/County important Sites, which are referred to as Local Wildlife Sites (LWSs) and Local Nature Reserves (LNRs).

9.2.16 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

### ***Valuing Biodiversity***

9.2.17 The Guidelines state that there are various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity; furthermore, that consultation, especially with local specialists, can be crucial for identifying less obvious important resources and features. The Cherwell Biodiversity Action Plans<sup>1</sup> are important references that have been used to inform the local context of the assessment.

### ***Valuing Habitats***

9.2.18 The Guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available. Where areas of a habitat or plant communities do not meet the necessary criteria for designation at a specific level, the Guidelines recommend that the ecologist may consider the local context if appropriate.

### ***Valuing Species***

9.2.19 Species should be assessed according to their biodiversity value rather than according to their legal status; although some species will fit into both categories. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. The evaluation of populations should make use of any relevant published evaluation criteria.

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<sup>1</sup> <http://www.cherwell.gov.uk/index.cfm?articleid=3210&articleaction=form&formid=28>.  
Accessed 04/11/14

### **Characterising Potential Effects**

- 9.2.20 The Guidelines state that the assessment of effects should be undertaken in relation to the baseline conditions within the zone of influence that are expected to occur if the Proposed Development were not to take place. Having identified the activities likely to cause significant effects, it is then necessary to describe the resultant changes and to assess the effect on valued ecological resources.
- 9.2.21 The Guidelines recommend that the process of identifying effects should make explicit reference to aspects of ecological structure and function on which the feature depends. Effects must be assessed in the context of the baseline conditions within the zone of influence during the lifetime of the Proposed Development.
- 9.2.22 The Guidelines further state that it is important to consider the likelihood that a change/activity will occur as predicted and also the degree of confidence in the assessment of the effect on ecological structure and function. The limitations to certainty should be described and the consequences for confidence in predictions must be stated clearly.
- 9.2.23 When describing changes/activities and effects on ecosystem structure and function, reference should be made to the following factors:
- Positive or negative;
  - Magnitude (minor, moderate or major);
  - Extent;
  - Duration;
  - Reversibility; and
  - Timing and frequency.
- 9.2.24 In order to characterise the likely change and effect, it is necessary to take into account all the above factors.
- 9.2.25 It is also important to consider the likelihood that a change/activity will occur as predicted and the degree of confidence in the assessment of the effect on ecological structure and function. The limitations to certainty should be described and the consequences for confidence in predictions must be stated clearly. The following four-point scale provided by the Chartered Institute of Ecology and Environmental

Management (CIEEM) has been adopted to describe the degree of confidence in the assessment of the effect on ecological structure and function:

- Certain/near-certain – probability estimated at 95% chance or higher;
- Probable – probability estimated above 50% but below 95%;
- Unlikely – probability estimated above 5% but below 50%; or
- Extremely unlikely – probability estimated at less than 5%.

### **Assigning Significance**

9.2.26 Legislation and policy often require significant adverse or beneficial effects to be distinguished from others, although there is little guidance on how this distinction should be made. The Guidelines define an ecologically significant effect as an “impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area”.

9.2.27 Within this chapter, ecological features of Local or greater value are carried forward to the assessment of likely significant effects stage. Other features of lower value (i.e. at the Site level or lower) may be subject to further assessment in order to demonstrate compliance with relevant nature conservation legislation and policy.

9.2.28 Although certain species and habitats may not constitute VERs based upon their nature conservation value, or likely absence from the Site, they may still warrant consideration during the design of the Proposed Development (and any mitigation identified) on the basis of their legal protection, their implications for policies and plans, or other issues, such as animal welfare. For example, consideration has been given to great crested newts and reptiles within this assessment where likely significant effects upon these species may arise, and in relation to potential mitigation measures as recommended in relation to residual effects, which may provide positive benefits to these species through habitat creation, restoration or enhancement.

### **Significance criteria**

**9.2.27** Once a potential significant effect is identified as likely to affect the integrity/favourable conservation status of a potential VER, the value of the receptor is then used to help determine the geographical scale at which the effect is significant. The significance of the effects upon VERs has been assessed both before and after consideration of additional mitigation measures. The latter represents the assessment of the residual effects of the Proposed Development. Finally, an assessment of cumulative effects upon VERs arising from the Proposed Development in combination

with proposed, consented or planned development within the zone of influence of the Site is undertaken.

### 9.3 RELEVANT POLICY & LEGISLATION

8.1.1. The following legislation of primary relevance has been referred to whilst compiling this chapter

- The Conservation of Habitats and Species Regulations 2010 (as amended), known as the 'Habitats Regulations', which implement European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('Habitats Directive') and European Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive');
- The Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way (CROW) Act 2000;
- The Natural Environment and Rural Communities (NERC) Act 2006; and
- The Protection of Badgers Act 1992.

#### **National Planning Policy Framework (March 2012)**

9.3.1 Chapter 11 of the NPPF 'Conserving and Enhancing the Natural Environment' contains policies which afford protection to statutory and non-statutory designated sites, wildlife habitats and protected species. The ODPM Circular 06/05 'Biodiversity and Geological Conservation' attached to the NPPF contains further guidance in respect of biodiversity conservation and its impact within the planning system. This document covers areas including internationally and nationally designated sites, habitats and species outside of designated sites, and protected species.

#### **Cherwell District Local Plan (1996)**

9.3.2 Policies within the adopted Local Plan 1996 have been saved. These are the policies used when making planning decisions<sup>1</sup>. Saved policy C1 seeks to protect the nature conservation interest of designated sites including sites of wildlife interest, scientific importance and local nature conservation value. Saved policy C2 provides planning policy protection for any species protected by Schedule 1, Schedule 5 and Schedule 8 of the 1981 Wildlife and Countryside Act and by the E.C. Habitats Directive 1992. Through saved policies C3 and C4 the local planning authority will seek to promote development proposals resulting in increased access to wildlife and the creation of new habitats and ecological and nature conservation areas.

### **The Non-Statutory Cherwell District Local Plan (2011)**

- 9.3.3 The Non-Statutory Cherwell Local Plan 2011 comprises an interactive web-based document for viewing the Cherwell Local Plan 2011<sup>2</sup>. Cherwell District Council ceased works on the Cherwell Local Plan 2011 on 13 December 2004 to begin the preparation of a Local Development Framework (LDF). However, the draft Cherwell Local Plan 2011, now re-titled as 'the Non-Statutory Cherwell Local Plan 2011', was also approved as interim policy on this date. Although "...*the policies and procedures in the draft Cherwell Local Plan 2011 have not been the subject of all of the statutory local plan preparation procedures... they will be an important material consideration amongst all other relevant considerations in deciding planning applications.*'
- 9.3.4 The Non-Statutory Cherwell Local Plan 2011 includes a number of policies of relevance to nature conservation and biodiversity as discussed below. Policy EN22 seeks to protect and enhance features of nature conservation value within a site through the provisioning of planning conditions or obligations and compensatory mechanisms where appropriate. Planning policy protection of sites of ecological value including internationally, nationally, regionally and locally important sites is afforded through Policy EN24, whilst protected species (including those protected by Schedule 1, Schedule 5 and Schedule 8 of the Wildlife and Countryside Act 1981 and the European Commission (E.C.) Habitats Directive 1992), and their habitats are protected from adverse effects arising from development through Policy EN25. Creation of new habitats, particularly those relating to priority species or habitats, within development proposals is promoted through Policy EN27.

### **Draft Cherwell Local Plan (2014)**

- 9.3.5 The draft Cherwell Local Plan, as submitted to the Secretary of State for Communities and Local Government for Formal Examination on 31 January 2014, includes Policy ESD 10: '*Protection and Enhancement of Biodiversity and the Natural Environment*'. The Policy seeks to provide a net gain to biodiversity through "...*protecting, managing, enhancing and extending existing resources, and by creating new resources.*" In addition, the Policy provides planning policy protection for designated sites of international value (through the Habitat Regulations Assessment process), national value and sites of regional or local importance (including habitats or species of principal importance for biodiversity). Through the Policy development proposals "...*will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site...*" whilst maintaining existing ecological networks to ensure habitat connectivity.

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<sup>2</sup> [http://npa.cherwell.gov.uk/LocalPlan/Plan\\_index.htm](http://npa.cherwell.gov.uk/LocalPlan/Plan_index.htm). Accessed 20/10/14

- 9.3.6 Additional biodiversity protection and enhancement is provided within the draft Cherwell Local Plan through Policy ESD 11: '*Conservation Target Areas*' which states that "*Where development is proposed within or adjacent to a Conservation Target Area biodiversity surveys and a report will be required to identify constraints and opportunities for biodiversity enhancement. Development which would prevent the aims of a Conservation Target Area being achieved will not be permitted. Where there is potential for development, the design and layout of the development, planning conditions or obligations will be used to secure biodiversity enhancement to help achieve the aims of the Conservation Target Area.*"



## 9.4 BASELINE CONDITIONS

### Overview

- 9.4.1 This section sets out the baseline context of the Proposed Development and should be read in conjunction with **Appendix 9.1**, where full methodologies and results of the ecological investigations are set out.

### Designated Sites

#### *Statutory Designations*

- 9.4.2 The Site and the study area are not covered by any statutory designated sites, nor do any exist within the standard 2 km search area around the study area.

- 9.4.3 However, the following two nationally important designations have previously been identified by Natural England as Valued Ecological Receptors (VERs) with the potential, in their opinion, to be detrimentally, indirectly affected by adverse changes in water quality/water quantity within the downstream section of the Langford Brook between the Site and the designations:

1. *Wendlebury Meads and Mansmoor Closes SSSI – located 5.5 km southwest of the Site ('as the crow flies'); and*
2. *Otmoor SSSI – located 7.4 km southwest of the Site ('as the crow flies')*

- 9.4.4 Both SSSIs support grassland and important plant communities. By reference to freely-available, web-based information sources, and based upon professional judgement and experience, it is considered by EDP that the likely significant effects (if at all) upon these two SSSIs from water quality/quantity changes associated with the Proposed Development are likely to be negligible, on the basis that:

- Otmoor SSSI is situated some way south of the River Ray and is not connected to the Langford Brook;
- Otmoor SSSI is in predominantly (73.72%) unfavourable 'recovering' condition, whilst Wendlebury SSSI is in favourable (100%) condition, despite the Langford Brook seeming to be currently at poor-moderate 'ecological' status (in Water Framework Directive) terms;

- The main source of hydrological inputs to both SSSIs is believed to be from the River Ray when it floods. As such the water quality/quantity inputs to the River Ray are believed to be more pertinent to the condition and management of the vegetation communities on the SSSIs than the Langford Brook. Any water quality/quantity changes (if at all) are likely to be minor and not significant in the context of existing sources of water quality/quantity issues in the broader river basin catchment and between the proposed development site and the SSSIs (e.g.. diffuse rural, Bicester Town , the M40); and
- For reasons of distance (the SSSIs are situated at least 5.5 km from the Site) such that any likely significant effects are likely to be largely attenuated over that distance.

9.4.5 On this desk-based appraisal, it is considered that both SSSIs can be scoped out of detailed consideration as part of the EclA because it can be reasonably determined, as demonstrated by the coarse ('high') level screening above, that the likely significant effects (if at all) upon these two SSSIs from water quality/quantity effects associated with the Proposed Development are likely to be negligible. This approach is consistent with Natural England's recent Scoping Opinion<sup>3</sup> supplied to David Lock Associates which states that the proposal "...does not appear, from the information provided, to affect any nationally designated geological or ecological sites (Ramsar, SPA, SAC, SSSI, NNR)..."

#### **Non-Statutory Designations**

9.4.6 The study area lies within the Ray Conservation Target Area (CTA), which covers the eastern extent of the Site (see **Figure 9.3**). CTAs in Oxfordshire were identified as the areas in which BAP habitat targets are to be delivered. At a landscape scale CTAs aim to link areas of BAP habitat, restore biodiversity at a landscape scale and allow wildlife to adapt to climate change through the creation and restoration of ecological corridors. The Ray CTA covers an area of 1192ha situated within the alluvial floodplain of the River Ray and extends to include areas of Buckinghamshire as well as Oxfordshire. The primary biodiversity interests supported within the Ray CTA include lowland meadow, wet grassland/floodplain grazing marsh, hedgerows, ponds and true fox sedge. The CTA covers a wide range of land uses including extensive areas of intensive agricultural land considered of negligible ecological interest. CTAs are therefore not considered to warrant inclusion within the EclA as a VER given the nature of the current arable use of the Site and the Ray CTA has been scoped out accordingly.

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<sup>3</sup> Cherwell District Council. *Scoping Opinion West Nov 2014*. Reference Number RH/14/00009/SCOP

The potential for the Proposed Development to contribute, or otherwise, towards the 2015 BAP habitat targets specified for the Ray CTA through proposed habitat creation/enhancement measures is however considered within the mitigation section of the EclA.

9.4.7 Gavray Drive Meadows LWS (see **Figure 9.3** for designation) lies within the centre of the Study Area but does not include any land within the Site. Based on the LWS citation, it is notable for the following:

- Supports lowland meadow which is a UK priority BAP habitat;
- Supports reed bunting (*Emberiza schoeniclus*), song thrush (*Turdus philomelos*), bullfinch (*Pyrrhula pyrrhula*), linnet (*Carduelis cannabina*) and great crested newts (*Triturus cristatus*) which are UK Priority BAP species;
- Supports the nationally scarce ground beetle (*Bembidion gilvipes*); and
- Supports Birds of Conservation Concern, namely: bullfinch, reed bunting, song thrush, yellow hammer (*Emberiza citrinella*), linnet, dunnock (*Prunella modularis*) and willow warbler (*Phylloscopus trochilus*).

9.4.8 Three other LWSs lie within 2km of the Site, namely:

- Graven Hill – which lies approximately 2km to the south west of the Site, is notable for its woodland habitat and the species that it supports, namely grasshopper warbler (*Locustella naevia*) and willow warbler (*Phylloscopus trochilus*), and a number of ancient woodland indicator species;
- Bicester Airfield – which lies approximately 1.6km to the north of the Site and is designated due to areas of species-rich grassland; and
- Meadows NW of Blackthorn Hill – which lies approximately 1.5km to the south east of the Site and is designated due to meadow habitat.

9.4.9 In addition to the above, the south-east corner of Bure Park LNR lies approximately 2km to the north-west of the Site, and is designated for its grass meadow, young broad leaved woodland, hedgerows and scrub habitats.

9.4.10 The following ‘Proposed Local Wildlife Sites and Extensions’ are also located within 2km of the Site:

- Bicester Airfield Proposed Extension – a proposed extension to the aforementioned Bicester Airfield;
- Skimmingdish Lane Fields - There is little information on this area although it includes rough grassland on old allotments, and was previously part of the proposed Bicester Airfield Site; and
- Jarvis Lane – a linear strip of trees and shrubs along a public right of way in Bicester, with a good range of woody species and a species-rich hedgerow. The site may also have value for birds.

9.4.11 Gavray Drive Meadows LWS is situated immediately beyond the eastern boundary of the Site and owing to its proximity requires consideration within an EclA as a VER of county value. The remaining non-statutory designations discussed above are not considered to be affected by the Proposed Development and would be scoped out of an EclA as a VER owing to their spatial separation and/or lack of ecological connections with the Site.

#### **Habitats**

9.4.12 A full description of the habitats present within the study area is set out in **Appendix 9.1**. Those habitats found and described within the Site include the following:

- Arable;
- Broadleaved woodland (linear);
- A single hedgerow;
- Scattered scrub;
- Tall ruderal;
- Langford Brook; and
- Trees

9.4.13 These habitats are of limited extent, species-poor composition and considered of negligible ecological value (site value or lower) and therefore not considered to constitute a VER in their own right. Impacts and mitigation require further consideration in the context of biodiversity loss/gain within these habitats, in order for the Proposed Development to remain compliant with national planning policy which advocates the provision of net gains to biodiversity (NPPF), and will therefore be addressed through habitat creation and enhancement.

- 9.4.14 Those habitats present within the Site which are considered of sufficient ecological value to warrant inclusion as VERs within the EclA are limited to Langford Brook and trees.
- 9.4.15 Langford Brook is a wet stream flowing north to south through the western centre of the Study Area, located along the eastern boundary of the Site. The Brook supports steep sided banks with associated scrub, tall, coarse grasses and tall ruderal vegetation. The Brook is tree lined along its eastern boundary by mature to semi-mature trees comprising predominantly oak and willow. The Brook is considered of local ecological value.
- 9.4.16 In addition to the above, Langford Brook is adjoined by a number of semi-mature to over-mature trees, some of which are subject to Tree Preservation Orders (TPOs), as detailed in full in the Arboricultural Assessment (Chapter 10). Many of these trees associated with the Brook are located outside of the Site but are considered in this Chapter due to the potential for effects arising from the Proposed Development. The trees comprise historical pollarded crack willow and ash trees, which are considered of intrinsic value, and are of potential value to roosting bats and nesting birds. Trees are collectively considered of local ecological value.
- 9.4.17 The value of those notable habitats above (Langford Brook and trees), together with other habitats within the Site which do not constitute VERs, to protected species is discussed within the species sub-sections below.

#### **Protected and /or Notable Species**

- 9.4.18 As set out previously, information on protected and/or notable species within or near the study area was collected through a desk study and a range of field surveys. The findings of these investigations are set out in full in **Appendix 9.1**, and are summarised below.

#### **Bats**

- 9.4.19 The 2013 updated desk study returned few records of bats within 2km of the study area. Records included a single record of common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auritus*), and three records of *pipistrelle* sp., none of which were from within the Site.

#### *Bat Roosting in Trees*

9.4.20 The day-time assessment of trees identified five trees with potential to support roosting bats located within or immediately adjacent to the Site. Of these trees there is one medium potential tree and four low potential trees located immediately to the east of Langford Brook with crown spread into the Site. These trees required further consideration within the EclA owing to the potential for the Proposed Development to result in adverse effects to bats potentially roosting within these trees. No conclusive evidence of roosting bats was encountered in any of the trees during the daytime assessments. Full results are provided within **Appendix 9.1**.

#### *Bat Foraging/Commuting Activity*

9.4.21 Information on bat foraging/ commuting activity within the Study Area was collected through the course of manual transect surveys undertaken between June to August 2013, as discussed in full in **Appendix 9.1**.

9.4.22 Within the Site low levels of foraging/commuting activity by the following species was recorded: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and *myotis sp.* Foraging/commuting habitats within the Site are limited to the thin band of broadleaved woodland along the southern boundary and the tree lined Langford Brook at the eastern boundary. The species assemblage and significantly low activity levels recorded is considered typical of an urban edge site subject to high levels of artificial light illumination of habitats.

9.4.23 In summary, the overall bat assemblage is considered to be of no more than local value.

#### **Birds**

9.4.24 Relatively few records of birds were returned by TVERC during the course of the desk study. Records of the following species were returned from within the Study Area including the Red Listed common songthrush and Amber Listed kestrel, green woodpecker, dunnock, common whitethroat and kingfisher. In addition to those records directly from the study area, records of Red List species pertinent to those habitats supported by the study area include the Red Listed grasshopper warbler, and Amber Listed willow warbler and common bullfinch.

9.4.25 The ornithological interest across the study area was assessed through 6 winter bird surveys undertaken monthly between October 2013 and March 2014 and a full breeding bird survey (comprising three survey visits) undertaken in spring 2013

*Wintering birds*

9.4.26 During the course of wintering bird surveys undertaken throughout the study area, a total of 42 species of bird were recorded, as discussed in full in **Appendix 9.1**.

9.4.27 However, with regards to those species of note within the Site, the arable field which largely comprises the entirety of the Site supported foraging flocks of redwing, black headed gull and pied wagtail.

9.4.28 Overall, the winter bird assemblage is considered to be relatively typical of an urban edge locality in lowland England being biased towards common generalist resident species and common winter migrants. None of the species recorded are considered to be of significant ecological value at more than a site to local level.

*Breeding birds*

9.4.29 A total of 37 species of bird were recorded within the study area during the three breeding bird survey visits, of which only 25 species were recorded in the Site. Of those 25 species, 13 (i.e. 52%) were confirmed as breeding or possibly breeding, based on the behaviour that they exhibited during the survey visits, with the other species only using the Site as a foraging resource.

9.4.30 The assemblage of birds consisted predominantly of common resident passerines such as wren (*Troglodytes troglodytes*), robin (*Erithacus rubecula*) and blackbird (*Turdus merula*) alongside three summer migrants: common whitethroat (*Sylvia communis*), black cap (*Sylvia communis*), black cap (*Sylvia atricapilla*) and chiff-chaff (*Phylloscopus collybita*).

9.4.31 Only five species of conservation concern, in terms of being listed as UK BAP Priority Species or Red/Amber Listed Species of Conservation Concern, were recorded in the Site including the following Amber listed species: dunnock (*Prunella modularis*), common whitethroat and stock dove (*Columba oenas*), and the following Red listed species: starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*). The following three species were all recorded foraging on the Site on just one occasion throughout the survey visits: stock dove, starling and house sparrow. One pair of dunnock and common whitethroat were confirmed breeding on Site.

9.4.32 In terms of habitats of value to breeding birds within the Site (excluding wintering birds which are discussed above) these are limited to the thin band of broadleaved woodland along the southern boundary of the Site, the single hedgerow (H2) running north to south running the western extent of the Site and the tree-lined Langford Brook.

*The overall bird assemblage*

9.4.33 The assemblage of bird species recorded within the Site is considered to be typical for the range and quality of habitats present, and for its geographic and topographic location. The wintering bird assemblage recorded within the Site is not considered to be of any greater value than at the site level. However the overall bird assemblage is considered to be of local value. It is considered that any avoidance, mitigation or compensation measures applied to birds will provide ecological protection and enhancement to breeding birds and wintering birds. As such, birds are collectively considered as a VER of local value within the EclA.

**Great crested newts**

9.4.34 The updated desk study returned 9 records from 2003 of great crested newts from a location at pond P9 (see **Figure 9.2**). The records include observations of up to 29 females and 69 males indicating a medium population present within the pond.

9.4.35 Detailed great crested newt surveys have been undertaken of ponds within, and surrounding, the study area on a number of years since 2002 (including in 2002, 2004, 2010, 2012 and 2013). The surveys have confirmed the presence of great crested newts within the study area in every year surveyed. Most recently (spring 2013) a peak count of 105 individuals was recorded across the ponds within the Study Area representing a large population present. Full details of great crested newt surveys undertaken in the Study Area are provided within **Appendix 9.1**.

9.4.36 However, the Site supports no aquatic habitats suitable of supporting great crested newts, and terrestrial habitats are sub-optimal and limited to arable and periphery trees and scattered scrub. The Site is situated beyond 250m of any confirmed breeding pond located to the east of Langford Brook and therefore lies outside of the range of core terrestrial habitat surrounding those ponds.

9.4.37 The Site is partially separated from terrestrial habitat beyond the eastern boundary by Langford Brook, although it is accepted that the brook does not present a permanent



physical barrier to dispersal. Terrestrial habitat beyond the southern and eastern boundary of the study area is separated from the Site by Gavray Drive Road and the A441 Charbridge Lane. However, it is expected that great crested newts would transverse these roads, and reside within the area of land to the east of Langford Brook where breeding ponds have been confirmed.

9.4.38 In view of the above, it is considered highly unlikely that great crested newts would migrate/reside within the Site, and the species has been scoped out as a VER from the EclA.

9.4.39 However, given the future land use and management of the Site as a result of the Proposed Development its future suitability and so use of the Site for great crested newts during the construction period cannot be entirely ruled out. Further consideration, in respect of the legislation pertaining to the protection of great crested newts and their habitats, is therefore required for the construction period along with suitable precautionary avoidance and mitigation measures as necessary.

### **Reptiles**

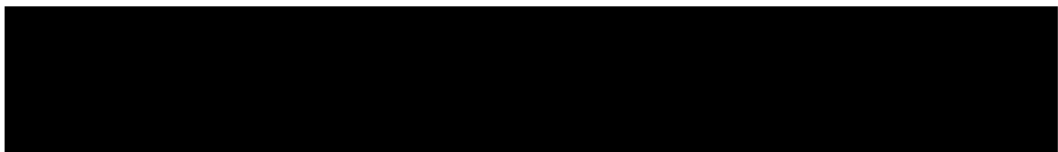
9.4.40 No records of reptiles were returned by TVERC during the 2013 updated desk study.

9.4.41 Reptile surveys undertaken throughout the study area (east of Langford Brook) confirmed the presence of common lizard (*Zootoca vivipara*) and grass snake (*Natrix natrix*) as discussed in full in **Appendix 9.1**.

9.4.42 The Site is not considered to support habitats suitable for widespread reptile species owing to the dominance of intensive arable and it is therefore considered that reptiles are not likely present and would be scoped out as a VER from the EclA. However, as discussed previously in relation to great crested newts, the future suitability of the Site, as a result of the Proposed Development, for reptiles cannot be guaranteed and, in respect of the population recorded immediately beyond the eastern boundary of the Site, reptiles warrant further consideration including the provision of suitable precautionary avoidance and mitigation measures to ensure no infringement of relevant legislation.

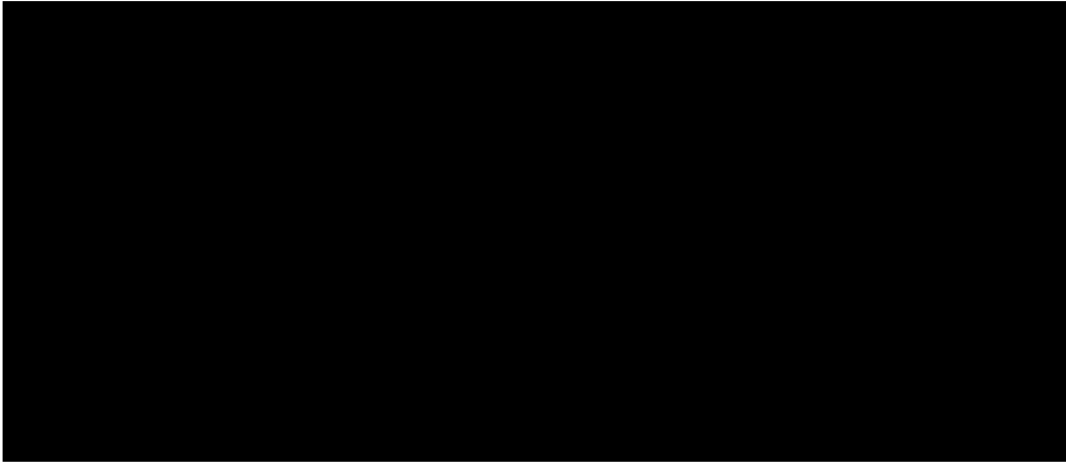
### **Badgers**

9.4.43



9.4.44

9.4.45



***Water vole and otter***

9.4.46 The 2013 desk study returned four records of water vole within 2km of the study area, the nearest record, dated 2000, being immediately north of the Site.

9.4.47 The water vole and otter walkover survey of Langford Brook undertaken in June 2013 recorded no evidence of water vole or otter activity.

9.4.48 In respect of water voles, the Brook is considered unsuitable to support a breeding population owing to the lack of permanent (year round) water and sufficient depth. Furthermore, the banks lack sufficient vegetation cover as a result of heavy shading in areas, thereby reducing the potential of the Brook to support water voles. The Brook was considered to offer some suitable foraging opportunities for otters and opportunities for otters to 'lie up' during the day are present within areas of scrub, woodland and rough grassland located outside of the Site (to the east of the Brook).

9.4.49 Owing to the lack of any direct evidence of water voles and otters, these species would be scoped out as a VER from the EclA.

***Harvest mouse***

9.4.50 No records of harvest mouse were returned by TVERC during the 2013 updated desk study.

9.4.51 The study area supports a large area of suitable foraging and nest-building habitat for harvest mice within tall, unmanaged, rough grassland with a significant scrub interface. During the detailed hand search of the study area a total of four harvest mouse nests were found.

9.4.52 Of these, only one nest was found within the Site, in the south-east corner. Owing to the paucity of suitable habitats within the Site itself, which is dominated by intensive

arable with little rough grassland and scrub, it is considered that nesting and foraging opportunities for harvest mice are significantly limited.

- 9.4.53 On a precautionary basis, the population of harvest mice supported by the Site is considered to be of local value and regarded as a VER requiring further consideration within the EclA.

#### ***White-letter hairstreak***

- 9.4.54 Surveys for white-letter hairstreak within the Study Area comprised eggs searches undertaken during November 2011 and updated in February 2013, an elm tree habitat suitability assessment in 2011, updated in May 2013, and adult searches completed in late June 2013 and mid-end July 2013.
- 9.4.55 The 2011 egg search recorded 25 white-letter hairstreak eggs, 8 eggs were recorded in 2013, within the Study Area. Of those eggs recorded, none are located within the Site.
- 9.4.56 Within the Site, elms are restricted to the hedgerow running north-south through the western extent of the Site (hedgerow H2); 16 elms were identified in this area all of which were considered of moderate suitability during the 2013 elm tree assessment.
- 9.4.57 During the 2013 adult searches, within the Site one adult was recorded within hedgerow H2 on the eastern boundary of field F14.
- 9.4.58 Full details of the survey methodologies and results as discussed above are provided in full in **Appendix 9.1**. In summary, only a single adult white-letter hairstreak sighting has been made, and no eggs recorded, within the Site, although 16 elm trees have been identified which are considered of moderate suitability to support the species. With regards to the above, it is considered that Site supports a population of value at no greater than the local level.

#### **Summary of Valued Ecological Receptors**

- 9.4.59 Based on the baseline ecological information described above (and presented in full in **Appendix 9.1**), a number of VERs requiring full consideration within the detailed Ecological Impact Assessment have been identified, as summarised in **Table 9.4**.

**Table 9.4:** Summary of VERs requiring consideration within the detailed assessment

Type	Receptor	Value	Distance from Application Site
Non-statutory designations	Gavray Drive Meadows LWS	County	Immediately adjacent to the eastern boundary but outside of the Site
Habitats	Langford Brook	Local	The Brook forms the eastern boundary of the Site
	Trees	Local	Located along the eastern boundary of the Site in proximity to Langford Brook, including some trees located immediately off-Site with canopy spread into the Site
Species	Bats	Local	On the Site
	Breeding birds	Local	On the Site
	Harvest mouse	Local	Single nest located within rough grassland/tall ruderal and scrub in south east corner of the Site
	White-letter hairstreak	Local	Single adult recorded in hedgerow H2 on the eastern boundary of field F14 within the Site and presence of 16 elms of moderate habitat suitability

9.4.60 A number of additional ecological receptors, namely great crested newts and reptiles are considered likely to be absent from the Site although this cannot be guaranteed in the future. Therefore, these species require further consideration in relation to potential infringement of wildlife legislation and/or planning policies relating to biodiversity impacts. These are considered further later in this Chapter in respect of the mitigation strategy.

#### **The projected future baseline**

9.4.61 It is anticipated that if the Proposed Development did not proceed, the Site would remain under arable land use offering little opportunities for biodiversity. The limited

extent of habitats available would be unexpected to change, and no biodiversity enhancements likely to arise in the absence of funded development of the Site.

## 9.5 LIKELY SIGNIFICANT EFFECTS

### Introduction

9.5.1 An assessment of likely significant effects of the Proposed Development on the ecological receptors identified above has been undertaken based on the Parameter Plans, which incorporate 'inherent' mitigation included as a result of an iterative assessment and design process. The likely effects are assessed with the inherent mitigation included, but in the absence of the additional mitigation measures required to address potentially significant effects.

9.5.2 Anticipated effects during the construction and post-completion stage of the Proposed Development are discussed in turn below.

### Construction stage

9.5.3 Generalised effects which could arise as a result of the construction of the Proposed Development in absence of mitigation include the following:

- Effects of direct habitat loss, damage and degradation due to land take upon habitats and species;
- Impacts of noise, light and human disturbance to species; and
- Pollution of groundwater and surface water flows, as further identified and evaluated in **Chapter 13 - Water Resources**.

### Non-statutory designations

9.5.4 Likely significant air quality effects arising from the construction of the Proposed Development on Gavray Drive Meadows LWS include construction dust emissions, which could if present in significant quantities/volumes have a detrimental effect on flora and fauna associated with the LWS. The Air Quality chapter of this EIA (see **Chapter 6**) has addressed the potential for adverse air quality effects during the construction period and concluded that, subject to the adoption of mitigation measures outlined in **Chapter 6**, that the residual significance of potential effects from all dust generating activities is not significant.

9.5.5 No significant effects on Gavray Drive Meadows LWS are therefore expected to arise during the construction period of the Proposed Development.

## Habitats

### *Langford Brook*

- 9.5.6 The Proposed Development may result in potential adverse hydrological effects pertaining to silt laden run-off/pollutants entering Langford Brook via changes to the quality and quantity of surface water run-off entering the watercourse. The effect is considered to be inherently mitigated through the provision of a development buffer via the Public Open Space (POS) proposed along the eastern boundary of the Site. In the absence of further mitigation, potential hydrological effects are considered indirect minor adverse (temporary) and reversible (site level), and so not significant for the purposes of the Ecological Impact Assessment (EclA).

### *Trees*

- 9.5.7 The Proposed Development has been designed to retain all of the trees within the Site and no direct losses are predicted as a result. Furthermore, the installation of BS5837 Compliant Protective Barrier around the Root Protection Area (RPA) of those retained trees, as recommended within the Arboricultural Assessment, to ensure appropriate protection is afforded to tree roots, is considered inherent mitigation to ensure that no significant adverse effects arise to trees during the construction stage of the Proposed Development.

## Species

### *Bats*

#### *Bat roosting – trees*

- 9.5.8 A total of four trees, including a single medium potential tree and four low potential trees, are located immediately to the east of Langford Brook. Following review of the Parameters Plan, and based on the proposed layout, it is anticipated that the Proposed Development will result in no direct loss to these trees, and as such no significant effect on bats potentially roosting in these trees will arise.
- 9.5.9 In addition, bats potentially roosting in trees along the eastern boundary of the Site are considered to be at potential risk of adverse effects from increased disturbance due to the increased use of artificial lighting during the construction period. Given that the majority of the construction works will be undertaken during daylight hours, the usage

of artificial lighting will likely be limited to the early morning and early evening hours, with greater use occurring during the winter months. In the absence of mitigation, negative effects of lighting on potentially roosting bats are considered an indirect minor adverse (temporary), reversible (site level) effect which is not significant for EclA purposes.

*Bat foraging/commuting*

9.5.10 Areas of the Site supporting foraging/commuting habitats for bats, namely the tree-lined Langford Brook along the eastern boundary and the thin band of broadleaved woodland along the southern boundary as discussed previously, are to be unaffected by the Proposed Development. The Proposed Development will result in no direct loss to these valued foraging/commuting habitats.

9.5.11 Potentially negative effects arising from increased use of artificial lighting during the construction phase, as discussed previously in relation to potentially roosting bats, are considered to apply equally to foraging and commuting bats. The Proposed Development includes for the provision of POS within the eastern extent of the Site which partially inherently mitigates for potential adverse effects on foraging/commuting bats within this area. Furthermore, the buffering of the southern boundary tree line within the Root Protection Area (RPA) of trees is considered to provide a degree of inherent mitigation. In view of the above, the effect of increased use of artificial lighting on foraging and commuting bats is considered likely to result in an indirect minor adverse (temporary), reversible (site level) impact which is not significant for EclA purposes.

*Birds*

9.5.12 In view of the inherent mitigation measures reflected in the retention of notable habitat features within the design layout, including the thin band of broadleaved woodland along the southern boundary and Langford Brook along the eastern boundary, the loss, damage and degradation of potential bird nesting and foraging habitats during construction will be restricted to arable and small losses of hedgerow habitat, as is evident from the Parameters Plan. These effects are considered to be of low magnitude and would constitute a minor adverse (temporary to permanent) effect (site level) which is not significant for EclA purposes.

9.5.13 The disturbance of nesting and foraging habitat for breeding birds through light spill, noise, visual and human disturbance during construction are likely to have an effect at no more than the site level owing to the limited availability of suitable habitats within



the Site. The effects are considered temporary and minor adverse (site level) and so not significant for EclA purposes.

- 9.5.14 The legal protection afforded to birds at the nest (their eggs and young) is considered inherent mitigation to ensure no effects relating to direct harm arise in respect of the breeding bird assemblage (including woodland birds).

*Harvest mouse*

- 9.5.15 Evidence of harvest mice has been recorded within the wider study area and within the south east corner of the Site through the discovery of harvest mouse nest(s). It is anticipated that the construction of the Proposed Development could result in the direct harm to harvest mice if construction activities are carried out within areas of rough grassland, tall ruderal and scrub identified within the south east corner of the Site. Similarly, construction within these areas could result in the loss, damage and degradation to harvest mouse nesting and foraging habitats. The potential harm to harvest mice and the loss, damage and degradation of harvest mouse habitats is considered a direct, minor (permanent) adverse effect at the site level which is not significant for EclA purposes.

*White-letter hairstreak*

- 9.4.62 Only a single adult white-letter hairstreak sighting has been made (within hedgerow H2; see **Figure 9.2**), and no eggs recorded, within the Site. The Parameters Plan indicates that this hedgerow H2 will be lost, resulting in the loss of habitat confirmed to support white-letter hairstreak. Habitat loss is considered a minor adverse (permanent) effect at the site level, and so not significant for EclA purposes.

**Post-completion stage**

- 9.5.16 Generalised effects which could arise as a result of the operation of the Proposed Development during the post-completion stage, in the absence of mitigation, include the following:

- Recreational pressures;
- Effects of light and noise/visual/human disturbance to habitats and species;
- Increased risk of collision to species arising from increased traffic movements;

- Increased levels of airborne pollutants due to emissions of nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and dust (see Chapter 6 – Air Quality) and
- Alteration of surface water and groundwater flow quality and quantity.

### **Non-statutory designations**

9.5.17 It is considered that during the post-completion stage of the Proposed Development Gavray Drive Meadows LWS is at risk of potential adverse effect as a result of increased recreational pressure resulting from increased housing provision. Increased recreational pressure has the potential to damage and degrade valuable ground flora and trees through trampling and littering, and disturb associated fauna occurring within the LWS including birds, great crested newts and reptiles. The effects of increased recreational pressure as discussed above are considered to have been partially inherently mitigated through the open space provision shown on the submitted Parameter Plan. The resulting effect is considered to be minor adverse (permanent) and of significance at the local level.

9.5.18 Likely significant air quality effects arising during the post-completion stage of the Proposed Development on Gavray Drive Meadows LWS include emissions of nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and dust emissions generated by additional traffic travelling to and from the proposed development, which could if present in significant quantities/volumes have a detrimental effect on flora and fauna associated with the LWS. The Air Quality chapter of this EIA (see **Chapter 6**) has addressed the potential for adverse air quality effects during the post-completion stage of the Proposed Development and concluded that, subject to the adoption of mitigation measures outlined in **Chapter 6**, that the residual significance of potential air quality effects is not significant.

### **Habitats**

9.5.19 During the post-completion stage of the Proposed Development, retained habitats are at risk of damage, disturbance or deterioration as a result of the increased residential population, potentially resulting in inappropriate recreational use and inappropriate management of habitats. Such effects are applicable only to those habitats retained, which is limited to the broadleaved woodland along the southern boundary, Langford Brook and associated trees. The effects are considered to be indirect, minor adverse (temporary to permanent) (site level) and so not significant in terms of EclA purposes.

- 9.5.20 Furthermore, Langford Brook is at risk of potential adverse effects resulting from hydrological impacts resulting from changes in water quality due to surface run-off/pollutants entering the water course. The Parameter Plans include a degree of inherent mitigation through the provision of 2 ha. undeveloped Public Open Space (POS) within the eastern extent of the Site, adjacent to Langford Brook.
- 9.5.21 The effect of the Proposed Development on Langford Brook post-completion is thus considered to be an indirect, minor adverse (temporary), reversible effect (site level), not significant for EclA purposes.

### **Species**

#### *Bats*

- 9.5.22 Effects of increased collision risk, light spill and disturbance upon sensitive habitats used for foraging, commuting and roosting during the operational stage of the Proposed Development, in the absence of mitigation, will have adverse (permanent) effects. Such effects are considered of low magnitude owing to the limited extent of suitable habitat available to bats within the Site. Furthermore, these effects have been minimised through inherent buffering afforded to the commuting and foraging habitats present including the broadleaved woodland along the southern boundary and the tree lined Langford Brook. Consequently these effects are considered to constitute minor adverse (permanent) effects (site level) and so not considered to be significant for EIA purposes.

#### *Birds*

- 9.5.23 Retained habitats supporting breeding and foraging birds are potentially at risk of disturbance and damage during the operational phase of the Proposed Development, and an increase in domestic cats and dogs in the vicinity would increase the risk of predation and disturbance of birds. These effects are considered to constitute minor adverse (permanent) effects (site level) and so not considered to be significant for the purposes of the EclA.

#### *Harvest mouse*

- 9.5.24 As discussed previously in relation to likely significant effects on breeding birds, an increase in domestic cats and dogs as a result of the Proposed Development could increase the risk of predation and disturbance to harvest mice. This effect is considered

to constitute a minor adverse (permanent) effect (site level) and so not considered to be significant for the purposes of the EclA.

*White-letter hairstreak*

9.5.25 No significant effects on white-letter hairstreak are anticipated during the operational phase of the Proposed Development.

## 9.6 MITIGATION MEASURES

- 9.6.1 Owing to the limited ecological value of the Site, the VERs identified and the proposed layout and inherent mitigation incorporated into the Illustrative Masterplan, adverse effects have been avoided or are not considered significant, such that further mitigation would not be required for the purposes of Ecological Impact Assessment.
- 9.6.2 However, in order to ensure compliance with relevant nature conservation legislation and relevant planning policy, both national and local, further mitigation is required to avoid or reduce in severity potential adverse effects, not all of which can be achieved through inherent mitigation alone. This section therefore describes those measures to avoid, mitigate or compensate for adverse effects on VERs, which are capable of being delivered at the detailed design stages.
- 9.6.3 In addition, habitat creation/enhancement measures are detailed within the mitigation section which are considered to contribute towards the 2015 BAP targets for the Ray Conservation Target Area (CTA).

### **Construction stage**

- 9.6.4 All necessary surveys are considered current at the time of submission, however where relevant and depending on development timescales and phasing, certain detailed species surveys may require updating prior to commencement of the relevant phase of development. The findings will be used to inform the measures set out below.
- 9.6.5 Detailed measures to protect habitats and species during the construction phase will be set out in an Ecological Construction Method Statement (ECMS) which it is anticipated would be secured through an appropriately worded pre-commencement condition attached to planning consent. The ECMS will cross reference the Arboricultural Method Statement (AMS), also prepared at the post-outline consent stages. The ECMS will incorporate details provided within the Arboricultural Assessment prepared along with this outline planning application (see **Chapter 10 - Arboriculture**).
- 9.6.6 An Environmental Clerk of Works (ECW) will be identified by the Developer to implement the ECMS prior to and during the construction phase.

### **Habitats**

- 9.6.7 The ECMS will contain measures to ensure that valued habitats retained within the Site which includes the broadleaved woodland along the southern boundary, Langford Brook and any associated trees are fully protected during construction activities.
- 9.6.8 Measures will include the establishment of Ecological Protection Zones (EPZs) within the Proposed Development layout, protected by fencing and signage to prevent activities such as the incursion by vehicles or personnel, fires and stockpiling of materials.
- 9.6.9 Indirect hydrological effects on Langford Brook will be further addressed through the adhering to Environment Agency Pollution Prevention Guidelines (PPGs), namely PPG1 'General guide to the prevention of pollution'ii, PPG5 'Works and maintenance in or near water'iii, PPG6 'Pollution prevention guidance for working at construction and demolition sites'iv and PPG21 'Pollution incident response planning'v to ensure that detrimental effects on the watercourse as a result of surface run-off, spillage and pollution arising throughout the construction phases are avoided. Implementation of best practice will also be incorporated into the detailed design stage so as to ensure that any discharge of surface water into the natural environment is of acceptable levels and quality as detailed further in Chapter 13 – Water Resources.
- 9.6.10 The measures above will address construction effects on retained habitats, ensuring that they are reduced to insignificant levels; however, habitat losses will be addressed through new habitat creation during and after construction. This is discussed further under the Completed Development mitigation section further below.

### **Species**

- 9.6.11 Protection of species during construction will be ensured through the provisions of the ECMS. As a general measure aimed at protecting species, "tool box talks" will be provided by a suitably qualified ecologist to the principal contractor appointed by the Developer, for distribution to all employees involved in any enabling works/vegetation clearance, to ensure that identification and protection of the relevant species, their habitats is understood.

9.6.12 In addition to the habitat protection measures described above, which will deliver much of the necessary species protection, further measures to be included in the ECMS for each species group are summarised below. Species VERs are bats, birds and harvest mice, the mitigation measures for which are discussed. In addition, protective measures are required in relation to non-VER species including great crested newts and reptiles, owing to their presence within the wider study area, to avoid potential infringement of legislation relating to these legally protected species.

#### *Bats*

- Retained trees with bat roost potential, or confirmed bat roosts, included within EPZs;
- The restriction of construction activities to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting;
- Update survey of trees with bat roost potential prior to felling or pruning of trees or demolition of buildings, if required, and, if bat roosts are confirmed present, cessation of works until an appropriate strategy is devised and agreed;
- Works may require a Natural England (NE) EPS licence to derogate from the legal protection afforded to bats. In order to obtain a licence NE will need to be satisfied that there will be no detriment to the maintenance of the favourable conservation status of the local bat population; and
- Other retained trees and/or proposed new buildings would provide ample opportunity to provide replacement roosting habitat to mitigate any losses.

#### *Birds*

- Retained nesting habitats included within EPZs; and
- Removal of potential nesting habitat will be undertaken outside the bird breeding season (namely March-August) unless a detailed survey by a suitably experienced ecologist has confirmed that no nests are present in the affected area immediately prior to works commencing.

*Harvest mouse*

- Retained habitats suitable for nesting and foraging harvest mice, namely the small area of rough grassland, tall ruderal and scrub habitat included within the south-east corner of the Site to be included within EPZs; and
- Where removal of vegetation considered suitable for harvest mouse nesting and/or foraging is required, this should be undertaken in mid-late Autumn to avoid the harvest mouse breeding season and the late winter to early spring period when populations are at their lowest<sup>vi</sup>. Vegetation clearance should be undertaken under supervision from an ECW and should allow for the phased clearance of vegetation working away from the construction area.

*Great crested newts*

- Owing to the presence of great crested newts within the wider study area, precautionary measures to avoid harm should be adopted during any vegetation clearance required within the Site;
- Vegetation clearance should include for the phased clearance of vegetation, with vegetation cut in intervals (to approximately 150mm above ground initially) with cut material removed from site, followed by fingertip searches for great crested newts by an ECW, followed by further clearance to approximately 50mm above ground with all cuttings removed from site;
- Follow vegetation clearance the sward within the Site should be maintained at a height of approximately 50-100mm to discourage the future dispersal of great crested newts into the Site;
- Vegetation clearance should be completed under supervision from an ECW;
- As a precaution to prevent dispersal of great crested newts into the Site from the wider study area (east of Langford Brook), exclusion fencing should be installed along the eastern boundary of the Site;
- The exclusion fencing should follow the installation guidelines provided within the English Nature (Natural England) great crested newt mitigation guidelines<sup>vii</sup> and should be installed by a suitably experienced ecological contractor under supervision by an ECW; and
- Such procedures will be set out within the ECMS.



### *Reptiles*

- Owing to the presence of a large population of common lizards, and a small population of grass snakes, within the wider study area (east of Langford Brook) vegetation clearance should include precautionary measures to avoid potential harm to mobile reptiles;
- Vegetation clearance should be completed through a phased clearance operation under supervision from an ECW as discussed above;
- Follow vegetation clearance the sward within the Site should be maintained at a height of approximately 50-100mm to discourage the future dispersal of reptiles into the Site;
- To further minimize the potential dispersal of reptiles into the Site from the wider study area (east of Langford Brook) exclusion fencing should be installed along the eastern boundary of the Site as discussed above. Exclusion fencing should be of a design suitable for the exclusion of both reptiles and great crested newts; and
- Such procedures will be set out within the ECMS.

### **Post-completion stage**

- 9.6.13 A Landscape Ecology and Arboricultural Management Plan (LEAMP) will be developed to ensure the long-term conservation of retained and new valued environmental resources, including habitats and species of ecological value.
- 9.6.14 It will be necessary for the LEAMP to be developed in detail prior to the initiation of the construction phase. It will also be necessary, prior to the construction phase, to identify the implementation responsibilities of the management plan.
- 9.6.15 The LEAMP will include detailed measures covering the establishment phase up to 5-years after commencement of the Proposed Development, with objectives and principles set out covering the long-term management. Monitoring of the effects of the implemented measures will form the basis for any revision of the scheme after five years. The Developer will provide a financial contribution for the long-term implementation of the LEAMP secured via a legal agreement.
- 9.6.16 The LEAMP will incorporate adoption of an approved Arboricultural Method Statement (AMS) incorporating best practice guidance set out in British Standard

5837: 2012 Trees in Relation to Design, Demolition and Construction which will ensure retained trees and other vegetation are not adversely affected during the construction process.

### **Non-statutory designations**

9.6.17 The severity of the potential effect of increased recreational pressure on Gavray Drive Meadows LWS is partially reduced owing to inherent mitigation through open space provision incorporated into the Proposed Development as shown on the Illustrative Masterplan. However, such effects will be reduced further at the detailed design stage of the Proposed Development through the appropriate management and design of areas of informal and formal open space, delivered through the LEAMP, such that they are multifunctional, so as to attract recreational usage itself without being detrimental to potentially sensitive habitat and species enhanced or created adjacent.

### **Habitats**

9.6.18 Owing to the limited extent of valued habitats within the Site, the LEAMP will focus on the establishment and maintenance of new habitats of long-term ecological value within the Proposed Development's open space provision, to provide net gains to biodiversity. These measures are summarised below.

#### *Trees*

- Ongoing viability and safety of tree stock on-site maintained including arboricultural inspections in accordance with industry best practice undertaken on an annual cycle, as specified within the 'Arboricultural Assessment' included within Chapter 10 - Arboriculture;

#### *Hedgerows*

- New native species-rich hedgerow planted within the Proposed Development's open spaces;
- Hedgerows to include a high proportion of elm to provide future habitat opportunities for white-letter hairstreak butterflies; and
- Once established new hedgerows are to be trimmed on a rotation which allows plants to develop flowers and fruit in order to enhance the wildlife value of the hedgerow.

#### *Ponds*

- Creation of swales/attenuation features within the Proposed Development's open space to provide aquatic habitat suitable for a range of species including bats, birds, great crested newts, aquatic invertebrates, dragonflies, damselflies and flying insects.

#### *Grassland*

- Creation of rough, tussocky grassland within open space provision to encourage great crested newt dispersal into the Site and to link existing breeding ponds east of Langford Brook to new SuDS provision, and to provide basking, foraging and sheltering opportunities for reptiles;
- Rough, tussocky grassland to be managed to allow the establishment of tall grasses with a dense litter layer to provide nesting opportunities for harvest mice; and
- Sowing of new species-rich grassland in open spaces and surrounding attenuation features, managed to benefit bats, reptiles, amphibians and invertebrates.

9.6.19 Potential adverse hydrological effects on Langford Brook will be addressed through the incorporation of a Sustainable Drainage System (SuDS) within the Public Open Space (POS) provision as illustrated on the Parameters Plan. This will include an attenuation feature(s) which will not only ensure the rate of surface water run-off from the Proposed Development matches current levels, but will also intercept pollutants before otherwise being discharged into Langford Brook. The LEAMP and/or Landscaping Scheme for the Proposed Development will detail suitable planting and management for the attenuation feature(s), which will enhance their ecological value and effectiveness at intercepting surface run-off.

#### **Species**

9.6.20 As described above, the LEAMP for the Proposed Development will include measures to create and enhance habitats of ecological value. These measures will also benefit valued species occurring within the wider study area (east of Langford Brook) through the provision of enhanced opportunities for breeding, refuge, foraging and/or dispersal. In general terms these habitats will be sympathetically managed according to protected species interests as detailed within the LEAMP. Human related disturbance effects will be reduced through the appropriate positioning and clear demarcation of PRoW in addition to the use of strategic structural planting.

9.6.21 Additional species specific measures to minimise operational effects and provide enhanced opportunities for species breeding and refuge will be included within the LEAMP as detailed below.

*Bats*

- Bat roosting features (e.g. bricks and access tiles) will be incorporated into selected new buildings along the eastern boundary of the Site;
- Installation of bat boxes within mature trees located along the eastern boundary of the Site (along Langford Brook) to provide further new roosting opportunities; and
- Detailed lighting proposals for the Site to be submitted at the reserved matters stage, as required by a suitably worded lighting condition attached to the grant of outline planning permission, should be incorporated to ensure that the southern boundary woodland/tree line and retained and new habitats along the eastern boundary are not illuminated to a level where bat activity is deterred.

*Birds*

- Durable bird boxes, comprising a range of designs to suit different species recorded on the Site, will be erected on retained mature trees; and
- Bird nesting features (e.g. swallow/swift ledges and sparrow terraces) will be incorporated into selected new and/or renovated buildings within the Site.

*White-letter hairstreak*

- New native species-rich hedgerow planted within the Site's open spaces (as discussed previously) to include a high density of elm trees to provide a foodplant for the species; and
- Scattered elm trees to be planted within POS provision to provide additional foodplants.

9.6.22 In addition to the above mitigation measures to be delivered via the LEAMP for those VERs included within the assessment, there is significant scope for the Proposed Development to deliver net gains to non-VER species including great crested newts and reptiles, as could be implemented through the provisions outlined below. Such

measures would be deliverable via the detailed Soft Landscaping proposals and LEAMP for the Site:

*Great crested newts*

- New aquatic habitat provision via SuDS within open space in the eastern extent of the site, subject to appropriate detailed design, planting and management; and
- Increase in terrestrial habitat resource quality, and features for shelter, refuge and hibernation within open space via creation of great crested newt hibernaculum and log piles and encouragement of rough, tussocky grassland within grassland.

*Reptiles*

- Terrestrial habitat enhancement to provide increased foraging, sheltering and hibernating resources via creation and management of rough, structurally complex grassland and installation of suitable deadwood habitat and hibernaculum as discussed above in relation to great crested newts.

## 9.7 RESIDUAL EFFECTS

### Construction stage

- 9.7.1 Subject to the mitigation measures outlined above, residual effects anticipated during the construction phase have been reduced to levels that are not considered to be significant.

### Post-completion stage

- 9.7.2 In light of the mitigation proposed, all potential effects on the VERs identified within the assessment are considered not to be significant. Furthermore, mitigation measures to be delivered via the Soft Landscape proposals and LEAMP will result in a minor beneficial (site level) effect owing to habitat creation and restoration, and new habitat creation, provided.

### Summary of effects

- 9.7.3 A summary of the residual effects during construction and after completion is provided in **Table 9.5**.

**Table 9.5: Summary of effects**

VER	Geographical Value	Potential effect	Nature of Effect	Significance pre-mitigation (Major/moderate/minor) (Beneficial/adverse/negligible) (Geographic scale)	Mitigation/ enhancement measures	Significance of residual effect (Major/moderate/minor) (Beneficial/adverse/negligible) (Geographic scale)
<b>Construction stage</b>						
<i>Habitats</i>						
Langford Brook	Local	Indirect hydrological effects on quality/quantity of surface water run-off	Temporary	Minor adverse (Site)	Indirect scheme design – development buffer via POS provision along eastern boundary	Negligible
Trees	Local	Damage and degradation caused by incursion of construction vehicles, plant and machinery within RPAs.	Temporary to permanent	Minor adverse (Site)	ECMS – protection of retained habitat through establishment of EPZs. LEAMP - ongoing maintenance of tree stock viability	Negligible
<i>Species</i>						
Bats	Local	Direct loss of roosting habitats in trees with confirmed bat roosts, or potential to support roosting bats	Permanent	Negligible (owing to legal compliance)	ECMS and AMS – protection of retained trees. EPS licence– protection of bats during habitat losses and provision of replacement roosting habitat	Negligible

		Disturbance of trees with potentially roosting bats via increased levels of artificial lighting	Temporary	Minor adverse (Site)	ECMS – sensitive working hours, construction methods and restricted access and lighting	Negligible
		Disturbance of retained foraging/commuting habitats via increased levels of artificial lighting	Temporary	Minor adverse (Site)		Negligible
Breeding birds	Local	Loss, damage and degradation of arable and hedgerow foraging/nesting habitat	Temporary to permanent	Minor adverse (Site)	ECMS – protection of retained habitat; LEAMP and Landscaping Scheme – new habitat creation and long-term management	Negligible
		Increased light spill, noise, visual and human disturbance of foraging/nesting habitat	Temporary	Minor adverse (Site)	ECMS – sensitive working hours, construction methods and restricted access and lighting	Negligible
		Direct harm	Permanent	Negligible (subject to legal compliance)	ECMS – sensitive timing and methods of habitat clearance	Negligible
Harvest mouse	Local	Direct harm, loss, damage and degradation of suitable foraging/nesting habitats	Permanent	Minor adverse (Site)	ECMS – protection of retained habitat; LEAMP and Landscaping Scheme – new habitat creation and long-term management	Minor beneficial (Site)
White-letter hairstreak	Site	Direct loss of hedgerow habitat confirmed to support white-letter hairstreak	Permanent	Minor adverse (Site)	LEAMP and Landscaping Scheme – new habitat creation and long-term management	Negligible
<b>Post-completion stage</b>						
<i>Non-statutory designations</i>						



Gavray Drive LWS	County	Potential for proportional increase in formal/informal recreational use of the Local Wildlife Site resulting in impact to habitat present	Permanent	Minor adverse (Site)	Inherent Scheme design – open space provision, and LEAMP – management of informal and formal open space	Negligible
Habitats		Potential for proportional increase in formal/informal recreational use of the Local Wildlife Site resulting in impact to habitat present	Permanent	Minor adverse (Site)	LEAMP & Landscaping Scheme – enhancement of habitats to increase resilience to disturbance effects, and establishment and maintenance of new habitats of ecological value within green open space provision	Negligible
		Hydrological effects including changes in water quality due to surface run-off/ pollutants entering Langford Brook	Temporary	Minor adverse (Site)	SuDS provision within Public Open Space, and LEAMP/ Landscape Scheme to ensure suitable planting and management of receptors to control surface water run-off and intercept pollutants	Negligible
<i>Species</i>						
Bats	Local	Increased collision risk, light spill and disturbance on foraging, commuting and roosting habitats	Permanent	Minor adverse (Site)	LEAMP & detailed design – to incorporate appropriate buffers along retained habitats, new habitat creation.  Detailed Lighting Scheme – avoid illumination of key habitats	Negligible
Breeding birds	Local	Disturbance/damage of nesting and foraging habitats, and increased predation, caused by	Permanent	Minor adverse (Site)	LEAMP and Landscaping Scheme – new habitat creation and long-term management of	Negligible

		increased residential and domestic pet population			retained and new breeding habitats	
Great crested newts	District (within Study Area)	Nil	N/A	N/A	LEAMP and Landscaping Scheme – new terrestrial and aquatic habitat creation and habitat restoration/ enhancement	Minor beneficial (Site)
Reptiles	District (within Study Area)	Nil	N/A	N/A	LEAMP and Landscaping Scheme – new terrestrial habitat creation and habitat restoration/ enhancement	Minor beneficial (Site)

## **9.8 CUMULATIVE EFFECTS**

9.8.1 The schemes to be considered in the cumulative assessment include the Proposed Development along with other committed developments (i.e. operational, those that have already begun construction, those that have not been commenced but have a valid planning permission and those schemes which are in the planning process). The assessment of cumulative effects repeats the assessment process set out above, but considers the potential change caused by all schemes identified for cumulative assessment. Those developments which have been considered for cumulative purposes are set out in Chapter 2. 'Land at Gavray Drive East' requires consideration in respect of ecology.

### **Designated Sites**

9.8.2 In terms of Gavray Drive Meadows LWS increased housing provision as a result of the residential development of Gavray Drive East may give rise to an increase in recreational pressure on the LWS. In the absence of mitigation, the cumulative effect of increased recreational pressure has potential to result in adverse effects on the ground flora and fauna within the LWS. Subject to the provision of suitable Public Rights of Way (PRoW) and informal and formal Public Open Space (POS) within the Proposed Development to facilitate the increased residential population it is considered unlikely that any significant adverse cumulative effects would arise on the LWS.

### **Habitats**

9.8.3 The potential cumulative effect of habitat loss, degradation and damage to valuable tree stock located along the eastern boundary of the Site and the western boundary of the proposed development at Gavray Drive East is considered not to be significant provided that an appropriate buffer to this habitat (free from development, and protected accordingly by fencing and signage) is provided by both of the developments.

9.8.4 Potential adverse hydrological cumulative effects on Langford Brook as a result of changes to surface water run-off quality and quantity caused by the proposed development of Gavray Drive East are considered not significant provided that an appropriate development buffer is afforded to the Brook with the creation of SuDS to attenuate surface water run-off.

### **Species**

- 9.8.5 The proposed residential development on Land at Gavray Drive East has a potential adverse effect on foraging/commuting bats through habitat loss, degradation, fragmentation and disturbance (including visual, noise and light spill) which is anticipated, in the absence of mitigation, to constitute a minor adverse cumulative effect (local) level. Provided that the effect is mitigated for through appropriate green infrastructure provision within the layout of the proposed scheme, which maintains and enhances existing habitat linkages, and that sensitive timing and construction methods which minimize disturbance are employed, the potential effect is considered not to be significant.
- 9.8.6 In addition, a potential adverse cumulative effect on breeding birds through habitat loss, fragmentation and degradation is also anticipated from the proposed residential development on Land at Gavray Drive East. The effect could potentially be significant at the local level. However, it is considered that provided the retention of notable nesting habitats within Ecological Protection Zones (EPZs) and the provision of new habitats through the erection of bird boxes and bird nesting features within retained/new buildings or mature trees is adopted by the proposals, the cumulative effect will not be significant to the overall breeding bird assemblage identified as a VER within the Site.
- 9.8.7 In relation to harvest mice it is considered that the proposed residential development of Gavray Drive East is likely to result in an adverse cumulative effect through habitat loss, degradation and damage, and disturbance from increased numbers of domestic pets. Retention, restoration and creation of tall, unmanaged tussocky grassland interspersed with scrub patches within the proposals for Gavray Drive East would mitigate the potential effect to ensure that the cumulative effect will not be significant upon the overall harvest mouse population present.
- 9.8.8 The proposed development on Land at Gavray Drive East will need to accommodate the retention and planting of elm trees within the development layout to mitigate the potential adverse cumulative effect of habitat loss, damage and degradation to elm trees resulting in negative effects to the white-letter hairstreak butterfly population present within the site. Subject to detailed design and implementation of a suitable Landscaping Scheme to maintain and plant elm trees within open space provision within the proposed layout the potential adverse cumulative effect is considered not to be significant.

### **Cumulative summary**

- 9.8.9 The cumulative proposal evaluated will also need to be designed to accommodate and mitigate ecological interests to fulfil planning policy requirements and thereby inherently protect ecological interests across the wider landscape from cumulative development effects. Owing to the absence of significant residual effects predicted, cumulative effects of the Proposed Development are considered to be extremely unlikely to arise in combination with the proposed residential development at Gavray Drive East.

## 9.9 SUMMARY AND CONCLUSIONS

- 9.9.1 This chapter provides an assessment of the significance and consequences of potential ecological effects upon identified Valued Ecological Receptors (VERs) arising from the Proposed Development. The assessment included a review of the current conditions found within the Site and identifies measures to avoid, mitigate and/or compensate where appropriate for significant effects that may arise. It has been prepared by EDP Ltd as part of an Environmental Statement (ES) that accompanies an outline planning application for the Site with all matters reserved except access.
- 9.9.2 The habitats within the Site are limited in extent and value comprising predominantly intensively farmed arable with a thin band of broadleaved woodland planting along the southern boundary and a single species-poor hedgerow located within the western extent of the Site. These habitats are considered of negligible (low) ecological value in their own right, although have some, albeit limited, potential to support protected species including bats and birds. Some habitats of moderately higher value were identified including Langford Brook, and associated trees, along the eastern boundary of the Site which were considered valuable ecological receptors (VERs). In addition, Gavray Drive Meadows LWS was identified as a VER included within the EcIA owing to its proximity to the Site. Populations of bats, birds, harvest mouse and white-letter hairstreak butterfly occurring within the Site, as identified through baseline ecological surveys, were also included as VERs within the assessment.
- 9.9.3 In the absence of further mitigation measures, predicted effects on local sites, habitats and species have been considered for the periods up to and during demolition/construction, and during the lifetime of the completed development. The assessment concludes that all the predicted effects, in the absence of mitigation, have an site level effect only and are not considered to have a significant effect for the purposes of Ecological Impact Assessment. However in accordance with both legislation and planning policies, measures are identified to mitigate these effects and/or compensate for effects which cannot be fully mitigated.
- 9.9.4 The strategy to mitigate adverse effects during construction includes specific measures to protect features of ecological value which are to be retained within undeveloped open spaces in the Site, but which are at risk of damage or disturbance. In addition, measures are identified to avoid harming species which may be present within habitats that will be cleared during the construction process, through sensitive timings and working methods.

- 9.9.5 The long-term strategy to mitigate adverse effects during the lifetime of the completed development includes for the creation and management of new habitats of ecological value including trees, hedgerows and rough, tussocky grassland thereby creating new opportunities for protected species, to compensate for effects during construction and provide net gains for biodiversity.
- 9.9.6 Overall, through sensitive design and additional mitigation measures proposed, no significant adverse effects on the ecology of the area are anticipated, and there are opportunities for ecological benefits to be delivered as part of the Proposed Development. In particular, the Landscaping Scheme applied to the Proposed Development will allow for the creation of wildflower grassland meadow within the POS provision in the eastern extent of the Site. In respect of the 2015 BAP habitat targets for the Ray Conservation Target Area (CTA), the habitat creation measures within the POS provision, which lies within the CTA, will (subject to detailed design and implementation) provide a contribution towards the target of 5ha creation of Lowland Meadow<sup>viii</sup>. It is concluded that the Proposed Development will result in a positive gain for biodiversity, in accordance with national planning policy.

## FIGURES

**Figure 9.1** Study Area and Site (EDP124\_105a 10 March 2015)

**Figure 9.2** Extended Phase 1 Survey (EDP124\_56c 27 October 2014)

**Figure 9.3** TVERC Designated Sites Map (EDP124\_109 17 November 2014)

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<sup>i</sup> <http://www.cherwell.gov.uk/index.cfm?articleid=9632>. Accessed 09.10.14

<sup>ii</sup> Environment Agency (2013) Pollution Prevention Guidelines: PPG1. Understanding Your Environmental Responsibilities – Good Environmental Practices.

<sup>iii</sup> Environment Agency (2007) Pollution Prevention Guidelines: PPG5 Works and maintenance in or near water.

<sup>iv</sup> Environment Agency (2012) Pollution Prevention Guidelines: PPG6 Working and construction and demolition sites. 2nd Edition.

<sup>v</sup> Environment Agency (2009) Pollution Prevention Guidelines: PPG21 Incident Response Planning

<sup>vi</sup> Creswell, W. J. *et al.* (2012) UK BAP MAMMALS: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

<sup>vii</sup> English Nature (2001) Great crested newt mitigation guidelines. Peterborough.

<sup>viii</sup> Wild Oxfordshire. *Ray CTA (Conservation Target Area)*. Available at <http://www.wildoxfordshire.org.uk/biodiversity/conservation-target-areas/>. Accessed 04.11.14.

SUGGESTIONS FOR GUIDANCE AND LEGISLATION note some duplicate what has been set out in 9.2.11 above but consideration should be given as to what may be relevant and if there are other pieces of guidance that should be listed

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## 10.1 INTRODUCTION

10.1.1 This chapter of the Environmental Statement (ES) has been prepared by the Environmental Dimension Partnership (EDP) on behalf of Gallagher Estates Limited. It considers the likely significant environmental effects of the Proposed Development on trees and hedgerows from an arboricultural perspective. The chapter describes the assessment methodology, the baseline conditions and the likely significant effects of the Proposed Development when viewed in conjunction with the Gavray Drive West Parameter Plan drawing number 001 Rev B. The mitigation measures required to reduce or offset any detrimental impacts are also examined.

10.1.2 This chapter also includes the following Appendices:

- **Appendix 10.1:** Findings of Arboricultural Assessment (Incorporating Tree Protection and Arboricultural Impact Assessment) **Report EDP124\_33a.**

10.1.3 The development comprises an outline planning application for residential development including affordable housing, public open space, localised land remodelling, compensatory flood storage and structure planting.

## 10.2 ASSESSMENT METHODOLOGY

10.2.1 A survey of the trees and hedgerows within and immediately adjacent to the site was undertaken utilising criteria within BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations to assess their suitability and desirability for retention should development proceed.

### Scope

10.2.2 The focus of the survey was to assess the condition of the subject trees and hedgerows, specifically:

- The main bole and central stems;
- The primary and secondary branch system and crown supported thereon; and
- Trees in relation to their surroundings.

### The Study Area

10.2.3 The site is centred on National Grid Reference (NGR) SP 459 222 and falls within the Cherwell District Local Planning Authority area. The site is bounded to the north by the London to Birmingham Chiltern railway, to the east by Langford Brook, to the south by Gavray Drive and to the west by the London to Bicester (Bedford extension) railway.

10.2.4 The extent of the study area as depicted on Plan EDP 1 enclosed within Appendix 10.1 is defined as the Proposed Development area. In addition, the study area includes all trees and hedgerows with an estimated stem diameter of 75mm or more that overhang the site or are located beyond the site boundaries within a distance of up to 12 times their estimated stem diameter as directed by para 4.2.4 of BS5837:2012.

### Data Sources

10.2.5 Consultation was undertaken in November 2014 with Cherwell District Council's Street Scene and Landscape Services Department. Through this consultation it was determined that none of the trees within the site are subject to a Tree Preservation Order (TPO), however several trees surveyed, located on the eastern side of Langford Brook and subsequently outside the proposed development area, are the subject of a Tree Preservation Order (Cherwell District Council Tree Preservation

Order No 17/90, Confirmed 6 August 1990), a copy of which is enclosed as Appendix EDP 6 within **Appendix 10.1**.

10.2.6 On site correlation of the provided TPO data from the Council confirmed that none of the trees within the Proposed Development area are the subject of a TPO

10.2.7 The site is not situated within a designated Conservation Area.

### **Assessment Approach**

10.2.8 The methodology adopted for this survey is based on guidelines set out in *BS 5837:2012 Trees in Relation to Design, Demolition and Construction*, especially Section 4.4, 'Tree Survey'. Site trees and other significant vegetation are as noted on the tree survey plan (**Appendix 10.1** (Plan EDP 1)). All surveyed items are detailed in (**Appendix 10.1** (Schedule EDP 1)).

10.2.9 Schedule EDP 1 provides information about the following factors in accordance with paragraph 4.4.2.5 of BS 5837:2012:

- Sequential Reference Number;
- Species;
- Height;
- Stem Diameter (DBH);
- Branch Spread;
- First Significant Branch and Direction of Growth;
- Existing Height Above Ground Level;
- Life Stage;
- Physiological Condition;
- Structural Condition;
- Preliminary Management Recommendations;

- Estimated Remaining Contribution; and
- Category Grading.

### **Category Grading**

10.2.10 Trees have been assigned 'U' or Category Grading 'A' to 'C' in accordance with the Cascade Chart given in BS 5837:2012 (copy extract contained within **Appendix 10.1**).

### **Significance Criteria**

10.2.11 Based on the assessment methodology within BS 5837:2012 (Survey Phase 4.1, 4.2 and 4.3) and the context and significance of the trees within the study area, the following significance criteria have been identified.

10.2.12 The criteria have been set against the level of perceived significance following the removal of a tree, group of trees or hedgerow,

10.2.13 The sensitivity of trees, groups of trees or hedgerows is assessed according to their perceived retention value. Their value is categorised on their perceived importance based on their potential size, quality, and value in terms of arboriculture landscape, cultural and conservation value. Their importance is scored as high, medium, low or negligible ('A', 'B', 'C' or 'U' respectively). Category 'U' trees are recommended for removal as they are not worthy of retention in their proposed situation.

### **Sensitivity of Receptors**

10.2.14 The following sensitivity groups are based on BS 5837: 2012 categories and have been used in this ES Chapter.

- High – Category 'A' Trees
- Medium – Category 'B' Trees
- Low – Category 'C' Trees
- Negligible – Category 'U' Trees

10.2.15 The categories, based on the BS 5837:2012 (Survey Phase 4.1, 4.2 and 4.3) assessment have been used to identify their quality, and value in terms of arboriculture landscape, cultural and conservation value. Their sensitivity is classified as High, Medium, Low or Negligible ('A', 'B', 'C' or 'U' respectively) to define receptor sensitivity. Further details on the characteristics assigned to each category are set out below.

10.2.16 Retention values were evaluated following guidance within Table 1 of BS5837 – 'Cascade Chart for Tree Quality Assessment.' This specifies four main categories.

1. CAT 'A' – Trees of high quality with an estimated remaining life expectancy of at least 40 years whereby they could make a substantial long term contribution to the area.
2. CAT 'B' – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years that are still of sufficient quality to make a substantial contribution to the area.
3. CAT 'C' – Trees of low quality with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150mm. All items within this category could be retained but would not be expected to impose a significant constraint on development.
4. CAT 'U' – Trees in such a condition that they cannot be realistically retained as living trees in the context of the current land use for longer than 10 years. They may however have existing or potential conservation value which it might be desirable to preserve.

### **Magnitude of Change**

10.2.17 The following terms have been used to define the magnitude of change:

- Major – Where development is likely to result in 100% removal of a group or specimen tree;
- Moderate - Where development is likely to result in more than 50% removed, but less than 100%;
- Minor - Where development is likely to result in less than 50% removed; and



- Insignificant - Marginal or no effect.

10.2.18 Table 10.1 below sets out the derivation of significance for arboricultural effects. major and major/moderate or moderate/major are considered significant in terms of the EIA Regulations.

### Significance of Effect

10.2.19 The following table determines the significance of effect based on the identified sensitivity of each tree or tree group and the assessed magnitude of change the development is likely to have on each tree or tree group. The resulting effects are either:

- Major;
- Moderate;
- Minor; or
- Negligible.

**Table 10.1 Level of Effects Matrix**

Overall Sensitivity	Overall Magnitude of Change			
	High	Medium	Low	Negligible
High	<b>Major</b>	<b>Moderate to Major</b>	Minor to Moderate	Negligible
Medium	<b>Moderate to Major</b>	<b>Moderate</b>	Minor	Negligible
Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

10.2.20 Each effect is described and evaluated individually through the combination of all of the relevant factors and assessed as either **significant** or **not significant**. For arboricultural effects, those effects identified as a major, major/moderate or moderate level (bold type within matrix above) are generally considered to be **significant** and those effects assessed at a moderate/minor, minor, minor/negligible or negligible level are considered to be **not significant**.

10.2.21 In certain cases, where additional factors may arise, a further degree of professional judgement may be applied when determining whether the overall change in the view will be significant or not and, where this occurs, this is explained in the assessment.

### Definition of Effects

10.2.22 Taking into account the levels of effect described above, and with regard to effects being either adverse or beneficial, the following table (Table 10.2) represents a description of the range of effects likely at any one receptor.

**Table 10.2 Definition of Effect**

Effect	Definition
Major	If the development will result in the loss of a considerable part of existing positive features (or the extent of these), if the trees, groups of trees or hedgerows are of high sensitivity and/ or have a low capacity to accommodate the proposed change and the magnitude of the impact is high.
Moderate	If the development will result in some loss of trees, groups of trees or hedgerows but the overall integrity of the arboricultural asset is maintained.
Minor	If the development could be integrated within the existing site area without the loss of features which contribute to the character and quality of the site and wider area
Negligible	A detectable but non-material change to the arboricultural resource or of visual amenity of the site.

10.2.23 For each assessment of effect these can either be:

- Beneficial - improving the value of the tree or tree group;
- Adverse - reducing the value of the tree or tree group; or
- Negligible - having a negligible result on its existing value.

10.2.24 By the nature of the assessment subject effects are expected to be either adverse, or negligible, however where a group of trees would benefit from the removal of lower quality elements of the group this could result in a beneficial effect

### 10.3 RELEVANT POLICY

#### **National Planning Policy Framework (March 2012)**

10.3.1 At a national level, the National Planning Policy Framework (NPPF) provides a framework within which planning decisions should be made. The purpose of the NPPF is to 'help achieve sustainable development' (NPPF Introduction). The Framework sets out the overall planning policies for England and how these should be applied at a local scale giving a framework within which local authorities should operate.

#### **National Planning Policy Guidance**

10.3.2 Government guidance contained within the NPPF attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people. Planning decisions should aim to ensure that development will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development.

10.3.3 Within Chapter 11 (Paragraph 109) of the National Policy Framework the conservation and enhancing the natural environment is illustrated. Recommendations include:

- Protecting and enhancing valued landscapes;
- Recognising the wider benefits of the eco system and
- Minimising impacts on biodiversity where possible.

10.3.4 Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a Tree Preservation Order or by their inclusion within a Conservation Area) or not, is a material consideration that is taken into account in dealing with planning applications.

#### **Local Planning Policy**

### **Cherwell District Local Plan (1996)**

10.3.5 The Cherwell District Local Plan was adopted in 1996 and policies within this plan are used for decision making. In respect of arboricultural matters, Saved Policy C7 is pertinent to this development in so much that it seeks to resist development that would harm the character of the countryside.

### **The Non-Statutory Cherwell District Local Plan (2004)**

10.3.6 The Non-Statutory Cherwell Local Plan 2004 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on this plan was discontinued prior to adoption.

10.3.7 The Non-Statutory Local Plan 2004 is not part of the statutory development plan but it has been approved as interim planning policy for development control purposes and includes saved policies from the Local Plan 1996. Therefore considering its approval as interim planning policy Policies EN35 is pertinent to this development.

10.3.8 Policy EN35 states 'the council will seek to retain woodlands, trees, hedges and any other feature which are important to the character or appearance of the local landscape as a result of their ecological, historical or amenity value'.

### **Draft Cherwell Local Plan (2014)**

10.3.9 The proposed new Cherwell Local Plan (2006-2031) was submitted to the Secretary of State for Communities and Local Government for formal Examination on 31st January 2014. Modifications to the Plan to meet the full, up to date, objectively assessed needs of the district, as required by the National Planning Policy Framework (NPPF) were submitted on the 21 October 2014.

10.3.10 Whilst the Plan is currently undergoing formal examination it should be noted that policy ESD 13 of the Plan is pertinent to this proposal. Policy ESD 13 states 'Opportunities will be sought to secure the enhancement of the character and appearance of the landscape, particularly in urban fringe locations, through the restoration, management or enhancement of existing landscapes, features or habitats and where appropriate the creation of new ones, including the planting of woodlands, trees and hedgerows.'

#### 10.4 BASELINE CONDITIONS

10.4.1 The site was surveyed in October 2014, in accordance with the recommendations of British Standard 5837:2012 Trees in relation to Design, Demolition and Construction: and as specified in Section 5.2 Assessment Methodology. All data recorded within the survey is included within **Appendix 10.1**. The survey identified a total of 8 individual trees, 7 groups of trees, and one unimportant hedgerow as defined by the 1997 Hedgerow Regulations, further consideration to hedgerows is detailed within Chapter 9 of this ES.

10.4.2 Two tree groups adjacent the site are afforded statutory protection by virtue of Tree Preservation Order No. 17 1990, the location of these trees is depicted within Appendix EDP 3 contained within **Appendix 10.1**. Whilst these trees do not fall within the site due to their proximity to its boundary they were recorded during the survey process, as their size and position may be a potential constraint to development.

10.4.3 The site comprises agricultural farmland with a linear feature of early mature bund planting, located on the southern boundary of the site. Species present in this location include: Ash, Silver Birch, Oak, Field Maple and Hornbeam. A mixed species hedgerow is present in the western area of the site, bisecting the site from north to south.

10.4.4 Located adjacent to the eastern side of Langford Brook and subsequently outside the red line boundary of the Proposed Development, is a linear feature of young to over mature specimen trees. These trees were recorded during the survey process, as their size and position may be a potential constraint to development. Species present in this location include; Willow, Ash, Oak and Field Maple, collectively these aforementioned trees form a significant landscape feature adjacent to the site.

## 10.5 POTENTIAL ENVIRONMENTAL EFFECTS

10.5.1 This section considers the overall effect of the development on the arboricultural receptors (trees, groups of trees and hedgerows), assessing the adverse effects that arise from construction and operation of the scheme and any beneficial environmental effects of mitigation and habitat creation measures.

10.5.2 BS5837 advises within its introduction that:

*“During their lifetime, trees will be vulnerable to disturbance, injury, environmental changes, pests and disease. Construction work often exerts pressures on existing trees, as do changes in their immediate environment following the constructions. A tree that has taken many decades to reach maturity can be damaged irreparably in a few minutes by actions that might be unwitting, negligent or wilful. The early provision of physical protection from damage is therefore critical.”*

10.5.3 The Standard also advises that trees can significantly impact on a design and losses may be inevitable. Furthermore surfacing, the installation of services, changes in levels and similar can all impact on tree health and viability.

### **Construction Phase**

10.5.4 At this outline planning application stage, generic construction methods and timescales are suggested in ES Chapter 5; whilst details cannot be defined at this stage the main effects associated with the construction operations are described below:

- Tree Loss - Trees requiring removal to facilitate construction activities;
- Hedgerow Loss - Hedgerows requiring removal to facilitate construction activities;
- Facilitation Pruning - Pruning operations required to facilitate construction activities;
- Damage to retained trees and hedgerows - Inadvertent impact damage to the physical form of trees and hedgerows by plant machinery;

- Damage to rooting environment - Compaction of rooting environment due to plant machinery operation; and
- Root damage/severance - Damage to or severance of tree or hedgerow roots by hand or plan machinery.

10.5.5 Table 10.3 details the effects that may arise throughout the construction phase, which of the recorded receptors may be affected and the subsequent significance of the effect.

**Table 10.3: Construction Stage**

Potential Effect	Receptor	Potential Significance
Tree Loss	None identified	Neutral
Hedgerow loss	Hedgerow (H4)	Minor adverse
Facilitation Pruning	None identified	Neutral
Damage to retained trees and hedgerows	T1, G2, G3,G5,T6, T7, T8, T9, T10, T11, T12, G13, G14, G15, G16	Major adverse
Damage to rooting environment	T1, G2, G3,G5,T6, T7, T8, T9, T10, T11, T12, G13, G14, G15, G16	Major adverse
Root damage/severance.	T1, G2, G3,G5,T6, T7, T8, T9, T10, T11, T12, G13, G14, G15, G16	Major adverse

### Post Completion Stage

10.5.6 Following completion of all construction activities retained arboricultural receptors are considered less prone to future effects than other more sensitive receptors such as ecological assets.

10.5.7 The post-completion stage assumes that all development is constructed and functional. With the nature of the effect on existing trees being principally associated with construction activity and the nature of the development as a principally low storey height residential led mixed use development, no significant post-completion stage effects have been identified.

10.5.8 Table 10.4 details the future potential effect of tree pruning, those receptors that may be affected and the subsequent significance of the effect.

**Table 10.4: Post-completion Stage**

Potential Effect	Receptor	Potential Significance
Requests for pruning works by interested parties in receptors	G2, G3, G5	Minor adverse



## 10.6 MITIGATION MEASURES

### Construction Stage

10.6.1 Loss of existing trees and hedgerows as a result of the development overall is considered negligible in terms of landscape and visual amenity. With regard to retained trees, the protection of Root Protection Areas (RPA) as defined by BS5837:2012 and as illustrated on Plan EDP 2 within **Appendix 10.1** using suitable protective barriers conforming to the Standard, will be an essential component for protecting against further damage to trees and hedgerows selected for retention.

10.6.2 Demarcation of the RPA of retained receptors will mitigate the potential for both root severance, soil compaction and damage to the central stem and branches of the retained items. Where the canopies of trees overhang the periphery of the RPA it is proposed that the protective barriers should be moved to 1 metre outside of the canopy extent thereby also mitigating the potential for impact damage to the aerial parts of the trees and hedgerows.

10.6.3 To compliment the physical tree protection measures outlined above it is proposed that an Arboricultural Method Statement is also prepared as part of the Reserved Matters application. The Arboricultural Method Statement should be appropriate to the proposals and might typically address some or all of the following, incorporating relevant information from other specialists as required:

- Removal of existing structures and hard surfacing;
- Installation of temporary ground protection;
- Excavations and the requirement for specialized trenchless techniques;
- Installation of new hard surfacing – materials, design constraints and implications for levels;
- Auditable/audited system of arboricultural site monitoring, including a schedule of specific site events requiring input or supervision.

### Post-completion Stage

10.6.4 The parameters plan shows a significant amount of proposed new planting of both trees and hedgerows, specific details relating to species, specification and planting

locations are to be submitted as part of the Reserved Matters application. The depicted mitigation for the loss of the one internal hedgerow (H4) proposes a like for like replacement due west of its current location, thereby reinforcing the site's western boundary. These proposals will contribute significantly to the future tree cover in the immediate area and contribute greatly to the visual amenity of the site.

## 10.7 RESIDUAL EFFECTS

10.7.1 Following the implementation of the mitigation measures, re-assessment has been undertaken to identify residual effects with respect to the arboricultural resource and the significance of the effects has been re-assessed. A summary of residual effects is provided in the tables below.

**Table 10.5: Construction Stage**

Potential Effect	Receptor	Residual Significance
Tree Loss	None identified	Neutral
Facilitation Pruning	None identified	Neutral
Damage to retained trees and hedgerows	T1, G2, G3, G5, T6, T7, T8, T9, T10, T11, T12, G13, G14, G15, G16	Negligible
Damage to rooting environment	T1, G2, G3, G5, T6, T7, T8, T9, T10, T11, T12, G13, G14, G15, G16	Negligible
Root damage/severance.	T1, G2, G3, G5, T6, T7, T8, T9, T10, T11, T12, G13, G14, G15, G16	Negligible

**Table 10.6: Post-completion Stage**

Potential Conflict	Trees/Groups/Hedges	Potential Significance
Loss associated with proposed access roads	Hedgerow (H4)	Moderate positive (Beneficial)
Requests for pruning works by interested parties in retained stock	G2, G3, G5	Neutral/Negligible

### Cumulative Effects

10.7.1 The schemes to be considered in the cumulative assessment include the Proposed Development along with other committed developments (i.e. operational, those that have already begun construction, those that have not been commenced but have a valid planning permission and those schemes which are in the planning process). 'Land at Gavray Drive East' requires consideration in respect of arboriculture.

10.7.1 Assessment of the proposed development and those committed developments determines that there are no Cumulative Effects.

## **10.8 CONCLUSION**

10.8.1 Following the implementation of the mitigation strategies within the construction stage of the Proposed Development as highlighted, the potential impacts associated with trees and development can be suitably reduced to an acceptable level, such that there are no significant effects identified.

10.8.2 The proposed outline development for the site requires the removal of one internal hedgerow (H4). The remaining individuals and groups of trees can be appropriately retained and with suitable protection can contribute greatly to the visual amenity of the area. With the implementation of landscape proposals this loss will be suitably mitigated and indeed increase the local tree cover in the immediate area of the development.

## **10.9 Glossary**

- 10.9.1 Arboriculturist – a person who has, through relevant education, training and experience, gained recognized qualifications and expertise in the field of trees in relation to construction.
- 10.9.2 Root Protection Area - this is a protection area established for around the base of each tree to prevent physical, chemical or compaction damage occurring. This is usually achieved through the erection of fencing or other barriers.
- 10.9.3 Tree Protection Plan - scale drawing prepared by an arboriculturist showing the final layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.
- 10.9.4 Group - the term 'group' is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally including for biodiversity (e.g. parkland or wood pasture).
- 10.9.5 Arboricultural Method Statement; methodology for the implementation of any aspects of development that has the potential to result in loss of or damage to a tree.



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## 11.1 INTRODUCTION

11.1.1 This chapter of the ES has been prepared by The Environmental Dimension Partnership ('EDP') and assesses the likely significant environmental effects of the project, in terms of archaeology and cultural heritage, and incorporates a summary of the baseline assessment, included as **Appendix 11.1**.

11.1.2 The chapter describes the assessment methodology; the baseline conditions at the Site and in its immediate environs; any likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

## 11.2 ASSESSMENT METHODOLOGY

### Scope

11.2.1 The historic environment includes a wide range of features resulting from human intervention in the landscape, varying in scope from buried archaeological remains up to late 20th century industrial structures. In this case, historic environment resources can be divided into the following two categories:

1. Archaeology

- Designated archaeological sites, features and remains; i.e. Scheduled Monuments (SMs – statutory);
- Registered Parks and Gardens (Grades I, II\* and II – non-statutory); and
- Undesignated archaeological finds and sites (non-statutory).

2. Built Heritage

- Listed Buildings (Grades I, II\* and II - statutory); and
- Conservation Areas (statutory).

11.2.2 Registered historic battlefields, shipwrecks and world heritage sites are not considered within this assessment, as no such designations are located within the Site or in its wider zone of influence (study area).

11.2.3 As well as the site itself, information from an appropriately sized study area around it was gathered and analysed to inform the work outlined above. In reference to the local topography and distribution of archaeological remains identified on the Oxfordshire HER, using professional judgement it was determined that a 1km radius study area, centred on the site, was proportionate to the size and scale of the Proposed Development and sufficient to identify the potential for significant effects on historic environment resources.

### Data sources

11.2.4 This ES chapter draws on a baseline archaeological and heritage assessment, which was prepared by EDP; included here as **Appendix 11.1**.

11.2.5 The assessment process principally involved the consultation of readily available archaeological and historical information from documentary and cartographic sources. The major repositories of information comprised:

- The Oxfordshire Historic Environment Record (HER) on known archaeological sites, monuments and findspots, within the vicinity of the site;
- Maps and documents held by the Oxfordshire History Centre;
- The National Heritage List for England curated by English Heritage;
- An archaeological trial trench evaluation report by Cotswold Archaeology in 2005 (see **Appendix 11.2**); and
- Aerial photographs held by the English Heritage Archive.

11.2.6 These sources of information were augmented with records made during a site visit in September 2013.

#### **Assessment Approach**

11.2.7 This chapter, and the baseline assessment which supports it, has been produced in accordance with the Standard and Guidance for Historic Environment Desk-Based Assessment issued by the Chartered Institute for Archaeologists (CIfA 2014). These guidelines provide a national standard for the completion of desk-based assessments.

11.2.8 In addition, the heritage setting assessment section of this ES chapter conforms to “*The Setting of Heritage Assets*” issued by English Heritage (EH 2011a) and with reference to “*Conservation Principles, Policies and Guidance*” (EH 2008), National Planning Policy Framework (DCLG 2012) and Planning Policy Guidance (DCLG 2014).

11.2.9 The assessment process has also given due consideration to English Heritage guidance on conservation areas, which is set out in *Understanding Place: Conservation Area Designation, Appraisal and Management* (EH 2011b), and views, which are set out in *Seeing the History in the View and A Method for Assessing Heritage Significance Within Views* (EH 2011c).

11.2.10 There were no issues raised within the scoping report (RH/14/00009/SCOP) which need to be addressed within this chapter, other than to update any historic environment information, which has been completed through a new Oxfordshire HER search. This new information is taken into consideration in the baseline section and **Appendix 11.1**.

### Significance Criteria

11.2.11 The following criteria is taken from the Highways Agency *Design Manual for Roads and Bridges* (HA et. al. 2007), which represents a national standard for the assessment of direct and indirect impacts on the historic environment.

11.2.12 This ES chapter includes consideration of the nature and sensitivity of all designated and undesignated heritage assets, as well as any previously unrecorded archaeological sites, using the criteria set out in **Table 11.1**.

11.2.13 For all forms of heritage asset (receptor), its sensitivity – which is defined as the comparative potential for an asset to be susceptible to harm through change to its fabric or setting, and defined as sub-categories of its level of rarity and either statutory or planning policy protection - is combined with the predicted magnitude (i.e. scale) of change (see **Table 11.2**) to arrive at the likely significance of effect (see **Table 11.3**).

**[Table 11.1: Sensitivity (Categories taken from HA et. al. 2007)]**

Receptor	Very High	High	Medium	Low	Negligible
World Heritage Site					
Scheduled Monument					
Grade I or II* Listed Building					
Grade I or II* Registered Park or Garden					
Other nationally important archaeological asset					
Grade II Listed Building					
Grade II Registered Park or Garden					
Conservation Area					
Other asset of regional or county importance					
Locally important asset with cultural or educational					

value					
Heritage site or feature with no significant value or interest					

[Table 11.2: Magnitude]

Scale of Change	Magnitude of Change				
	Large	Moderate	Small	Very Small	None
Change to a heritage asset or its setting so that it is completely altered or destroyed		Change to a heritage asset or its setting so that it is significantly modified			
		Change to a heritage asset or its setting so that it is noticeably different			
		Change to a heritage asset or its setting that hardly affects it			
		No change to an asset or its setting			

[Table 11.3: Significance]

MAGNITUDE	SENSITIVITY				
	Very High	High	Medium	Low	Negligible
<b>Large</b>	Major	Major/ Moderate	Moderate	Moderate/ Minor	Minor
<b>Moderate</b>	Major/ Moderate	Moderate	Moderate/ Minor	Minor	Negligible
<b>Small</b>	Moderate	Moderate/ Minor	Minor	Negligible	Neutral
<b>Very Small</b>	Moderate/ Minor	Minor	Negligible	Neutral	Neutral
<b>None</b>	Neutral	Neutral	Neutral	Neutral	Neutral

11.2.14 Predicted effects on all forms of historic environment receptors are categorised with regard to their nature (adverse, beneficial or neutral) and their permanence (permanent, temporary or reversible). The combination of sensitivity and magnitude is undertaken with reference to the matrix in **Table 11.3**, with those effects defined as major or major/moderate being significant in terms of the EIA Regulations. All other effects are determined to be not significant (see **Table 11.3**).

11.2.15 In this context direct impacts are those effects that result in the alteration or loss of the fabric of an asset; as opposed to indirect impacts, which are those effects which alter the setting of an asset (defined below), particularly with reference to the contribution it makes to the significance of a heritage asset.

11.2.16 Setting is defined as follows (EH 2012):

*“...setting is the surroundings in which an asset is experienced. All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not. Elements of a setting may make a positive or negative contribution to the significance [see below] of an asset, may affect the ability to appreciate that significance or may be neutral”.*

11.2.17 In terms of heritage, significance is defined within **Appendix 2** of the NPPF as:

*“The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting”.*

11.2.18 As discussed above, the assessment of setting is made with reference to the EH guidance, particularly *The Setting of Heritage Assets* (2011a).

11.2.19 It should be noted that these tables are used for guidance only. Ultimately, professional judgement will also be a deciding factor when assessing potential impacts on each heritage asset.

#### **Uncertainties and Limitations**

11.2.20 There are no known uncertainties or limitations to the information and conclusions recorded within this ES chapter.

### 11.3 RELEVANT POLICY

#### Current Legislation

- 11.3.1 The Planning (Listed Buildings and Conservation Areas) Act of 1990 is the primary legislative instrument addressing the treatment of listed buildings and conservation areas through the planning process.
- 11.3.2 Section 66 of the Planning (Listed Buildings and Conservation Areas) Act of 1990 sets out the statutory test, against which proposals involving listed buildings should be assessed by the Local Planning Authority. It 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 which it possesses*”.
- 11.3.3 Section 72 addresses conservation areas and states that “*...with respect to any buildings or other land in a conservation area, of any powers under any of the provisions mentioned in subsection (2), special attention shall be paid to the desirability of preserving or enhancing the character or appearance of that area*”.
- 11.3.4 As far as Section 72 is concerned, it has previously been established by the Courts that development that does not detract from the character or appearance of a conservation area is deemed to be in accordance with the legislation. In other words, there is no statutory requirement to actively ‘enhance’.

#### National Planning Policy Framework (March 2012)

- 11.3.5 Following its publication by the Coalition Government on 27 March 2012, the National Planning Policy Framework (NPPF) sets out national planning policy concerning archaeological remains and other elements of the historic environment in Section 12 (DCLG, 2012).
- 11.3.6 The opening paragraph [126] of Section 12 emphasises the need for local authorities to set out a clear strategy for the conservation and enjoyment of the historic environment, where heritage assets are recognised as a finite and irreplaceable resource, which should be preserved in a manner appropriate to its significance.
- 11.3.7 Paragraph 128 concerns planning applications, stating that “*...local planning authorities should require an applicant to describe the significance of any heritage*



*assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation".*

11.3.8 Designated heritage assets are addressed in Paragraph 132, which states that *"...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. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. As heritage assets are irreplaceable, any harm or loss 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".*

11.3.9 Undesignated heritage assets are addressed in Paragraph 135, which states that: *"The effect of an application on the significance of a undesignated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly undesignated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset".*

### **National Planning Policy Guidance**

11.3.10 Planning practice guidance to support the NPPF of relevance to this ES chapter is contained within *Planning Practice Guidance: Conserving and Enhancing the Historic Environment* (DCLG 2014).

11.3.11 The section of this guidance entitled Decision-taking: Historic Environment states that:

*“Heritage assets may be affected by direct physical change or by change in their setting. Being able to properly assess the nature, extent and importance of the significance of a heritage asset, and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals”.*

11.3.12 With regard to the setting of heritage assets, it continues by adding that:

*“A thorough assessment of the impact on setting needs to take into account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.”*

#### **Cherwell District Local Plan (1996)**

11.3.13 Scheduled monuments are protected under saved Policy C25 of the Cherwell District Council Local Plan 1996, which is worded as follows:

*“In considering proposals for development which could affect the site or setting of a scheduled ancient monument, other nationally important archaeological sites and monuments of special local importance, the council will have regard to the desirability of maintaining its overall historic character, including its protection, enhancement and preservation where appropriate”.*

#### **The Non-Statutory Cherwell District Local Plan (2004)**

11.3.14 The settings of conservation areas are protected under Policy EN40 of the Cherwell District Council Non-Statutory Local Plan 2011, which states the following:

*“In a conservation area or an area that makes an important contribution to its setting planning control will be exercised to ensure, inter alia, that the character or appearance of the area so designated is preserved or enhanced. There will be a presumption in favour of retaining buildings, walls, trees or other features which make a positive contribution to the character or appearance of a conservation area. A new development should understand and respect the sense of place and architectural language of the existing but should seek to avoid pastiche development except where this is shown to be clearly the most appropriate”.*

11.3.15 In addition, the settings of listed buildings are protected under Policy EN44 as follows:

*“Special care will be taken to ensure that development that is situated within the setting of a listed building respects the architectural and historic character of the building and its setting”.*

11.3.16 Undesignated archaeology is covered by Policy EN47, which is worded as follows:

*“The Council will promote sustainability of the historic environment through conservation, protection and enhancement of the archaeological heritage and its interpretation and presentation to the public. In particular it will:*

- i. seek to ensure that scheduled ancient monuments and other unscheduled sites of national and regional importance and their settings are permanently preserved;*
- ii. ensure that development which could adversely affect sites, structures, landscapes or buildings of archaeological interest and their settings will require an assessment of the archaeological resource through a desk-top study, and where appropriate a field evaluation;*
- iii. not permit development that would adversely affect archaeological remains and their settings unless the applicant can demonstrate that the archaeological resource will be physically preserved in-situ, or a suitable strategy has been put forward to mitigate the impact of development proposals;*
- iv. ensure that where physical preservation in-situ is neither practical nor desirable and sites are not scheduled or of national importance, the developer will be responsible for making appropriate provision for a programme of archaeological investigation, recording, analysis and publication that will ensure the site is preserved by record prior to destruction. Such measures will be secured either by a planning agreement or by a suitable planning condition.”*

### **Draft Cherwell Local Plan (2014)**

11.3.17 The Draft Cherwell Local Plan document, submitted for review in January 2014, contains Policy ESD 16, which pertains to the historic environment as follows:

#### *Policy ESD 16*

##### *The Character of the Built and Historic Environment*

*Successful design is founded upon an understanding and respect for an area's unique built, natural and cultural context. New development will be expected to complement and enhance the character of its context through sensitive siting, layout and high quality design. All new development will be required to meet high design standards. Where development is in the vicinity of any of the district's distinctive natural or historic assets, delivering high quality design that complements the asset will be essential. New development proposals should...*

- Contribute positively to an area's character and identity by creating or reinforcing local distinctiveness and respecting local topography and landscape features, including skylines, valley floors, significant trees, historic boundaries, landmarks, features or views, in particular within designated landscapes, within the Cherwell Valley and within conservation areas and their setting*
- Conserve, sustain and enhance designated and non designated 'heritage assets' (as defined in the NPPF) including buildings, features, archaeology, conservation areas and their settings, and ensure new development is sensitively sited and integrated in accordance with advice in the NPPF. Proposals for development that affect non-designated heritage assets will be considered taking account of the scale of any harm or loss and the significance of the heritage asset as set out in the NPPF...*
- Include information on heritage assets sufficient to assess the potential impact of the proposal on their significance. Where archaeological potential is identified this should include an appropriate desk based assessment and, where necessary, a field evaluation.*
- Respect the traditional pattern of routes, spaces, blocks, plots, enclosures and the form, scale and massing of buildings. Development should be*

*designed to integrate with existing streets and public spaces, and buildings configured to create clearly defined active public frontages...”*

*The Council will provide more detailed design and historic environment policies in the Development Management DPD.*

## 11.4 BASELINE CONDITIONS

### Designated Heritage Assets

- 11.4.1 The Site does not contain any designated heritage assets; such as scheduled monuments or listed buildings.
- 11.4.2 One scheduled monument, 12 listed buildings (not including those within the Bicester Conservation Area) and one conservation area are situated in the 1km radius study area, as detailed below.
- 11.4.3 The scheduled monument designates the remains of Wretchwick deserted medieval village (SM 1015549), which is located c. 700m south of the Site. This designated heritage asset is of **high sensitivity**. The archaeological remains of this settlement consist of holloways, building platform earthworks and water management channels.
- 11.4.4 The key contributors to the significance of this asset are considered to be the relationship between the non-extant buildings and the layout of the connecting roads. The immediate farmland is considered to positively contribute to the significance, but much of this has now been developed or altered. The land within the Site is physically separated by modern development and has no visual, aesthetic or functional links to this designated asset. Therefore, the Site does not form part of the setting of, or contribute to the significance of, this scheduled monument.
- 11.4.5 Of the 12 listed buildings in the study area, one is Grade I listed (5142) and one Grade II\* listed (18164), both are considered to be of **high sensitivity**. A further 10 are Grade II listed (18179, 18178, 18177, 18176, 18175, 18174, 18161, 2789, 18162 and 18163), and are considered to be of **medium sensitivity**.
- 11.4.6 All of these listed buildings are located in the village of Launton, c. 900m east of the Site. Their village setting and their group value are considered to be the principal contributors to their significance as heritage assets. The Site is physically and visually segregated from these listed buildings by the Birmingham Snow Hill to London Marylebone railway line, modern buildings, topography and hedges/trees. Therefore the Site does not form part of the setting of, or contribute to the significance of, these listed buildings.
- 11.4.7 The conservation area, a receptor of **medium sensitivity**, designates the historic core of the town of Bicester and is situated c. 365m west of the Site. The Bicester Conservation Area appraisal identifies key views as being internal. The setting of the designated area is considered to be negative; it being entirely surrounded by the 20<sup>th</sup> century expansion of Bicester which now entirely separates it from the surrounding

farmland. The Site is physically separated from this designated asset and has no visual or aesthetic relationship. Therefore the Site does not form part of the setting of, or contribute to the significance of, the Conservation Area and its buildings.

#### **Undesignated Heritage Assets**

11.4.8 The Site was subject to an archaeological trial trench evaluation by Cotswold Archaeology in 2005 (**Appendix 11.2**). This comprised 10 trenches, each measuring 15m by 4m. This investigation recorded a single Iron Age pit (**Area B** on **Figure 11.1**) and two undated gullies (**Area A**) within the Site.

11.4.9 The Site was also subject to a geophysical survey (**EOX2160**), which did not locate any archaeological anomalies. It was postulated that this may be due to layers of alluvium concealing deeper buried archaeological deposits.

11.4.10 There are also several undesignated heritage assets within the study area, as recorded on the Oxfordshire HER.

#### **Prehistoric**

11.4.11 As mentioned above, a single Iron Age pit (**Area B**) was identified within the Site.

11.4.12 In the study area, there are two areas of prehistoric settlement identified by previous archaeological work. One dates to the mid-Iron Age (**16120**), c. 380m to the east of the Site, and the other to the Late Iron Age/Roman period (**EOX1389**), c. 125m to the north of the Site. An individual flint flake was also recovered from c. 325m south east of the Site.

11.4.13 Therefore, the Site appears to have been situated within a settled and cultivated landscape in the late prehistoric period.

#### **Roman**

11.4.14 A trial trench evaluation (OAU 1997), conducted c. 200m south east of the Site, identified a number of Roman or possible Roman archaeological features (**EOX103**). The only definitively dated features comprised an enclosure ditch and two gullies which contained c. 2<sup>nd</sup> century AD pottery. These are probably connected with the area of identified Roman settlement to the north (**EOX1389**). Roman pottery was recovered from the fill of a possible pit in this area, but this was also found to contain sherds of Anglo-Saxon pottery.

11.4.15 In addition to these confirmed Roman features, the investigation also identified a further 19 undated ditches, pits and gullies. These may be contemporaneous with the Roman period, but some may be of earlier or later date. None of these features survived in a good state of preservation, varying in depth between 0.06m and 0.35m. This suggests truncation by later medieval and modern ploughing regimes.

11.4.16 However, it should be noted that the trial trench evaluation conducted on the Site did not identify any archaeological features from the Roman period.

#### ***Early Medieval***

11.4.17 The trial trench evaluation to the south east (**EOX103**) recovered a total of five sherds of Anglo-Saxon pottery from the topsoil and two irregular features which may have been tree throws or natural hollows. Although this pottery is rare for the area, there were no definite *in situ* archaeological deposits identified in relation to these artefactual finds.

11.4.18 The trial trench evaluation conducted on the Site did not identify any archaeological features, deposits or finds from the early medieval period.

#### ***Medieval to Modern***

11.4.19 Through aerial photograph analysis, it has been identified that the majority of the Site was formerly covered in ridge and furrow which probably dated to the medieval period. None of this ridge and furrow survives as above ground features today.

11.4.20 A trial trench evaluation by Oxford Archaeology in 2013 (see **Figure 11.1**) on land adjacent to the north of the Site, identified several likely plough furrows and a single post-medieval field boundary. The latter which is in the approximate location of a field boundary visible on the First Edition Ordnance Survey Map of 1881 (see **Figure 11.2**).

#### ***Summary of Undesignated Heritage Assets***

11.4.21 The undesignated archaeological features recorded by the trial trench evaluation in 2005 (**EOX1936**) represent the only known heritage assets within the Site boundary. The undated gullies (**Area A**) are of no greater than **low sensitivity**. The single Iron Age pit (**Area B**) is of no greater than **low sensitivity**.



### **Historic Landscape Character**

11.4.22 As detailed within the archaeological and heritage assessment (**Appendix 11.1**), the Site comprises a single large modern field with no internal divisions. Although ridge and furrow earthworks were once present, these have now been removed as above ground features by modern ploughing. Hedgerows were noted within the Site on maps of 1753 and 1881, but these boundaries do not survive (see **Figure 11.2**).

11.4.23 Therefore, the Site is of **negligible sensitivity** in terms of historic landscape value.

### **Projected future baseline**

11.4.24 If the Proposed Development does not proceed, conceivably the Site will continue to be ploughed. These effects would have a negative impact upon the identified archaeological deposits and may lead to their removal.

## 11.5 LIKELY SIGNIFICANT EFFECTS

### Construction stage

#### *Designated Heritage Assets*

11.5.1 The Site does not form part of the setting of, or contribute to the significance of, any of the designated heritage assets in the study area. Therefore, the construction stage will not affect any designated heritage assets directly or indirectly.

#### *Undesignated Heritage Assets*

11.5.2 The construction of the Proposed Development will likely remove any archaeological deposits present within its footprint, therefore the undated gullies (**Area A**) will be subject to a permanent, large, direct and negative impact of **moderate/minor adverse significance**. The Iron Age pit (**Area B**) will also be subject to a permanent, large, direct and negative impact of **moderate/minor adverse significance**. Neither of these effects are considered to be significant in terms of the EIA.

### Historic Landscape Character

11.5.3 The historic landscape character of the Site is identified as being of negligible sensitivity. Therefore, the temporary, large, direct and negative impact, resulting from the complete land use and character change from agricultural land to construction site, will be of **minor adverse significance**. This is a non-significant effect in terms of the EIA.

### Post-completion stage

#### *Designated Heritage Assets*

11.5.4 The Site does not form part of the setting of, or contribute to the significance of, any of the designated heritage assets in the study area. As such, there will be no effects arising from the completed Proposed Development on any of the identified designated heritage assets.

### ***Undesignated Heritage Assets***

- 11.5.5 All impacts on undesignated heritage assets will occur during the construction phase. As such, there will be no impacts on these during the post-completion stage.

### **Historic Landscape Character**

- 11.5.6 The historic landscape character of the Site is identified as being of negligible sensitivity. Therefore, the permanent, large, direct and negative impact, resulting from the complete land use and character change from agricultural land to residential, will be of **minor adverse significance**. This is a non-significant effect in terms of the EIA.

## 11.6 MITIGATION MEASURES

### Construction stage

#### *Designated Heritage Assets*

11.6.1 As there are no impacts identified upon designated heritage assets, there is no requirement for mitigation measures.

#### *Undesignated Heritage Assets*

11.6.2 A mitigation strategy; to record both the identified and unidentified undesignated archaeological features within the Site; has been agreed with Richard Oram, archaeological advisor to Cherwell District Council. Details of this strategy are included here as **Appendix 11.2**.

#### **Historic Landscape Character**

11.6.3 There are no measures available to mitigate the impact upon the historic landscape character of the Site of negligible sensitivity.

### Post-completion stage

#### *Designated Heritage Assets*

11.6.4 As there are no impacts identified upon designated heritage assets, there is no requirement for mitigation measures.

#### *Undesignated Heritage Assets*

11.6.5 All mitigation measures for undesignated heritage assets will be implemented during the construction phase.

#### **Historic Landscape Character**

11.6.6 There are no measures available to mitigate the impact upon the historic landscape character of the Site of negligible sensitivity.

## 11.7 RESIDUAL EFFECTS

### Construction stage

#### *Designated Heritage Assets*

11.7.1 As there are no impacts identified upon designated assets, therefore there are no residual effects.

#### *Undesignated Heritage Assets*

11.7.2 As the undesignated heritage assets will be removed through the mitigation and construction processes described above, there will be no residual effects.

### Historic Landscape Character

11.7.3 As there are no measures available to mitigate the impact upon the historic landscape character of the Site, the impact will remain temporary, large, direct and negative, resulting in a **minor adverse effect** which is not significant for the purposes of environmental impact assessment.

### Post-completion stage

#### *Designated Heritage Assets*

11.7.4 There are no impacts identified upon designated assets, and therefore there will be no residual effects.

#### *Undesignated Heritage Assets*

11.7.5 All impacts will have occurred during the construction phase and there will therefore be no residual impacts during the post-completion stage.

### Historic Landscape Character

11.7.6 As there are no measures available to mitigate the impact upon the historic landscape character of the Site, the impact will remain permanent, large, direct and negative, resulting in a **minor adverse effect**, which is not significant for the purposes of environmental impact assessment.

**Summary of effects**

11.7.7 The effects identified are summarised in Table 11.4 below:

**Table 11.4: Summary of effects**

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Removal of Iron Age pit	<b>Moderate/Minor Adverse</b>	Mitigation through archaeological fieldwork, as detailed within Appendix 11.2	<b>Neutral</b>
Removal of undated gullies	<b>Moderate/Minor Adverse</b>	Mitigation through archaeological fieldwork, as detailed within Appendix 11.2	<b>Neutral</b>
Impact on historic landscape character by change in land use	<b>Minor Adverse</b>	None	<b>Minor Adverse</b>
<b>Post-completion stage</b>			
Impact on historic landscape character by change in land use	<b>Minor Adverse</b>	None	<b>Minor Adverse</b>

## 11.8 CUMULATIVE EFFECTS

11.8.5 Only residential development sites within a 1km radius study area were considered within this cumulative effects assessment. This was considered to be a proportionately sized study area in light of the extent of the Proposed Development and the relatively enclosed position of the Site, in terms of wider views.

11.8.6 Therefore, below is a summary of potential cumulative effects, with regard to Gavray Drive East and Talisman Road.

11.8.7 The Site and Gavray Drive East, which is located adjacent to the south east, would provide up to 300 dwellings. The approved Talisman Road scheme, which is located c.900m to the south west, will provide 125 dwellings.

### *Designated Heritage Assets*

11.8.8 There are no impacts identified upon designated assets, and therefore there will be no cumulative effects in that respect.

### *Undesignated Heritage Assets*

11.8.9 There is no indication that archaeological deposits identified within the Application Site will extend into the Gavray Drive East site, and vice versa. The same is true of the Talisman Road scheme, mentioned above. Therefore, there will be no cumulative impacts on undesignated heritage assets.

### **Historic Landscape Character**

11.8.10 The Gavray Drive East site has more surviving historic landscape features, including hedgerows, some of which are depicted on 17<sup>th</sup> century maps, and ridge and furrow earthworks. The Site, on the other hand, has a negligible value due to its lack of ridge and furrow earthworks and historic hedgerows. Therefore, in combination with Gavray Drive East, it will lead to the land use change of historic farmland to residential development, with the cumulative effect considered to be **adverse**, although not significant for the purposes of environmental impact assessment.

11.8.11 The Site is distant and physically separate from Talisman Road, and, as such, there will be no cumulative effects arising in terms of historic landscape character.





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## **12.1 INTRODUCTION**

12.1.1 This chapter of the ES has considered the likely significant environmental effects of the Proposed Development in terms of agriculture and soils. This assessment has been undertaken by Kernon Countryside Consultants Limited (KCC). KCC is a specialist consultancy advising farmers, landowners and local authorities on farm business, farm diversification enterprises and development proposals which seek to use agricultural land for non-agricultural purposes.

## 12.2 ASSESSMENT METHODOLOGY

### Scope

- 12.2.1 This assessment has considered two key agricultural circumstances: the effects of the Proposed Development on agricultural land quality and soils and the effects of the Proposed Development on agricultural businesses.
- 12.2.2 The Site extends to approximately 6.7 hectares (ha) and contains an area of approximately 6 ha of land currently in agricultural use. Remaining land within the Site is currently in use on a temporary basis as a construction compound associated with railway works.

### Data sources

#### *Land quality and soils*

- 12.2.3 Information regarding agricultural land quality has been gathered from existing sources. The Site was the subject of a detailed Agricultural Land Classification (ALC) survey in 2004 as part of a wider site area. The survey was undertaken by CPM (Chapter 4 of the Environmental Statement 'Agricultural Land Classification and Farming', CPM Environmental Planning and Design Ltd, December 2004). The CPM ALC survey results remain relevant and have been utilised for the purposes of this assessment. The CPM ALC assessment includes an extract from the "provisional" ALC map (MAFF Provisional ALC map, sheet 145) for land around Bicester.
- 12.2.4 The CPM ALC survey was undertaken in accordance with the guidelines and criteria set out in 'Agricultural Land Classification for England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land' published by MAFF in October 1988, which remain the current guidelines for ALC in England and Wales (hereafter referred to as 'the ALC Guidelines').
- 12.2.5 Information regarding ALC has also been gathered from the Government website [www.magic.gov.uk](http://www.magic.gov.uk).

#### *Farm businesses*

- 12.2.6 One occupying farm business has been identified within the Site area and is accordingly affected by the Proposed Development. Baseline data has been obtained from the occupying business's land agent in October 2014 and analysed.

### Scoping Opinion and Consultees

12.2.7 A Scoping Opinion has been sought from the Council. Natural England provided comment regarding the effects on agricultural land stating that, based on the information provided by the Applicants, that the Proposed Development “**does not appear**” to “**have significant impacts on the protection of soils (particularly of sites over 20 ha of best and most versatile agricultural land)**”.

#### **Assessment approach**

12.2.8 The assessment of the effects on agricultural land quality and farm businesses has been carried out in three stages. Firstly the magnitude of the potential effects has been considered. Secondly the importance / sensitivity of the resource / receptor has been considered and, thirdly, the significance of effects has then been determined by the interaction of magnitude and sensitivity. The effects have been determined by the thresholds set out in **Tables 12.1 – 12.3**.

#### **Significance criteria**

12.2.9 There are no defined thresholds for assessing the effects of non-agricultural development on agricultural assets. The National Planning Policy Framework (2012) states that “**local planning authorities should take into account the economic and other benefits of the best and most versatile agricultural land**” (BMV). Identification and consideration of BMV agricultural land is therefore necessary, and the loss of BMV is a measure of the effect of the Proposed Development.

12.2.10 The assessment of potential effects as a result of the Proposed Development has taken into account the construction and operational phases. The significance level attributed to each effect has been assessed based on the magnitude of impact due to the Proposed Development and the sensitivity of the affected receptor/receiving environment to the impact.

12.2.11 There is no the definition of “**significant development of agricultural land**” (NPPF, para 112) or of “significant” in EIA terms, however the loss of 20 ha or more of BMV agricultural land for non-agricultural purposes and which is not in accordance with the provisions of a development plan requires consultation with Natural England. The thresholds set out in the following tables have been adopted following consultation with other consultants and representatives from the Department for Environment, Food and Rural Affairs (Defra) and are based upon professional judgement and best practice.

12.2.12 The magnitude of the effects of the Proposed Development has been assessed against the criteria set out in **Table 12.1**.

**Table 12.1: Magnitude**

Magnitude	Effects on Soils	Effects on Local Agriculture
Large	The Proposed Development would directly lead to the loss of over 50 hectares of BMV agricultural land (Grades 1 / 2 / 3a).	The effect of the Proposed Development would render a full-time agricultural business non-viable.
Moderate	The Proposed Development would directly lead to the loss of between 20 and 50 hectares of BMV agricultural land (Grades 1 / 2 / 3a).	The effect of the Proposed Development would require significant changes in the day-to-day management of a full-time agricultural business.
Small	The Proposed Development would directly lead to the loss of less than 20 hectares of BMV agricultural land (Grades 1 / 2 / 3a) or the loss of any quantity of non-BMV land (Grades 3b, 4 or 5).	The Proposed Development would require only minor changes in the day-to-day management / structure of a full-time agricultural business or would result in the loss or a significant effect on a part-time business.
Negligible	No direct effect upon agricultural land.	The Proposed Development would require only negligible changes to an agricultural business.

12.2.13 The methodology for determining the sensitivity of receptors is set out in **Table 12.2**. There are two identified receptors, one of national importance, the loss of which is determined as high, while the second receptor is of local importance and defined as of low sensitivity.

**Table 12.2: Sensitivity**

Sensitivity	Receptor
High	The agricultural land resource is a matter of potentially national importance. There are no defined criteria against which to set thresholds. National planning policy towards the development and protection of agricultural land is at paragraph 112 of the National Planning Policy Framework (2012). The effect on land resources is a

	combination of the quantum and quality of agricultural land affected, relative to both the national resource and the relative availability of land of that quality locally. Land resources should therefore be classified as being of high environmental value (sensitivity).
Low	Farm businesses are of potentially local importance. The way that farms are operated will vary over time according to ownership and local and international economic factors. Farm businesses are tolerant of some change without detriment to their character.

**Table 12.3: Significance**

MAGNITUDE	SENSITIVITY	
	High	Low
Large	Major Adverse / Beneficial	Moderate Adverse / Beneficial
Moderate	Major to Moderate Adverse / Beneficial	Moderate to Minor Adverse / Beneficial
Small	Moderate to Minor Adverse / Beneficial	Minor Adverse / Beneficial
Negligible	Negligible	Negligible

12.2.14 Based on professional experience, the loss of 20 ha or more of BMV land is likely to be identified as a significant effect, i.e. an effect of Major to Moderate Adverse significance and above.

12.2.15 With regards the effects of the Proposed Development on agricultural businesses, the definitions are based on professional judgement. The rendering of a full-time business unviable would, based on professional experience, be identified as a significant effect, i.e. a Minor Adverse effect.

### **Uncertainties and limitations**

12.2.16 Results of an ALC survey undertaken in 2004 have been utilised. The western field is currently occupied as a temporary construction compound for adjacent railway works and is not therefore in agricultural use. The extent and condition of underlying soils within the construction compound are not known. Whilst it is possible that if a soils survey was undertaken at present, some or all of the land used for the construction compound would be described by a soils surveyor as “non-agricultural”, for the purposes of this Assessment, the original ALC survey results for this land have been utilised i.e. the condition of the soils before the construction compound use began.

## 12.3 RELEVANT POLICY

### National Planning Policy Framework (March 2012)

- 12.3.1 With regards the effects of the Proposed Development on agricultural businesses, the definitions are based on professional judgement. The rendering of a full-time business unviable would, based on professional experience, be identified as a significant effect, i.e. a Minor Adverse effect.
- 12.3.2 National policy guidance governing the non-agricultural development of agricultural land is set out in the National Planning Policy Framework (2012) (the NPPF). Annex 2 of the NPPF identifies the “**best and most versatile agricultural land**” (BMV) as land in Grades 1, 2 and 3a of the Agricultural Land Classification (ALC). Throughout England and Wales this amounts to one third of agricultural land, but in parts of England the proportion is much higher.
- 12.3.3 Paragraph 112 of the NPPF states “**local planning authorities should take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality**”.

### National Planning Policy Guidance

- 12.3.4 The national Planning Practice Guidance suite (DCLG, March 2014) restates the contents of paragraph 112 of the NPPF at paragraph 8-026-20140306. It states “**The National Planning Policy Framework expects local planning authorities to take into account the economic and other benefits of the best and most versatile agricultural land**” and “**where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality.**”

### Cherwell District Local Plan (1996)

- 12.3.5 The Cherwell District Local Plan (adopted in 1996) does not contain a specific policy regarding the protection of BMV agricultural land.

### The Non-Statutory Cherwell District Local Plan (2004)

12.3.6 Policy E16 of the interim Non-Statutory Cherwell District Local plan (2004) seeks to protect BMV agricultural land. The policy states that “**if development needs to take place on agricultural land, then the use of land in Grades 3b, 4 and 5 should be used in preference to higher quality land except where other sustainability considerations suggest otherwise**”.

**Draft Cherwell Local Plan (2014)**

12.3.7 The Draft Local plan does not contain a general policy relating to the protection of BMV land, however an assessment of land quality is required at individually proposed development sites.

12.3.8 The Site is listed in the Schedule of Proposed Main Modifications to the (Submission) Local Plan (Part 1) (August 2014). Amongst the key site specific design and place shaping principles listed for the Site is “**a detailed survey of the agricultural land quality identifying the best and most versatile agricultural land and a soil management plan.**”



## 12.4 BASELINE CONDITIONS

### Agricultural Land Quality

- 12.4.1 The Agricultural Land Classification (ALC) system divides land into five grades according to the extent to which inherent characteristics can be exploited for agricultural production. ALC is based upon an assessment of limiting factors, including soils, climate and other physical limitations and the way in which these factors interact. Grade 1 is described as being of 'excellent' quality and Grade 5, at the other end of the scale, is described as being of 'very poor' quality. Grade 3 is subdivided into Subgrade 3a 'good' and Subgrade 3b 'moderate' quality agricultural land.
- 12.4.2 A detailed ALC survey was undertaken by CPM in 2004 across the Site and adjoining land to the east in 2004 as part of a previous Environmental Impact Assessment. The survey was undertaken in accordance with the ALC Guidelines. The relevant paragraphs from the 2004 ES Chapter and its accompanying Appendices and ALC map are reproduced at Appendix 12.1.
- 12.4.3 Land quality within the Site (i.e. the western portion of the land surveyed in 2004) is identified as Subgrade 3b. The area and percentage of ALC grades across the Site are summarised in Table 12.4 below and are shown at Figure 12.1, transferred onto the current Location Plan.

**Table 12.4: Agricultural Land Classification**

ALC Grade	Area (Ha)	Area (% of Total Site)
Grade 1 (Excellent)	0	0
Grade 2 (Very Good)	0	0
Subgrade 3a (Good)	0	0
Subgrade 3b (Moderate)	6.7	100
Grade 4 (Poor)	0	0
Grade 5 (Very Poor)	0	0
Other / Non-agricultural	0	0
Not surveyed	0	0
<b>Total</b>	<b>6.7</b>	<b>100</b>

### Farm Businesses

- 12.4.4 One agricultural business has been identified at the Site. The business occupies approximately 6.0 ha within the site area, comprising one field in arable use. Farm business occupation at the Site is shown at Figure 12.2.
- 12.4.5 The land is owned by a Trust and rented by the farm business on a secure Agricultural Holdings Act 1986 tenancy. Negotiations are currently under way between the landowning Trust and the tenant for the termination of the tenancy by mutual consent.
- 12.4.6 The tenant business, a farming partnership, is based at Middleton Stoney to the west of Bicester. The main holding extends to approximately 500 ha (c. 1,200 acres) of owner-occupied land. The business operates a mixed arable and livestock enterprise. The arable enterprise operates a combinable crops rotation of cereals, oilseed rape and beans. The livestock enterprise produces beef and pigs.
- 12.4.7 The Site is an off-lying area used for the production of arable crops. The tenant farmer also occupies a field to the east of the Site, which is in grassland use and not therefore farmed directly in conjunction with the Site.
- 12.4.8 There are no buildings within the site area, so crops are carted away for storage elsewhere. The tenant's agent is not aware of any agricultural land drainage across the area, and there is no mains water supply to the site.
- 12.4.9 The land is not entered into an agri-environment scheme, there is no sporting activity across the land and there are no particular issues reported with regards trespass at this urban fringe location.

#### **The projected future baseline**

- 12.4.10 If the Proposed Development does not proceed, agricultural land quality will be unaffected and agricultural use can continue. It is not known whether all or part of the land which is currently used as a construction compound would be returned to agriculture.

## 12.5 LIKELY SIGNIFICANT EFFECTS

12.5.1 Two potential effects have been identified:

- effects on the national resource of agricultural land; and
- effects on farm businesses, i.e. the effects of non-agricultural development on the viability of the farm business operating within the Site.

12.5.2 The effects can be broken down in the construction stage and post-completion stage.

### **Construction stage**

12.5.3 It is assumed that at the commencement of construction all agricultural use of the Site will cease and the resource will no longer be available. On that basis construction phase effects have been identified as:

- effects on the national resource of agricultural land. This effect will be permanent and will continue throughout the post-completion stage;
- effects on farm size and structure. Again this effect will be permanent and continue throughout the post-completion stage;
- effects on field drainage, water supplies and on-farm irrigation. These will also be permanent effects and will continue throughout the post-completion stage;
- effects on field accesses.

12.5.4 The definitions for evaluating the effects are based on guidance set out in the NPPF in relation to the loss of BMV agricultural land. The definitions for effects on farm businesses are based on professional judgement.

### *Effects on the National Resource of Agricultural Land*

12.5.5 The Proposed Development includes the development of approximately 6 ha of agricultural land of Subgrade 3b 'moderate' quality plus a further circa 0.7 ha currently in use as a temporary construction compound which has also been identified as Subgrade 3b. The Site therefore does not contain BMV agricultural land. The impact is of a small magnitude on a receptor of high sensitivity. Based upon the significance matrix at Table 12.3, this results in a **Moderate to Minor Adverse** effect. As 6.7 ha of Subgrade 3b is at the lower end of the Low magnitude parameters (at Table 12.1), it is considered that the effect would be of Minor Adverse significance.

*Effects on Farm Businesses*

- 12.5.6 The Proposed Development affects one identified agricultural business.
- 12.5.7 The business occupies approximately 6.0 ha across the Site, in use for arable production. The farm business occupies the land under a secure tenancy agreement (the termination of which is currently under negotiation). The rented land is an off-lying parcel, some 8 km from the main farming base at Middleton Stoney.
- 12.5.8 The main holding extends to approximately 500 ha. The loss of approximately 6 ha represents around 1% of the farmed area. The loss of this land to the wider arable enterprise may lead to some adjustments, but any changes necessary will be of a very minor nature. The small magnitude of impact upon a full-time agricultural business, a receptor of low sensitivity, will lead to a **Minor Adverse** effect.

**Post-completion stage**

- 12.5.9 The following effects have been identified during the post-completion stage:
- effects of trespass.
- 12.5.10 Once in operation, the non-agricultural use of land can lead to trespass onto neighbouring agricultural land. The spread of such trespass can prohibit the full agricultural exploitation of adjacent land.
- 12.5.11 The farm business also occupies land at Gavray Drive to the east of the Site. The Proposed Development of the Site could lead to a spread of trespass across the remaining agricultural land. The small magnitude of the effect of trespass on farm businesses, themselves receptors of low sensitivity, would result in an effect of **Minor Adverse** significance.

## 12.6 MITIGATION MEASURES

### Construction stage

- 12.6.1 Mitigation of the loss of agricultural land is best achieved by limiting the extent of development to the smallest size possible, consistent with operational requirements. Soils handling and conservation during construction should be undertaken in accordance with the relevant chapters in the “Good Practice Guide for Handling Soils” (MAFF 2000).
- 12.6.2 Soils have a number of important functions beyond the support and growth of plants. These include improving drainage and maintaining solution pathways, supporting ecosystems and providing green areas for communities to use and enjoy. In order to sustain these basic functions it is important that appropriate consideration is given to the soil resource on any development site and, if it is not managed carefully during construction and ground preparation, these important functions can be lost.
- 12.6.3 “The Construction Code of Practice for the Sustainable Use of Soils on Construction Sites” (Defra 2009) is a practical guide to assist managers of construction sites in protecting the soil resource with which they work. The Code is not legally binding but, by using it, the soil resource on site may be enhanced and wider environmental benefits may be achieved. For example, careful movement of soil during ground preparation, including the timing of land work and storage of soils for after use, will provide materials in better condition for landscaping and will also help natural site drainage.
- 12.6.4 There are very few measures which can be put in place to mitigate the long term effects on agricultural businesses. Given the **Minor Adverse** effect on one farm business, however, mitigation measures are not considered to be required.

### Post-completion stage

- 12.6.5 The effects of trespass as a result of development can limit the full exploitation of adjacent agricultural land. The design for the Proposed Development includes an area of public open space between the two sites which will help mitigate the spread of trespass from one area to the other.

## 12.7 RESIDUAL EFFECTS

### Construction stage

12.7.1 The development of agricultural land for residential purposes is permanent. The loss of agricultural land at the Site will therefore remain **Minor Adverse** and the effect on one farm business will remain **Minor Adverse**.

### Post-completion stage

12.7.2 The design of the Proposed Development will help mitigate any effects from trespass onto adjacent agricultural land. The significance of trespass is considered to be **Negligible**.

### Summary of effects

12.7.3 The effects identified are summarised in Table 12.5 below:

**Table 12.5: Summary of effects**

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Loss of agricultural land.	<b>Minor Adverse</b>	The loss of agricultural land will be permanent. Appropriate handling of soils during construction will help preserve the soil resource for other uses such as landscaping.	<b>Minor Adverse</b>
Farm businesses	<b>Minor adverse</b>	Mitigation measures deemed unnecessary.	<b>Minor adverse</b>
<b>Post-completion stage</b>			
Loss of agricultural land.	<b>As above</b>	The loss of agricultural land will be permanent. No mitigation measures.	<b>As above</b>
Potential trespass onto adjacent agricultural land.	<b>Minor adverse</b>	Design of the scheme will include open space between the residential areas and adjacent agricultural land.	<b>Negligible</b>

## **12.8 CUMULATIVE EFFECTS**

12.8.1 The Proposed Development is now considered in conjunction with other recently approved or potential developments involving agricultural land in terms of the cumulative effect. The effect upon agricultural land will be permanent so the construction and operational phases are not considered separately. There are ten sites, listed below.

- North West Bicester (Bicester 1)
- Graven Hill (Bicester 2)
- South West Bicester Phase 1
- South West Bicester Phase 2 (Bicester 3)
- Bicester Business Park (Bicester 4)
- Bicester Gateway (Bicester 10)
- North East Bicester (Bicester 11)
- South East Bicester (Bicester 12)
- Talisman Road
- Gavray Drive East

12.8.2 All sites contain agricultural land and are considered in turn below.

### North West Bicester (Bicester 1)

12.8.3 This site extends to approximately 380 ha of primarily agricultural land. The south-eastern part of the site, approximately 47 ha, has been subject to an ALC survey (the results have been accessed and the area measured on [www.magic.gov.uk](http://www.magic.gov.uk)) and is shown to be Subgrade 3b. The remainder of the site has not been surveyed but is shown on the “provisional” ALC map in an area of undifferentiated Grade 3 (ref. Appendix 3 of the CPM ALC report at Appendix 12.2 of this ES). It is not known, therefore, if BMV land is present.

12.8.4 As a worst case scenario, if 50 ha or more of the Bicester 1 site was shown to be BMV, the significance of the effect within the Bicester 1 site would be Major Adverse. If the entire 380 ha is shown to be non-BMV agricultural land, the effect would be considered Moderate Adverse. Therefore, the addition of approximately 380 ha of agricultural land to the 6.7 ha Site would accordingly generate a cumulative effect somewhere between Major Adverse significance (if 50 or more ha are shown to be BMV) and Moderate Adverse (depending on the amount of BMV involved and due to the quantum of agricultural land involved i.e. approximately 387 ha cumulatively).

Graven Hill (Bicester 2)

12.8.5 The site at Graven Hill to the south-east of Bicester extends to approximately 220 ha. Much of the area is non-agricultural, being woodland and former military land however there may be fields within the site area which are in agricultural use. The site has not been the subject of an ALC survey ([www.magic.gov.uk](http://www.magic.gov.uk)). The potential agricultural land is shown on the provisional map (op cit) in an area of Grade 4 agricultural land.

12.8.6 It is not therefore known if BMV agricultural land is present and it is not possible to be precise about the extent of the area of agricultural land within the Bicester 2 site. As a worst case scenario, if 50 ha or more of the Bicester 1 site was shown to be BMV, the significance of the effect within the Bicester 1 site would be Major Adverse. Therefore, the addition of agricultural land within the Graven Hill site to the 6.7 ha Site would accordingly generate a cumulative effect between Major Adverse significance (if 50 or more ha are shown to be BMV) and Moderate Adverse (if <50h agricultural land is shown to be BMV or due to the quantum of agricultural land involved, i.e. approximately 227 ha cumulatively).

South West Bicester Phase 1

12.8.7 This site extends to approximately 110 ha, the majority of which is shown to be Subgrade 3b ([www.magic.gov.uk](http://www.magic.gov.uk)). An area of approximately 85 ha has been surveyed, the large majority of which is Subgrade 3b. Approximately 5 ha of the land surveyed is of Subgrade 3a quality and is therefore BMV. It is not known if the remaining 25 ha within the site area is BMV or non-BMV.

12.8.8 If all unsurveyed land was shown to be BMV (i.e. the total area of BMV could be as high as 30 ha) the cumulative effect would be assessed as of Major to Moderate Adverse significance. If the remaining land was primarily non-BMV, meaning the total area of BMV land with the South West Bicester Phase 1 area is less than 20 ha, the cumulative effect with the Site would be considered Moderate Adverse due to the quantum of BMV and the quantum agricultural land involved (approximately 117 ha cumulatively).

South West Bicester Phase 2 (Bicester 3)

12.8.9 This site extends to approximately 32 ha, the majority of which (approximately 24 ha when measured from [www.magic.gov.uk](http://www.magic.gov.uk)) is graded as Subgrade 3b. If



remaining land (approximately 8 ha) was shown to be BMV, or the entire site was shown to be non-BMV, the cumulative effect when considered in conjunction with the Site would be Minor Adverse due to the quantum of agricultural land involved (39 ha) with or without a potentially small area of BMV.

Bicester Business Park (Bicester 4)

12.8.10 This site extends to approximately 28 ha and has not been subject to an ALC survey. If all land were shown to be of BMV quality (i.e. 28 ha of BMV agricultural land), the cumulative effect would increase to Major to Moderate Adverse. If all land within the site was shown to be non-BMV, the cumulative effect would be of Moderate Adverse significance due to the quantum of agricultural land involved (approximately 35 ha).

Bicester Gateway (Bicester 10)

12.8.11 This site extends to approximately 15 ha and has not been subject to an ALC survey. If all land were shown to be of BMV quality (i.e. 15 ha of BMV agricultural land), the cumulative effect would increase to Moderate to Minor Adverse due to the potential quantum of BMV land). If all land within the site was shown to be non-BMV, the cumulative effect would be of Minor Adverse significance due to the quantum of agricultural land (approximately 22 ha).

North East Bicester (Bicester 11)

12.8.12 This site extends to approximately 8 ha, of which approximately 3 ha has been subject to an ALC survey ([www.magic.gov.uk](http://www.magic.gov.uk)). The land surveyed is predominantly Subgrade 3b with a very small area of Subgrade 3a in the north. If the unsurveyed land was shown to be BMV, the site would accordingly contain around 5 – 6 ha of BMV land. Due to the small scale of the Bicester 11 site, leading to a total area of approximately 15 ha, including a small area of BMV, the cumulative effect would be of Minor Adverse significance.

South East Bicester (Bicester 12)

12.8.13 This site extends to approximately 52 ha and the large majority has been subject to an ALC survey. All surveyed land is shown to be Subgrade 3b. The cumulative effect is considered to be Moderate Adverse due to the quantum of agricultural land involved.

Talisman Road

12.8.14 This site extends to approximately 4 ha. The site has not been subject to an ALC survey. However, due to the quantum of agricultural land involved, even if the 4 ha site was shown to be BMV, the cumulative effect would be of Minor Adverse significance.

Gavray Road East

12.8.15 This site extends to approximately 15.7 ha and has been subject to an ALC survey (ref. Appendix 12.2). The survey has shown that 14.7 ha are Subgrade 3b and one small area (1 ha) is Grade 2. Due to the quantum of agricultural land involved (21.7 ha), including a small area of Grade 2, the cumulative effect is considered to be Minor Adverse.



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### 13.1 INTRODUCTION

- 13.1.1 It is recognised that development of greenfield spaces could cause degradation to hydrological and ecological status of the surrounding water environment due to decreased natural floodplain storage, increased surface water runoff rates, pollution associated with the development and engineering activities in water bodies. Appropriate mitigation measures are therefore required to minimise the risks to the water environment as far as reasonably practicable.
- 13.1.2 Residential developments are generally considered to pose a low risk of significant pollution to receiving water environment with the main pollutants being atmospheric deposition, heavy metals, hydrocarbons and suspended solids, especially within the roads and car parking areas. Nevertheless the proposed surface water drainage system will need to address the potential pollution risks and, if possible improve the baseline conditions.
- 13.1.3 This chapter provides an assessment of the potential environmental impacts upon hydrology, hydrogeology, flood risk and drainage associated with the proposed residential development at Gavray Drive, Bicester, Oxfordshire and its immediate surroundings. It explains the methods used in assessing the sensitivity of the water environment as well as magnitude and significance of the likely environmental effects. It also identifies measures to mitigate those effects during construction and operation phases of the Proposed Development. This chapter has been prepared by JBA Consulting.
- 13.1.4 This Chapter also aims to address issues raised by the Cherwell District Council in their Scoping Opinion of 6<sup>th</sup> November 2014 (ref: RH/14/00009/SCOP) in relation to the impacts generated by the Proposed Development on the existing water environment, including flood risk and drainage.
- 13.1.5 This chapter is supported by a detailed Flood Risk Assessment and Drainage Strategy report produced for the Proposed Development by JBA Consulting in February 2015. The report is included in **Appendix 13.1**.

## 13.2 ASSESSMENT METHODOLOGY

### Scope

- 13.2.1 This section outlines the methodology applied to assess the sensitivity of the water environment and the magnitude and significance of the likely effects of the Proposed Development on hydrology, hydrogeology, flood risk, fluvial morphology and existing drainage patterns.
- 13.2.2 The effects on existing hydrology and flood risk are assessed based on comparison of the post-development scenario in terms of flows and water levels in the adjacent water bodies against the baseline conditions.
- 13.2.3 The existing groundwater quality, levels and pathways are considered when assessing the effects of the Proposed Development on the hydrogeology.
- 13.2.4 A comparison between the existing surface water quality and runoff rates and the post-development scenario is made to appraise the effects of the Proposed Development on the existing surface water drainage patterns in the study area. The potential impacts of the proposed drainage system's failure area also considered.
- 13.2.5 The study area for this assessment comprises the Proposed Development site and immediate environs as well as Langford Village located to the south of the site. The whole site is located within the catchment of the Langford Brook.
- 13.2.6 Relevant information from the following Chapters has been considered to aid the assessment process.
- Chapter 9: Ecology and Biodiversity
  - Chapter 14: Ground Contamination

### Data sources

- 13.2.7 Baseline conditions have been identified through consultations with statutory bodies and supplemented by the following activities:
- Desk-based study comprising a review of publicly available information, including local and regional flood risk and water management mapping, to obtain baseline and historical data
  - Site visit and visual inspection of the study area
  - Field surveys including trial pits and soakaway tests carried out on the site by Wardell Armstrong to confirm the nature of the local geology and the infiltration potential of the underlying soils
  - A topographic survey of the site was commissioned to determine site slopes and levels, identify and survey field drains and key hydraulic structures potentially impacting flood risk and drainage patterns on the site. The topographic survey can be found in Appendix B of the Flood Risk Assessment report.

- Hydraulic modelling of the Langford Brook to predict the pre-development flood extents. A copy of the hydraulic model representing the Langford Brook in Bicester was obtained from the Environment Agency in June 2013.

13.2.8 The following guidance documents and secondary sources of information have been consulted to inform the assessment of the likely significant effects of the Proposed Development on the water environment and development of appropriate mitigation measures:

- Ordnance Survey 1:10,000 Street View mapping and 1:25,000 Vector Map
- Environment Agency “What’s In your Backyard” online mapping – flood risk<sup>1</sup>
- Environment Agency “What’s In your Backyard” online mapping - River Basin Management Plans<sup>1</sup>
- British Geological Survey Bedrock and Superficial Geology map<sup>2</sup>
- Flood Estimation Handbook (FEH), including FEH CD-ROM Version 3
- CIRIA C697: The SUDS Manual, 2007
- Environment Agency: Rainfall Runoff Management for Developments, Report SC030219, 2013
- Department for Communities and Local Government: Code for Sustainable Homes, Technical Guide, 2010
- Environment Agency: Pollution Prevention Guidelines (PPG)
- CIRIA C532: Control of water pollution from construction sites, 2001

13.2.9 The main statutory consultees for this assessment were Oxfordshire County Council (consulted in 2010 via Gallagher Estates) and the Environment Agency (consulted on a number of occasions with the most recent contact in February 2014). The main issues raised and requirements imposed by the consulted parties were as follows:

- Level for level floodplain compensation to offset the existing floodplain storage lost due to the development has been requested by the EA
- The Oxfordshire County Council requested that drainage to all highways on site (except those carrying a bus service) should make use of porous block paving allowing infiltration of surface water into underlying stone blanket (with 30% void ratio).

#### **Assessment approach**

13.2.10 The likely significant effects on the surface water and groundwater quality and quantity in the study area have been assessed in accordance with Part 1, Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

13.2.11 The approach used in the assessment applies best practice methods in reference to legislation and standards where available. Where quantification of the environmental

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<sup>1</sup> <http://www.environment-agency.gov.uk/homeandleisure/37793.aspx>

<sup>2</sup> <http://www.bgs.ac.uk/opengeoscience>

effects is impossible a qualitative appraisal has been carried out utilising existing knowledge and reasoned professional judgement.

Significance criteria

13.2.12 The significance of an effect on the surface and groundwater environment is derived from a product of the sensitivity of the receptor and the magnitude of the likely effect.

13.2.13 The assessment criteria used to determine the magnitude of the effect and sensitivity of the receptor are shown in Tables 13.1 and 13.2. The two parameters are then combined to estimate the significance of the likely effect as presented in Table 13.3. The magnitude of the effect can either be adverse or beneficial, except when negligible.

**[Table 13.1: Magnitude of an effect on attribute]**

MAGNITUDE	ASSESSMENT CRITERIA	TYPICAL EXAMPLE
Large	<p>Adverse: Loss of attribute and/or quality and integrity of the attribute,</p> <p>Beneficial: Major improvement of attribute quality or creation of new attribute</p>	<p>Adverse: Increased flood risk to essential infrastructure, highly or more vulnerable developments; decrease in WFD ecological status, loss or extensive change to fisheries, loss of or extensive change to aquifer or groundwater supported wetlands, major impact on habitat</p> <p>Beneficial: Creation of flood plain and decrease in flood risk; increase in productivity or size of fishery; increase in surface water ecological WFD status; recharge of an aquifer, increase in groundwater qualitative or quantitative WFD status, major impact on habitat</p>
Moderate	<p>Adverse: Effect on integrity of attribute, or loss of part of attribute</p> <p>Beneficial: Moderate improvement of attribute quality</p>	<p>Adverse: Increased flood risk to less vulnerable developments; no change of WFD status but measurable decrease in surface water ecological or chemical quality or reversible change in the yield or quality of an aquifer, partial loss in productivity of a fishery, partial loss or change to groundwater supported wetlands, moderate impact on habitat</p> <p>Beneficial: Moderate decrease in flood risk, measurable increase in surface water quality or in the yield or quality of aquifer benefiting existing users but not changing ecological WFD status, moderate impact on habitat</p>
Small	<p>Adverse: Some measurable change in</p>	<p>Adverse: Increased flood risk to water-compatible development or impact which does not affect existing or any</p>



	attributes quality or vulnerability  Beneficial: Some beneficial effect on attribute or a reduced risk of negative effect occurring	possible future developments; minor decrease in surface water ecological or chemical quality; minor decrease in yield or quality of aquifer and minor effect on groundwater supported wetlands, no change in WFD status, minimal impact on habitat  Beneficial: Minor decrease in flood risk, minor increase in surface water ecological or chemical quality; minor increase in yield or quality of aquifer not affecting existing users, no change in WFD status, minimal impact on habitat
Negligible	Effect on attribute, but of insufficient magnitude to affect the use or integrity	Negligible change to flood risk; no measurable impact on surface water and groundwater quality and quantity, insignificant, highly localised impact on habitat

[Table 13.2: Sensitivity of an attribute]

SENSITIVITY	ASSESSMENT CRITERIA	TYPICAL EXAMPLE
High	Attribute has a high quality and rarity on regional or national scale	Floodplain or defence protecting more than 100 properties from flooding, high WFD status, salmonid/cyprinid fishery, designated site (SSSI, SAC, Ramsar site, etc) water body highly vulnerable to changes in fluvial morphology processes, regionally important aquifer, SPZ1
Medium	Attribute has a medium quality and rarity on local scale	Floodplain or defence protecting between 1 and 100 properties or industrial sites from flooding, good WFD status, major cyprinid fishery, potentially vulnerable to changes in fluvial morphology processes, locally important aquifer, SPZ2
Low	Attribute has a low quality and rarity on local scale	Floodplain or defence protecting less than 10 industrial properties from flooding, moderate WFD class, aquifer supporting agricultural or industrial use, SPZ3
Negligible	Attribute has a negligible quality and rarity on local scale	Low probability of flooding of residential or industrial sites, poor WFD class, unproductive strata

[Table 13.3: Significance of an effect]

MAGNITUDE	SENSITIVITY			
	High	Medium	Low	Negligible
Large	Major	Major	Moderate	Minor

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<b>Moderate</b>	Major	Moderate	Minor	Negligible
<b>Small</b>	Moderate	Minor	Minor	Negligible
<b>Negligible</b>	Minor	Negligible	Negligible	Negligible

### Uncertainties and limitations

The following uncertainties and limitations have been recorded during the environmental assessment process:

- The hydraulic model of the Langford Brook supplied by the EA has not been calibrated. However considering that the EA utilises the modelling results to assess the flood risk the model is thought to be 'fit for purpose'
- Limited soakaway testing was undertaken as part of the ground investigation thus the assumed ground permeability is based on BGS data and trial pit information
- The design of the surface water drainage is based on an assumption that the proposed finished road levels across the development site are 300mm above the top of stone blankets to allow for construction of the road surface

### 13.3 RELEVANT POLICY AND LEGISLATION

#### **European Floods Directive (2007)**

13.3.1 The aim of the European Floods Directive (2007/60/EC) is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The directive sets out requirements for the UK Government (and all other European Union members) to assess and map flood risk from all major rivers. Preliminary Flood Risk Assessments (PFRAs) have been produced by all Lead Local Flood Authorities, and by 2013 the flood mapping stage should be complete. By 2015, Flood Management Plans will need to be produced, focussing on flood prevention, protection and preparedness.

#### **Flood and Water Management Act (2010)**

13.3.2 The Flood and Water Management Act received Royal Assent in April 2010 and was a direct consequence of the Pitt Review<sup>3</sup> following the summer floods of 2007.

13.3.3 The Act established new roles for local responsibility concerning the management of flood risk, notably the Lead Local Flood Authority (LLFA) (the local unitary or county council, the SUDS Approving Body, and the Risk Management Authority).

13.3.4 Some of the main roles and responsibilities of the various organisations are listed below:

- The Environment Agency strategically overviews all matters related to Flood and Coastal Erosion Risk Management and will develop a National Flood and Coastal Erosion Risk Management Strategy,
- Each LLFA must produce a Local Flood Risk Management Strategy,
- Each LLFA must investigate flood incidents to determine responsibilities,
- Each LLFA must maintain a register of structures and features that are likely to have a significant impact on flood risk – this includes third party assets,

#### **National Planning Policy Framework (2012) and Planning Practice Guidance (2014)**

13.3.5 Under Chapter 10 'Meeting the challenge of climate change, flooding and coastal change of the National Planning Policy Framework (NPPF), it is a requirement for development applications to consider the potential risk of flooding to a Proposed Development over its expected lifetime and any possible impacts on flood risk

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<sup>3</sup> Learning lessons from the 2007 floods. *The Pitt Review*. June 2008

elsewhere, in terms of its effects on flood flows and runoff. Where appropriate, the following aspects of flood risk should be addressed in all planning applications within flood risk areas:

- The area liable to flooding.
- The probability of flooding occurring now and over time.
- The extent and standard of existing flood defences and their effectiveness over time.
- The likely depth of flooding.
- The rates of flow likely to be involved.
- The likelihood of impacts to other areas, properties and habitats.
- The effects of climate change.
- The nature and expected lifetime of the development and the extent to which the development is designed to deal with flood risk.

13.3.6 All new developments must comply with the flood risk guidance set out in the NPPF. As the development site is greater than 1ha in area and partially lies within the 1,000-year floodplain, a site specific flood risk assessment is required, as per paragraph 103 of the NPPF, to consider the risk to the development from all sources of flooding including fluvial (river), tidal, coastal, pluvial (surface runoff / surcharging sewers) and groundwater. The NPPF advocates a risk-based approach to flood risk management in terms of appraising, managing and reducing the consequences of flooding both to and from a development site. The Strategic Flood Risk Assessment (SFRA) and Local Development Documents set out a series of requirements for site specific Flood Risk Assessments (FRA). 'These are aligned with the NPPF requirements and it is considered that the Proposed Development meets the requirements as part of this FRA.

13.3.7 Chapter 11 'Conserving and enhancing the natural environment' of the NPPF aims to encourage the planning system to ensure that pollution and other adverse effects on the local and natural environment are minimised. The planning authorities should set strategies for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.

13.3.8 Further explanation of the NPPF policies relating to flood risk, protection of natural environment and water quality is given in the following Planning Practice Guidance (PPG): 'Flood risk and coastal change', 'Natural Environment' and 'Water supply, wastewater and water quality'.

#### **Water Framework Directive (2000)**

13.3.9 The European Water Framework Directive (WFD) (2000/60/EC) and Groundwater Directive (80/68/EEC) became a part of UK law in December 2003. The framework provides regulatory controls over a variety of activities in order to improve the water

environment. It commits the UK Government (and all other European Union members) to improving the quality of all surface and groundwater bodies and ensuring that deterioration in the status of these water bodies is prevented.

13.3.10 Any modifications to a water body and its floodplain are now required to be Water Framework Directive (WFD) compliant. Assessments should be undertaken to determine the impacts of interventions within a water body on the designated ecological status for that water body. All water bodies have to achieve a good ecological Status or good ecological potential (for heavily modified water bodies) by 2027. Some water bodies have targets to reach a good status by either 2015 or 2021.

13.3.11 Under the WFD the status of surface water bodies is assessed using a range of parameters, including physical, chemical, ecological, hydrological and morphological to present a comprehensive appraisal of a given aquatic ecological health.

13.3.12 The WFD classification for groundwater is 'good' or 'poor' considering the 'qualitative' and 'chemical' status of the water body.

13.3.13 Responding to WFD recommendations the River Basin Management Plans were published in 2009. They state the current status of the surface water and groundwater bodies and define specific mitigation measures to improve polluted water bodies and protect those currently in good condition. Interventions within the water body should work with these mitigation measures so that, for example, a new flood defence scheme not only achieves its objective of protecting properties but also helps the water body to achieve a good status. If it is determined that the Proposed Development could have a negative impact on the ecological status of the water body, it is likely it will be rejected by the regulatory authority and revisions will have to be made so that it does not have a negative impact and also, where possible, improves the ecological status of the water body.

### **The Strategic Flood Risk Assessment (SFRA) Level 1 for Cherwell and West Oxfordshire (2009)**

13.3.14 The Proposed Development site has been identified as a Potential Development Site and was considered in the 2009 Level 1 SFRA review for Cherwell and Oxfordshire District Councils (ID reference B1 31, Bicester SE quadrant). The information contained in the SFRA regarding flood risk and development, applicable to the Proposed Development site, is summarised below.

13.3.15 The following sources of flood risk have been identified in the SFRA:

- Fluvial flood risk - the SFRA mapping shows that the Proposed Development site is located within Flood Zones 1, 2 and 3 of the Langford Brook however due to the scale of the presented maps it is impossible to determine the

precise extents of the flood zones. Flood defences are shown on the SFRA maps. During flood events, considerable inter-relation resulting in backwater effect is known to be arising upstream from the confluences of the Langford Brook. The SFRA mapping of the Langford Brook flood risk is based on the EA detailed hydraulic modelling. It should be noted however that the EAs hydraulic model has been revised after production of the SFRA thus the mapping does not represent the most up to date information.

- Pluvial / Surface Water and Sewer flood risk - no data available
- Groundwater flood risk - no aquifer, site not considered to be materially affected
- Flooding from artificial sources (reservoirs/canals/other) – site not affected
- Historical flooding - a number of historic flood events in CDC are listed in Table 7.1 of the SFRA. None are thought to have flooded the Proposed Development site.

Further information on the SFRA findings is included in Flood Risk Assessment report by JBA Consulting, February 2015, included in Appendix 13.1.

#### **Catchment Flood Management Plan (2009)**

13.3.16 The EAs River Thames Catchment Flood Management Plan (CFMP) was published in December 2009. This establishes current and future levels of flood risk within the River Thames catchment, setting appropriate flood risk management policies accordingly. The Proposed Development site lies within the Towns and villages in open floodplain (north and west) sub-area (policy unit), for which the preferred policy is policy option 6: areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits. A number of specific actions were established to implement this policy, none of which have specific relevance for the site.

#### **Cherwell District Local Plan (1996)**

13.3.17 The 1996 Cherwell Local Plan is the adopted development plan for Cherwell District Council (CDC). A list of Saved Policies indicates that the saved flood risk policies are not applicable to the development proposals and nature of flood risk at the development site.

### **The Non-Statutory Cherwell Local Plan (2011)**

13.3.18 The Non Statutory Cherwell Local Plan 2011 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on this plan was discontinued prior to adoption. Although it does not form a part of the statutory development plan it has been approved as an interim planning policy for development control purposes.

13.3.19 The policies relevant to the development proposals and flood risk are as follows:

- H1a: Location of New Housing - the proposals for new housing development will be considered against the physical and environmental constraints on development land including flood risk and climate change
- EN14: Flood Defence -in areas at risk from flooding, new developments, the intensification of developments or land raising will not be permitted if the proposals are likely to result in a new loss of floodplain storage, impede the flow of flood water or increase the risk of flooding elsewhere
- EN15: Surface Water Run-off and Source Control - new development generating increased surface water run-off likely to result in an adverse impact on surface drains and will not be permitted unless the proposals include appropriate source control and / or attenuation measures.

### **Cherwell Submission Local Plan (2014)**

13.3.20 The Submission Local Plan does not have Development Plan status - it is currently being submitted to the Secretary of State for Communities and Local Government - but it is a material planning consideration. The Submission Local Plan sets out CDC's strategy for the District until 2031. The policies relevant to the proposals and flood risk are as follows:

- ESD1: Mitigating and Adapting to Climate Change
- ESD6: Sustainable Flood Risk Management
- ESD7: Sustainable Drainage Systems
- ESD13: Protection & Enhancement of Biodiversity & the Natural Environment
- Documents detailing the policies requirements were not available.

## 13.4 BASELINE CONDITIONS

### Site description and topography

13.4.1 The Proposed Development is located at Gavray Drive, approx. 1.3km east of Bicester town centre immediately to the north of Langford Village. The site is currently greenfield with no formal drainage system present.

13.4.2 The topography within the site varies from approximately 69.20mAOD in the westerly corner to 66.60mAOD in the south easterly corner near the Langford Brook with the general ground fall in a south easterly direction towards the brook.

### Site hydrology

13.4.3 The Proposed Development falls within catchment of the Langford Brook. Surface water and groundwater features in the vicinity of the site have been identified through desk studies and field surveys. Water bodies of significance to the Proposed Development site are described as follows:

- Langford Brook

Langford Brook forms an eastern boundary of the Proposed Development site. It is a tributary of the River Ray with approximately 18km<sup>2</sup> catchment immediately downstream of the site. The upper extent of the catchment is predominantly rural with isolated settlements. The largest urbanised area in the catchment is Bicester. The watercourse enters the site boundary in a culvert under Chiltern railway line. It then flows in a southerly direction in an open channel along the eastern boundary of the Proposed Development before leaving the site in a culvert under Gavray Drive. The annual average rainfall depth within the catchment is 634mm, as derived from the Flood Estimation Handbook (FEH) CD-ROM. V.3.

The Langford Brook has been classed as having WFD moderate ecological status in 2009 with forecast of achieving good ecological status in 2015.

The Environment Agency's flood maps based on hydraulic model of the Langford Brook show the watercourse as 'Main River' and indicate the site being currently at risk of fluvial flooding from it. The Langford Brook is considered to be of **medium sensitivity**.

- Tributaries of the Langford Brook

Minor unnamed tributaries of the Langford Brook/drains are located immediately to the north of the culvert under railway line and some 400m south of the site. These water bodies are not classed under WFD. For the purpose of this assessment however they have been considered as having the same WFD class as their receptor, the Langford Brook and be of **low sensitivity**.

- Other surface water features



A number of surface water ponds are located to the south of the site. Following a visual inspection of these water bodies they're thought to be surface water attenuation features serving the development plots within the Langford Village. Due to their artificial nature they are considered to be of **negligible sensitivity**.

### **Site hydrogeology**

- 13.4.4 The Environment Agency website shows aquifer designations which have been published by the British Geological Society (BGS). The majority of the site (underlain by Kellaways Clay) has been given an aquifer designation of "Unproductive Strata" by the BGS. However the immediate vicinity of the Langford Brook (overlain by naturally occurring alluvial deposits) is considered as Secondary A aquifer (outside of the main development area). This strata may be capable of local water supply and also potentially active in supplying base flow to watercourses. This assessment is based on the designation of the present geological strata and its generalised permeability.
- 13.4.5 The groundwater within the site is not classed under the WFD and the site is outside the groundwater source protection zone in line with the EA's River Basin Management Plans. It is therefore considered to be of **low sensitivity**.
- 13.4.6 The site investigation carried out by Wardell Armstrong indicated that the site is overlain by a thin layer of made ground materials consistent with the historical agricultural activity on the site. The made ground is underlain by natural superficial deposits typically comprising brown sands and clays with a mixture of sandstone and quartzite gravel. Firm to stiff grey and brown silty clays, representing the Kellaways strata were found at approximately 2.0 to 2.5m below ground level.
- 13.4.7 Groundwater was encountered within the majority of the excavated trial pits. Seepages were recorded between 0.44m and 2.39m below ground level. A moderate water ingress into the trial pits was observed which suggests that dewatering of shallow excavations may be required during construction.
- The results of the standpipes monitoring indicated that the depth of groundwater is relatively shallow across the site.
- 13.4.8 This variability in the groundwater levels across the site may be due to perched groundwater within discrete isolated pockets of granular material within the clay layer. At the time of the groundwater monitoring there was evidence of water ponding on the surface within some areas of the site. It is therefore likely that some of the shallower groundwater levels are representative of the recharge of these isolated granular pockets within the clay materials by surface water.
- 13.4.9 An initial soakaway test was carried out within the site to determine suitability of the underlying soils for infiltration based surface water drainage. The investigation found the soils to be of low permeability (negligible water level drop over a 4 hour period)..

13.4.10 Soil and groundwater sampling and testing was undertaken as part of the site investigation. The results concluded that the soil and groundwater encountered on site does not pose a significant risk to human health and the environment

13.4.11 Ray Conservation Target Area (CTA) is located to the east of the Langford Brook. It is an area in which Biodiversity Action Plan (BAP) habitat targets are to be delivered. It aims to restore local biodiversity through the creation and restoration of ecological corridors. The primary biodiversity interests supported within the CTA include lowland meadow, wet grassland/floodplain grazing marsh, hedgerows, ponds and true fox sedge. Although no statutory nature conservation designations cover the site the existing Gavray Drive Meadows, located to the east of the Langford Brook are considered as 'valued ecological receptors'.

#### **Water abstractions**

13.4.12 The EA mapping does not identify any surface or groundwater abstractions within the study area.

#### **Historical flooding**

13.4.13 The British Hydrological Society's 'Chronology of British Hydrological Events' database was consulted however, no site-specific historical records of flooding were found for the Proposed Development site.

13.4.14 The Level 1 SFRA for Cherwell and Oxfordshire District Councils have not identified any historic flooding events within the Proposed Development site.

13.4.15 An internet based search regarding flooding events from various sources at the Proposed Development site was also undertaken. No records of historic flooding pertaining to the site were found.

13.4.16 Based on the review of the historical flooding data in relation to the site the main access road, the Gavray Drive, is not shown to be at risk of flooding or passing through an area at risk of flooding. The Proposed Development should ensure that emergency access to the site is available at all times and the Gavray Drive would be a suitable route for access and egress to and from the site in the event of emergency.

#### **Fluvial flood risk**

13.4.17 The Level 1 SFRA produced by CDC Council and the EA's flood maps show that the site is at risk of fluvial flooding from the Langford Brook and lies partially within Flood Zones, 1, 2 and 3. The EA flood extents are based on a detailed hydraulic modelling study of the Langford Brook undertaken in 2010 utilising ISIS-TUFLOW software. Consequently the EA flood maps represent the most up to date information in relation to flood risk. The 1 in 100-year with climate change flood water levels in the Langford

Brook channel along the site boundary vary between 67.18mAOD immediately downstream of the railway line crossing and 66.91mAOD immediately upstream of the Gavray drive crossing.

#### **Surface water flood risk**

13.4.18 The Level 1 SFRA does not include any data regarding surface water flooding on the site. The EA flood map shows the Proposed Development site being largely at low/very low risk of surface water flooding. Small, isolated areas at medium to high risk to surface water flooding are located in the vicinity of the Langford Brook and the Chiltern railway line with a concentrated area in the south east corner of the site near the culvert under Gavray Drive.

13.4.19 A review of the topographic survey and a visual inspection of the site have confirmed the findings of the EA mapping. The surface water is likely to collect in the localised depressions across the site and naturally low lying areas along the Langford Brook.

#### **Groundwater flood risk**

13.4.20 The Level 1 SFRA concluded that the site will not be materially affected by groundwater flooding.

13.4.21 The ground investigation and soakaway test results showed that the site is underlain by impermeable clay based soils. Whilst the clay layer may prevent deep groundwater reaching the surface the shallow perched groundwater present within the topsoil may equally be unable to infiltrate and hence could potentially resurface within the site. Based on that the groundwater poses some risk of localised flooding within the site however this could not be quantified.

#### **Risk of flooding from reservoirs**

13.4.22 In line with the EA flood map the site is not in an area identified at risk of flooding due to reservoir failure.

13.4.23 Further information on flood risks pertinent to the Proposed Development are presented in the Flood Risk Assessment included in Appendix 13.

#### **The projected future baseline**

13.4.24 Rainfall intensity and peak flows in the Langford Brook channel are expected to increase over the life-time of the Proposed Development. Consequently, existing flooding problems downstream of the Proposed Development site are expected to increase.

13.4.25 To mitigate against the effect of climate change, appropriate provisions in the design of fluvial compensatory storage and surface water drainage have been made.

13.4.26 To ensure that the proposed surface water drainage system employed on site is operational at all times (and does not cause flooding or existing water quality deterioration) a long term management strategy setting out the maintenance regime will be required. This should also include a provision for repairs due to vandalism acts.

13.4.27 Future developments along the river corridor may lead to deterioration in water quality and local ecology unless appropriate mitigation measures are employed as part of the development proposals.

### 13.5 LIKELY SIGNIFICANT EFFECTS

#### Construction stage

13.5.1 This section explains the potential effects the proposed construction activities could have on the water environment if no mitigation measures are employed on site. This is based on activities normally associated with construction sites however the specific working methods will be developed by an appointed contractor for the works. Where measures would be required to mitigate against significant effects this is stated within the text.

#### *Water quality*

13.5.2 The following likely effects on water quality associated with construction phase of the development have been identified:

- Degradation of water quality in Langford Brook due to erosion and silt mobilisation as a result of vegetation and topsoil strip and construction traffic movement. Suspended solids can cause detrimental impacts on receiving watercourses, particularly those with gravel beds, by filling voids between gravel particles. These voids are vital for macro-invertebrates, as they provide important pockets of air within the bed and collect small food particles
- Contamination of perched groundwater and Langford Brook due to accidental spillages of fuel and oil from site plant and use of construction materials
- Pollution of surface and perched groundwater due to engineering works mainly construction of flood compensatory storage and surface water outlet structure and piling operations as well as accidental spillages
- Although no contaminants posing a risk to the environment have been encountered during the ground investigation the historic agricultural use of the land suggests that the soil may be rich in nutrients such as phosphorus and nitrogen (the site is located within surface water Nitrite Vulnerable Zone in line with the EA map). Excavation, movement of construction plant and dewatering activities could mobilise the organic pollutants leading to eutrophication of the receiving watercourses.

#### *Drainage and flood risk*

13.5.3 The following likely effects on existing drainage and flood risk associated with construction phase of the development have been identified:

- Increased surface water runoff rates and volumes from the site due to stripped vegetation, exposed and compacted soils and creation of impermeable surfaces (decreased hydraulic roughness and evapo-transpiration potential) leading to increased flood risk downstream

- Increased flood risk downstream due to discharge of groundwater to Langford Brook (dewatering of excavations)
- The site is located within the floodplain of the Langford Brook thus until the flood alleviation scheme is put in place the site team and associated machinery would be at risk of flooding during the construction phase of the development

13.5.4 The magnitude of the construction phase effects on the existing water quality is considered to be **moderate adverse** whereas the magnitude of the effects on the existing drainage and flood risk is considered to be **large adverse**.

13.5.5 Although majority of the potential construction effects would be of a temporary nature appropriate mitigation measures will be required to minimise the adverse impacts on the quality and quantity of the existing water environment.

#### **Post-completion stage**

13.5.6 This section explains the potential effects the Proposed Development could have during an operational phase on the water environment if no mitigation measures are employed on site. Where measures would be required to mitigate against significant effects this is stated within the text.

#### *Fluvial flood risk*

13.5.7 The hydraulic modelling of the Langford Brook concluded that the most south easterly part of the development site encroaches into the 1 in 100-year with climate change floodplain. A summary of floodplain volumes lost at specific elevations is presented in Table 13.4.

**Table 13.4: Floodplain capacity lost due to the development**

Elevation (mAOD)	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )
66.3	0.00	0.00
66.4	0.00	0.00
66.5	40	1.47
66.6	300	15.91
66.7	1564	98.45
66.8	3764	354.30
66.9	5984	844.44
67.0	7140	1511.79

13.5.8 The above results show that the development of the site would lead to a loss of approximately 1512m<sup>3</sup> of existing floodplain storage capacity and consequently could put the Proposed Development at risk of fluvial flooding and further increase a flood risk downstream. Consequently the magnitude of the effects is considered to be **large adverse**. Appropriate mitigation measures in line with the current best practice would therefore be required to minimise the effects of the Proposed Development on flood risk.

13.5.9 Details of the flood risk analysis in the Langford Brook are provided in the Flood Risk Assessment report included in Appendix 13.1.

13.5.10 It is likely that a land raising will be necessary in the northern part of the site (adjacent to the railway line) to facilitate gravity surface water drainage system within the site. As the land raising would take place outside the current floodplain extent it would not have a material impact on the existing flood water levels.

*Surface water runoff quality and quantity*

13.5.11 The proposed surface water drainage system will be based on a gravity discharge to the Langford Brook. The introduction of impermeable surfaces like roofs and hardstandings on site would increase the rate and volume of surface water runoff compared with its pre-development greenfield condition. Utilisation of traditional pipe drainage system based on unrestricted and untreated discharge to the Langford Brook could exacerbate flood risk downstream and adversely impact the water quality in the receiving watercourse. Consequently the magnitude of the uncontrolled surface water discharges is considered to be **moderate adverse**. Appropriate mitigation measures incorporating SuDS techniques in line with the current best practice would therefore be required to address the quality and quantity of surface water runoff disposed of the site.

13.5.12 The surface water drainage system will be designed to manage runoff from the site during design storm events. Exceedance of the design capacity of the system, failure of individual components, blockage within the system or acts of vandalism could cause failure of the drainage system leading to increased flood risk and water quality issues in the receiving watercourse. The magnitude of the drainage system failure effects is considered to be **moderate adverse**. Appropriate measures to reduce the risk of the drainage system failure will be required.

13.5.13 To facilitate the development the natural site topography will be modified to a certain extent. Where ground slopes are reduced, the speed of runoff will slightly decrease, increasing the potential for infiltration within the open spaces leading to an overall reduction in runoff rates and volumes. Where topography is steepened, this will locally increase the runoff velocity, decrease infiltration potential and therefore increase the rate and volume of runoff. Considering that the average ground slope across the site will remain as per the existing condition and the underlying geology is essentially impermeable magnitude of the modified topography effect is considered to be **negligible**. No mitigation measures are therefore required.

13.5.14 No significant disturbance of the underlying soils other than general garden maintenance and occasional construction of extensions is anticipated. Consequently the risk of mobilisation of the existing organic pollutants from the soil and their transfer to the Langford Brook via surface water runoff will be low. Additionally, the SuDS management train employed on the site will further reduce the concentration of

organic pollutants improving the runoff quality discharged to the watercourse thus no further mitigation measures would be required. The magnitude of the mobilised organic pollutant effect is considered to be **negligible**.

Groundwater quality and quantity

13.5.15 Considering the impermeable nature of the underlying soils no infiltration based surface water drainage system will be installed on site. The drainage will discharge to the Langford Brook. As a result the risk of pollution to the groundwater due to runoff discharges is minimised. The magnitude of the effect is considered to be **negligible** and no mitigation measures are required.

13.5.16 The majority of the site has an aquifer designation of “Unproductive Strata” except of a small area in the immediate vicinity of the Langford Brook which is considered as Secondary A aquifer (outside of the main development area). However it is not known to be used for any water supply or irrigation purposes. Currently the site does not contribute significantly to recharging the aquifer located beneath it due to steep site slopes and essentially impermeable nature of the underlying soils. Incorporation of the impermeable surfaces would not therefore significantly affect the groundwater recharge rates. Consequently the magnitude of the effect is considered to be **negligible** and no mitigation measures are required.

13.5.17 There is a potential for localised groundwater flooding on site due to the underlying geology, especially in the low lying areas. The magnitude of the effect is considered to be **small adverse** and some mitigation measures will be required to ensure that the proposed properties are protected against groundwater flooding. The groundwater flooding is not considered however to pose a threat to human life.

## 13.6 MITIGATION MEASURES

### Construction stage

13.6.1 Construction activities, although temporary, can cause watercourse pollution, such as discolouration and siltation, having potentially long term detrimental effect on local habitat. They can also lead to flooding. Although working methods containing details of planned risk mitigation measures would be developed by an appointed contractor it is envisaged that they will be prepared in line with the current best practice guidance including EA’s Pollution Prevention Guidelines, mainly PPG 1, PPG 5, PPG 6, PPG 8 and PPG 21.

13.6.2 An Environmental Management Plan including Water Management Plan and pollution emergency procedure would need to be developed for the site in consultation with the EA and Oxfordshire County Council prior to construction works commencing.

13.6.3 It is anticipated that the below general mitigation rules will be followed:



- Method statements will be produced and approved by relevant authority prior to works commencing
- Minimise the extent of bare soils and establish vegetation as soon as practicable
- Temporary surface water drainage including settlement lagoons/tanks will be provided to cater for runoff (providing a degree of treatment and attenuation) from the construction area. The construction phase drainage and associated SuDS should be separated from permanent drainage system. The permanent SuDS, such as detention basins and retention ponds should be planted and established prior to connection of the new drainage system to ensure that the facilities are not contaminated with the construction runoff.
- Haul roads and material storage compounds will be located away from the watercourse and water drainage paths
- Oil/fuel compounds will be bounded and positioned away from the watercourse and water drainage paths. Emergency spill kits will be available
- Topsoil stockpiles will be located away from the watercourse and main drainage paths and will not be left exposed to minimise sediment load
- Silt curtains will be positioned along the watercourse to capture the sediments coming of the site,

13.6.4 A consent should be sought from the Oxfordshire County Council prior to commencing any engineering works in or in the immediate vicinity of the watercourse.

13.6.5 Based on the local hydrogeological conditions no extensive dewatering of the excavations is anticipated thus no major water quality or flood risk issues are envisaged.

13.6.6 It is considered that incorporation of the aforementioned construction mitigation measures will reduce the risk of watercourse pollution and flooding and the magnitude of the temporary effects will be **small adverse**.

#### **Post-completion stage**

##### *Fluvial flood risk*

13.6.6 The Proposed Development will encroach onto the 1 in 100-year with climate change floodplain of the Langford Brook. A consultation with the EA in March 2014 revealed that a level for level floodplain compensation scheme will be required to offset the floodplain storage lost as a result of the Proposed Development. The compensatory storage should mimic the existing condition, e.g. coming into effect at the same time during the post-development 1 in 100-year with climate change flood event as it would during the baseline scenario.

13.6.7 An area within the most north easterly part of the site, currently located outside the 1 in 100-year with climate change flood extent, has been allocated for the

compensatory flood storage. The location of the storage area has been determined based on its hydraulic connectivity with the Langford Brook, its proximity to the affected part of the floodplain and the requirement that it should be deployed at the same levels as the existing storage. A summary of the estimated compensated floodplain volumes during the 1 in 100-year with climate change flood event is presented in Table 13.5.

**Table 13.5: Comparison of existing and compensated floodplain volumes**

Elevation (mAOD)	Existing floodplain loss volumes (m <sup>3</sup> )	Floodplain compensation volumes	Loss (-) or Gain(+)
66.3	0.00	0.00	+0.00
66.4	0.00	0.00	+0.00
66.5	1.47	252.18	+251.00
66.6	15.91	504.35	+488.00
66.7	98.45	756.53	+658.00
66.8	354.30	1008.71	+654.00
66.9	844.44	1260.89	+416.00
67.0	1511.79	1513.06	+1.00

13.6.8 The above results show that the floodplain storage lost as a result of the Proposed Development can be fully offset by the proposed flood compensation scheme. Incorporation of the flood compensatory storage will place the residential footprint of the Proposed Development fully outside the 1 in 1000-year flood extent, i.e. in Flood Zone 1.

13.6.9 The excavated area will be an integrated part of the public open space and used for amenity purposes. It will periodically fill with water and thereby provide flood storage capacity. As flood levels subside, the stored water will drain back into the Langford Brook by gravity.

13.6.10 Further details of the post-development flood risk analysis in the Langford Brook are provided in the Flood Risk Assessment report included in Appendix 13.1.

13.6.11 In line with best practice and the general EA recommendation the minimum finished floor levels of residential properties should be set 600mm above the modelled 1 in 100-year plus climate change flood levels which in this case is 67.78mAOD. The 600mm freeboard accounts for modelling uncertainties, wave action of flood waters, blockage of existing water conveyance structures and ground settlement following construction.

13.6.12 Further information on predicted flood water levels in the Langford Brook is presented in the Flood Risk Assessment report included in Appendix 13.1.

13.6.13 The availability of safe access and egress to and from the site has been assessed in relation to the EA flood map. The main access road to the site is the Gavray Drive along the southern boundary of the Proposed Development. The road is shown not to be at risk from fluvial flooding. Access via Gavray Drive should therefore be maintained to allow safe access and egress to and from the development site during extreme flood events in the Langford Brook.

13.6.14 Considering the proposed fluvial flood mitigation measures are employed on site the magnitude of the effect would be **negligible**.

*Surface water runoff quality and quantity*

13.6.15 The accelerated and untreated runoff from the built up areas can cause deterioration of water quality and increase a flood risk in the receiving Langford Brook. A surface water drainage strategy, incorporating SuDS management train, has therefore been produced for the Proposed Development area. The surface water drainage system employed at the new development will ensure that the flood risk elsewhere will not be increased and that adequate opportunity for water quality treatment and ecological enhancement will be provided throughout the site. All surface water drainage features included in the strategy will be located within the proposed site boundary.

13.6.16 In line with CIRIA C697 The SuDS Manual at least two levels of runoff treatment from residential access roads and car parking areas and one level of treatment of runoff from roofs should be provided. The proposed SuDS management train for the site will comprise the following components;

- Porous paving with underlying stone blanket (within highways and car parking and driveway areas) providing first level of runoff treatment by removing suspended solids and heavy metals
- Detention basin providing second level of treatment by further pollutant settlement and biodegradation.

13.6.17 To protect downstream sites against increased flood risk attenuation of the generated surface water runoff on site will be provided in line with the EA Rainfall Runoff Management for Developments, Report SC030219.

13.6.18 The stone blankets and detention basin will provide attenuation of the 1 in 100-year with climate change post-development storm event to the equivalent 1 in 2-year greenfield runoff rate. It will ensure that the development will not have a negative impact on the watercourse in terms of the flow rates and volume of runoff. The restricted flow will be discharged to the Langford Brook by gravity. Considering the potential pockets of shallow groundwater the proposed drainage system will be lined.

13.6.19 In the event of the exceeded stone blanket capacity or system blockage designated overland flood routes within the site boundary (mainly along highways) will convey the waters away from the buildings and towards the detention basin prior to discharge to the watercourse.

13.6.20 Further information on the proposed surface water drainage strategy is presented in the Flood Risk Assessment report included in Appendix 13.1.

13.6.21 In line with Part H of the Building Regulations, it is recommended that finished floor levels are set at least 150mm above the surrounding ground levels to prevent storm water from ponding near doorways and flowing through ingress routes such as vents and air bricks.

13.6.22 When considering the landscaping of the site, ground levels should be designed such that surface water runoff is directed away from buildings and towards the formal drainage system or less vulnerable areas such as highways and open spaces.

13.6.23 A long term management plan will be required to ensure that the proposed drainage system is regularly maintained and operational at all times. It is envisaged that the proposed SuDS system will be adopted by Oxfordshire County Council as part of its future SuDS Approving Body responsibility within its role as a Lead Local Flood Authority. In the event that the Council would not adopt the proposed drainage system a management company should be appointed to maintain the system.

13.6.24 Considering the proposed surface water management measures are employed on site the magnitude of the effect will be **negligible**.

*Groundwater flood risk*

13.6.25 Although the risk of groundwater flooding is considered to be low, if the new properties are to contain basements beneath ground level, their design should ensure that a waterproof tanking layer is provided to prevent ingress of ground water. The floors of all new buildings should be made of solid construction materials or the ground beneath suspended floors should be sealed to prevent ingress of groundwater in the event of raised water table level directly beneath the site. Furthermore incorporation of basements in properties positioned in the low lying areas in the local topography is not recommended.

13.6.26 Considering the proposed groundwater flood risk mitigation measures are employed on site the magnitude of the effect will be **negligible**.

## 13.7 RESIDUAL EFFECTS

### Construction stage

13.7.1 The adoption of best working practices and compliance with the EAs Pollution Prevention Guidelines by the appointed contractor would reduce the risk of significant effects on the quality and quantity of the local water environment during the construction phase of the development. It will not however totally eliminate the risks thus the significance of the temporary residual effects will be **minor adverse**.

### Post-completion stage

#### *Fluvial flood risk*

13.7.2 Subject to incorporation of the proposed fluvial mitigation measures the significance of the effect will be **negligible**.

#### *Surface water runoff quality and quantity*

13.7.3 Subject to incorporation of the proposed SuDS scheme measures the significance of the effect will be **negligible**.

#### *Groundwater flood risk*

13.7.4 Subject to incorporation of the recommended protection measures against groundwater flooding the significance of the effect will be **negligible**.

### Summary of effects

13.7.5 The identified effects are summarised in Table 13.6.

**Table 13.6: Summary of significant effects**

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage (temporary effects)</b>			
Water quality (deterioration of surface water and groundwater quality)	Moderate adverse	Adherence to best working practices and EAs PPGs. Method statements to be approved by LLFA.	Minor adverse
Flood risk and drainage (increased flood risk elsewhere)	Major adverse	Adherence to best working practices and EAs PPGs. Method statements to be approved by LLFA.	Minor adverse
<b>Post-completion stage (long term)</b>			

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
effects)			
Fluvial flooding to the Proposed Development and elsewhere	Major adverse	Implementation of flood compensation scheme	Negligible
Surface water runoff (deterioration of water quality in Langford Brook)	Moderate adverse	Implementation of SuDS scheme and adherence to long term management plan to ensure drainage efficiency at all times	Negligible
Surface water runoff (increased flood risk elsewhere due to discharge to Langford Brook)	Moderate adverse	Implementation of SuDS scheme and adherence to long term management plan to ensure drainage efficiency at all times	Negligible
Groundwater flooding to proposed properties	Negligible	Appropriate protection/waterproofing to basements (if proposed). Incorporation of basements is not recommended in low lying areas in the local topography	Negligible

### **13.8 CUMULATIVE EFFECTS**

- 13.8.1 The likely significant cumulative effects arising from the interaction between the Proposed Development and other potential developments within the catchment of the Langford Brook have been considered.
- 13.8.2 Based on the assumption that the future proposed developments will follow the current best practice and approved design standards in relation to flood risk and surface water management (e.g. provision of flood protection and SuDS schemes addressing water quality and quantity) and groundwater protection the significance of the cumulative impacts on the hydrology, hydrogeology and flood risk would be negligible.
- 13.8.3 Considering the potential hydrological and hydrogeological variations across the Langford Brook catchment site specific conditions within the other development sites would have to be investigated prior to incorporation of appropriate mitigation measures in order to protect the water quality and quantity in the Langford Brook catchment.

## **Glossary**

*Mitigation:* With respect to an undertaking, the elimination, reduction or control of the adverse effects or the significant environmental effects of the undertaking, and may include restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

*Model:* a simplified representation of reality.

*Resilience:* the ability of a system (ecological, economic, or social) to absorb stresses created by external disturbances, without modification of the system.

*Scenario:* a prediction obtained from assumptions formulated to make comparisons with other scenarios rather than to predict real events or conditions.

*Sensitivity analysis:* a technique used in computer simulations of deliberately changing some of the assumptions or values of the input variables for the purpose of determining the relative effects on the values of the output variables.





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## 14. GROUND CONDITIONS

### 14.1. INTRODUCTION

- 14.1.1. This section has been prepared by Odyssey Markides LLP and provides an assessment of any likely significant environmental effects upon ground conditions at the site. This assessment has been based on a review of available desktop information regarding the conjectured geology beneath the Site and current environmental risks associated with the Site informed by an intrusive investigation. The assessment covers the requirements set out in the Scoping Opinion letter from Cherwell District County, reference number RH/14/00009/SCOP.
- 14.1.2. In relation to the development proposal, Wardell Armstrong LLP carried out a Desk Study (Desk Study and Preliminary Site Investigation Report, May 2007: **Appendix 14.1**) informed by an intrusive investigation on site in order to identify anticipated ground conditions and environmental risks. Through the desk top research, intrusive investigation and subsequent laboratory testing, the assessment identifies any existing and potential receptors which may be present and the pathways by which the receptors may be exposed to any identified sources of contamination at the Site.
- 14.1.3. Additional intrusive site investigations are recommended prior to detailed design to assist and inform the detailed design and construction of the Proposed Development. The studies and surveys undertaken to inform the assessment set out in this Chapter have enabled an assessment of any likely significant environmental effects of the Proposed Development.

## 14.2. ASSESSMENT METHODOLOGY

### Scope

- 14.2.1. The Wardell Armstrong LLP desk study (**Appendix 14.1**) assesses the likely significant environmental effects due to the geological setting of the Site based on published geological mapping and in site investigation. The desk study considers the Site and its immediate vicinity. The results of the study have been used to complete this chapter and determine the requirement for any mitigation works needed at the more detailed design stages.
- 14.2.2. This chapter summarises the findings of the desk study and on site intrusive investigation (**Appendix 14.1**). The objective of this chapter is to compile information from a range of sources to provide an assessment of the likely significant environmental effects due to ground conditions at the Site.

### Data sources

- 14.2.3. Available published information combined with results from the onsite intrusive investigation (**Appendix 14.1**) have been used to assess the likely ground conditions which may be expected across the Site. These data sources comprise the following:
- On site investigation comprising:
    - 84 Standard Penetration Tests;
    - 5 CBR tests;
    - 1 soakaway test;
    - 13 soil samples for geotechnical tests; and
    - 63 soil samples and 11 groundwater samples for contamination testing.
  - GroundSure Environmental Data Reports – environmental datasets and maps designed to reinforce professional opinion with regards to environmental consulting;
  - Environment Agency (EA) - utilising the vast amount of data the EA have collected and stored in their databases. This includes (but is not

limited to) Groundwater Vulnerability Map, Aquifer Maps, Groundwater Source Protection Zones;

- Geological mapping and memoirs - published by the British Geological Survey (BGS), these maps have been reviewed as a point of reference for historical layout and land usage; and
- Ordnance Survey Plans – detailed, up to date mapping which has been referenced in this chapter as evidence of current features of Site and the surrounding area.

#### **Assessment approach**

14.2.4. This assessment considers the way in which the Proposed Development may affect the ground conditions at the Site. The evaluation takes into account the effects of the change of land use together with the potential impact of the construction phase and the proposed end use of the land.

14.2.5. The assessment of contamination risk for the Site reviews potential complete pollution linkages between a contaminant source and a sensitive receptor via an exposure pathway. The fundamental concept is that without each of the three elements (contaminant, pathway and receptor as defined in the Department for Environment, Food & Rural Affairs' (April 2012) *Environmental Protection Act 1990: Part2A, Contaminated land Statutory Guidance*, London: The Stationary Office) being present on the Site forming a complete pollution linkage there can be no contamination risk. The presence of contamination at a particular location does not necessarily represent an associated risk.

#### **Significance criteria**

14.2.6. In order to assess the risk posed to a receptor by the structural and chemical make-up of the existing conditions, including contamination (substances within the ground that could cause harm), the sensitivity of the receptor, exposure duration and site end-use scenario form part of the assessment. For example, the concentration of contaminants tolerable at a site to be developed for residential use, with gardens used to grow vegetables and accessible to young children, is lower than that tolerable

on a commercial site, where soil is exposed only in minor areas of soft landscaping and where the only long-term users of the site are adults.

- 14.2.7. The magnitude of change predicted and the sensitivity of identified receptors are used to qualitatively and quantitatively assess the impact significance of the Proposed Development. The quantitative assessment refers to human exposure and is based on Soil Guideline Values (SGV) presented within the Contaminated Land Exposure Assessment (CLEA) model published by the Department for the Environment, Food and Rural Affairs (DEFRA). Impacts have the potential to be either adverse or beneficial. The details of impact assessment will be discussed in paragraphs 14.2.14 to 14.2.23 in this ground condition assessment.

<b>Magnitude</b>	
<b>Typical Description of the Change Predicted</b>	
<b>Large</b>	i.e. Large area of the site contains contamination levels that significantly exceed the intervention levels or Soil Guideline Values. Remediation to a state 'suitable for use' required prior to site development
<b>Moderate</b>	i.e. Proposals cause the release or mobilisation of contaminants through the creation of a pathway to expose receptors to high levels of contamination
<b>Small</b>	i.e. Contaminants identified on site are approaching the Soil Guideline Values, or are between the target and intervention levels. Remediation may be required prior to development
<b>Negligible</b>	i.e. Existing contaminants identified are found in relatively low concentrations that pose no significant risk to receptors, and therefore no remedial action is taken

**Table 1 : Magnitude**

- 14.2.8. The magnitude of an effect is to be considered by the nature of change, its severity, the duration of an effect and the likelihood of an effect occurring, therefore, the risk assessment has been based on a qualitative assessment and professional judgement. The magnitude of an impact has been described as either a 'large', 'moderate', 'small' or 'negligible'.

<b>Receptor</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Negligible</b>
Typical Description of Receptor	i.e. Land to be used for allotments or domestic gardens, to grow crops for human consumptions, or upon which animals are reared for human consumption	i.e. Parks, playing fields and open spaces	i.e. commercial land uses	i.e. industrial land uses or concrete covered area

**Table 2: Sensitivity**

- 14.2.9. A receptor may be an existing receptor affected by change in mobilisation of a pollutant, or a proposed land use that is potentially sensitive to the existing contamination.
- 14.2.10. In line with statutory guidance, the proposed land use is a key factor in determining an acceptable level of contamination. Therefore, if more than one land use is proposed for the site, the sensitivity of receptor may be determined according to the levels and locations of contamination identified in relation to the proposed master plan or site use, and the subsequent potential for contamination to affect receptors.

MAGNITUDE	SENSITIVITY			
	High	Medium	Low	Negligible
Large	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Insignificant
Small	Moderate	Minor	Minor	Insignificant
Negligible	Insignificant	Insignificant	Insignificant	Insignificant

**Table 3: Significance**

- **Major:** Highly sensitive land uses, highly sensitive ecosystems and water receptors and also land uses resulting in human exposure to hazardous concentrations of contaminant (greater than their intervention level, or between intervention and target level). Pathway to release / mobilisation / exposure to contaminant is generated to humans and/or ecosystem. Potential for moderate and major changes to very sensitive ecosystems.
- **Moderate:** Low sensitivity land uses, water receptors and ecosystems exposed to contaminant concentrations greater than their intervention level, or between intervention and target level. Also highly sensitive receptors exposed to contaminants approaching target level. Potential for minor changes to ecosystems.
- **Minor:** Low sensitivity land uses, water receptors and ecosystems exposed to contaminant concentrations approaching target level. Potential for minor changes to ecosystem. High / moderately sensitive receptors are exposed to contaminants found in relatively low concentrations that pose no significant risk to humans, animals or plants.



- **Insignificant:** Non-sensitive land use, water course or ecosystem exposed to contaminants found in relatively low concentrations that pose no significant risk to humans, animals or plants.
- 14.2.11. For the purposes of environmental assessment major and moderate effects (whether adverse or beneficial in nature) are considered to be significant.
- 14.2.12. With regards to significance, professional judgement can be used to vary the category where specific circumstances dictate, for example due to the vulnerability or condition of the receptor. For example, not all contaminants are harmful to all receptor types, such that a phototoxic contaminant may significantly impact a nature conservation receptor of importance for sensitive plants and not impact fauna. Factors such as chemical absorption and synergistic effects may also moderate the assessment. Impacts shall be reviewed on an overall basis of 'adverse' or 'beneficial', except where negligible magnitudes and sensitivities are noted.
- 14.2.13. The degree of 'pollution' will be fundamentally affected by, and can be moderated through reference to, the integrity of the pollutant linkage. The category will be dependent on the completeness and nature of the pathways between contaminate source and receptor. Other factors may also be deemed to amend the assessment of significance, such as the local, regional or national shortage of a particular receptor resource. The reason for and nature of any variation will be made clear in the assessment. If the degree of effect is moderate or above, then the effect is considered to be significant.

#### **Conceptual Site Model**

- 14.2.14. A Conceptual Site Model (CSM) for the Site has been developed by Wardell Armstrong LLP (**Appendix 14.1**) and assesses potential contaminants, potential sources of contamination, potential receptors and potential pathways by which the receptors may be exposed. With respect to land contamination, potential receptors include human health, controlled waters, flora and fauna and buildings and structures. A pathway is a route or routes by which a receptor is exposed to a contamination source. Pathways can also determine the likelihood of the

contamination source contacting a receptor. It should be noted that some uncertainties exist due to the limited site-specific data available.

- 14.2.15. The CSM is based upon the desk study information (sourced from information readily available and obtained from archives as listed in **Appendix 14.1**) and the intrusive investigation.

*Sources*

- 14.2.16. The desk study (**Appendix 14.1**) research did not identify any widespread potential contaminant sources on-site. No industrial processes or

significant material storage has been identified at the Site. Sources of contamination may potentially exist within unforeseen ground conditions.

14.2.17. The historical mapping for the Site identified potential offsite sources of contamination to comprise the following:

- electricity substation located within 31m;
- Fuel station entries within a 250m radius of the Site. Both entries are listed as being associated with Joblings garage 100m north west and 114m west of the Site.

#### *Pathways*

14.2.18. A number of possible pathways have been identified by the Wardell Armstrong Desk Study (**Appendix 14.1**) whereby potential receptors can be exposed to, or affected by, the identified contaminants:

- Groundwater/perched groundwater;
- Surface water runoff;
- Dermal contact, ingestion or inhalation of soil contaminants by site users;
- Inhalation of contaminated dust and gasses;
- Uptake of contaminants from soil by flora;
- Migration of ground gases into buildings;
- Migration through service ducts and foundations; and
- Direct contact with building substructures.

#### *Receptors*

14.2.19. Receptors are essentially anything or anyone that can be adversely affected by contamination once a source and a pathway have been established.

14.2.20. The presence of potential receptors has been evaluated using understanding of the current and future land use(s) of the Site.

14.2.21. Consideration of potential receptors in the immediate surrounding area ensures the accurate assessment of potential on-site contamination impacting off-site locations.

14.2.22. The receptors and conceptual model are reviewed and specified in further detail within the Wardell Armstrong Desk Study Report (**Appendix 14.1**) and are listed as:

- Humans;
- Surface waters (Langford Brook);
- Groundwater;
- Buildings; and
- Construction material.

**Uncertainties and limitations**

14.2.23. This assessment has been undertaken based on the findings of the Wardell Armstrong LLP Desk Study and Preliminary Site Investigation Report undertaken in May 2007 (**Appendix 14.1**). Odyssey Markides cannot definitively comment on the potential for contamination associated with any sources of contamination not investigated within that report, or contamination which has occurred subsequent to that report being prepared.

### 14.3. RELEVANT POLICY

#### National Planning Policy Framework (March 2012)

14.3.1 The control of development and land use in the future is the responsibility of the planning system, which is the principal regulatory driver for this Site. In March 2012, the Government released the National Planning Policy Framework (NPPF) which replaced all previous planning policy statements and guideline (PPS/PPG) documents including Planning Policy Statement (PPS) 23 Planning and Pollution Control. However, it should be noted that the NPPF does not change the statutory basis on which planning decisions are founded and emphasises the requirement for sustainable development.

14.3.2 A fundamental principle of sustainable development is that the condition of land, its use and its development should be protected from potential hazards. The NPPF states that:

- *120. To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.*
- *121. Planning policies and decisions should also ensure that:*
  - the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;
  - *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*

- *adequate site investigation information, prepared by a competent person, is presented.*

### **National Planning Policy Guidance**

- 14.3.3 On 6 March 2014 the Government announced the launch of the new Planning Practice Guidance ('PPG').
- 14.3.4 The key PPG features relevant to ground condition assessment have been detailed within this chapter.
- 14.3.5 Land Affected by Contamination (Available at: <http://planningguidance.planningportal.gov.uk/blog/guidance/land-affected-by-contamination/> [Date accessed: 06/03/2014]): The PPG highlights how failure to deal adequately with contamination could cause harm to human health, property and the wider environment. This could also limit or preclude new development; and undermine compliance with European Directives such as the Water Framework Directive.
- 14.3.6 Hazardous Substances (Available at: <http://planningguidance.planningportal.gov.uk/blog/guidance/hazardous-substances/> [Date accessed: 06/03/2014]): The PPG explains planning controls for storage of hazardous substances mainly stemming from Seveso II Directive. The Seveso II Directive is the main piece of EU legislation that deals specifically with the control of on-shore major accident hazards involving dangerous substances.
- 14.3.7 Land Stability (Available at: <http://planningguidance.planningportal.gov.uk/blog/guidance/hazardous-substances/> [Date accessed: 06/03/2014]): The guidance on land stability provides advice to local authorities and developers to ensure that development is appropriately suited to its location, and that there are no unacceptable risks caused by unstable land or subsidence.
- 14.3.8 Flood Risk (Available at: <http://planningguidance.planningportal.gov.uk/blog/guidance/land-stability/> [Date accessed: 06/03/2014]): In light of recent weather conditions at the time of producing this chapter, the PPG contains strict guidance on how local authorities should act on flood risk assessments. It states that the tests as set out in the NPPF should be followed and

where the tests are not met, new development on flood risk sites should not be allowed.

- 14.3.9 It is clear that in many areas of planning the PPG takes National Policy a step further. Parts of it are designed as a direct response to issues which have arisen out of the NPPF and have been the subject of much debate at the level of decision taking.

#### **Cherwell District Local Plan (1996)**

- 14.3.10 The Cherwell Local Plan was adopted in 1996 and had an end date of 2001. The base date for the plan was 1986. It remains part of the statutory Development Plan for the area but ran to only 2011. Some policies are 'saved' until the Council's Local Development Framework that will replace the adopted Cherwell Local Plan, is in place.
- 14.3.11 The Secretary of State's saving of policies beyond 2011 was explicitly related to the requirement to ensure a continual supply of land for housing land and only insofar as those saved policies remain consistent with national guidance (such as the NPPF) which the Secretary of State indicated should carry considerable weight.
- 14.3.12 The policies in Chapter 10 of the Cherwell District Local Plan (1996) seek to protect the environment and prevent pollution through the control of development. The plan refers to the relationship between a Council's planning responsibilities and the separate statutory responsibilities exercised by local authorities and other pollution control bodies, principally under the Environmental Protection Act 1990 and the Water Resources Act 1991.
- 14.3.13 In cases where there is uncertainty over the potential impact of a development the Council will take a precautionary stance.
- 14.3.14 The Council will seek to ensure that the amenities of the environment, and in particular the amenities of residential properties, are not unduly affected by development proposals which may cause environmental pollution.
- 14.3.15 Proposals for the redevelopment of sites known or suspected to be contaminated will be considered against the ENV12 policy. Development

on land known or suspected to be contaminated must accord with the regulations set out in Circular 21/87.

**Draft Cherwell Local Plan (2014)**

14.3.16 The draft Local Plan (incorporating Proposed Modifications) is an important document for Cherwell District. The draft broadly sets out how the District will grow and change in the period up to 2031. The Local Plan sets out the long term spatial vision for the District and contains policies to help deliver that vision.

14.3.17 One of the plan's key challenges to ensuring sustainable development is 'a need to ensure that contamination is addressed effectively on sites through re-development' [Paragraph A.25].



#### 14.4. BASELINE CONDITIONS

##### Site Location

- 14.4.1. The Site is located approximately 1 kilometre east south east of Bicester town centre.
- 14.4.2. The Site is centred at National Grid Reference SP 59450 22450 and comprises a field currently not being used for any specific purpose. The field boundaries within the Site are demarcated with mature hedgerows and trees along the majority of the Site boundary.
- 14.4.3. The Site is bound to the north by the Birmingham to Marylebone railway line. The Langford Brook borders the eastern boundary with Gavray Drive to the south. The western boundary is formed by the Oxford to Bletchley railway line.
- 14.4.4. There is a public right of way in the form of a track running through the site generally in a north – south direction passing through a small underpass below the Birmingham to Marylebone railway line on the northern boundary.
- 14.4.5. Topographical survey indicate the Site to be generally flat with a gentle slope west to east. Through inspection of currently available desk based research the Site appears to comprise clear farmland apart from areas of vegetation, with no evidence of deposited waste materials on the Site.
- 14.4.6. Reference to the topographical survey and information from available online aerial photography of the Site has been used to provide a Site description.

##### *Site History*

- 14.4.7. A comprehensive breakdown of the Site history is included within the Wardell Armstrong Desk Study Report (**Appendix 14.1**) for the study area.

##### On-site

- 14.4.8. In terms of land use, the Site has always historically been associated agriculture and historic mapping shows previous existence of farm buildings associated with Frogley's Farm. These buildings are shown by

the 1992 – 1994 historical mapping to no longer exist. The site has remained as open fields to present day.

### **Surrounding Area**

- 14.4.9. Early mapping (1881) shows the existence of the railway line adjacent to the western Site boundary. No significant changes are shown until the 1922 mapping which identifies a railway line along the northern boundary of the site. A number of industrial properties appear within the 1968 mapping, including a housing estate also to the west of the site.
- 14.4.10. By 1972 a number of circular tanks have appeared to the north west within 70m of the site. These tanks are not shown by the 1987 mapping. A number of the industrial buildings have been converted to warehouses by 1972.
- 14.4.11. By 1994 the southern housing estate has been established and an industrial estate has appeared to the north of the site.
- 14.4.12. The industrial estates to the north and north west of the site are shown as warehouses/distribution centres and commercial operations present day.

### **Recorded Geology**

#### *Superficial Deposits*

- 14.4.13. No superficial deposits are recorded to be present on Site.

#### *Solid Geology*

- 14.4.14. The online geological mapping for the area (BGS Digital Geological map of Great Britain <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>) indicates the West Site to be mostly underlain by the Kellaways Clay Member, with the East Site to be split between Kellaways Sand Member and Peterborough Member.
- 14.4.15. There are a number of BGS boreholes recorded within the Site, all less than 10m in depth, and a number of less than 10m deep boreholes in the immediate surrounding area and a single borehole greater than 30m in depth in the immediate surrounding area.

### **Hydrogeology**

- 14.4.16. The Environment Agency (EA) Website has been consulted in respect of the underlying aquifer designation. The reviewed information indicates

that the underlying strata is mainly classified as unproductive strata for the entirety of the Site. There is an aquifer located to the north west, approximately 200m from the site, which is classified as a minor aquifer with high vulnerability. The aquifers bedrock designation is a Secondary A.

14.4.17. The strata classified as a Secondary A aquifer typically contains permeable layers capable of supporting water supplies at a local rather than strategic scale. It is noted that such waters can, in some cases form an important source of base flow to rivers. As such the aquifer beneath the Site can be classed as a potential receptor for any contamination present on Site.

14.4.18. The Site is not located within a Groundwater Source Protection Zone.

### **Hydrology**

14.4.19. The nearest hydrological receptor identified is the Langford Brook located on eastern boundary of the Site. The Brook continues in a southerly direction where it joins with the River Ray approximately three miles south of the Site. A large pond is also located at this junction.

### **Site Sensitivity**

14.4.20. Information published by GroundSure indicates that the only aspect of concern regarding site sensitivity is nitrate vulnerability. The entire Site and surrounding area is indicated to be within a nitrate vulnerable zone (NVZ). Farmers with land in NVZs must follow mandatory rules to tackle nitrate loss from agriculture.

14.4.21. The Nitrate Pollution Prevention Regulations bring into force the European Commission nitrates directive. The latest review came into force on 17 May 2013. The regulations mean that land that drains into waters polluted by nitrates are designated as Nitrate Vulnerable Zones. The Nitrates Directive is implemented by separate regulations in England and Wales.

The Environment Agency is responsible for enforcing and assessing farmers' compliance with these regulations in England.

- 14.4.22. Four sites of nitrate vulnerability are located within 2000m of the Site with the closest being 112m.
- 14.4.23. There are three sites recorded as Environmentally Sensitive Sites within 2000m of the subject Site. These are an Ancient and Semi-Natural Woodland located 1628m from the Site, a Local Nature Reserve (Bure Park) located 1482m from the Site and the Upper Thames Tributaries situated within 846m of the Site.
- 14.4.24. There is are no records of Sites of Special Scientific Interest, Special Areas of Conservation, or Special Protection Areas on Site or in the immediate surrounding area.

#### **Ground Stability and Mining / Mineral Extraction**

- 14.4.25. The Goundsure report indicated that there are no records for mining activity undertaken within 1000 metres of the site.
- 14.4.26. The Groundsure report indicates the following stability information with regard to hazards potentially associated with the Site:
- The potential for collapsible ground at the Site is very low;
  - The potential for landslide ground stability hazards on the Site are low;
  - The potential for running sand ground stability hazards on the Site is considered to be low; and
  - The potential for shrinking or swelling clay ground stability hazards across Site are detailed as being moderate.
- 14.4.27. The desk study report (**Appendix 14.1**) notes that ground was stable within the majority of boreholes and trial pits. Spalling of the sands within the superficial deposits near the Langford Brook were observed and it was therefore recommended that excavations deeper than 1 metre in this area

(or areas affected by groundwater) should be subject to temporary support.

### **Radon Gas**

14.4.28. The Building Research Establishment (BRE) 'Guidance on Protective Measures for New Dwellings' (BR211) has been consulted along with the information provided within the GroundSure report and the Wardell Armstrong LLP Desk Study (**Appendix 14.1**). The Desk Study included a "Detailed Radon Protective Measures Report" from the BGS due to natural Radon levels in the area. The documentation indicates that the Site is located within an area where no radon protective measures are required. It is recommended that following the grant of planning permission an updated radon protection report from the British Geological Survey (BGS) is obtained which would provide further detailed information on this to assist in the detailed planning and construction of the Proposed Development.

### **Environmental Setting**

14.4.29. Information published by the Environment Agency has been obtained via a GroundSure data report dated 2 February 2015. The following assessment is undertaken regarding the Site location and a suitable radius around the study area. The information includes details of sites that are recorded to hold abstraction or discharge consents, recorded pollution incidents, licensed waste sites, sites subject to environmental authorisations (air pollution controls etc.) and sites that have, or historically have potentially contaminative uses.

#### *Abstraction Licences*

14.4.30. The GroundSure report indicates that there are six recorded groundwater abstractions recorded within 2km of Site. The closest recorded groundwater abstraction is located 803m to the south of the Site and relates to the use of Thames Groundwater for general farming and domestic use at Little Wretchwick Farm, Bicester. Two surface water abstraction licenses exist within 2km of the Site. These are both located 630m from the Site and areas described as "Make-Up or Top Up Water"

for West End, Launton, Oxon. No records exist of potable water abstraction licenses within 2km of the site.

*Discharge Consents*

- 14.4.31. There are three recorded discharge consents within 500m of the Site (not including various permit versions of the same licence). The closest consent is located 37m north of the Site at Chaucer Estate for sewage discharge.
- 14.4.32. The remaining discharge consents are located 196m west and 237m south west of the Site.

*Pollution Incidents to Controlled Water*

- 14.4.33. There are no records of pollution incidences to controlled water within 500m of the Site.

*Flooding*

- 14.4.34. The Environment Agency website indicates that the areas to be constructed in on the West Site are located within Flood Zones 1, 2 and 3. The Flood Risk Assessment prepared by JBA Consulting and the Water Chapter 13 within this Environmental Statement should be read for more detailed information.

*Landfill Sites and Waste Management Facilities*

- 14.4.35. The Groundsure report indicates one landfill site within 1500m of the Site. This operation is located 609m south west of the Site and is operated by Ploughley Rural District Council.
- 14.4.36. Five other waste sites operating as metal recycling facilities are located within 1500m of the Site with the closest being 853m south west of the site.

*Pollution Incident / Contaminated Land Register*

- 14.4.37. There are four records of pollution incidents on the National Incidents Recording System (List 2) within 500m of the Site. The closest being 77m north east of the site and recorded as a significant impact on water and

minor impact on both land and air. There are no recorded incidents on the National Incidents Recording System (List 1) within 500m of the Site

*Local Authority Pollution Prevention and Controls*

14.4.38. There are no Local Authority Pollution Prevention and Controls recorded within 500m of the study Site.

*Potential Contaminative Uses*

14.4.39. The Groundsure report identifies 28 potential contaminative industrial sites within 250m of the Site.

14.4.40. Within 100m of the site the following industries have been identified:

- electricity substation located within 31m;
- Industrial Engineers (Burckhardt Compression) within 50m;
- New Vehicles (A Class Corporate Travel Uk Ltd) within 97m;

*Fuel Station*

14.4.41. There are two fuel station entries within a 250m radius of the Site. Both entries are listed as being associated with Joblings garage 100m north west and 114m west of the Site.

*Underground High Pressure Oil and Gas Pipelines*

14.4.42. There are no underground high pressure oil and gas pipelines fuel station entries within a 500m radius of the Site.

*Hazardous Substances*

14.4.43. The desk study research indicates there have been no incidents or indication of hazardous substances on Site or within the immediate surrounding area.

**The Projected Future Baseline**

14.4.44. No significant changes to baseline conditions are likely to occur in the future if the Proposed Development does not proceed.

## 14.5. LIKELY SIGNIFICANT EFFECTS

### Construction Stage

14.5.1. The desk study (**Appendix 14.1**) research identified a number of elements which could have a potential effect on the study Site and/or ground conditions at the construction phase of the Proposed Development (in absence of mitigation). These factors are summarised below:

- Potential Effects of the existing ground conditions on the Proposed Development;
- The possibility of clay being at considerably shallow depths, which have the potential to heave / shrink due to the influence of trees;
- The potential for localised soil contamination associated with agricultural use within the area of site. Such contamination includes leached agricultural inputs, i.e. fertiliser, pesticides and herbicides;
- The possible presence of localised ground gases associated with topsoil materials;
- The presence of the Langford Brook located adjacent to the site;
- Discharge to surface water / groundwater – i.e. sewage pumping station.

14.5.2. Potential Effects of the Proposed Development on ground conditions include:

- The layout of the Proposed Development may have an impact on the ground conditions. Removal or incorporation of trees and shrubs into the development could have an impact on the condition of the weathered clay material. This may result in swelling or shrinkage of the ground dependent upon the hydrological conditions at the site. In addition, large areas of hardstanding are likely to reduce the amount of water ingress into the soils and potentially affect the ground conditions;
- Fuel and oil based hydrocarbon contamination associated with plant and machinery activity on site;
- It is possible that contamination of the ground may occur due to activities relating to the developments. This could include spillage of oils and fuel from plant working at the site, chemical spillages and other contaminants,



and potential for construction waste such as broken brick, tiles, waste concrete and cement, to become incorporated into the surface of the ground;

- Removal of topsoil materials and tracking of plant across uncovered cohesive bedrock material may cause additional weathering and disturbance to the shallow ground conditions and could result in softening and rutting of the surface; and
- Removal of topsoil materials is likely to increase surface run-off.

#### **Post-completion Stage**

- 14.5.3. The desk study (**Appendix 14.1**) research identified a number of elements which could have a potential effect on the study site and/or ground conditions at the post-completion phase of the Proposed Development (in absence of mitigation). These factors are summarised below:

##### *Potential Effects of the Ground Conditions on the Proposed Development*

- 14.5.4. Excluding unforeseen activities/alterations undertaken within the individual housing plots, the effects of the post-completion ground conditions are deemed to be the same as those in the construction stage (this is considered to be accurate if no mitigation procedures have been undertaken).

##### *Potential Effects of the Proposed Development on ground conditions*

- 14.5.5. Following development of the Site the ground will be affected by activities undertaken within the individual housing plots. This could include spillages of oils, fuels or other chemicals associated with vehicle and household activities.
- 14.5.6. Similarly the roads serving the development provide further potential for contamination of the ground.

## 14.6. MITIGATION MEASURES

### Construction Stage

- 14.6.1. Additional intrusive site investigations are recommended prior to detailed design to assist and inform the detailed design and construction of the Proposed Development.
- 14.6.2. Assessment of the ground conditions at the Site will inform the design of the foundations appropriate for the structures within the development. If required, particular measures should be used to prepare the ground for development.
- 14.6.3. An appropriate intrusive Site investigation could be undertaken once a detailed development layout is finalised. This investigation will be effective in providing up-to-date information pertaining to the contaminative and geotechnical characteristics of the shallow ground and will aid in the design of mitigation measures should they be deemed appropriate.
- 14.6.4. A working plan should be designed, which will allow excavations to be managed efficiently and mitigate any potential environmental impacts, especially with regards to encountering unidentified areas of buried waste/contamination.
- 14.6.5. In terms of minimising the impact of the Proposed Development on the ground conditions, there would be a requirement during the development/construction phase the contractor shall follow the best practice guidance contained within the Environment Agency's Pollution Prevention Guidelines to ensure that materials and chemicals used during the construction would not impact the ground adversely. This would involve the use of industry standard pollution prevention measures such as, bunded tanks, vehicle maintenance and minimisation of construction related waste. Appropriate measures should be in place to deal with accidental spills and any wastes produced during construction. Construction activities would also require material management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground.
- 14.6.6. Construction activities may also require material management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground. Mitigation will be achieved

through application of a Construction Environmental Management Plan (CEMP).

#### **Post-completion Stage**

- 14.6.7. A regime of geochemical/geotechnical assessment should be undertaken after the development phase to review the impact of construction activity. Any unsatisfactory results should be remedied as soon as practicable.
- 14.6.8. The Flood Risk Assessment and Drainage strategy by JBA shows that the proposed surface water drainage system will form a Sustainable Drainage System (SUDS) to provide 2-3 treatment trains for runoff pollution. The SUDS have been designed in accordance with Construction Industry Research and Information Association (2007) CIRIA C697 *The SUDS Manual*, London.
- 14.6.9. The SUDS devices specified for the site include water butts, crushed stone blankets located beneath highways and a storage basin on the site's eastern boundary which will provide treatment to runoff and sufficient storage for events up to the 1 in 100-year climate change event, ensuring that flow from the site is limited to the 1 in 2-year Greenfield rate.
- 14.6.10. There are few measures that may be put in place to minimise the impact that individuals occupying the Proposed Development may have on the ground conditions, however the predominately clayey nature of both the existing made ground and underlying weathered clay strata would help to contain any spillage or contamination within any isolated location and impede transmission.

## 14.7. RESIDUAL EFFECTS

### Construction Stage

14.7.1. It is considered that the existing ground conditions at the Site provides minimal impact upon the Proposed Development of the Site. The assessments reported above do not identify any significant adverse residual effects.

### Post-completion Stage

14.7.2. It is considered that the existing ground conditions at the Site provides minimal impact upon the Proposed Development of the Site. The assessments reported above do not identify any significant adverse residual effects.

### Summary of Effects

14.7.3. The effects identified are summarised in Table 14.4.

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction stage</b>			
Clay at shallow depths, which have the potential to heave / shrink due to the influence of trees	Minor	As part of the detailed design stages of the development, it would be beneficial to undertake further assessment to determine the contaminative status of the Site.  A working plan should be in place to manage excavations to mitigate any potential environmental impacts, especially with regards to encountering unidentified areas of buried waste/contamination.  Industry standard pollution prevention measures such as bunded tanks, vehicle maintenance and minimisation of construction related waste	Insignificant
Soil contamination associated with agricultural use within the area of Site. Leached agricultural inputs, i.e. fertiliser, pesticides, herbicides, etc;	Minor		Insignificant
Localised ground gases associated with topsoil materials	Minor		Insignificant
The presence of the Langford Brook adjacent to the Site	Moderate		Insignificant
Discharge to surface water / groundwater – i.e. sewage pumping stations	Moderate		Minor
Elevated concentrations of metals/metalloids associated with the made ground.	Minor		Insignificant
Removal or incorporation of trees and shrubs into the development could	Minor		Insignificant

have an impact on ground conditions.		should be used throughout construction.	
Fuel and oil based hydrocarbon contamination associated with plant and machinery activity on Site.	Moderate	Appropriate measures should be in place to deal with accidental spills and any wastes produced during construction.	Insignificant
Contamination of the ground due to activities relating to the development. This could include spillage of oils and fuel from plant working at the Site, chemical spillages and construction wastes, etc.	Moderate	Construction activities may also require material management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground.	Minor
Removal of topsoil materials and tracking of plant across uncovered cohesive clay material	Minor	Mitigation will be achieved through application of a CEMP.	Insignificant
Removal of topsoil materials is likely to increase surface run-off.	Minor		Insignificant
<b>Post-completion stage</b>			
Excluding unforeseen activities/alterations undertaken within the individual housing plots, the effects of the post-completion ground conditions are deemed to be the same as those in the construction stage.		A regime of geochemical/geotechnical assessment should be undertaken after the development phase to review the impact of construction activity and any failures remedied.	
Activities undertaken within the individual housing plots. This could include spillages of oils, fuels or other chemicals associated with vehicle and household activities.	Minor	The design includes a SUDS to provide suitable treatment to all runoff.  There are few measures that may be put in place to minimise the impact that individuals occupying the Proposed Development may have on the ground conditions, however the predominately clayey nature of the made ground and underlying strata would help to contain any spillage or contamination within any isolated location and impede transmission.	Insignificant
The roads serving the development provide further potential for contamination of the ground.	Minor		Insignificant

**Table 4: Summary of Effects**

**14.8. CUMULATIVE EFFECTS**

- 14.8.1. The risks due to ground conditions will be similar for all of the planned development in the Local Plan. However, only effects to groundwater and surface water (particularly from Gavray Drive east) are considered to be cumulative.
- 14.8.2. During construction of all sites, it is assumed suitable mitigation measures and, if required, remediation measures will be in place to prevent contamination of groundwater and surface water.
- 14.8.3. Therefore the cumulative effect of contamination during construction is considered to be insignificant.
- 14.8.4. Spillages or other sources of contamination within individual housing plots may have a cumulative impact during the Post-completion stage. However, the magnitude of this is considered to be negligible and therefore the cumulative effect is deemed to be insignificant.

#### 14.9. GLOSSARY

**Ground Conditions:** The structural and chemical make-up of the ground, including groundwater.

**Contaminate/contamination:** Substances within the ground that could cause harm to people or protected species or pollution of surface waters or groundwater.

**Groundwater:** Water held underground.

**Surface water:** Water held on the surface of the ground.







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## **15. WASTE AND UTILITIES**

### **15.1. INTRODUCTION**

15.1.1. This Chapter of the ES has been prepared by Odyssey Markides LLP and comprises a waste and utilities assessment of the Proposed Development at the Site known as Gavray Drive. The utilities assessed within this report are as follows:

- Electricity
- Gas
- Water Supply
- Foul Drainage
- Telecommunications

15.1.2. In particular it considers any likely, significant environmental effects, of the Proposed Development, which may arise during construction and operation, on the various existing utility networks and waste storage/disposal networks.

15.1.3. The application is for outline planning permission for residential use over an area of 6.9 hectares. This environmental statement assesses a potential development comprising up to 180 homes on the western side of the existing land.

15.1.4. The Site is centred on National Grid Reference SP 59459 22330.

15.1.5. The assessment of the impact on the hydrogeology (groundwater) of the Site due to the Proposed Development is assessed in Environmental Statement Section 14 'Ground Conditions and Section 13 'Water Resources'.

15.1.6. A site specific Flood Risk Assessment (FRA) has been completed by JBA Consulting for the proposed development.

## 15.2. ASSESSMENT METHODOLOGY

### Scope

- 15.2.1. This section of the ES considers the potential impacts of the waste likely to arise during construction and from the completed development. This section of the ES also considers the provision of public utility services for the development, as this has the potential to cause adverse environmental effects due to an increase in demand for those services noted in 15.1.1.
- 15.2.2. The scope of work for the assessment of waste associated with the Proposed Development includes:
- Establishing the baseline situation: existing waste sources, location of facilities and capacities to handle construction and household waste;
  - Assessing the types and volumes of waste to be generated during construction phase and once the development is completed;
  - Considering how waste will be treated within the Proposed Development;
  - Considering mitigation measures and waste reduction measures to be employed to reduce the volume of waste requiring final disposal including the potential to recycle;
  - Considering the final destination of the residual waste and assessing potential effects on the capacity of existing waste management facilities; and
  - Assessing cumulative impacts of other Proposed Developments in the area.
- 15.2.3. The scope of work for the provision of public utility services for the development includes:
- Establishing the baseline situation: location of facilities and existing infrastructure;
  - Assessing of potential environmental effects associated with the provision of utilities to serve the proposed new development;

- Considering mitigation measures which may be available to reduce the effects of the Proposed Development on the existing utility infrastructure;
- Considering the residual effects after mitigation has been implemented and;
- Assessing cumulative impacts of other Proposed Developments in the area.

#### **Extent of the Study Area**

- 15.2.4. The assessment takes into account all existing services within the extents of the Site and the immediate surrounding area. For exact extents of the study, please refer to appendix 15.1 and the responses received from the individual utilities providers. The assessment considers the effect on all services located – Electricity, Gas, Water Supply, Foul Drainage and Telecommunications
- 15.2.5. The assessment takes into account the present and future conditions of the Site during the operational phase.
- 15.2.6. Copies of correspondence with the existing utility providers can be found in Appendix 15.1.
- 15.2.7. Relevant Elements of the Proposed Development
- 15.2.8. The following components of the Proposed Development are relevant to this Utilities and Waste Chapter of the Environmental Statement:
- The proposed and existing foul drainage infrastructure;
  - The proposed and existing water supply infrastructure;
  - The proposed and existing telecommunications infrastructure;
  - The proposed and existing gas supply infrastructure;
  - The proposed and existing electrical supply;
  - Number of dwellings and size of dwellings within the proposed development and;
  - Site topography and finished floor levels.

- 15.2.9. The assessment has been based on the application plans submitted, including the detailed plans and associated Parameter Plans.
- 15.2.10. The assessment has been carried out in conjunction with the site specific FRA included in Appendix 13.1

**Data sources**

- 15.2.11. In preparation of this ES chapter and researching baseline information, reference has been made to the following information sources:
- Waste Management Plan for England 2013;
  - Revised Waste Framework Directive 2008;
  - Waste (England and Wales) (Amendment) Regulations 2012;
  - Waste Dataflow <http://www.wastedataflow.org/>;
  - Government Review of Waste Policy in England, June 2011;
  - SMARTWaste Data Report July 2013 – Waste Performance indicators by construction phase;
  - Oxfordshire Minerals and waste Plan (1996);
  - Oxfordshire Emerging Minerals and Waste core strategy;
  - Oxfordshire Waste Partnership Joint Municipal Waste Management Strategy (MWMS), January 2013;
  - Cherwell District Local Plan (1996);
  - Non-Statutory Cherwell District Local Plan (2004);
  - Draft District Cherwell Local Plan (2014);
  - Oxfordshire Minerals and waste annual monitoring report 2013 (Feb 2014);
  - Oxfordshire Minerals and Waste Development Framework – Waste Assessment Needs (May 2012);
  - Environment Agency – Data from Permitted Waste Management Facilities 2011;

- Site Waste Management Plan Regulations 2008;
- BS 5906: 2005 Waste Management in Buildings, Code of Practice;
- Commercial and Industrial Waste in England – Statement of Aims and Actions 2009;
- Envirocheck Utilities Report;
- Thames Water Capacity Flow & Pressure Investigation Location: Gavray Drive, Bicester, Oxfordshire, OX26 6SU, (Western Site);
- Scottish and Southern Energy Budget Quote West Side@ Gavray Drive Bicester;
- JBA Consulting Drainage Impact Assessment – Foul Water Report;
- Existing geological and hydrogeological data was obtained from British Geological Survey online borehole records (<http://www.bgs.ac.uk/>);
- The Site topography was taken from the Topographical Survey, drawing number 8141OGL, undertaken by Greenhatch Group (June 2014);
- Flood Risk Assessment produced by JBA consulting November 2014;
- A general investigation of miscellaneous existing services was undertaken using the Linesearch facility (<http://www.linesearchbeforeudig.co.uk/#>).

15.2.12. Further consultation was undertaken with the following service providers known to be located within the area:

- BskyB (Easynet)
- Interoute (Ringway/Beach/51 degrees/Plancast)
- May Gurney Ltd (Fujitsu)
- CityFibre Holdings Ltd
- GTC [includes Envoy]
- Vodafone
- Energetics Electricity



- McNicholas
- TfL Tram Network
- Fulcrum Pipelines
- KCOM Group PLC
- TrafficMaster Plc
- Verizon Business
- Colt Technology Services
- C.A. Telecom UK Ltd

### **Assessment approach**

#### *Waste*

15.2.13. The assessment of waste arising during the site clearance and construction works is based on available data for construction waste in The Oxfordshire Minerals and Waste Annual Monitoring Report 2013, and considers the following:

- Generation of materials during site clearance activities which require disposal;
- Creation of waste materials during construction activities which may require off-site disposal. Some of the waste streams likely to be generated during the construction phase include concrete rubble, wood, glass, metals, waste packaging (including cardboard and pallets) and residual general site waste;
- Decrease in local landfill capacity if construction materials are not segregated for reuse or recycling; and
- Increase in the use of virgin aggregate materials if no recycled or reclaimed materials are used in the construction process.

15.2.14. The approach taken to inform the assessment of construction phase effects has involved the identification and use of suitable benchmark data for the prediction of waste arisings during the construction activities. Opportunities for waste minimisation re-use and recycling has been identified based on

best practice construction site management such as the Code of Considerate Practice.

15.2.15. There are no existing buildings that require demolition. Works will largely comprise the site preparation and construction of the development, during which the majority of the waste produced will be generated.

15.2.16. Demolition and construction waste is defined by the Office for the Deputy Prime Minister (ODPM) in the Survey of Arisings and Use of Demolition and Construction Waste as "waste materials, which arise from the construction or demolition of buildings and/or civil engineering infrastructure, including hard construction and demolition waste and excavation waste, whether segregated or mixed".

- Construction Waste

15.2.17. There is no standard methodology for estimating construction waste arisings; however a suitable approach has been developed for use in this assessment using various published data such as the Building Research Establishment's SMART Waste system. Estimates have been made of likely construction waste volumes and the likely proportions of constituent materials as identified below.

15.2.18. Consideration should be given to the fact that different contractors use varying construction methods and materials, which will generate varying amounts of waste.

- Volume of Construction Waste

15.2.19. For the purpose of this assessment data from the Building Research Establishment's (BRE) SMART Waste system was used.

15.2.20. The estimated construction waste arisings from the Proposed Development have been calculated by (separately) multiplying the total floor area of the proposed land uses of the Proposed Development by the relevant benchmark (i.e. residential).

- Operational Waste

15.2.21. The assessment of waste effects during the operation phase has been undertaken through predictions of waste arising from the Proposed Development based on latest waste arising data.

### *Utilities*

- 15.2.22. The utilities chapter is a compilation of Utility Company record plans. These are obtained via application to the Utility Companies following the geographic search to determine which companies are in a given area. This data is reviewed and assessed to determine baseline conditions regarding existing services within the study area. Existing service plans for the Site are shown within Appendix 15.1.

### **Significance Criteria**

- 15.2.23. The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account both the construction and operational phases. The significance level attributed to each effect has been assessed based on the magnitude of change due to the development proposals, and the sensitivity of the affected receptor / receiving environment to change. Magnitude of change and the sensitivity of the affected receptor / receiving environment are both assessed on a scale of high, medium, low and negligible.
- 15.2.24. No standard criteria exist for assessing the significance of the potential effects that may arise from waste generated from the Proposed Development. Therefore, criteria have been derived for this assessment based on the relevant legislation and local planning policy relating to waste management and utilities Listed in section 15.3.
- 15.2.25. The assessment criteria is based on several factors, including:

### *Waste*

- The “treatability” of the waste; whether the waste can be easily treated with minimal residual waste, such as recycled waste, or whether the waste requires a specialised treatment with potentially toxic residual waste;
- Management of waste in the context of the waste hierarchy - whether generation of the waste can be minimised, the waste can be recycled, landfilled etc.; and
- Potential environmental effects or human health risks associated with the waste e.g. hazardous waste.

*Utilities*

- The “magnitude” of change due to the development proposals,
- The “sensitivity” of the affected receptor / receiving environment to change

15.2.26. The significance of effects from the Proposed Development associated with waste and utilities has been assessed according to the following criteria:

*For Waste*

<b>Magnitude</b>	<b>Criteria</b>
Large	Large increase in the quantity of waste generated compared to existing levels, the quantity of waste generated does not assist in the achievement of local and regional recycling and composting targets and significantly increases annual waste generation figures for Cherwell, waste is hazardous and requires incineration or landfilling resulting in permanent environmental effects, waste cannot be disposed of within Cherwell or adjacent counties
Moderate	Moderate increase in the quantity of waste generated compared to existing levels, quantity of waste generated does not prevent achievement of local and regional recycling and composting targets, waste is hazardous but can be recovered with pre-treatment resulting in temporary environmental effects, waste can be disposed of within Cherwell or adjacent counties
Small	Small increase in the quantity of waste or demand for generated, waste is non-hazardous or inert and can be recycled or composted within Cherwell
Negligible	No significant change.

**Table 1 : Waste Magnitude Criteria**

<b>Sensitivity</b>	<b>Criteria</b>
High	Receptor is very sensitive to the effect and is from a notably vulnerable group, such as children, elderly, or sensitive watercourses. In the context of waste and resource management, the receptor is the waste management infrastructure, where particular sensitivity may arise due to a scarcity in capacity or availability. High importance may also result from a large group of people being affected, for example, a recycling activity located near to offices, or the receptors are particularly sensitive, for example hazardous wastes being handled near a school.
Medium	The receptor is sensitive to the anticipated effect but is not from a notably vulnerable group. The

	receptor is likely to experience moderate effects from the activity, but these are mitigated for example due to the duration or nature of the effect or the distance between the activity and the receptor. With regards to waste management infrastructure, this particular sensitivity may arise if there is sufficient capacity available to accommodate the waste streams (compared to the scarcity of capacity above), but is still considered important as it will result in reduced availability over time.
Low	The receptors may be sensitive to some effects, but these are unlikely to be prolonged or significant, and do not pose a danger to health or the environment. With regards to the waste infrastructure, this particular sensitivity may arise if waste arisings cannot be reused on-site, but can be accommodated at waste facilities that will have no impact on future availability (e.g. water treatment works or composting facilities).
Negligible	The effects will not be noticeable to receptors due to the source and nature of the activity. There is no danger of harm to human health or the environment.

**Table 2 : Waste Sensitivity Criteria**

*For Utilities*

<b>Magnitude</b>	<b>Nature of Impact</b>
Large	Permanent/irreversible change to key characteristics of the strategic utility network (electric, gas, potable water, foul water) with important considerations at a district scale. Impacts certain or likely to occur (i.e. diversion of National Grid Overhead transmission lines that cross the site requiring outages.).
Moderate	Permanent/irreversible change to the local utility network (electricity, gas, potable water, foul water) that may result in temporary disruptions locally.
Small	Temporary change, over a limited/local area, to key characteristics of the incumbent utility network (electricity, gas, potable water, foul water). Impacts likely to occur (i.e. increase in loading due to the development proposals before infrastructure improvements offsite are completed)
Negligible	Minor temporary change (during the project duration or part of the construction phase), over a limited/local area, to key characteristics of the incumbent utility network (electricity, gas, potable water, foul water). Impacts unlikely or rarely to occur (i.e. lowering/protection of existing minor / local utility apparatus to facilitate the construction of development)

**Table 3 : Utilities Magnitude Criteria**

Sensitivity	Criteria
High	Development located in an area with a lack of local utility capacity (electric, gas, potable water, foul water treatment or quality issues and telecoms). Therefore requiring significant offsite network reinforcements to deliver a complete, coordinated and integrated infrastructure arrangement for the site. Utility Diversions: Development located in an area requiring significant utility diversions to strategic infrastructure (such as strategic water mains, National Grid Overhead transmission lines, high pressures gas mains) to facilitate its construction.
Medium	Development located in an area where currently there are capacity issues on the existing utility networks to supply at least one of the utility services (electric, gas, potable water, foul water, telecoms) and therefore, considerable offsite reinforcements works would be required to deliver one of the utility services. Utility Diversions: Development located in an area requiring major utility diversions to incumbent utility provider's infrastructure.
Low	Development located in an area where currently there are minor capacity issues on the existing utility networks to supply the utility services (electric, gas, potable water, foul water, telecoms) and therefore, minor reinforcements works would be required to deliver the utility services. Utility Diversions: Development located in an area requiring small scale utility diversions to incumbent utility provider's infrastructure to facilitate the development.
Negligible	Development located in an area where the incumbent utility provider's network (electric, gas, potable water, foul water, telecoms) has enough capacity to supply the development. Utility Diversions; Development located in an area requiring minimal utility diversions to incumbent utility provider's infrastructure to facilitate the development.

**Table 4 : Utilities Sensitivity Criteria**

Magnitude	Sensitivity			
	High	Medium	Low	Negligible
Large	Major	Major	Moderate	Minor
Moderate	Major	Moderate	Minor	Insignificant
Small	Moderate	Minor	Minor	Insignificant
Negligible	Insignificant	Insignificant	Insignificant	Insignificant

**Table 5 : Waste and Utilities Significance Criteria**

## Uncertainties and limitations

### *Waste*

- 15.2.27. The assessment of waste is based on available information published by various bodies such as DEFRA and the geotechnical investigation by Wardell Armstrong in May 2007. The waste arisings and waste capacities stated within the referenced documents are partially based on estimations, therefore the findings within this chapter are also partially based on estimations.

### *Utilities*

- 15.2.28. Thames Water have undertaken on site testing of the potable water supply with findings based on their own criteria for serviceability levels, based on current development proposals.
- 15.2.29. Development foul flows have been calculated based on guidance set out in Sewers for Adoption, 7<sup>th</sup> Edition. Assessment of drainage options and connection to the existing public sewer network has been based on developer rights prescribed within the Water Industry Act 1991.
- 15.2.30. No underground survey of existing sewers has been undertaken. Therefore assumptions have been made in regard to the condition, size and depth of some of the existing sewers, however Thames Water have a responsibility for the condition and maintenance of the public sewers.
- 15.2.31. Each Utility Company has its own disclaimer statement in respect of the information they provide. They do not guarantee or provide a warranty for the data. The Utility Company disclaimers should be referred to when considering the accuracy and completeness of the data. Generally the plans provided in the report are for guidance only and are not guaranteed to be up to date or to be a complete record of the Utility Company plant in any given area.
- 15.2.32. Some Utility Companies only show main utilities. Therefore service pipes or cables may not be shown on the plans but they may be present on the Site. The utilities may deviate from the route and position shown on plans.
- 15.2.33. Whilst every effort is made to locate all Utility Companies in a given area, due to the sensitive or restrictive nature of certain sites, the existence of redundant utilities, the emergence of new companies and the combining of, takeover or sale of existing Companies, details on all utilities cannot be guaranteed.

- 15.2.34. Due to the Utility Companies plans being regularly changed and updated, this assessment is only valid at the time of production.
- 15.2.35. For reasons discussed in this section of the chapter Odyssey Markides cannot accept any liability for or offer any guarantees for the responses received to the enquiries for existing Utilities information. No representation is made by Odyssey Markides as to the accuracy, completeness, and sufficiency or otherwise of the information provided.
- 15.2.36. The statistics used for the development of the baseline conditions, in section 15.4.11 are, as stated, from sources which are up to 13 years old. There is a potential therefore, for an element of inaccuracy in the figures.



### **15.3. RELEVANT POLICY**

- 15.3.1. The following sections discuss the relevant policies at three different levels, National Policies, Regional Policies and finally local policies.

#### **Legislative Framework**

- 15.3.2. The applicable legislative framework is summarised as follows:

##### *Waste*

- The EU Waste Framework Directive 2008
- The EU Landfill Directive April 1999
- The Waste (England and Wales) Regulations 2011
- The Waste Framework Directive November 2008
- Waste Strategy For England 2011
- Site Waste Management Plan Regulations 2008
- The Hazardous Waste Regulations 2005

##### *Foul Water*

- National Policy Statement For Waste Water March 2012
- Water Industry Act 1991
- Public Health Act 1936

##### *Electricity Supply*

- Electricity Act 1989 (And Its Amendments)
- The Electricity Safety, Quality and Continuity Regulations 2002

##### *Gas Supply*

- Gas Act 1986 (And Its Amendments)
- Gas Safety (Management Regulations) 1996 (GSMR)
- Gas Safety (Rights of Entry) Regulations 1996

- Gas Safety (Installation and Use) Regulations 1998

#### *Potable Water Supply*

- The Water Industry Act 1991
- The Private Water Supplies Regulations 1991 SI No.2790
- European Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption. Official Journal L 330 , 05/12/1998 p. 0032 – 0054
- Water Supply (Water Fittings) Regulations 1999
- The Drinking Water (Undertakings) (England and Wales) Regulations 2000 SI No.1297 (Reference 1)
- The Water Supply (Water Quality) (England and Wales) Regulations 2000 (And Its Amendments) SI No.3184
- Water Act 2003
- The Private Water Supplies Regulations 2009
- The Water Supply Regulations 2010 (The Proposed Development has been designed in accordance with the aforementioned legislation to minimise the demand on the utilities previously listed).

### **National Planning Policy Guidance**

#### **Planning Practice Guidance**

- 15.3.3. On 6 March 2014 the Government announced the launch of the new Planning Practice Guidance ('PPG').
- 15.3.4. The PPG is broken into 45 sections of which Waste and Water supply, Wastewater and water quality are two.

#### **National Planning Policy Framework (2012) (NPPF)**

- 15.3.5. The NPPF defines the purpose of the planning system as "delivering sustainable development", comprising three elements: planning for prosperity (an economic role), planning for people (a social role), and planning for places (an environmental role). Local plans, and development proposals for major schemes should tackle these issues in an integrated way.

15.3.6. Key policy directions include:

- At paragraph 162 that local planning authorities should work with other authorities and providers to assess the quality and capacity of infrastructure for telecommunications and utilities.
- The NPPF does not contain any specific waste policies. Planning Policy Statement 10 'Planning for Sustainable Waste Management' (revised March 2011) will remain in place until a National Waste Management Plan is published.

**Planning Policy Statement 10 'Planning for Sustainable Waste Management' (revised March 2011)**

15.3.7. Planning Policy Statement 10 (PPS10) (Revised March 2011) encourages sustainable waste management. Key objectives include encouraging waste to be disposed of as a last resort and managed and disposed of as near as possible to its place of origin, and to ensure that through planning strategies the design and layout of new developments support sustainable waste management.

15.3.8. Furthermore, PPS 10 states that proposed new development should include preparation of a site waste management plan, with reference to guidance produced by the Department of Trade and Industry (DTI).

**Government Review of Waste Policy in England (2011)**

15.3.9. A national waste policy review was undertaken by the Coalition Government in late 2010/early 2011. Any future European legislation will continue to be a driving force in English waste policy, and the Government will implement the revised Waste Framework Directive (rWFD). The Government's aim is to work towards a 'zero waste economy'.

**The 'Waste Management Plan for England' (published in December 2013)**

15.3.10. Extract "The key aim of the waste management plan for England is to set out our work towards a zero waste economy as part of the transition to a sustainable economy. In particular, this means using the "waste hierarchy" (waste prevention, re-use, recycling, recovery and finally disposal as a last option) as a guide to sustainable waste management."

15.3.11. This document indicates that the rate of recycling for waste from households is increasing towards the EU target of recycling 50% of household waste by

2020. The 70% target for recovering construction and demolition waste is already exceeded. It is estimated that England and the UK are already achieving a 93% recovery rate of construction and demolition waste. The commercial and industrial waste recycling rate reached in 2010 was 52%. This document provides the latest data on national waste arising's by sector and latest recycling rates and rates of waste to landfill.

### **Construction Waste Targets**

- 15.3.12. Under the revised Waste Framework Directive (November 2008) 70% of all construction and demolition waste must be recycled or recovered by 2023.
- 15.3.13. The 70% target for recovering construction and demolition waste is already exceeded.

Commercial and Industrial Waste in England – Statement of Aims and Actions  
2009

- 15.3.14. Defra's aims for commercial and industrial waste are as follows:
- To reduce the amount of waste arising by more sustainable design, production, purchasing and use as well as reuse of products and materials in the economy;
  - To increase the proportion of waste that does arise which is productively re-used, recycled or recovered;
  - To reduce significantly the amount of waste that is sent to landfill or incinerated without recovering energy;
  - Manage any remaining residual waste responsibly; and
  - Maximise the investment opportunities for business from commercial and industrial waste.

### **BS5906: 2005 Waste Management in Buildings Code of Practice**

- 15.3.15. This British standard is a code of practice for methods of storage, collection, segregation for recycling and recovery, and on-site treatment of waste from residential and non-residential buildings and healthcare establishments. It is applicable to new buildings, refurbishments and conversions of residential and non-residential buildings, including but not limited to retail and offices.

### **Local Planning Policy Guidance**

#### **Oxfordshire Minerals and Waste Plan (OMWP) 1996**

- 15.3.16. The OMWP covers the periods up to 2006 and will be replaced by the new Minerals and Waste Plan that is currently in development. The OMWP presents a core strategy and related policies which will enable waste and recycling targets to be met.

#### **Oxfordshire Emerging Minerals and Waste Core Strategy**

- 15.3.17. The plan outlines the need to make provision for waste management facilities to meet the needs of Oxfordshire over the next 20 years. The plan states that waste is increasingly being diverted from landfill by recycling and treatment.

#### **Oxfordshire Waste Partnership Joint Municipal Waste Management Strategy (MWMS), January 2013**

- 15.3.18. The MWMS for Oxfordshire 2013 sets out plans for dealing with Oxfordshire's Municipal waste through to 2030. Oxfordshire has already met and exceeded its target of recycling and composting 55% of waste by 2020 and seeks to continually increase that figure.
- 15.3.19. The MWMS states "We will work in partnership to reduce waste and to maximise reuse, recycling and composting. We will treat residual waste before disposal to recover further value and to minimise the environmental impact of managing our waste streams".

#### **Cherwell District Local Plan (1996)**

- 15.3.20. The Cherwell District Local Plan states that "whilst the County Council is the waste disposal authority, this council has some responsibilities with reference to recycling. A Recycling Plan has been prepared which sets out the authority's targets, including the promotion and expansion of community based recycling centres".

#### **The Non-Statutory Cherwell District Local Plan (2004)**

- 15.3.21. The plan seeks to encourage recycling by providing adequate space in new developments for multiple bin storage. Policy D9 states "In assessing development proposals the council will seek to ensure that energy efficiency design principals are incorporated by means of:.... (vi) Providing adequate accommodation for waste separation and recycling facilities".

**Draft Cherwell Local Plan (2014)**

- 15.3.22. The draft local plan states that although waste management and disposal is the responsibility of Oxfordshire County Council, the district council will continue to consider the emerging Minerals and waste development framework in the preparation of the local plan. The plan highlights minimising waste and maximising recycling as one of its key challenges to ensure sustainable development.

## 15.4. BASELINE CONDITIONS

### Waste Arisings

#### *Construction and Demolition Waste Arisings*

- 15.4.1. Under the revised Waste Framework Directive (November 2008) 70% of all construction and demolition waste must be recycled or recovered by 2023.
- 15.4.2. The Waste Management Plan for England, published in December 2013 indicates that the rate of recovery is at 93%.
- 15.4.3. It is recognised that the majority of development in Cherwell is upon greenfield land which, during construction, will not generate recycled material to be used as aggregate. However greenfield sites may produce surplus soils which require off-site disposal and these can be used as restorative materials at landfills and quarries.
- 15.4.4. Construction and Demolition waste accounted for 54% of the total waste managed during 2012 in Oxfordshire.
- 15.4.5. The Oxfordshire Minerals and Waste Annual Monitoring Report 2013 (OMWAMR) states that in 2012, 1,360,000 tonnes of construction, demolition and excavation waste was managed in Oxfordshire. The 1,360,000 tonnes was managed as follows:
- Landfill 22%
  - Recycled 54%
  - Recovered 24%

#### *Municipal and Household Waste Arisings*

- 15.4.6. The OMWAMR states that an estimated 2.5 million tonnes of waste was managed in Oxfordshire in 2012, of which 12% was municipal waste. Figures for the financial year 2012/2013 show that 299,580 tonnes of municipal waste was managed in Oxfordshire. Of the 299,580 tonnes of municipal waste 279,207 tonnes was household waste.
- 15.4.7. The 299,580 tonnes of municipal waste was managed as follows:
- Landfill 42%
  - Energy from waste 5%

- Reuse/Recycled 33%
- Composted 20%

15.4.8. In 2012/2013 58% of municipal waste was diverted from Landfill in Oxfordshire. In 2012/2013 60% of household was diverted from landfill in Oxfordshire. These figures exceed both the Oxfordshire's 2020 target of 55% and the national target of 45% by 2015.

15.4.9. The population of Oxfordshire is estimated at 653,800 with 258,900 households. This equates to average household waste produced per person and per household per year in Oxfordshire as follows:

- Average household waste generated in kg/person/year = 427kg (2012/2013) (of which 256kg was diverted from landfill)
- Average household waste generated in kg/household/year = 1,078kg (2012/2013) (of which 647kg was diverted from landfill)

15.4.10. In 2012/2013 the following National Waste Performance Indicator figures relate to Oxfordshire:

- NI 191 = 410kg of residual household waste per household
- NI 192 = 60% of household waste sent for reuse, recycling or compositing
- NI 193 = 42% of municipal waste sent to landfill

#### *Commercial and Industrial Waste (C&I) Arisings*

15.4.11. The survey of C&I waste arising's in 2010 (published by DEFRA in June 2011) indicates that approximately 47 million tonnes of C&I waste was produced in England during 2009, a reduction of 29% since the last survey conducted in 2002/2003. 52% of C&I waste was recycled and 24% landfilled in 2009.

15.4.12. The OMWAMR has made estimates based on information from the Environment Agency that a total amount of C&I waste arising's in 2012 were 844,665. 30% of this was sent to landfill, 69% recycled or composted and 1% sent for other treatment.



#### *Hazardous Waste Arisings*

- 15.4.13. Hazardous wastes include substances such as pesticides, asbestos, mobile phone batteries, used engine oils, redundant refrigerators and scrap cars (End of Life Vehicles) and some waste electrical equipment.
- 15.4.14. According to the OMWAMR, the total amount of hazardous waste arising in Oxfordshire in 2012 was approximately 52,000 tonnes. The OMWAMR states that just over 10,500 tonnes of Oxfordshire's Hazardous waste was dealt with within Oxfordshire and a further 20,500 tonnes of hazardous waste was imported into Oxfordshire to be managed.

#### *Current Waste Disposal Arrangements*

- 15.4.15. According to Cherwell District council website, household waste is collected as follows on alternate weeks:
- Blue recycling bin/box (dry recyclables including paper, plastic, tins & cardboard)
  - Brown bin – Food and garden waste (Including cooked and uncooked food waste, garden prunings, pet straw, grass cuttings and leaves)
  - Green bin – Residual waste (Including disposable nappies, plastic bags, polystyrene)

#### *Waste Management Facilities*

- 15.4.16. The use of the completed development will generate 'controlled waste' which will need disposal off-site.
- 15.4.17. Oxfordshire has 7 non-hazardous landfill sites. One of the non-hazardous landfill sites Alkerton, which is in the vicinity of Banbury, isn't currently accepting non-hazardous waste as it is at the end of its consent. The void at Alkerton is 0.85 million cubic metres. It is anticipated that this could reopen in the future, however for the purposes of this assessment it will not be considered as available landfill. It is recognised that waste management is continually changing and focussing on implementing the model of the waste hierarchy, where disposal at landfill should be viewed as a last resort.
- 15.4.18. The total waste management capacity in Oxfordshire at May 2012 up to 2028 was:
- 17.2 million tonnes /14.6 million cubic metres of landfill;

- 2.3 million tonnes per annum of recycling and compost; and
- 0.4 million tonnes per annum of recovery treatment.

### **Utilities**

#### *Electricity*

- 15.4.19. Scottish & Southern Energy is the only electricity supplier with apparatus identified within the zone of interest and it is therefore anticipated that they will service the proposed development.
- 15.4.20. Records received from Scottish & Southern Energy show HV (11kV 185x3C Al CAS) underground cable along Gavray Drive and two HV (11kV 300x3C Al CAS and 240x3C Al XLPE) underground cables along the A4421 Charbridge Lane.
- 15.4.21. It is not known at this stage if the increase in electrical demand in the local area will require reinforcing of the infrastructure network.

#### *Gas*

- 15.4.22. Southern Gas Networks plan shows Low Pressure (LP) 250mm Polyethylene (PE) gas main pipe along Gavray Drive and the A4421 Charbridge Lane.
- 15.4.23. It is anticipated that Southern Gas Networks will service the proposed development.
- 15.4.24. Southern Gas Networks Connections works will consist of connection to the existing 250mm LP PE main in Gavray Drive and installation of new LP PE mains and services to serve 180 new dwellings. This will terminate with ¾" capped control valves in 180 x external meter boxes to suit.
- 15.4.25. SGN Connections has stated that reinforcement of the existing network will be required to accommodate this development based upon current network model data. However, this is subject to change and upon the receipt of a firm request, SGN will evaluate whether reinforcement is actually needed or not.

#### *Water Supply*

- 15.4.26. Thames Water operates the water supply to this area and Utilities records show an existing 350mm (15 inch) Asbestos Cement (AC) Strategic trunk main running across the eastern side of the existing land along the A4421

Charbridge Lane and a 200mm water main pipe is located along Gavray Drive.

*Foul Drainage*

- 15.4.27. Thames Water utility records show separate foul and surface water sewers along Gavray Drive and the A4421 Charbridge Lane.
- 15.4.28. A 150mm diameter foul water main is shown running alongside Gavray Drive which connects to a 450mm sewer along Wretchwick Way, outfalling to a foul pump station located on Peregrine Way.
- 15.4.29. Previous enquires to Thames Water undertaken by JBA Consulting in 2009 indicated that the existing foul pumping station in Peregrine Way had sufficient capacity to cater for a total additional flow of approximately 25 l/s, being significantly higher than current development proposals in foul flow terms.
- 15.4.30. Thames Water is currently carrying out an Impact Study of their existing network with an additional 180 units from the application site.

*Telecommunications*

- 15.4.31. There are telecommunication underground cables owned by BT along Gavray Drive and the A4421 Charbridge Lane.
- 15.4.32. BT (Openreach) plant records show connection points required to serve the new development.
- 15.4.33. There is also Virgin Media telecommunication infrastructure at the existing development to the south of the site.
- 15.4.34. Based on the existing plant location, from records, and upon consultation with BT, it would appear that diversion of existing plant is not anticipated.

*Other Utilities*

- 15.4.35. Using the Linesearch facility, the following utility providers were identified as not containing apparatus within the site boundary.

Not in the Zone of Interest		
AWE Pipeline	FibreSpeed Limited	Oikos Storage Limited
BOC Limited (A Member of the Linde Group)	Gamma	Perenco UK Limited (Purbeck Southampton Pipeline)
BP Midstream Pipelines	Geo Networks Limited	Phillips 66
BPA	Government Pipelines & Storage System	Premier Transmission Ltd (SNIP)
Centrica Energy	Humbly Grove Energy	RWEnpower (Little Barford and South Haven)
Centrica Storage Ltd	HV Cables	SABIC UK Petrochemicals
ConocoPhillips (UK) Ltd	IGas Energy	Scottish Power Generation
Coryton Energy Co Ltd (Gas Pipeline)	Ineos Enterprises Limited	Seabank Power Ltd
CSP Fibre c/o Centara	INEOS Manufacturing (Scotland and TSEP)	Shell Pipelines
EirGrid	Lark Energy	Spiecapag UK Limited (Carrington)
Electricity North West Limited	Mainline Pipelines Limited	Total (Finaline, Colnbrook & Colwick Pipelines)
E-on UK Plc (Gas Pipelines Only)	Manchester Jetline Limited	Transmission Capital
ESP Utilities Group	Marchwood Power Ltd (Gas Pipeline)	Western Power Distribution
ESSAR	National Grid Gas (above 2 bar) and National Grid Electricity Transmission	Wingas Storage UK Ltd
Esso Petroleum Company Limited	NPower CHP Pipelines	

**Table 6 : Linesearch Facility Utilities Check**

15.4.36. In addition to the above, the following providers were also consulted and found not to maintain any apparatus within the development site.

BskyB (Easynet)	Interoute (Ringway /Beach /51 degrees /Plancast)	May Gurney Ltd (Fujitsu)
CityFibre Holdings Ltd	GTC [includes Envoy]	Vodafone
Energetics Electricity	McNicholas	TfL Tram Network
Fulcrum Pipelines	KCOM Group PLC	TrafficMaster Plc
Verizon Business	Colt Technology Services	C.A. Telecom UK Ltd

**Table 7 : Additional Utilities Check**

**The projected future baseline**

15.4.37. Without the Proposed Development, the Site is expected to remain unused and produce no waste. The same current utilities will remain if the Proposed Development does not occur.

## 15.5. LIKELY SIGNIFICANT EFFECTS

### Construction Stage

#### *Construction Excavation Waste*

- 15.5.1. The greenfield Site will not generate recycled material to be used as aggregate, although construction operations associated with the Proposed Development have the potential to affect the aggregate market by temporarily increasing local demand for aggregate materials, which will be required for construction of the proposed development.
- 15.5.2. Excavated materials will arise during the Site preparation works associated with the Proposed Development. This will include top soil strip and road box excavation. Refer to Chapter 14 “Ground Conditions” for further information.

#### *New Build Construction Waste*

- 15.5.3. Construction operations will generate waste materials as a result of general handling losses and surpluses. These materials are likely to be disposed of off-site as wastes and therefore have the potential to affect waste management capacity. Those materials utilised in the construction of residential developments, as based upon current practice, are likely to be as follows:
- Concrete;
  - asphalt;
  - brick;
  - glass; and
  - timber.
- 15.5.4. There will also be packaging materials such as plastics and paper. Any unused paints, timber treatments etc. may also require off-site disposal as hazardous materials.
- 15.5.5. Building Research Establishment (BRE) has produced benchmark data that provides an indication of the average quantity of construction waste that is produced for new builds for each project type (i.e. residential, commercial) in each region of England. Table 4 summarises the floor space of each land

use type of the Proposed Development and the estimated waste generated during construction.

- 15.5.6. For the purposes of estimating the likely construction waste arisings, a total floorspace of 18810m<sup>2</sup> has been assumed for the residential floorspace (180 units). This figure is based on an estimate that the average GEA for the average dwelling is 110m<sup>2</sup>.

Land Use/Class Use	Estimated maximum area of floorspace proposed within the development (m <sup>2</sup> )	Benchmark waste value (data up to July 2013)	Predicted Waste Generation (m <sup>3</sup> )
Residential	19,800	22.9m <sup>3</sup> /100m <sup>2</sup>	4,534 m <sup>3</sup>
		Total	4,534m <sup>3</sup>

**Table 8 : Predicted Construction Waste by Class Use**

- 15.5.7. As Table 4 indicates, up to approximately 4534m<sup>3</sup> construction waste is anticipated to be generated as a result of the Proposed Development. It is likely that a significant proportion of this could be recycled or re-used. If based on current Oxfordshire recycling rates for demolition and construction waste that 78% was recycled/recovered and 22% landfilled, the development would therefore generate up to 998 m<sup>3</sup> of waste to landfill and this would equate to <0.5% of the remaining annual landfill capacity, resulting in an insignificant effect.
- 15.5.8. From review of the Oxfordshire Minerals and Waste Development Framework Annual Monitoring Report it is considered that there is sufficient waste management recovery/recycling capacity to deal with the estimated generated construction materials of 3536 m<sup>3</sup> which could be recycled or reused.

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- 15.5.9. There is potential for construction works to give rise to likely significant environmental effects if appropriate mitigation measures are not employed during the installation works to provide new utility service; e.g. fuel spillages and increased noise emissions from plant and machinery.
- 15.5.10. During construction, there is the potential for plant, on site, to strike existing services (for example cables and pipes) if they are not on record drawings or are not located prior to commencement of excavation. This could cause temporary loss of the aforementioned services to the general population in the local area temporarily.

### **Operational stage**

15.5.11. The users of the completed development will produce wastes which will require disposal and which by virtue of the volumes which will arise are likely to give rise in the long term to a more significant impact upon the waste management capacity within Oxfordshire. These forms of waste are assessed in more detail below.

#### *Household Waste*

15.5.12. The Site will generate household and commercial wastes which will require disposal and in an appropriate way in accordance with the Waste Management Hierarchy.

15.5.13. The waste arising from the Site, when completed, will comprise predominantly domestic waste. Waste materials arising from the Proposed Development will have an impact on waste management facilities and any residual waste upon the landfill capacity. A significant proportion of the waste materials generated from the proposed residential and commercial premises will be classified as household and municipal wastes.

15.5.14. The Proposed Development has been assessed in this ES to include up to 180 new dwellings.

15.5.15. The average household waste generated in kg/household/year in Oxfordshire is 1,078kg. This equates to up to approximately 194040kg or 195 tonnes of household waste being generated annually by the Proposed Development. The development would therefore give rise to an increase of less than 0.01% of household waste in Oxfordshire per year.

15.5.16. If the 60% landfill diversion rate is maintained, then 78.6 of the 195 tonnes of household waste generated each year by the development will require landfilling. There is approximately 17.2 million tonnes of available landfill capacity and therefore this equates to a <0.1% impact on the available landfill capacity.

#### *Commercial waste*

15.5.17. As there are no commercial properties on the proposed development, no commercial waste will be produced.

### *Utilities*

15.5.18. The users of the completed development will require the provisions of the utilities assessed within this chapter of the ES (potable water, electricity, gas, telecommunications and foul drainage) and therefore the development is likely to give rise in the long term to a more significant impact upon the ability of Oxfordshire to provide the aforementioned services. These are assessed in more detail below.

### *Potable Water*

15.5.19. Upon consultation with the relevant water suppliers, it has been shown that no diversions are anticipated in order for the development to proceed.

15.5.20. Increased water consumption will lead to additional water being extracted from the water source(s) for treatment and distribution. If the development water use was to match the average of 164 l/person/day, the total increase, compared to the existing buildings, would be 41 Ml/year assuming an average household occupancy of 4 people per house.

15.5.21. The sensitivity of the potable water source is medium and the magnitude of change, prior to any required mitigation, is low. Therefore, there is likely to be an insignificant to minor effect prior to the implementation of mitigation measures.

15.5.22. Thames Water was commissioned to undertake a flow & pressure test on the distribution mains which will serve the site. The resulting investigation has established that the network has sufficient spare capacity to serve the proposed development without the need for offsite reinforcement works.

15.5.23. The pressure test simulated the development load and found an insignificant impact on the existing network pressure head. Thames Water require a minimum of 10m head at each meter point with the test registering a range of 36.40m to 46.87m available head in the existing network.

15.5.24. The proposed development will therefore not impact on the serviceability level of the existing potable water supply to the area.

### *Electricity*

15.5.25. Upon consultation with the relevant electricity suppliers, it has been shown that no diversions are anticipated in order for the development to proceed.



- 15.5.26. Increased electricity consumption will lead to an increase in demand from the national grid. If the proposed development electrical demand was to match the average of 3,300 kilowatt hours (kWh) per household per year, the total increase would be 594,000 kWh/year.
- 15.5.27. The total electrical consumption in the United Kingdom for 2013 was 317,300 GWh. The increase in electrical demand due to this development would equate to an increase of 0.00019%.
- 15.5.28. Of the 317,000 GWh, 17,532 GWh were imported into the UK.
- 15.5.29. The sensitivity of the electrical supply to the area source is therefore determined to be medium and the magnitude of change, prior to any required mitigation, is small. Therefore, there is likely to be a direct, minor effect on electricity demand of minor negative significance prior to the implementation of mitigation measures.

#### *Gas*

- 15.5.30. Upon consultation with the relevant gas service providers, it has been shown that no diversions are anticipated in order for the development to proceed.
- 15.5.31. Increased gas consumption will lead to an increase in demand from the national grid. If the development gas demand was to match the average of 16,500 kilowatt hours (kWh) per household per year, the total increase would be 2,970,000 kWh/year.
- 15.5.32. The total gas consumption in the United Kingdom for 2013 was 850,382 GWh. The increase in gas demand due to this development would equate to an increase of 0.00035%.
- 15.5.33. Of the 850,382 GWh, 535,106 GWh were imported into the UK.
- 15.5.34. The sensitivity of the gas supply to the area source is medium and the magnitude of change, prior to any required mitigation, is low. Therefore, there is likely to be a direct, temporary, long-term effect on gas demand of minor negative significance prior to the implementation of mitigation measures.

#### *Telecommunications*

- 15.5.35. Upon consultation with all relevant telecommunications providers, it has been shown that no diversions are anticipated in order for the development to proceed.

- 15.5.36. As telecommunications capacity is only limited by physical infrastructure and not a natural resource, the Proposed Development will not have an effect on the existing network performance and deliverability based on preliminary outline advice from network providers.

*Foul Drainage*

- 15.5.37. Upon consultation with the relevant drainage providers, it has been shown that no diversions are anticipated in order for the development to proceed.
- 15.5.38. Based on a flow rate of 600 l/s per household and a peak flow of 6DWF + 10%, development foul flows will be 7.84 l/s from the 180 dwellings. This flow will discharge into the existing 150mm diameter foul sewer within Gavray Drive.

## 15.6. MITIGATION MEASURES

### Construction stage

#### Waste

- 15.6.1. The volume of waste generated during the construction works will be minimised through adherence by the Site contractor to the Code of Practice on Site Waste Management Plans (SWMP). The Code of Practice endorses the waste hierarchy, promotes legal compliance and provides guidance on best practice, monitoring and reporting.
- 15.6.2. The Construction Environmental Management Plan (CEMP) provides a mechanism for the implementation of recommended mitigation measures at the Site from the start of the Site clearance and enabling works, through to the completion of construction. The finalised CEMP (which should be prepared in discussion with the appointed contractor) will be agreed with Cherwell District Council, Oxfordshire County Council and other authorities as appropriate prior to commencement of works at the Site. The Site contractor(s) will be required to comply with the requirements of the CEMP and the SWMP.
- 15.6.3. Measures will be included within the SWMP to reduce the impact of waste arisings during the construction works, which are likely to include the following:
- Efficient planning of material deliveries to the Site by contractors and sub-contractors to avoid damage to the materials and the unnecessary generation of waste;
  - Effective co-ordination between contractors and suppliers to avoid the excessive purchase of raw materials and to prevent the risk of materials being lost, stolen or damaged; and
  - Effective handling and storage of delivered materials to prevent loss or damage through exposure to the weather, mud and on-site vehicles.
- 15.6.4. Where possible, the general site waste will be re-used/recycled. The generation, storage and disposal/recycling of this waste will be controlled and monitored through the SWMP and implemented via the CEMP.
- 15.6.5. The developer will seek to reuse any surplus of soil material generated thus minimising the amount which will require transportation off-site. It is

anticipated that soils will be reused on Site wherever possible for new gardens and areas of open space.

*Potable Water, Electricity, Gas, Telecommunications, Foul Drainage*

- 15.6.6. Further enquiries and investigations should be undertaken to satisfy the developer as to the adequacy of the plans and position of the utilities. The exact position of the utilities should be verified by the use of suitable detecting devices and safe digging practices in accordance with HS(G)47.
- 15.6.7. The installation works to provide new utility service will be subject to appropriate construction management plans and pollution prevention guidance to ensure any environmental impacts during the temporary construction phase will be negligible.
- 15.6.8. The Principal Contractor is to ensure that proper procedure is followed and areas to be excavated/used as storage are CAT (Cable Avoidance Tools) scanned to locate any known services from record drawings, or to locate any unknown services. Once services are located they should be marked clearly and the depth found by use of trial pits.

**Operation stage**

*Waste*

- 15.6.9. Detailed design of the Site will take into account relevant guidance when considering waste management.
- 15.6.10. As the planning application is for outline planning permission, detailed layouts are not available for the individual development areas but this chapter of the ES considers the likely generation of waste through the construction phase and operational phase of the proposed development.
- 15.6.11. An extract of the BS5906: 2005 Waste Management in Buildings Code of Practice states that:

“The developer or his agent should reach agreement with all appropriate authorities, particularly upon the following points:

- a) The methods of storage, segregation, on-site treatment and collection of waste, including recyclable material, to be used for the form of layout and building density adopted.

- b) A designated location for waste including recyclable material storage, segregation and treatment areas to be provided and means of access to them for waste collection staff and vehicles.
  - c) The storage capacity to be provided with allowance for the frequency of collection specified by the collection authority, the volume and nature of waste including recyclable material expected and the size and type of containers to be used.
  - d) The responsibility for cleansing and maintenance of storage facilities.
  - e) Environmental aspects, e.g. air pollution, indoor air quality, noise control, and litter abatement.
  - f) The discharge of waste into sewers (e.g. food waste disposers).
  - g) Means of escape and fire-fighting arrangements in waste and recyclable material storage and collection areas.
  - h) Appropriate arrangements for older persons and persons with disabilities.”
- 15.6.12. Any effects arising will be mitigated through appropriate management and detailed design as noted below.
- 15.6.13. Many issues outlined in sections 15.5.11 to 15.5.17, can be mitigated through appropriate design and location of waste storage and collection facilities.
- 15.6.14. The production of waste materials from the completed development can be mitigated by encouraging waste minimisation and commercial recycling schemes.
- 15.6.15. At the detailed design stage consideration will also be given to the following:
- Prominence of skips/waste bins within the development;
  - Adequate storage space for skips/bins to avoid obstructing the pavements;
  - Providing convenient locations/ease of access for producers of waste and for collection;
  - Adequate surfacing of waste storage/collection points to avoid damage from refuse collection vehicles;

- Separation of waste and recycling;
- Careful design to avoid pollution issues (i.e. odours, vermin);
- Fire safety issues of waste storage areas and impact upon public health.

#### *Potable Water*

- 15.6.16. To minimise water use, sustainable water fittings will be specified for all water outlets throughout the development. This will be applied to all taps, shower heads and toilets with the intent of limiting water consumption to 105 l/person/day. The total increase of water usage from the site is expected to be approximately 27.6 Ml/year.

#### *Electricity*

- 15.6.17. The introduction of energy efficiency measures in accordance with the anticipated Building Regulations revisions during the detailed design stage will reduce the overall energy demand consumption. Therefore the 594,000 kWh/year electricity demand from the Proposed Development is a realistic worst case and is likely to reduce during the detailed design stage.

#### *Gas*

- 15.6.18. If reinforcement of the existing gas network needs to take place in order to supply the development, the newly proposed lines will follow the same route as the existing and as such, environmental impact will be minimal. It should be noted however that it is not certain that any upgrade works will be necessary.
- 15.6.19. The introduction of energy efficiency measures in accordance with the anticipated Building Regulations revisions during the detailed design stage will reduce the overall energy demand consumption, predominately by reducing the heating demand.

#### *Telecommunications*

- 15.6.20. As no diversions are required and there will be no effects on the existing network, as explained in section 15.5.35 and 15.5.36, it is not anticipated that any mitigation measures will need to be put in place.
- 15.6.21. Detailed proposals for telecommunications within the Proposed Development will be confirmed during the detailed design stage.

*Foul Drainage*

- 15.6.22. All drainage will be kept as shallow as possible to minimise the excavations required and subsequent impact.

## 15.7. RESIDUAL EFFECTS

### Construction Stage

#### *Waste*

- 15.7.1. The estimated levels of waste generation during the construction of the development, that are likely to require disposal to landfill, can be readily accommodated in landfill sites in the Oxfordshire Plan Area. The total volume requiring disposal during each year of the construction of the Proposed Development is likely to represent a small percentage of the annual tonnage landfilled in the region. Where possible recycling facilities for construction wastes will be utilised to minimise the waste produced.

#### *Potable Water, Electricity, Gas, Telecommunications, Foul Drainage*

- 15.7.2. The installation works to provide new utility service will be subject to appropriate construction management plans and pollution prevention guidance to minimise any environmental impacts during the temporary construction phase. Residual impacts will be negligible.

### Operation Stage

#### *Waste*

- 15.7.3. Residual waste materials from the completed development which cannot be re-used, recycled or recovered are likely to be disposed of to landfill within the Minerals and Waste Local Plan area. The use of landfill capacity for non-recyclable wastes from the completed development is not reversible and therefore will have a long term impact on the overall availability of landfill capacity, however the residual impact is therefore likely to have effect at a local and district level and to be relatively minor in nature.
- 15.7.4. There is sufficient capacity in waste management facilities in the area to handle the recyclable and recoverable wastes that are estimated to be generated from the Proposed Development.

#### *Potable Water*

- 15.7.5. There are not expected to be any significant residual effects from the increase in potable water demand during the operation of the development.



*Electricity*

- 15.7.6. There are not expected to be any significant residual effects from the increase in electricity demand during the operation of the development.

*Gas*

- 15.7.7. There are not expected to be any significant residual effects from the increase in gas demand during the operation of the development.

*Telecommunications*

- 15.7.8. There are not expected to be any significant residual effects from the increase in telecommunications traffic during the operation of the development.

*Foul Drainage*

- 15.7.9. Residual effects will be restricted to the reduction in available capacity of the public sewer network utilised by the development, reducing any spare capacity in the future.

**Summary of effects**

*Waste*

- 15.7.10. There will be a small adverse impact on the availability of landfill capacity, as a result of the disposal of non-recyclable wastes from the development. This impact will include a reduction in the total landfill space available for other wastes. Waste materials from the development are likely to be disposed of to landfills in the local area with any residual hazardous materials taken further afield to adjoining counties. The impact is therefore likely to have an effect at local or district scale rather than a regional level. As a result of the mitigation measures which will be applied, the impacts on local landfill availability are likely to be relatively minor overall. The use of landfill capacity for non-recyclable wastes from the development is not reversible and therefore will have a long-term impact on the overall availability of landfill capacity in the area.
- 15.7.11. With the current facilities in place it is anticipated that the impact of the Proposed Development on the County's ability to handle the recyclable and recoverable wastes generated by the Proposed Development will be negligible.

*Utilities*

15.7.12. With an increase in housing within the area, there will be an increase in demand for all the utilities investigated within this report. However due to the current infrastructure available and potential for supply, it is anticipated that there will be an insignificant impact following mitigation measures implemented to existing networks to serve the development.

15.7.13. The effects identified are summarised in Table below:

**Outline Planning Application**

Potential Effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
<b>Construction Stage</b>			
Construction Excavation Waste	Moderate	<ul style="list-style-type: none"> <li>• Adherence by the Site contractor to the Code of Practice on Site Waste Management Plans (SWMP)</li> <li>• Creation of a Construction Environmental Management Plan (CEMP)</li> </ul>	Insignificant
New Build Construction Waste	Moderate	<ul style="list-style-type: none"> <li>• Adherence by the Site contractor to the Code of Practice on Site Waste Management Plans (SWMP)</li> <li>• Creation of a Construction Environmental Management Plan (CEMP)</li> </ul>	Insignificant
Construction Of Service Routes	Major	<ul style="list-style-type: none"> <li>• Adherence by the Site contractor to HS(G)47</li> <li>• Production of appropriate construction management plans during installation of new utility services.</li> <li>• Adherence to appropriate pollution prevention guidance during installation of new utility services.</li> </ul>	Minor
<b>Operation Stage</b>			
Household Waste	Moderate	<ul style="list-style-type: none"> <li>• Observing appropriate guidance during detailed design, notably siting of appropriate waste/recycling storage and collection facilities.</li> <li>• Encouragement of household composting/waste minimisation and commercial recycling schemes.</li> </ul>	Insignificant
Increased Water Consumption	Moderate	<ul style="list-style-type: none"> <li>• Use of sustainable water fittings throughout the development.</li> </ul>	Insignificant
Increased Electricity Consumption	Moderate	<ul style="list-style-type: none"> <li>• Introduction of energy efficiency measures in accordance with the appropriate Building Regulations during the detailed design stage.</li> </ul>	Insignificant
Increased Gas Consumption	Moderate	<ul style="list-style-type: none"> <li>• Potential reinforcement of existing local gas network.</li> </ul>	Insignificant

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Increased Foul Flows	Moderate	• Undertaking of a Thames Water Impact Study and the application of the study recommendations should mitigation be required.	Insignificant
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***Outline Planning Application***

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**15.8. CUMULATIVE EFFECTS**

- 15.8.1. The risks due to utilities and waste will be similar for all of the planned development in the Local Plan.

*Waste*

- 15.8.2. If all the proposed developments are constructed, residual waste materials which cannot be re-used, recycled or recovered, from all construction activity is likely to be disposed of to landfill, within the Minerals and Waste Local Plan area. The use of landfill capacity for non-recyclable wastes from the completed developments is not reversible and therefore will have a long term impact on the overall availability of landfill capacity.

*Utilities*

- 15.8.3. If all proposed developments are constructed in a short time period, the cumulative additional demand may affect power and gas supplies to the local area where insufficient lead in time for network reinforcement exists. This could lead to a potential risk that of the infrastructure not meeting demand, creating power outages and gas shortages. Infrastructure reinforcement is assessed at the planning stage however in consultation with the utility providers and therefore provides a mechanism in which power and gas provision can be planned into the future to cater for increased demand.
- 15.8.4. If all the proposed developments are constructed, the cumulative additional demand would put additional strain on the existing water supply network. There is then the risk that, not enough water could be supplied to meet the demand, creating a water shortage, especially during prolonged periods of hot dry weather. Infrastructure reinforcement is assessed at the planning stage however in consultation with the utility providers and therefore provides a mechanism under the five year Asset Management Plan process to ensure provision for increased demand.
- 15.8.5. There are not expected to be any significant cumulative effects from the increase in telecommunications traffic.

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15.8.6.

**15.9. GLOSSARY**

15.9.1. **CAT Scanner (Cable Avoidance Tool):** A tool used for the detection of buried utilities equipment







## 16 CONCLUSION AND CUMULATIVE IMPACTS

16.1 This EIA has found that the Proposed Development would have few residual effects of more than minor significance, whether adverse or beneficial. This chapter examines the effects identified in each chapter, sets out the required mitigation measures and residual impacts remaining. Cumulative impacts are set out.

### **Socio-Economic Effects**

#### *Effects*

- 16.2 During construction the likely significant direct and indirect effects of the construction works upon job creation and expenditure would be **temporary**, of **local scale** and of **moderate beneficial** significance. As the effects are temporary this assessment is not considered to be significant in the overall context of the EIA.
- 16.3 The effect of the population increase, is considered to be **permanent**, of **local to regional scale** (but primarily local) and of **major beneficial** significance. There will be more residents within Bicester as a result of the development who will contribute to the labour market generate and support the local and national economies, which is a significant factor as part of the EIA.
- 16.4 Both the direct and indirect effects of the Proposed Development on the local and regional housing market will be **permanent**, of **local** and to some extent **regional** scale and of **moderate beneficial significance** for the long term development of the area. As the development will meet local demand from households for dwellings the significance from an EIA perspective is significant to a small extent.
- 16.5 The effects of the Proposed Development on the local labour market are therefore assessed as being **permanent**, of **local** scale, and of **moderate beneficial** significance. No jobs are being created on site but the development will generate a substantial labour market which is significant for the EIA.
- 16.6 The impact of the Proposed Development on education will be addressed as part of the Section 106 agreement. Overall it is expected that the new development will have **permanent** effects, of **local** scale and of **moderate beneficial** significance. Given the number of potential pupils generated from the development and the lack of on-site provision this significance in terms of the EIA is not significant. Although there is no onsite provision of primary or secondary education, it is considered that there is capacity in the local area to accommodate the numbers of both primary and secondary school children, despite increasing demand in Bicester, the wider Cherwell District and Oxfordshire as a whole. Chesterton Primary and Launton CE School are the nearest to the Site and both have capacity to expand or increase their admission numbers, whilst Heyford Park Free School decreases immediate pressures on secondary education provision, although it is acknowledged that two new secondary establishments will be required as housing developments come forward.

- 16.7 The effects of the Development upon health are expected to be **permanent**, of **local** scale and of **minor beneficial** significance. The population increase does not warrant new services to be provided on-site or elsewhere, therefore the significance in terms of the EIA is not significant.
- 16.8 Although the Proposed Development results in an overall loss of on-site open space, the quality of the public open space to be provided will be much greater than what currently exists and will be made available to the public which is not currently the case. The public open space to be provided is considered to be a **permanent** effect of **local** scale and **moderate beneficial** significance to existing and future residents, users and visitors. Given the ecological sensitivity of the area and the importance of providing open space on-site this effect is considered significant in the context of the EIA.
- 16.9 No on-site community facilities are proposed as part of this application, however the nearest community facilities are located at Langford Village, approximately 975m on foot using local footpaths or 1.5km driving. It is unlikely that other community facilities across Bicester will be used, or at the very least used by pedestrians from the Site. Overall, the effects of the Proposed Development on community facilities are expected to be **permanent**, of **local scale** and of **neutral** significance.
- 16.10 The effects of on the existing local centres, superstores, Bicester town centre and Bicester Shopping Village are likely to arise from additional money being spent at these locations, therefore the effects can be considered to be **permanent** and of **moderate benefit**, and of a **local scale**. The new dwellings will contribute towards maintaining the viability of the retail provision in Bicester as the Site is well-served. However the significance of this is minimal in terms of the overall EIA.
- 16.11 During the construction of the Proposed Development there might be the need for security fencing or other measures to provide the required safety while the development is not yet advanced enough to provide a sufficient level of indirect surveillance. In terms of crime and public safety, the Proposed Development would have beneficial effects upon the surrounding areas as the level of activity will be increased and with it indirect surveillance and perceived safety. This could indirectly affect both the local housing market and local economy by attracting new interest and investment. It is considered that the Proposed Development would have **permanent, local** to the development and of **minor beneficial** effects on crime and public safety both for the development and its surroundings.

#### *Mitigation Measures*

- 16.12 As shown in the previous section, the socio-economic effects of the Proposed Development will be beneficial during both the construction phase, as well as after completion. Suitably worded conditions on any planning permission will be discussed and agreed with Cherwell District Council, as well as delivery thresholds that will form

part of the Section 106 legal agreement, to ensure that any harm caused by the development will be appropriately mitigated.

#### *Residual Effects*

16.13 All effects of the Proposed Development will be predominantly beneficial. Consequently, the residual effects during construction and following completion of the Proposed Development would remain identical to those described within the assessment of the likely significant effects.

#### *Cumulative Effects*

16.14 All effects of the Proposed Development will be predominantly beneficial with one effect being adverse to a small extent. Consequently, the residual effects during construction and following completion of the Proposed Development would remain identical to those described within the assessment of the likely significant effects. Given that the effects arising from the Proposed Development will not be significant, the same will be true for its cumulative effects with other schemes in the area.

### **Transport**

#### *Effects*

16.15 Likely significant transportation and access related effects that may arise from construction include:

- Increase in vehicle movements associated with construction staff accessing the site;
- Increase in proportion of daily HGV movements within the local highway network along route that construction vehicle are most likely to use and that will be agreed with OCC / CDC;
- Reduction in amenity and safety for pedestrians and cyclists.

16.16 The additional HGV traffic will result in a **minor temporary adverse effect**, across the majority of the receptors based on their sensitivity which would not be considered significant for the purposes of environmental impact assessment.

16.17 The volume of additional HGV traffic relative to existing traffic flows and HGV proportions, will result in a **moderate / minor temporary adverse effect** on Gavray Drive receptor, which again would not be considered significant for the purposes of environmental impact assessment.

16.18 As there are existing footways away from the carriageway edge, the magnitude of effect on pedestrian amenity and safety is considered to be a **minor temporary adverse effect**. Cyclists benefit from off-road cycle routes running parallel with Gavray Drive and

the A4421 and so the magnitude of effect on cyclist amenity and safety is a **minor temporary adverse effect**.

16.19 The additional traffic during operation will result in a moderate **long term adverse effect** on Gavray Drive which is considered significant, but with all other receptors having a **minor adverse effect which is not considered significant**.

16.20 The increase in bus patronage will result in a **minor long term adverse effect** based on the receptor having a low sensitivity to change.

16.21 The scale of development will not result in any perceptible change to pedestrian or cycle journey times, safety or amenity and nor is it believed that the additional number of vehicle movements will have any perceptible change to pedestrian severance. The effect is therefore considered to be, at worse, **minor adverse**.

#### *Mitigation Measures*

16.22 A number of measures will be implemented to mitigate the general effect of additional construction vehicles, which will be finalised within a Construction Environmental Management Plan that is likely to be a requirement conditioned in any planning permission.

16.23 These measures include:

- Agreeing routes to and from the Site, avoiding residential and congested routes as far as possible;
- Scheduling deliveries to avoid morning and evening peak hours;
- Controlled working hours;
- On-site loading and unloading;
- Encouraging the construction workforce to access the Site using public transport;
- Wheel washers will be provided for transport vehicles leaving the Site;
- Operation of plant will be carried out in such a way that noise is minimised;
- Re-use and recycle excavated materials and waste as much as possible;
- Avoid lorries leaving the Site empty wherever possible (i.e. anything that needs to leave the Site to be taken on delivery lorries if at all practicable), and
- Signage and hoarding used to control pedestrian access around the Site.

16.24 A residential Travel Plan will be implemented to ensure there is no increase in the number of vehicle movements to/from the Site as well as well as encouraging modal shift. In particular, single occupancy vehicle trips will be discouraged in favour of promoting more sustainable modes of travel.

#### *Residual Effects*

- 16.25 The impact of additional construction traffic during a full working day will be insignificant. This will be supported by the range of mitigation measures that have been identified to ensure there is not a concentrated impact within a short period of time such as traditional peak hours. The residual effect during operation of the Proposed Development will be minor to moderate adverse and so for some effects will remain significant.

*Cumulative Effects*

- 16.26 As a result of the introduction of the relief road through South East Bicester, there is a reduction in vehicle movements on the A4421 Neunkirchen Way and A41 South arms on approach to the roundabout junction, with the remaining arms experiencing an increase in traffic flows. Whilst there is a major magnitude of change, the additional traffic during the cumulative scenario will result in a moderate long term adverse effect on Gavray Drive, with all other receptors continuing to have a minor adverse effect. This impact can be attributed to the fact that Gavray Drive currently serves a limited number of residential units.

**Air Quality**

*Effects*

- 16.27 During construction, dust emissions are considered to have a moderate significant effects. Following mitigation, the residual significance of potential impacts from all dust generating activities is *negligible* as outlined in the IAQM guidance.
- 16.28 Taking into account traffic growth, post construction impacts for all receptors are anticipated to experience *negligible* impacts as a result of the operation of the proposed development.
- 16.29 Considering the proximity of the railway lines, the effects are predicted to be negligible at all sensitive receptors in all assessment scenarios.

*Mitigation Measures*

- 16.30 With effective mitigation implemented as part of the Construction Environmental Management Plan (CEMP), effects associated with the construction phase are likely to be insignificant.
- 16.31 As the proposed development does not result in any significant effects for local air quality no mitigation for the operational phase is required.

*Residual Effects*

- 16.32 With mitigation measures implemented, the residual significance of potential impacts from all dust generating activities is not significant at receptor locations.

*Cumulative Effects*

16.33 Should the construction phase programmes of other committed developments in the vicinity of the proposed development overlap then there is the potential for increases in dust impacts at sensitive locations. However, it is not anticipated these will be significant and the implementation of suitable mitigation options, as outlined within this chapter, should control impacts to an acceptable level. Post construction, all receptors are anticipated to experience *negligible* impacts as a result of the operation of the proposed development and Gavray Drive East.

## Noise

### *Effects*

- 16.34 Daytime construction noise levels at all noise sensitive receptors are below the daytime significance criteria of 65dB<sub>L<sub>Aeq,T</sub></sub>. For these locations the effects are considered to be **insignificant**.
- 16.35 There is the potential for vibration effects at sensitive receivers during demolition, foundation works, and superstructure construction. The identification of significant vibration effects at residential properties is complex due to the highly variable nature and durations of vibration impacts arising from construction work. It is considered that the significance of vibration effects from construction work cannot be assessed quantitatively and should be determined using professional judgement. As each phase of construction is planned in detail it will be possible to establish more detailed method statements. Where methods are considered likely to cause increased noise and vibration best practicable means should be used to control noise and vibration, including the provision of appropriate monitoring where deemed necessary. The details will be discussed and agreed with the Local Authority and an appropriate Code of Construction Practice will be developed.
- 16.36 For the future operational assessment year (2020) and the construction traffic assessment year of 2018 the entirety of the nearby road network experiences a **neutral/insignificant** noise increase (i.e. an increase of less than 1dB) in all scenarios with the exception of link ATC2 – Gavray Drive during the future operational scenario, which experiences a **minor adverse** increase in noise.
- 16.37 The increase in traffic noise for operation on Gavray Drive is between 1.4dB and 2dB, as shown in Tables 10, 11, 13 and Table 14 for “committed” and the proposed development, and “committed”(our proposed) and both west and east land parcels i.e. sensitive development without the south east Bicester development.
- 16.38 The assessed levels represent the committed, and the site proposed development with the south east Bicester. If the southeast Bicester development is in place, as well as the committed, proposed and sensitive development, along Gavray Drive, noise levels reduce as traffic is distributed onto other roads servicing south east Bicester.

16.39 As traffic noise changes would not be significant it follows that any changes in air-borne vibration effects from traffic would also be not significant. Any new internal traffic routes would not be expected to generate detectable ground-borne vibration as new roads would be smooth and free from potholes or any other discontinuities. Also, the distances to existing properties from new internal roads would be too great for there to be any possibility of significant effects.

#### *Mitigation Measures*

16.40 For the majority of receptors no specific additional mitigation measures beyond the CEMP are proposed to address construction noise impacts. This is because the net effect of the proposed development on these properties is considered to be neutral/insignificant.

16.41 No specific additional mitigation measures are proposed to address the impacts of increased numbers of vehicles using the existing road network. This is because the net effect of the proposed development on road traffic noise levels is considered to be neutral / insignificant for the entirety of the road network.

#### *Residual Effects*

16.42 During construction there will be neutral/insignificant residual noise effects at the receptors outside the application boundary as a result of the construction activity. After completion the residual indirect effects for existing roads would be neutral/insignificant.

#### *Cumulative Effects*

16.43 Existing baseline noise levels have been incorporated into the assessment, which include road traffic noise and rail traffic noise. Overall the changes to baseline conditions are expected to be **neutral/insignificant**.

16.44 With regards to construction noise effects, the timing for construction of surrounding committed development is unknown and as such not quantifiable, however, there is the potential to contribute to cumulative effects should construction of other committed development coincide with the proposed scheme.

16.45 Even under such a scenario, the cumulative impact of two sites cannot result in a noise level more than 3dB greater than that from a single development assuming that the same assessment criteria and constraints are applied to both sites.

16.46 The assessment of construction activity for the proposed development has been based upon worst case assumptions and effects still remain well below the adopted significance thresholds. Cumulative construction noise effects resulting from committed development are therefore not considered to materially influence the outcome of this assessment.

16.47 Post completion, with regards to the indirect effects from road traffic on the wider road network, nearby committed development has been included within the traffic flow figures

used and therefore the assessment already takes account of committed development in the area.

## **Landscape**

### *Effects*

- 16.48 The direct effects of the proposed development on the Site would be adverse through the establishment of a new land use at the site; these effects are adverse and significant in EIA terms. It is inevitable given the utility of a greenfield site for a new residential development with built form and ancillary features. These effects should not be seen as an obstacle to development as the mature landscape setting of the site contains effects so as to reduce, offset and mitigate otherwise adverse indirect effects from extending across the immediate and surrounding landscape to the Site. The protection, retention and enhancement of the site's native tree and hedgerow boundaries would afford inherent mitigation. Whilst the landscape mitigation proposed as part of the proposed development would retain and enhance the landscape character surrounding the site and give opportunity for new characterful planting within the Site. However, it is considered that the proposed development would not significantly alter the character of the wider surrounding landscape, which is classified as urban edge/fringe, due to the discrete geographical area over which effects will be experienced.
- 16.49 The most adverse visual effects are likely to be experienced along public footpath (PRoW 129/3) which is situated within the Site area. This level of effect diminishes from major-moderate, adverse (construction phase) to moderate – minor, adverse (Year 1 – Year 15) which is inevitable given the change of land use from greenfield / agriculture to residential with ancillary development.
- 16.50 The visual effects predicted to arise as a result of the introduction of the proposed development follow a similar pattern to effects upon landscape character, in that generally significant effects are likely to occur only within and in very close proximity to the proposed development; the magnitude of change to views decreases rapidly with distance from the development site.

### *Mitigation Measures*

- 16.51 Mitigation during construction includes adoption of an approved Construction Environmental Management Plan and Arboricultural Method Statement. Post-completion, the proposed masterplan has been developed iteratively through the development of a Landscape Visual Impact Assessment. This approach has been key to ensure the proposed development succinctly integrates with its setting and landscape character area. The masterplan has incorporated existing landscape features for inherent mitigation, as well as facilitating additional mitigation measures as detailed below



16.52 The landscape elements specific to the detailed design of the proposed development would be the retention and enhancement of existing features as well as the establishment of new measures that would provide:

- Retention and continuity of typical landscape features to reinforce landscape character and provide a distinctive sense of place;
- Visual screening of the proposed development;
- Creation of new public and private amenity; and
- Contribution to green networks and enhancement of habitat connectivity and ecological value.

#### *Residual Effects*

16.53 What indirect impacts are experienced diminish over the time of the proposed development through the maturity of the site setting and the effectiveness of mitigation measures. Effects by Year 15 would significantly reduce and would remain insignificant in EIA terms over the lifetime of the proposed scheme.

16.54 A mitigation strategy has been identified to offset or reduce these impacts through proactive management (during the construction stage), the application of best national practice, the utility of inherent mitigation and the introduction of new mitigation measures. Overall, these effects present a residual situation which is insignificant and also not significantly adverse in EIA terms.

#### *Cumulative Effects*

16.55 It is considered that the proposed development would be experienced as an “infill” to the existing urban area of Bicester and would not be experienced simultaneously with other proposed residential schemes (which being much larger would be perceived as urban extensions rather than “infills”). Inherent mitigation would screen and contain interspersibility through the Site’s mature landscape setting, railway embankment and also existing residential built form. These existing physical characteristics would offset, reduce and mitigate any cumulative effect to a negligible level not significant in EIA terms).

16.56 There would inevitably be cumulative effect with the development of the adjacent Gavray Drive East site (referred to as Scheme 1 in the cumulative assessment of this ES Chapter). However, adverse landscape effects would be moderate but would be contained within each of the site’s well defined boundaries. The anticipated cumulative effect would diminish from construction stage to an adverse minor effect due to the expedient establishment of “embedded mitigation measures”. In both cases each of these schemes would be experienced as “infilling” to the existing urban area due to the extent of surrounding residential development (particularly south of Gavray Drive) and the robust physical elements which contain the sites i.e. adjacent railway embankment and A4421 Charbridge Road.

## **Ecology**

### *Effects*

- 16.57 During construction, subject to the adoption of mitigation measures the potential effects from all dust generating activities is not significant.
- 16.58 The hydrological effect pertaining to silt laden run-off/pollutants entering Langford Brook via changes to the quality and quantity of surface water run-off entering the watercourse effect is considered to be inherently mitigated through the provision of a development buffer via the Public Open Space (POS) proposed along the eastern boundary of the Site. In the absence of further mitigation, potential hydrological effects are considered indirect minor adverse (temporary) and reversible (site level), and so not significant for the purposes of the Ecological Impact Assessment (EclA).
- 16.59 There are no significant adverse effects arising to trees during construction.
- 16.60 The Proposed Development will result in no direct loss to trees, and as such no significant effect on bats potentially roosting in these trees will arise not to bats foraging and commuting. Bats roosting, foraging and commuting are at potential risk of adverse effects from increased disturbance from artificial lighting during construction. In the absence of mitigation, negative effects of lighting on potentially roosting bats are considered an indirect minor adverse (temporary), reversible (site level) effect which is not significant for EclA purposes.
- 16.61 For birds, the loss, damage and degradation of potential bird nesting and foraging habitats during construction will be restricted to arable and small losses of hedgerow habitat. These effects are considered to be of low magnitude and would constitute a minor adverse (temporary to permanent) effect (site level) which is not significant for EclA purposes. The disturbance of nesting and foraging habitat for breeding birds through light spill, noise, visual and human disturbance during construction are likely to have an effect at no more than the site level owing to the limited availability of suitable habitats within the Site. The effects are considered temporary and minor adverse (site level) and so not significant for EclA purposes.
- 16.62 The Proposed Development could result in the direct harm to harvest mice if construction activities are carried out within areas of rough grassland, tall ruderal and scrub identified within the south east corner of the Site. The potential harm to harvest mice and the loss, damage and degradation of harvest mice habitats is considered a direct, minor (permanent) adverse effect at the site level which is not significant for EclA purposes.
- 16.63 A single adult white-letter hairstreak sighting has been made and no eggs recorded, within the Site. The hedgerow H2 will be lost, resulting in the loss of habitat confirmed to support white-letter hairstreak. Habitat loss is considered a minor adverse (permanent) effect at the site level, and so not significant for EclA purposes.
- 16.64 Post-completion, Gavray Drive Meadows LWS is at risk of potential adverse effect as a result of increased recreational pressure resulting from increased housing provision.

Increased recreational pressure has the potential to damage and degrade valuable ground flora and trees through trampling and littering, and disturb associated fauna occurring within the LWS including birds, great crested newts and reptiles. The effects of increased recreational pressure as discussed above are considered to have been partially inherently mitigated through the open space provision shown on the submitted Parameter Plan. The resulting effect is considered to be minor adverse (permanent) and of significance at the local level.

- 16.65 There will be low significance of air quality effects arising during the post-completion stage.
- 16.66 During the post-completion stage of the Proposed Development, retained habitats are at risk of damage, disturbance or deterioration as a result of the increased residential population, potentially resulting in inappropriate recreational use and inappropriate management of habitats. Such effects are applicable only to those habitats retained, which is limited to the broadleaved woodland along the southern boundary, Langford Brook and associated trees. The effects are considered to be indirect, minor adverse (temporary to permanent) (site level) and so not significant in terms of EclA purposes.
- 16.67 Effects of increased collision risk, light spill and disturbance upon sensitive habitats used by bats for foraging, commuting and roosting during the operational stage of the Proposed Development, in the absence of mitigation, will have adverse (permanent) effects. Such effects are considered of low magnitude owing to the limited extent of suitable habitat available to bats within the Site. These effects are considered to constitute minor adverse (permanent) effects (site level) and so not considered to be significant for EIA purposes.
- 16.68 Retained habitats supporting breeding and foraging birds are potentially at risk of disturbance and damage during the operational phase and an increase in domestic cats and dogs in the vicinity would increase the risk of predation and disturbance of birds. These effects are considered to constitute minor adverse (permanent) effects (site level) and so not considered to be significant for the purposes of the EclA.
- 16.69 An increase in domestic cats and dogs could increase the risk of predation and disturbance to harvest mice. This effect is considered to constitute a minor adverse (permanent) effect (site level) and so not considered to be significant for the purposes of the EclA.
- 16.70 No significant effects on white-letter hairstreak are anticipated during the operational phase of the Proposed Development.

#### *Mitigation Measures*

- 16.71 Adverse effects have been avoided or are not considered significant, such that further mitigation would not be required for the purposes of Ecological Impact Assessment. However, in order to ensure compliance with relevant nature conservation legislation and relevant planning policy, both national and local, further mitigation is required to avoid or

reduce in severity potential adverse effects, not all of which can be achieved through inherent mitigation alone.

- 16.72 Detailed measures to protect habitats and species during the construction phase will be set out in an Ecological Construction Method Statement (ECMS). An Environmental Clerk of Works (ECW) will be identified by the Developer to implement the ECMS. This will include measures to address construction effects on retained habitats, ensuring that they are reduced to insignificant levels; however, habitat losses will be addressed through new habitat creation during and after construction. Protection of species during construction will be ensured through the provisions of the ECMS. Specific measures have been identified to be included in the ECMS for each species group.
- 16.73 Post-completion a Landscape Ecology and Arboricultural Management Plan (LEAMP) will be developed to ensure the long-term conservation of retained and new valued environmental resources, including habitats and species of ecological value. The LEAMP will include detailed measures covering the establishment phase up to 5-years after commencement of the Proposed Development, with objectives and principles set out covering the long-term management. Monitoring of the effects of the implemented measures will form the basis for any revision of the scheme after five years. The Developer will provide a financial contribution for the long-term implementation of the LEAMP secured via a legal agreement. The LEAMP will focus on the establishment and maintenance of new habitats of long-term ecological value within the Proposed Development's open space provision, to provide net gains to biodiversity
- 16.74 Potential adverse hydrological effects on Langford Brook will be addressed through the incorporation of a Sustainable Drainage System (SuDS) within the Public Open Space (POS) provision.

#### *Residual Effects*

- 16.75 Residual effects anticipated during the construction phase have been reduced to levels that are not considered to be significant.
- 16.76 Post-completion, in light of the mitigation proposed, all potential effects on the valuable ecological receptors (VERs) identified within the assessment are considered not to be significant. Furthermore, mitigation measures to be delivered via the Soft Landscape proposals and LEAMP will result in a minor beneficial (site level) effect owing to habitat creation and restoration, and new habitat creation, provided.

#### *Cumulative Effects*

- 16.77 Any cumulative proposal evaluated will also need to be designed to accommodate and mitigate ecological interests to fulfil planning policy requirements and thereby inherently protect ecological interests across the wider landscape from cumulative development effects. Owing to the absence of significant residual effects predicted, cumulative effects

of the Proposed Development are considered to be extremely unlikely to arise in combination with the proposed residential development at Gavray Drive East.

### **Arboriculture**

#### *Effects*

- 16.78 Possible construction impacts can be avoided and mitigated through construction techniques. Following completion of all construction activities retained arboricultural receptors are considered less prone to future effects than other more sensitive receptors such as ecological assets.
- 16.79 The proposed outline development for the site requires the removal of one internal hedgerow (H4). The remaining individuals and groups of trees can be appropriately retained and with suitable protection can contribute greatly to the visual amenity of the area. With the implementation of landscape proposals this loss will be suitably mitigated and indeed increase the local tree cover in the immediate area of the development.

#### *Mitigation Measures*

- 16.80 Loss of existing trees and hedgerows as a result of the development overall is considered negligible in terms of landscape and visual amenity. The protection of Root Protection Areas (RPA) using suitable protective barriers conforming to the Standard, will protect against damage to trees and hedgerows selected for retention.
- 16.81 Significant new planting of both trees and hedgerows, specific details relating to species, specification and planting locations are to be submitted as part of the Reserved Matters application. The depicted mitigation for the loss of the one internal hedgerow proposes a like for like replacement due west of its current location, thereby reinforcing the site's western boundary.

#### *Residual Effects*

- 16.82 Following the implementation of the mitigation measures, residual effects with respect to the arboricultural resource are limited to neutral and negligible significance.

#### *Cumulative Effects*

- 16.83 There are no cumulative effects arising. Following the implementation of the mitigation strategies within the construction stage of the Proposed Development as highlighted, the potential impacts associated with trees and development can be suitably reduced to an acceptable level, such that there are no significant effects identified.

### **Historic Environment**

#### *Effects*

- 16.84 The Site does not form part of the setting of, or contribute to the significance of, any of the designated heritage assets in the study area. Therefore, the construction stage will not affect any designated heritage assets directly or indirectly.
- 16.85 The construction of the Proposed Development will likely remove any archaeological deposits present within its footprint, therefore the undated gullies will be subject to a permanent, large, direct and negative impact of **moderate/minor adverse significance**. The Iron Age pit will also be subject to a permanent, large, direct and negative impact of **moderate/minor adverse significance**. Neither of these effects are considered to be significant in terms of the EIA.
- 16.86 The historic landscape character of the Site is identified as being of negligible sensitivity. Therefore, the temporary, large, direct and negative impact, resulting from the complete land use and character change from agricultural land to construction site, will be of **minor adverse significance**. This is a non-significant effect in terms of the EIA.
- 16.87 The Site does not form part of the setting of, or contribute to the significance of, any of the designated heritage assets in the study area. As such, there will be no effects arising from the completed Proposed Development on any of the identified designated heritage assets.
- 16.88 All impacts on undesignated heritage assets will occur during the construction phase. As such, there will be no impacts on these during the post-completion stage.
- 16.89 The historic landscape character of the Site is identified as being of negligible sensitivity. Therefore, the permanent, large, direct and negative impact, resulting from the complete land use and character change from agricultural land to residential, will be of **minor adverse significance**. This is a non-significant effect in terms of the EIA.

#### *Mitigation Measures*

- 16.90 As there are no impacts identified upon designated heritage assets, there is no requirement for mitigation measures.
- 16.91 A mitigation strategy; to record both the identified and unidentified undesignated archaeological features within the Site; has been agreed with Richard Oram, archaeological advisor to Cherwell District Council.
- 16.92 As there are no impacts identified upon designated heritage assets, there is no requirement for mitigation measures.

#### *Residual Effects*

- 16.93 As there are no impacts identified upon designated assets, there are no residual effects. As the undesignated heritage assets will be removed through the mitigation and construction processes described above, there will be no residual effects. As there are no measures available to mitigate the impact upon the historic landscape character of the Site, the impact will remain temporary, large, direct and negative, resulting in a **minor adverse effect** which is not significant for the purposes of environmental impact

assessment. There are no impacts identified upon designated assets, and therefore there will be no residual effects.

- 16.94 All impacts will have occurred during the construction phase and there will therefore be no residual impacts during the post-completion stage. As there are no measures available to mitigate the impact upon the historic landscape character of the Site, the impact will remain permanent, large, direct and negative, resulting in a **minor adverse effect**, which is not significant for the purposes of environmental impact assessment.

#### *Cumulative Impacts*

- 16.95 Residential development sites within a 1km radius study area were considered within this cumulative effects assessment. This was considered to be a proportionately sized study area in light of the extent of the Proposed Development and the relatively enclosed position of the Site, in terms of wider views. There are no impacts identified upon designated or undesignated assets, and therefore there will be no cumulative effects in that respect.
- 16.96 The Gavray Drive East site has more surviving historic landscape features, including hedgerows, some of which are depicted on 17<sup>th</sup> century maps, and ridge and furrow earthworks. The Site, on the other hand, has a negligible value due to its lack of ridge and furrow earthworks and historic hedgerows. Therefore, in combination with Gavray Drive East, it will lead to the land use change of historic farmland to residential development, with the cumulative effect considered to be **adverse**, although not significant for the purposes of environmental impact assessment.

#### **Agriculture and Soil Resources**

##### *Effects*

- 16.97 The Proposed Development includes the development of approximately 6 ha of agricultural land of Subgrade 3b 'moderate' quality plus a further circa 0.7 ha currently in use as a temporary construction compound which has also been identified as Subgrade 3b. The impact is of a small magnitude on a receptor of high sensitivity with a **Moderate to Minor Adverse** effect. As 6.7 ha of Subgrade 3b is at the lower end of the Low magnitude parameters, it is considered that the effect would be of Minor Adverse significance.
- 16.98 The loss of land may lead to some adjustments to the farm business, but any changes necessary will be of a very minor nature. The small magnitude of impact upon a full-time agricultural business, a receptor of low sensitivity, will lead to a **Minor Adverse** effect.
- 16.99 Once in operation, the non-agricultural use of land can lead to trespass onto neighbouring agricultural land. The spread of such trespass can prohibit the full

agricultural exploitation of adjacent land. The small magnitude of the effect of trespass on farm businesses, themselves receptors of low sensitivity, would result in an effect of **Minor Adverse** significance.

#### *Mitigation Measures*

- 16.100 There are very few measures which can be put in place to mitigate the long term effects on agricultural businesses. Given the **Minor Adverse** effect on one farm business, however, mitigation measures are not considered to be required.
- 16.101 The effects of trespass as a result of development can limit the full exploitation of adjacent agricultural land. The design for the Proposed Development includes an area of public open space between the two sites which will help mitigate the spread of trespass from one area to the other.

#### *Residual Effects*

- 16.102 The development of agricultural land for residential purposes is permanent. The loss of agricultural land at the Site will therefore remain **Minor Adverse** and the effect on one farm business will remain **Minor Adverse**.
- 16.103 The design of the Proposed Development will help mitigate any effects from trespass onto adjacent agricultural land. The significance of trespass is considered to be **Negligible**.

#### *Cumulative Effects*

- 16.104 A worst case scenario has been considered in terms of cumulative effects, given that it is not known the extent of the Best and Most Versatile Agricultural Land on all development sites, nor the extent of the proposed loss of agriculture in each case. As a result, if all the land within each committed site comprises BMV then there will be a minor to moderate adverse impact.

### **Flood Risk and Drainage**

#### *Effects*

- 16.105 The magnitude of the construction phase effects on the existing water quality is considered to be **moderate adverse** whereas the magnitude of the effects on the existing drainage and flood risk is considered to be **large adverse**. Although majority of the potential construction effects would be of a temporary nature appropriate mitigation measures will be required to minimise the adverse impacts on the quality and quantity of the existing water environment.
- 16.106 Post-completion, the development of the site would lead to a loss of approximately 1512m<sup>3</sup> of existing floodplain storage capacity and consequently could put the Proposed Development at risk of fluvial flooding and further increase a flood risk



- downstream. Consequently the magnitude of the effects is considered to be **large adverse**. Appropriate mitigation measures in line with the current best practice would therefore be required to minimise the effects of the Proposed Development on flood risk.
- 16.107 The proposed surface water drainage system will be based on a gravity discharge to the Langford Brook. The introduction of impermeable surfaces would increase the rate and volume of surface water runoff. Utilisation of traditional pipe drainage system based on unrestricted and untreated discharge to the Langford Brook could exacerbate flood risk downstream and adversely impact the water quality in the receiving watercourse. Consequently the magnitude of the uncontrolled surface water discharges is considered to be **moderate adverse**. Appropriate mitigation measures would therefore be required.
- 16.108 Exceedance of the design capacity of the system, failure of individual components, blockage within the system or acts of vandalism could cause failure of the drainage system leading to increased flood risk and water quality issues in the receiving watercourse. The magnitude of the drainage system failure effects is considered to be **moderate adverse**.
- 16.109 Considering that the average ground slope across the site will remain as per the existing condition and the underlying geology is essentially impermeable magnitude of the modified topography effect is considered to be **negligible**. No mitigation measures are therefore required.
- 16.110 No significant disturbance of the underlying soils other than general garden maintenance and occasional construction of extensions is anticipated. Consequently the risk of mobilisation of the existing organic pollutants from the soil and their transfer to the Langford Brook via surface water runoff will be low. The magnitude of the mobilised organic pollutant effect is considered to be **negligible**.
- 16.111 Considering the impermeable nature of the underlying soils no infiltration based surface water drainage system will be installed on site. The drainage will discharge to the Langford Brook. As a result the risk of pollution to the groundwater due to runoff discharges is minimised. The magnitude of the effect is considered to be **negligible** and no mitigation measures are required.
- 16.112 Currently the site does not contribute significantly to recharging the aquifer located beneath it due to steep site slopes and essentially impermeable nature of the underlying soils. Incorporation of the impermeable surfaces would not therefore significantly affect the groundwater recharge rates. Consequently the magnitude of the effect is considered to be **negligible** and no mitigation measures are required.
- 16.113 There is a potential for localised groundwater flooding on site due to the underlying geology, especially in the low lying areas. The magnitude of the effect is considered to be **small adverse** and some mitigation measures will be required to ensure that

the proposed properties are protected against groundwater flooding. The groundwater flooding is not considered however to pose a threat to human life.

*Mitigation Measures*

- 16.114 An Environmental Management Plan including Water Management Plan and pollution emergency procedure would need to be developed for the site in consultation with the EA and Oxfordshire County Council prior to construction works commencing. The incorporation of this will reduce the risk of watercourse pollution and flooding and the magnitude of the temporary effects will be **small adverse**.
- 16.115 An area within the most north easterly part of the site, currently located outside the 1 in 100-year with climate change flood extent, has been allocated for compensatory flood storage. Considering this along with other construction requirements as part of the proposed fluvial flood mitigation measures on site then the magnitude of the effect would be **negligible**.
- 16.116 A surface water drainage strategy, incorporating SuDS management train, has therefore been produced for the Proposed Development area. The proposed surface water management measures will reduce the magnitude of the effect to **negligible**.
- 16.117 The risk of groundwater flooding is considered to be low, however construction techniques can ensure this remains negligible.

*Residual Effects*

- 16.118 The adoption of best working practices and compliance with the EAs Pollution Prevention Guidelines by the appointed contractor would reduce the risk of significant effects on the quality and quantity of the local water environment during the construction phase of the development. It will not however totally eliminate the risks thus the significance of the temporary residual effects will be **minor adverse**.
- 16.119 Subject to incorporation of the proposed fluvial mitigation measures the significance of the effect will be **negligible**. Subject to incorporation of the proposed SuDS scheme measures the significance of the effect will be **negligible**. Subject to incorporation of the recommended protection measures against groundwater flooding the significance of the effect will be **negligible**.

*Cumulative Effects*

- 16.120 The likely significant cumulative effects arising from the interaction between the Proposed Development and other potential developments within the catchment of the Langford Brook have been considered.
- 16.121 Based on the assumption that the future proposed developments will follow the current best practice and approved design standards in relation to flood risk and surface water management (e.g. provision of flood protection and SuDS schemes addressing water quality and quantity) and groundwater protection the significance of

the cumulative impacts on the hydrology, hydrogeology and flood risk would be negligible.

## Ground Conditions

### *Effects*

16.122 Potential Effects of the Proposed Development on ground conditions during construction include:

- Removal or incorporation of trees and shrubs into the development could have an impact on the condition of the weathered clay material. This may result in swelling or shrinkage of the ground dependent upon the hydrological conditions at the site. In addition, large areas of hardstanding are likely to reduce the amount of water ingress into the soils and potentially affect the ground conditions;
- Fuel and oil based hydrocarbon contamination associated with plant and machinery activity on site;
- It is possible that contamination of the ground may occur due to activities relating to the developments. This could include spillage of oils and fuel from plant working at the site, chemical spillages and other contaminants, and potential for construction waste such as broken brick, tiles, waste concrete and cement, to become incorporated into the surface of the ground;
- Removal of topsoil materials and tracking of plant across uncovered cohesive bedrock material may cause additional weathering and disturbance to the shallow ground conditions and could result in softening and rutting of the surface; and
- Removal of topsoil materials is likely to increase surface run-off.

16.123 Excluding unforeseen activities/alterations undertaken within the individual housing plots, the effects of the post-completion ground conditions are deemed to be the same as those in the construction stage. Following development of the Site the ground will be affected by activities undertaken within the individual housing plots. This could include spillages of oils, fuels or other chemicals associated with vehicle and household activities. Similarly the roads serving the development provide further potential for contamination of the ground.

### *Mitigation Measures*

- 16.124 In terms of minimising the impact of the Proposed Development on the ground conditions, there would be a requirement during the development/construction phase the contractor shall follow the best practice guidance contained within the Environment Agency's Pollution Prevention Guidelines to ensure that materials and chemicals used during the construction would not impact the ground adversely.
- 16.125 Construction activities may also require material management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground. Mitigation will be achieved through application of a Construction Environmental Management Plan (CEMP).
- 16.126 There are few measures that may be put in place to minimise the impact that individuals occupying the Proposed Development may have on the ground conditions, however the predominately clayey nature of both the existing made ground and underlying weathered clay strata would help to contain any spillage or contamination within any isolated location and impede transmission.

*Residual Effects*

- 16.127 It is considered that the existing ground conditions at the Site provides minimal impact upon the Proposed Development of the Site. The assessments reported above do not identify any significant adverse residual effects.

*Cumulative Effects*

- 16.128 The risks due to ground conditions will be similar for all of the planned development. However, only effects to groundwater and surface water (particularly from Gavray Drive East) are considered to be cumulative. During construction of all sites, it is assumed suitable mitigation measures and, if required, remediation measures will be in place to prevent contamination of groundwater and surface water. Therefore the cumulative effect of contamination during construction is considered to be insignificant. Spillages or other sources of contamination within individual housing plots may have a cumulative impact during the Post-completion stage. However, the magnitude of this is considered to be negligible and therefore the cumulative effect is deemed to be insignificant.

**Waste and Utilities**

*Effects*

- 16.129 Construction operations will generate waste materials as a result of general handling losses and surpluses. Up to approximately 4534m<sup>3</sup> construction waste is anticipated to be generated as a result of the Proposed Development. It is likely that a significant proportion of this could be recycled or re-used resulting in an insignificant effect.

- 16.130 There is potential for construction works to give rise to significant environmental effects if appropriate mitigation measures are not employed during the installation works to provide new utility service; e.g. fuel spillages and increased noise emissions from plant and machinery.
- 16.131 During construction, there is the potential for plant, on site, to strike existing services (for example cables and pipes) if they are not on record drawings or are not located prior to commencement of excavation. This could cause temporary loss of the aforementioned services to the general population in the local area temporarily.
- 16.132 The users of the completed development will produce wastes which will require disposal and which by virtue of the volumes which will arise are likely to give rise in the long term to a more significant impact.
- 16.133 The users of the completed development will require the provisions of the utilities (potable water, electricity, gas, telecommunications and foul drainage) and therefore the development is likely to give rise in the long term to a more significant impact.

*Mitigation Measures*

- 16.134 The volume of waste generated during the construction works will be minimised through adherence by the Site contractor to the Code of Practice on Site Waste Management Plans (SWMP).
- 16.135 The installation works to provide new utility services will be subject to appropriate construction management plans and pollution prevention guidance to ensure any environmental impacts during the temporary construction phase will be negligible.
- 16.136 The production of waste materials from the completed development can be mitigated by encouraging waste minimisation and commercial recycling schemes.
- 16.137 To minimise water use, sustainable water fittings will be specified for all water outlets throughout the development. The introduction of energy efficiency measures in accordance with the anticipated Building Regulations revisions during the detailed design stage will reduce the overall energy demand consumption. If reinforcement of the existing gas network needs to take place in order to supply the development, the newly proposed lines will follow the same route as the existing and as such, environmental impact will be minimal. No mitigation measures will need to be put in place with regards to telecommunications. All drainage will be kept as shallow as possible to minimise the excavations required and subsequent impact

*Residual Effects*

- 16.138 There will be a small adverse impact on the availability of landfill capacity, as a result of the disposal of non-recyclable wastes from the development. This impact will include a reduction in the total landfill space available for other wastes. Waste materials from the development are likely to be disposed of to landfills in the local area with any residual hazardous materials taken further afield to adjoining counties.

The impact is therefore likely to have an effect at local or district scale rather than a regional level. As a result of the mitigation measures which will be applied, the impacts on local landfill availability are likely to be relatively minor overall.

16.139 The use of landfill capacity for non-recyclable wastes from the development is not reversible and therefore will have a long-term impact on the overall availability of landfill capacity in the area. With the current facilities in place it is anticipated that the impact of the Proposed Development on the County's ability to handle the recyclable and recoverable wastes generated by the Proposed Development will be negligible.

16.140 With an increase in housing within the area, there will be an increase in demand for all the utilities investigated within this report. However due to the current infrastructure available and potential for supply, it is anticipated that there will be an insignificant impact following mitigation measures implemented to existing networks to serve the development.

#### *Cumulative Effects*

16.141 The risks due to utilities and waste will be similar for all of the planned development in the Local Plan. If all the proposed developments are constructed, residual waste materials which cannot be re-used, recycled or recovered, from all construction activity is likely to be disposed of to landfill, within the Minerals and Waste Local Plan area.

16.142 If all proposed developments are constructed in a short time period, the cumulative additional demand may affect power and gas supplies to the local area where insufficient lead in time for network reinforcement exists. This could lead to a potential risk that of the infrastructure not meeting demand, creating power outages and gas shortages. Infrastructure reinforcement is assessed at the planning stage however in consultation with the utility providers and therefore provides a mechanism in which power and gas provision can be planned into the future to cater for increased demand.

16.143 If all the proposed developments are constructed, the cumulative additional demand would put additional strain on the existing water supply network. There is then the risk that, not enough water could be supplied to meet the demand, creating a water shortage, especially during prolonged periods of hot dry weather. Infrastructure reinforcement is assessed at the planning stage however in consultation with the utility providers and therefore provides a mechanism under the five year Asset Management Plan process to ensure provision for increased demand.

16.144 There are not expected to be any significant cumulative effects from the increase in telecommunications traffic.

