



MINISTRY OF DEFENCE

**Defence Estates  
Environmental Advisory Services**

**EIA Scoping Report**

**Future Defence Storage and Distribution**

**MOD Bicester Redevelopment**

February 2010

Document Control	
Project:	Future Defence Storage and Distribution, MOD Bicester Redevelopment
Document Title:	EIA Scoping Report
Date:	18 Jan 11
Version:	1.4
Primary Author:	Diane O'Leary
Contributors:	Entec UK Ltd, Martin Brown DE
Reviewed by:	Maira Manners, Philippa Charles, Ellen O'Grady, Entec UK Ltd
Distribution:	Philippa Charles, Ellen O'Grady, Entec UK Ltd



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## 1.0 INTRODUCTION

1.1 The Ministry of Defence (MOD) intends to rationalise its logistics activities in the Bicester area. Defence Estates has selected two sites for disposal; one for a mixed use redevelopment and one for redevelopment as an employment site. A further site will be retained and redeveloped for MOD operations, accommodating rationalised logistics activities. MOD intends to apply for outline planning permission for these sites (see Annex A for sites location map). The following is proposed:

- Site A: disposal and redevelopment for commercial use (Class B8);
- Graven Hill (includes Site-D and Site-E): disposal and redevelopment for residential use (Class C3) and commercial use (Class B1, B2, B8); and
- C-site: retain in MOD ownership and redevelop fit for the purpose of storage and nationwide distribution (Class B8).

1.2 The purpose of this Scoping Report is to provide Cherwell District Council (CDC) and other Statutory Bodies the opportunity to comment on the content and methodology to be used for the Environmental Impact Assessment (EIA) that will be submitted to support the Planning Application. The Report will address the issues at all three sites.

### Need for an Environmental Impact Assessment

1.3 The *Town and County Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (as amended) require that for certain types of development an EIA must be undertaken. The Regulations set out the types of development which must always be subject to an EIA (Schedule 1) and other developments which may require an assessment if they give rise to significant environmental impacts (Schedule 2). The proposals for the MOD Bicester Redevelopment fall within Schedule 2, Section 10 (a) and (b).

1.4 The proposals are also subject to the Policy Statement by the Secretary of State for Defence on Safety and Environmental Protection (September 2010) which states:

*“Carry out sustainability appraisals and environmental assessments, as appropriate, for new or revised policies, programmes (including acquisition programmes) office relocations, new projects and training activities.”*

1.5 On consideration of the above criteria and to demonstrate the thoroughness of its approach to the preparation of the application, the MOD has recommended that an EIA is carried out to accompany the Planning Application.



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## Purpose of the Scoping Report

- 1.6 Regulation 10 of the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (as amended) allows potential applicants to ask the relevant local planning authority to state in writing the information that ought to be provided in an Environmental Statement (ES). This scoping report does not constitute such a request.
- 1.7 The purpose of this report is to identify the likely significant effects that will be assessed in the EIA. Scoping will ensure that the EIA focuses on those areas where significant effects are likely, therefore preventing resources being used to address issues where no significant effects are likely.
- 1.8 The report will enable statutory and non-statutory organisations with an interest in the proposals ('stakeholders') to comment on the proposed scope of the assessment. Defence Estates (via Entec UK Ltd) is seeking comments on the scoping report within a period of **five weeks from the receipt of the report**.
- 1.9 This report seeks to:
- describe the existing site and outline the proposals;
  - identify the key organisations to be consulted in the EIA process;
  - determine the environmental issues to be covered in the EIA through the scoping process;
  - propose investigations and studies required to complete the EIA; and
  - establish the content of the ES.
- 1.10 This report will be issued to Cherwell District Council for their consideration.

## Project Team

- 1.11 The project team consists of members of Defence Estates (DE) and Entec. In particular, the key staff include:

Philippa Charles, DE Project Manager

Ellen O'Grady, DE Senior Town Planner

Diane O'Leary, DE Environmental Advisory Services

Martin Brown, DE Environmental Advisory Services

Rosie Wilcock, DE Environmental Advisory Services

Entec provided technical input for the water, noise, air quality and socio-economic sections.

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## Structure of the Report

1.12 The following Chapters form the report:

- Chapter 2 provides details and background on each of the sites that are being proposed for the redevelopment.
- Chapter 3 details the project objectives, alternatives considered and description of the proposal.
- Chapter 4 details the consultation process.
- Chapter 5 relates to the Sustainability Appraisal undertaken in support of the proposal and used to inform this Scoping Report.
- Chapter 6 describes the scoping process and includes the actual assessment of effects of the environmental topics.
- Chapter 7 provides the summary and conclusions.
- Chapter 8 provides a list of references used to compile the report.

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## 2.0 SITE DESCRIPTION

### Location

2.1 The MOD Bicester sites considered for disposal and redevelopment are located to the south and southeast of the town of Bicester and approximately 30km northeast of Oxford. The A41 runs along the north of the sites and the M40 is in close proximity to the west and southwest. There is an internal railway track routed to all sites and is currently used for transporting freight around the sites. The main Bicester railway line abuts the northwest of the Graven Hill Site.

2.2 The three sites will be described separately below, they are:

- A-site (west of Piddington);
- Graven Hill (south of Bicester & east of Ambrosden); and
- C-site (west of Upper Amcott).

### Background

2.3 All three sites are under the management of Joint Support Chain Services (JSCS) (previously known as Defence Storage and Distribution Agency (DSDA)). The role of MOD Bicester is to provide the primary storage and distribution hub for defence by receiving, storing, maintaining and processing strategic, war-like and time critical material in order to sustain the armed forces world-wide. The principle commodities managed on the Bicester Sites are Operational Ration Packs, Engineer Resources, Clothing, Tentage and Loan Pools. Facilities include warehousing, comprising high security storage, hazardous item storage, controlled-humidity environments, document storage, covered and open equipment storage, and hard-standing. All three sites are non-explosive storage sites. Land use across all of the sites, therefore, is currently for storage and maintenance of equipment and supplies. Where possible, infrastructure such as paths and ditches will be retained for use in the redevelopment of the sites to minimise ground disturbance.

2.4 The centre of the Graven Hill site (referred to as the "hilltop") is under the management of the Army and comprises St David's Barracks including accommodation and workshops along with the ancient woodland site, Gravenhill. The hilltop apart from St David's Barracks will comprise part of the redevelopment known as Graven Hill.



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## Sites

### A-site

- 2.5 A-site (OS ref: SP633 177) is located to the south-east of Bicester, between the villages of Piddington to the south-east and Upper Arncott to the west. It is at an elevation of 65-70m Above Ordnance Datum (AOD). It is in a predominantly rural area surrounded by arable, semi-improved and improved fields. See Annex A for site location map.
- 2.6 The site is 38.8 hectares (ha), of which, 4.8ha are covered in buildings (3 large storehouses and 3 smaller storage buildings), 2.6ha are hard-standing for external storage, 5.8ha are roads, railway infrastructure and vehicle parking, and the remaining 25.6ha are grassed areas or woodland planted around the eastern and southern boundaries. It is planned to retain rail connectivity to the site, but as part of the redevelopment the rail infrastructure on the site will require a complete overhaul as it has fallen into disrepair. The site will continue in its use as B& storage & distribution, however, in future it will be operated and occupied by commercial parties rather than the MOD.

### Sensitive features

- 2.7 The Home Office own 11.54ha adjacent to A-site (between the site and B4011) which has planning consent for an immigration detention centre, which would need to be considered in any future development.
- 2.8 There are no landscape or nature conservation designations on the site; however, there are four Sites of Special Scientific Interest (SSSIs) within 2km of the site boundary. There are also several non-statutory sites (e.g. County/Local Wildlife Sites) within 2km of the site. The north of the site abuts the Upper Thames Tributaries Environmentally Sensitive Area (ESA). There are no cultural heritage designations on the site but there are several listed buildings in the vicinity. The majority of the site is in the low risk Flood Zone 1, apart from a small part by the northwest boundary closer to the River Ray, which is in Flood Zone 3.

### Graven Hill

- 2.9 D-site (OS ref: SP592 198) and E-site (OS ref: SP585 209) are described together in this report as they surround the Graven Hill hilltop which itself is also included in the proposal (see Annex A for site location map). The site extends to approximately 237ha. The site lies adjacent to the A41 just south of Bicester; Ambrosden Village lies to the east and Langford Village is situated to the north of the site on the other side of the A41. The main railway line runs along the north-western edge of the site. Just west of the railway line, is a sewage treatment works owned by

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Thames Water Utilities. Agricultural land surrounds most of the site, with Wretchwick Farm and Langford Park Farm in close proximity.

- 2.10 The area under JSCS management comprises approximately 13ha of buildings (11 large store houses and two small storage buildings), 4ha of hard-standing for outdoor storage, 23ha are roads, railway infrastructure and vehicle parking areas and the remaining 66ha is grassed area/woodland. The internal railway runs along the west and southern edge of the site. Bicester International Freight Terminal is located in the North part of the site and comprises railway sidings, container stacking areas, loading, transfer, and circulation areas.
- 2.11 The central Graven Hill area, under the management of the Army, is approximately 103ha and comprises St David's Barracks (accommodation, supporting infrastructure, offices, workshops), pasture land and Gravenhill Wood which is an ancient woodland site. The barracks area extends to approximately 17ha (2ha are buildings, 5ha roads/railway/carparks, 10ha grass/woodland). Apart from Gravenhill Wood, this area will remain within the control of the Army and will not form part of the Planning Application for redevelopment.
- 2.12 It is planned to retain the rail infrastructure in the south and west of the site. Existing roads are planned to be retained for reuse. The majority of buildings on all sites are unsuitable for retention and will be removed.

#### Sensitive features

- 2.13 There are no statutory conservation designations on the site, but the Arncliffe Bridge Meadows SSSI is within 2km and there are several other SSSIs within 5km of the site. The Gravenhill Wood County Wildlife Site is located in the centre of the site and the Bicester Wetland Reserve is within 40m of the western boundary of the site. The sites are in close proximity to the Upper Thames Tributaries ESA. There are no cultural designations within the site, but there are four listed buildings in proximity to the site and the Scheduled Ancient Monument of the Roman town of Ailchester nearby. The majority of the site is in the low risk Flood Zone 1, apart from a small part by the northwest boundary which is Flood Zone 3.

#### C-site

- 2.14 C-site (OS ref: SP607 173) is located approximately 4km south-east of Bicester, and is adjacent to the village of Upper Arncliffe on the east. It is at an elevation of 65-70m AOD. The surrounding area is largely flat, open agricultural land consisting of arable, semi-improved and improved grassland fields. See Annex A for site location map.
- 2.15 The site is approximately 83ha and is the largest of all the storage sites at MOD Bicester. Approximately 13ha are taken up with buildings, 4ha with hard-standing for external storage,

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19ha with roads/railway/vehicle parking and the remaining 50ha with grassed areas/woodland. Only the north part of the site is proposed for redevelopment. It is planned to remove some of the rail and road infrastructure, along with some of the buildings in the northern part of the site.

#### Sensitive features

- 2.16 There are no conservation designations on the site, however, there are two SSSIs within 2km of the site (Aincott Bridge Meadows SSSI and Whitecross Green and Oriel Woods), and there are several other SSSIs within 5km of the site. There are also a number of non-statutory sites within 2km of the site. The site is surrounded, apart from along the east of the site, by the Upper Thames Tributaries ESA. There are four listed buildings just outside the site boundary but no cultural heritage designations on the site. C-site is in Flood Zone 1.



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### **3.0 DESCRIPTION OF THE PROPOSAL**

#### **Background and project objectives**

- 3.1 The MOD's vision is "to have an estate of the right size and quality to support the delivery of defence capability, that is managed and developed effectively and efficiently in line with acknowledged best practice and is sensitive to social and environmental considerations".
- 3.2 MOD currently occupies some 600ha of land around Graven Hill and Amcott Hill. MOD Bicester became the focus of the Treasury (HMT) Operational Efficiency Programme (OEP) in late 2008, which charged MOD with looking at its storage and distribution function, run by JSCS, along with the estate it occupies, to determine whether there are any opportunities to release funds back to HMT. As a result of these studies, the MOD has identified two sites (A-site and Graven Hill) that could be disposed of to a third party with outline planning permission for a mixed redevelopment and one site (C-site) that will be retained and redeveloped for use by JSCS. The proposals would release land to the local area for development as residential and business use and comply with MOD policy to have an estate of the right size.
- 3.3 It is the aim of the project to secure outline planning permission for commercial use of A-site, mixed use redevelopment on Graven Hill, both prior to sale, and MOD development on C-site.

#### **Construction method**

- 3.4 As it is proposed to sell A-site and Graven Hill with outline planning permission, construction details are not yet known; however, future developers would be expected to be members of the 'Considerate Constructors Scheme' and implement a Construction Environmental Management Plan (CEMP) to control and minimise the risk of adverse environmental effects from construction activities. Industry best practice will also be applied to the redevelopment of C-site.
- 3.5 The first phase of residential development would take place in 2015, delivering some 1650 dwellings over a period of 11 years. Commercial development in parallel is planned to see employment opportunities keep pace with uptake of the residential development. The commercial development at Graven Hill is likely to be completed within the same 11 years, whilst A-site is likely to be developed later in the programme taking completion of the site beyond 2026. Redevelopment of C site for MOD is planned for completion within the first phase of the plan period.

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## Alternatives considered

- 3.6 A detailed review of MOD's activities and infrastructure in the Bicester area was undertaken in 2008 to identify the potential for rationalisation and further development in line with MOD's policy (para 3.1). During the course of this work, other uses for the sites in Bicester were considered as well as alternative UK locations for the MOD logistics function. Specifically, the issue of relocation of troops from Germany was considered, and given other UK sites available for this purpose, the storage & distribution sites in Bicester were ruled out for further development for this purpose as other sites provided greater opportunities.

## Proposal details

- 3.7 Draft master plans for the three sites have been produced by Entec UK Limited. There have been several iterations due to responses from consultation and results of initial baseline studies. The proposals for each site are set out below. Proposed mitigation is detailed in the assessment of effects in Chapter 6.

### A-site

- 3.8 It is proposed to redevelop A-site for commercial use as follows (see Annex B, A-site master plan):
- 18.5ha of Class B8 storage and distribution (warehouse, distribution centres, repositories) (7,400m<sup>2</sup> floor-space – 84 employees at job/floor-space ratio 1:88m<sup>2</sup>);
  - 3.2ha of public open space; and
  - 6.1ha of woodland.

### Graven Hill

- 3.9 The following mixed use redevelopment has been proposed for Graven Hill (see Annex C, Graven Hill master plan):
- 55.1ha of Class C3 residential use (30 dwellings per hectare, a total of 1650 dwellings) including Public Open Space and road network;
  - 3.1ha of Class B1<sup>1</sup> business use (offices, laboratories, light industry) (12,000m<sup>2</sup> floorspace);
  - 6.9ha of Class B2 general industrial (28,000m<sup>2</sup> floorspace);

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<sup>1</sup> A B1 use must be capable of being undertaken "in any residential area without detriment to the amenity of that area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit".



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- 14.5ha of Class B8 storage and distribution (58,000m<sup>2</sup> floorspace);
  - 4.2ha of local facilities (e.g. school); and
  - St David's Barracks will be retained at 23.4ha with a proposed expansion of 6.6ha.

3.10 The residential area is proposed for the north of the site; business and commercial use along the east and storage and distribution use to the south. It is intended to retain the existing woodlands around the site and the woodland in the centre which is designated as an Ancient Woodland. The proposed master plan also includes an area for energy production (Combined Heat and Power) and an area for allotments to support the residential community.

#### C-site

3.11 The intention is to retain C-site (83ha) for MOD use. The northern part of the site is to be considered for redevelopment at this time; a mix of warehouse structures supported by hard-standing as follows (see Annex D, C-site master plan):

- 10.44ha of Class B8 storage and distribution;
- 8.3ha Hard-standing;
- 1.7ha Open Space; and
- 0.7ha Woodland/Screening.

3.12 Refurbishment of existing buildings on the southern end of the site is also planned during the same period.

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#### 4.0 CONSULTATION

- 4.1 A consultation event was hosted by Entec on behalf of DE in September 2010 inviting organisations and members of the public to review and comment on the proposals. The feedback received was used in the master planning process.
- 4.2 This Scoping Report will be issued to statutory and non-statutory consultees to provide them with opportunity to comment on the proposed scope for the EIA. Comments will be addressed as appropriate and included in the ES.

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## 5.0 SUSTAINABILITY APPRAISAL

- 5.1 A Sustainability Appraisal (SA) of the proposal was undertaken in accordance with the guidance provided in the *MOD Sustainability and Environmental Appraisal Tools Handbook* (2006).
- 5.2 SA is a process that allows Sustainable Development Objectives to be integrated into projects, activities and decisions at an early stage and was undertaken as part of this study in order to meet the requirements of MOD policy (Secretary of State for Defence, September 2010) to 'support(s) wider Government initiatives including those on Sustainable Development'.
- 5.3 The SA facilitates the systematic review and identification of key environmental, social and economic issues that would be generated as a result of the proposals. Checklists are provided to record a score for the extent to which a proposal contributes towards the Sustainable Development objectives of the following topics:

Climate Change and Air Quality	Geology and Soils
Travel and Transport	Biodiversity and Nature Conservation
Energy Consumption	Archaeology and Historic Environment
Noise and Vibration	Landscape and Townscape
Cultural Heritage and Archaeology	Health, Safety and Crime
Water and Drainage	Communities and Social Values
Waste	Infrastructure and Amenities
Land, Buildings and Construction	Economy and Employment
Materials	

- 5.4 The completed checklists from the appraisal are attached at Annex E. In line with EIA regulations and guidance, the environmental impact topics investigated may vary to some of those used in the SA checklist.

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## 6.0 SCOPING STUDY

### Approach to scoping

- 6.1 The purpose of this section is to determine the effects which will need to be assessed in the EIA, and to indicate what further information is required and propose how it will be obtained.

### Assessment of effects

- 6.2 The environmental requirements set out in Annex IV of the EIA Directive (97/11/EC) require a description of the aspects of the environment likely to be significantly affected by the proposed project, including, in particular, population, fauna, flora, soil, water, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.
- 6.3 Within the EIA, the assessment of effects for each topic will take into account the environmental effects of both the construction and operational phases of the proposed developments.
- 6.4 A number of criteria will be used to determine whether or not the potential effects of the development are 'significant'. These significance criteria comprise:
- international, national and local standards;
  - relationship with planning policy;
  - sensitivity of receiving environment;
  - reversibility and duration of effect;
  - inter-relationship between effects; and
  - results of consultations.
- 6.5 The effects that are considered to be significant will be identified in the EIA. The significance of effects reflects judgements as to the importance or sensitivity of the affected receptor(s) and the nature and magnitude of the predicted changes. For example, a large adverse impact on a feature or site of low importance will be of lesser significance than the same impact on a feature or site of high importance.
- 6.6 Mitigation measures, which can be described as 'any measure...to avoid, reduce and, if possible, remedy significant adverse effects', will be provided where appropriate. The effects after implementation of mitigation measures will be indicated.

6.7 Each of the sites will be dealt with separately under the environmental topics listed in Table 6.1 for ease of reference (apart from Transport, Air quality, Socio-Economics and Cumulative Effects where it was deemed more appropriate to consider them together). The following structure will be applied under each theme:

- introduction (all sites together);
- existing baseline conditions (individual sites);
- identification of potential impacts and significance of their effects (individual sites); and
- scope of investigation - proposed surveys or studies to determine the significance of effects where unknown (individual sites).

**Table 6.1: Environmental Topics**

Topics in the EIA Regulations	Topics in this Scoping Report
Population	Traffic and Transport (6.1); Noise (6.3); Air (6.4); Landscape and Visual (6.8); and Socio-Economics (6.9).
Fauna	Biodiversity (6.6)
Flora	Biodiversity (6.6)
Soil	Land Quality, Geology and Soils (6.5)
Water	Hydrology and Water Quality (6.2)
Air	Traffic and Transport (6.1); Air Quality (6.4)
Climatic factors	Hydrology and Water Quality (6.2)
Material assets, including the architectural and archaeological heritage	Cultural Heritage (6.7)
Landscape	Landscape and Visual (6.8)
The inter-relationship between the above factors	These are discussed within each section as relevant.



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## **6.1 TRAFFIC AND TRANSPORT**

### **Introduction**

- 6.1.1 A Transport Assessment is being undertaken to determine how the proposed developments will impact on the transport network in the Bicester area and whether the potential impacts are likely to be significant.
- 6.1.2 In the absence of any redevelopment at MOD Bicester there would be an increase in road traffic levels as a result of consented and future proposed developments in the local area, see Section 6.10, Cumulative Effects for details of these developments.
- 6.1.3 The following paragraphs provide a general overview for this theme for all sites.

### **Existing conditions**

- 6.1.4 Bicester is well located with regard to the motorway network, with good links to Marchwood Military Port, RAF Brize Norton, DSDC Donnington and the Channel Tunnel. The MOD sites are signed clearly from the M40 Junction 9. The A41 is the principal access route for all Bicester sites; it is a dual carriageway from the M40 to the edge of Bicester. Graven Hill is accessed directly from the A41; A-site and C-site are all accessed from the A41 via the B4011 and Palmer Avenue.
- 6.1.5 Currently 80% of MOD's stock is transported by road, the remainder is transported by rail using MOD's own rail infrastructure and the national rail network.
- 6.1.6 Whilst the sites are served by buses on the public road network, there are no public transport services within the sites.

### **Potential impacts and significance**

- 6.1.7 Table 6.2 below sets out the receptors with potential to be affected by the proposed development; the potential impacts that could occur at both the construction and operational phases; whether or not these impacts are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.2: Potential Impacts and their likely significance (all sites)**

Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Users of the transport network	Temporary increase in plant and equipment traffic.	Unknown at this stage of assessment.	The construction contractor should be part of the Considerate Constructor Scheme and will need to implement a Construction Environment Management Plan (CEMP) which is a standard requirement that ensures stringent controls are in place and best practice is adopted to address potential adverse environmental effects.
Local residents	Increase in air pollutants from additional vehicles and activities (see also Air Quality Section 6.4)	Unknown at this stage of assessment.	Adoption of CEMP.
<b>Operational Phase</b>			
Users of the transport network	Increased private cars (both residential and commercial) and lorries.	Unknown at this stage of assessment.	Centralising the MOD activities at C-site has the potential to reduce traffic with more efficient journeys around the UK for collection and delivery of stock. In addition, there is the potential to utilise the internal rail infrastructure more efficiently to reduce the amount of stock transported by road. Graven Hill site is in walking distance to Bicester Town Centre and railway station and this could be considered and enhanced in the development design. As general mitigation, a green travel plan will be required as part of the development proposals.
Local residents	Increase in air pollutants from additional vehicles (see also Air Quality Section 6.4)	Unknown at this stage of assessment.	As above.

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### Scope of further investigation

- 6.1.8 A Transport Assessment is being undertaken to determine what the environmental effects will be and their significance. Consideration of the study undertaken by White Young Green in 2008 will be included in the assessment. There are a number of other proposed developments in the area (see Section 6.10, Cumulative Effects) that will also have an impact on the transport network and will be considered in the assessment as agreed with consultees such as Oxfordshire County Council Highways Authority.
- 6.1.9 The methodology used to assess traffic effects is in accordance with IEMA's Guidelines for the Environmental Assessment of Road Traffic, 1992. Using the criteria within this guidance, traffic effects would only be assessed for those roads experiencing a 30% increase in traffic (or HGV traffic), or for more sensitive roads an increase of 10% in traffic flows. Therefore, if the traffic modelling predicts an increase less than this then traffic effects will be scoped out of the ES, however, a Transport Assessment will still be completed which considers how the travel network functions rather than effects on people. The receptors to be considered are drivers, cyclists and pedestrians using affected roads. The types of effects considered under the IEMA guidance are pedestrian and driver delay, pedestrian amenity, fear and intimidation effects, severance, accidents and safety and hazardous loads. The findings will be detailed in the ES.

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## 6.2 HYDROLOGY AND WATER QUALITY

### Introduction

- 6.2.1 A draft flood risk assessment (FRA) and drainage strategy has been undertaken for each of the proposed development sites by Entec (October 2010). The assessments were undertaken to identify the level of risk to the sites from flood and the drainage strategy required to manage surface water run-off from the new developments. The data from the reports has been used to develop the master plan for each site and inform the scope of the assessment. In addition, Entec undertook a desk-based study (November 2010) of the existing water environment within each site and the surrounding area to also inform the scope of the assessment.
- 6.2.2 Assessments and data gathering are undertaken in compliance and with consideration to relevant policy and legislation. The FRAs are in line with Planning Policy Statement 25 (Development and Flood Risk) requirements and demonstrate that the proposed development sites are appropriate and comply with flood risk requirements.
- 6.2.3 Cherwell and West Oxfordshire Level 1 Strategic Flood Risk Assessment contains information on all sources of flooding in the area and is used to inform the selection of sites for development and assist in the submission and consideration of planning applications. JSP 418<sup>2</sup> contains MOD's policy relating to water resources. See also the References Section 8 for other sources of information used to compile this report.
- 6.2.4 In the absence of the proposed developments, the land use is unlikely to change substantially, and no significant changes in soils would be anticipated. However, climate is likely to prove more variable, with observed historical and predicted future changes in global climate due to a combination of both natural and human causes. For South East England, the latest climate change predictions<sup>3</sup> indicate decreases in summer rainfall and increases in winter rainfall. Changes in runoff and recharge characteristics may therefore occur on the site as a result of these changes in rainfall patterns, even without development.
- 6.2.5 Potential receptors, which may be affected by changes in the water environment comprise the following:
- People and property potentially affected by changes in flood risk from changes to surface runoff as a result of the proposed developments.

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<sup>2</sup> Joint Services Publication 418: Sustainable Development and Environment Manual

<sup>3</sup> UK Climate Projections for the South East 2008: [www.ukcp.org.uk](http://www.ukcp.org.uk)



- The surface water environment (including the Upper Thames Tributaries ESA, onsite ditches, the River Ray and its tributaries, the pond outside A Site and the Amcott Bridge Meadows SSSI) which may experience changes in surface runoff and contaminant levels in the construction and operation phases as well as changes in water quantity and flows due to changes in the amount of water draining from the sites as a result of the proposed developments.
- Underlying aquifers the quality of which may be effected by discharges to ground or surface runoff during construction or operation.

6.2.6 Baseline water resources information for A-site, Graven Hill and C-site are detailed separately below.

### A-site

#### **Existing conditions**

6.2.7 A-site is situated within the River Ray catchment. The Ray is located approximately 900m from the northwest of the site in a westerly direction. There is an un-named river identified in the GroundSure EnviroInsight Report (January 2010), running along the eastern most point of the site boundary, near Homestead, for a small distance. The river flows from south to north, to join the River Ray. In addition, a pond is located south-west of the site. On the site are a number of ditches that flow to two main outfall points located on the site boundary. One of the outfalls is located in the south-west near the pond, taking water from ditches running east to west along the southern half of the site. The second outfall is located on the northern boundary of the site, potentially ending up in the River Ray, which takes water from ditches in the north of the site. The annual average rainfall for the River Ray catchment is 649mm/year, lower than the average rainfall for England at 828mm/year.

6.2.8 The site is underlain by superficial deposits of clay, silt, sands and gravels. The majority of the bedrock geology of the site is mudstone, with small areas of limestone and sandstone (EnviroInsight Report, 2010). The bedrock formations under all sites are named as Kellaways and Oxford Clay formations. Information from the Environment Agency (EA) indicates that the north part of the site is classified as a Secondary A aquifer<sup>4</sup> in the permeable superficial (drift) deposits but with low leaching potential. The site is not in a groundwater source protection zone.

6.2.9 The results of the draft FRA indicate that there is no fluvial flood risk from main rivers at the site, with the exception of a very small area at the northwest boundary of the site, where Flood

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<sup>4</sup> Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.



Zone 3 (high flood risk) extends on to the site. Geology and soils across the majority of the site are impermeable which means that there is unlikely to be a risk of groundwater flooding apart from the area of the aquifer, where local groundwater may pose a flood risk.

6.2.10 There are no groundwater or surface water abstractions within the site or within 500m of the site (GroundSure EnviroInsight Report, January 2010). There are two licensed discharges on-site (water company pumping stations for sewage effluent that discharge to the River Ray) and three licensed discharges within 500m of the site (effluent and trade discharges to the River Ray). There have been no recorded pollution incidents.

6.2.11 Results from the EA water quality monitoring in the Langford Brook and the River Ray area indicates that water quality is moderate, with high levels of nutrients (P and N) which may be affected by the sewage treatment works north west of the site close to the Graven Hill site.

#### Potential impacts and significance

6.2.12 The resulting increase in surface water runoff will be managed by an appropriate sustainable drainage strategy (Sustainable Urban Drainage Systems (SuDS)).

6.2.13 The storage volume required to accommodate the surface water runoff will be agreed with the Environment Agency (EA) at detailed planning stage to ensure that water draining from the site does not contribute to increased flood risk in the surrounding area.

6.2.14 Table 6.3 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.3: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Surface and ground water environment within and surrounding the site.	Potential reduction in water quality as a result of accidental spillage/pollution incidents or increased sediments in run-off from ground disturbance	Unlikely to be significant – temporary effect and standard measures will be incorporated into the management of construction which	The construction contractor will be required to implement a Construction Environment Management Plan (CEMP) incorporating standard best practice mitigation measures such as those set out in the Environment Agency

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
	and vegetation removal	will minimise the risk of pollution effects	PPG guidance notes and CIRIA guidance.
Surface watercourses/ infrastructure	Potential increase in flow volumes if impermeable areas are increased and surface water run-off is not appropriately managed	Unlikely to be significant – standard measures will be incorporated into the management of construction which will minimise the risk of flooding.	Flood risk during demolition / construction will be mitigated through phased implementation of SuDs.
<b>Operational Phase</b>			
People and property downstream of the site	Potential risk of flooding from increased runoff reaching rivers and change in land use increasing the groundwater flooding risk.	Unlikely to be significant - as the draft FRA has demonstrated that SuDs can be provided on site to prevent any increase in run-off rates.	The site will operate with an appropriate drainage scheme for the site to reduce run-off rates taking into account the potential effects from climate change. Further details will be provided in the ES and FRA.
Surface water-courses within and surrounding the site	Potential increase in flow volumes due to an increase in impermeable areas and the surface water runoff is not appropriately managed.	Unlikely to be significant – as the draft FRA has demonstrated that SuDs can be provided on-site to prevent any increase in run-off rates.	The site will operate with an appropriate drainage scheme for the site to reduce run-off rates taking into account the potential effects from climate change. Further details will be provided in the ES and FRA.
Surface water-courses	Potential decrease in water quality.	Unlikely to be significant – standard measures will be incorporated into the development design to minimise the risk of pollution effects.	Surface water run-off will be controlled via proposed drainage measures, and is unlikely to contain sediments post construction. Oil interceptors will be implemented in parking areas. Spill response measures will be in place. Foul drainage will be kept separate. Further details on these measures will be provided in the ES.
Infrastructure	Potential flood risk to infrastructure in the	Unlikely to be significant – the	The FRA data was used in developing the master plan and

Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
	north-west of the site classified as Flood Zone 3	masterplan has been designed to incorporate non- sensitive land uses in this area	therefore this area will comprise public open space

### Scope of further investigation

- 6.2.15 As it is unlikely that there will be any significant effects in relation to water quality or flood risk from the proposed developments then no further assessment of these effects will be undertaken. However, further consultation with the Environment Agency will be conducted to seek advice on SuDS as part of consultation in relation to the FRA.
- 6.2.16 Further detail will be provided in the ES on the measures which will be implemented as part of the development to mitigate environmental effects. The FRAs will also be submitted in support of the planning application.

### Graven Hill

#### Existing conditions

- 6.2.17 The site is located in the River Ray catchment, the river flows westwards to the south of the site, at a distance of approximately 1500m at its nearest point. The Langford Brook tributary of the River Ray is located outside the western edge at the north of the site (GroundSure EnviroInsight Report, January 2010). This crosses along the western most point of the site boundary and flows southwards to join the River Ray. An additional small un-named tributary of the River Ray is located outside the south-eastern boundary, flowing south to join the River Ray. There are three outfall points on the southern boundaries of the site, taking water from the ditches across the lower elevations on site. The outfalls appear to be in the direction of Langford Brook from the north of the site, and towards an additional un-named tributary of the River Ray from the south of the site. No indication is provided of water flows, if any, within the on-site ditches.
- 6.2.18 The hydrology of the area is typified by a high volume of surface water run-off due to the impermeable clay soil. As a result, the site is not in a groundwater protection zone, and there is no risk from groundwater flooding.
- 6.2.19 The Draft FRA (Entec, 2010) indicates that the site is underlain by clayey, loamy soils, with an impermeable layer at a shallow depth. The geology underlying the site comprises superficial



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deposits of clay, silt, sands and gravels. The majority of the bedrock geology of the sites is mudstone, with small areas of limestone and sandstone (EnviroInsight Report, 2010). The bedrock formations under all sites are named as Kellaways and Oxford Clay formations (<http://maps.bgs.ac.uk/GeolIndex/default.aspx>). There are small sections of the site at both the northwest and southwest boundaries that have been classified as Secondary A (minor) aquifer. No major aquifers underlie the site.

- 6.2.20 The western tip of the site falls within flood zone 3, but the remainder of the site is within flood zone 1. The site is in an area with high potential for groundwater flooding due to the geological conditions. Draft FRAs undertaken for Graven Hill indicate that there is a localised risk of groundwater flooding in the north-western part of the Site.
- 6.2.21 There are no groundwater or surface water abstractions within the site or within 500m of the site (GroundSure EnviroInsight Report, January 2010). Within the north of the site, there are several sewage discharge pumping points that discharge to Langford Brook. Additional discharges north of the hill are trade discharges, one discharging to Langford Brook, the other to the River Ray. Within the southern part of the site, one consent discharges to Langford Brook (sewage discharge), while the other points discharge to the River Ray (sewage and trade discharges).
- 6.2.22 Within the north of the site, there has been one reported pollution incident (diesel) that was identified as having a significant impact on water quality. A pollution incident outside the north-western boundary (sewage materials) was identified as having minor impact on water quality.
- 6.2.23 Results from the EA water quality monitoring in the Langford Brook and the River Ray area indicates that water quality is moderate, with high levels of nutrients (P and N) which may be affected by the sewage treatment works north west of the site at the other side of the railway line. There are no Groundwater protection zones beneath the site.

#### **Potential impacts and significance**

- 6.2.24 The proposed development will lead to an increase in the impermeable area across the site. The resulting increase in surface water run-off will be managed by an appropriate sustainable drainage strategy (Sustainable Urban Drainage Systems (SuDS)).
- 6.2.25 The storage volume required to accommodate the surface water run-off will be agreed with the EA at detailed planning stage and to ensure that water discharged from the site does not contribute to increased flood risk in the surrounding area.

6.2.26 Table 6.4 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.4: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Surface and ground water environment within and surrounding the site.	Potential reduction in water quality as a result of accidental spillage/pollution incidents or increased sediments in run-off from ground disturbance and vegetation removal.	Unlikely to be significant – temporary effect and standard measures will be incorporated into the management of construction which will minimise the risk of pollution.	The construction contractor will be required to implement a Construction Environment Management Plan (CEMP) incorporating standard best practice mitigation measures such as those set out in the Environment Agency PPG guidance notes and CIRIA guidance.
Surface watercourses/ infrastructure	Local flood risk from additional surface water run-off during demolition/construction activities.	Unlikely to be significant – temporary effect and standard measures will be incorporated into the management of construction which will minimise the risk of flooding.	Flood risk during demolition / construction will be mitigated through phased implementation of SuDs.
<b>Operational Phase</b>			
People and property downstream of the proposed sites	Potential risk of flooding from increased run-off reaching rivers and change in land use increasing the groundwater flooding risk.	Unlikely to be significant – as the draft FRA has demonstrated that SuDs can be provided on-site to prevent any increase in run-off rates.	The site will operate with an appropriate drainage scheme for the site to reduce run-off rates taking into account the potential effects from climate change. Further details will be provided in the ES and FRA.
Surface water-courses within and	Potential increase in flow volumes if an increase in	Unlikely to be significant – as the draft FRA has	The site will operate with an appropriate drainage scheme for the site to reduce run-off rates



Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
surrounding the site.	impermeable areas and surface water runoff is not appropriately managed.	demonstrated that SuDs can be provided on-site to prevent any increase in run-off rates.	taking into account the potential effects from climate change Further details will be provided in the ES and FRA.
Surface water courses	Potential decrease in water quality.	Unlikely to be significant - standard measures will be incorporated into the development design to minimise the risk of pollution effects.	Surface water run-off will be controlled via proposed drainage measures, and is unlikely to contain sediments post construction. Oil interceptors will be implemented in parking areas. Spill response measures will be put in place. Foul drainage will be kept separate. Further details on these measures will be provided in the ES.
Infrastructure	Damage to infrastructure from flooding at western tip of the site (which is within flood zone 3) and at the north-west boundary due to groundwater flooding.	Unlikely to be significant – the master plan has been designed to incorporate non-sensitive land uses in these areas.	The FRA data was used in developing the master plan and therefore these areas will comprise public open space and woodland.

#### Scope of further investigation

- 6.2.27 As it is unlikely that there will be any significant effects in relation to water quality or flood risk from the proposed developments then no further assessment of these effects will be undertaken. However, further consultation with the Environment Agency will be undertaken to seek advice on SuDS as part of consultation in relation to the FRA.
- 6.2.28 Further detail will be provided in the ES on the measures which will be implemented as part of the development to mitigate environmental effects. The FRAs will also be submitted in support of the planning application.

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## C-site

### **Existing conditions**

- 6.2.29 This site is located south of the River Ray. At its nearest point the River Ray runs along the north western-most tip of the site (GroundSure EnviroInsight Report, January 2010). A number of channels are also located to the south of the site boundary, within 250m or greater of the site boundary (GroundSure EnviroInsight Report, January 2010). There are two outfall points on the site, one in the north-west, taking flows from the western side of the site, and one in the south-east of the site taking water from the south of the site.
- 6.2.30 There are no known aquifers on the site either primary or secondary; there is a Secondary A aquifer outside the north of the site stretching around to the north-west of the site. A high degree of surface water run-off is indicative of the Ray Valley due to clayey soils. No part of the site is within a groundwater source protection zone.
- 6.2.31 The north-western tip of C site is at the extent of the Flood Zone 3 of the River Ray, whilst Flood Zones 2 and 3 associated with channels are present to the south of the site within 250m of the site boundary. The site is in an area with high potential for groundwater flooding due to the geological conditions. However, the Draft FRA (Entec, 2010) indicates that it is unlikely that the site would experience any groundwater flooding. The area of proposed development lies within flood zone 1.
- 6.2.32 The Draft FRA (Entec, 2010) indicates that the site is underlain by clayey, loamy soils, with an impermeable layer at a shallow depth.
- 6.2.33 There are no groundwater or surface water abstractions within the site or within 500m of the site (GroundSure EnviroInsight Report, January 2010). There are three licensed discharges on-site (water company pumping stations for discharging sewage effluent to the River Ray) and two trade discharges to the River Ray which are located in the northern half of the site. There are several sewage discharge points within 500m of the site. There has been one reported pollution incident involving oils and fuels, within 250m of the eastern boundary of the site, which had a minor impact on water in the area.
- 6.2.34 The water quality in the area is classed as moderate, with high levels of nutrients (P and N) which may be as a result of the nearby sewage treatment works.

## Potential impacts and significance

- 6.2.35 Any changes in surface water run-off as a result of the proposed development will be managed by an appropriate sustainable drainage strategy (Sustainable Urban Drainage Systems (SuDS)).
- 6.2.36 The storage volume required to accommodate the surface water run-off and level of treatment required will be agreed with the EA at detailed planning stage. This will ensure that water discharged from the site does not contribute to increased flood risk in the surrounding area.
- 6.2.37 Table 6.5 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.5: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Surface and ground water environment within and surrounding the site.	Potential reduction in water quality as a result of accidental spillage/pollution incidents or increased sediments in run-off from ground disturbance and vegetation removal.	Unlikely to be significant – temporary effect and standard measures will be incorporated into the management of construction which will minimise the risk of pollution.	The construction contractor will be required to implement a Construction Environment Management Plan (CEMP) incorporating standard best practice mitigation measures such as those set out in the Environment Agency PPG guidance notes and CIRIA guidance.
Surface watercourses/ infrastructure	Local flood risk from additional surface water run-off during demolition/construction activities	Unlikely to be significant – temporary effect and standard measures will be incorporated into the management of construction which will minimise the risk of flooding.	Flood risk during demolition / construction will be mitigated through phased implementation of SuDs. As indicated by the draft FRA, a discharge consent is required for the outlet discharge as it enters the River Ray.
<b>Operational Phase</b>			



Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
People and property downstream of the proposed sites	Potential risk of flooding from increased run-off reaching rivers and change in land use increasing the groundwater flooding risk.	Unlikely to be significant – as the draft FRA has demonstrated that SuDs can be provided on-site to prevent any increase in run-off rates.	The site will operate with an appropriate drainage scheme for the site to reduce run-off rates taking into account the potential effects from climate change. Further details will be provided in the ES and FRA.
Surface water courses within and surrounding the site.	Potential increase in flow volumes if an increase in impermeable areas and surface water runoff is not appropriately managed.	Unlikely to be significant – as the draft FRA has demonstrated that SuDs can be provided on-site to prevent any increase in run-off rates.	The site will operate with an appropriate drainage scheme for the site to reduce run-off rates taking into account the potential effects from climate change. Further details will be provided in the ES and FRA.
Surface water courses	Potential decrease in water quality.	Unlikely to be significant - standard measures will be incorporated into the development design to minimise the risk of pollution effects.	Surface water run-off will be controlled via proposed drainage measures, and is unlikely to contain sediments post construction. Oil interceptors will be required on parking areas. Spill response measures will be in place. Foul drainage will be kept separate. As indicated by the draft FRA, a discharge consent is required for the outlet discharge as it enters the River Ray which will also regulate water quality.
Infrastructure	Damage to infrastructure from flooding from the north of the site which is in Flood Zone 3.	No effect – outside of the development area.	N/A



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#### **Scope of further investigation**

- 6.2.38 As it is unlikely that there will be any significant effects in relation to water quality or flood risk from the proposed developments then no further assessment of these effects will be undertaken. However, further consultation with the Environment Agency will be undertaken to seek advice on SuDS as part of consultation in relation to the FRA.
- 6.2.39 Further detail will be provided in the ES on the measures which will be implemented as part of the development to mitigate environmental effects. The FRAs will also be submitted in support of the planning application.

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## 6.3 NOISE AND VIBRATION

### Introduction

- 6.3.1 A desk-based noise and vibration study has been undertaken for each of the proposed development sites by Entec (December 2010). The results of the study provide an understanding of the noise and vibration context within and surrounding the redevelopment sites at MOD Bioester. The study also identifies the scope of the assessment of noise and vibration effects on both new and existing receptors in the area which will need consideration during the design of the site.
- 6.3.2 With respect to noise and vibration, the most common sensitive receptors are generally considered to be local residents as well as schools. Occupants of commercial developments (such as offices etc.), may have the potential to be significantly affected by noise and vibration, however, they would usually be considered to be less sensitive than residential dwellings. Occupants of industrial units would not normally be considered likely to experience noise and vibration effects from other developments, since such uses are more commonly major sources of noise themselves. In addition to human receptors, certain species of fauna could experience potentially significant noise effects.
- 6.3.3 Assessments and data gathering are undertaken in compliance and with consideration to relevant policy and legislation. The Noise Policy Statement for England, March 2010, clarifies the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. European policy on environmental (or ambient) noise, and the Environmental Noise (Identification of Noise Sources) (England) (Amendment) Regulations 2007 are in place to control noise from transport and industrial activities. PPG 24 on Planning and Noise outlines broad principles in minimising the adverse impact of noise. It also recommends appropriate levels for exposure to different sources of noise. See also the References Section 8 for other sources of information used to compile this report.
- 6.3.4 The following factors are likely to influence existing baseline noise levels in and around the site in the future even in the absence of the development:
- noise associated with road traffic is likely to increase as there is likely to be a natural growth in vehicle traffic over time resulting in a background growth in road traffic noise levels; and
  - proposed development in and around the area (e.g. proposed Immigration centre adjacent to A-site) has the potential to also increase road traffic levels in and around the proposed development sites and therefore increase noise levels.
- 6.3.5 The noise and vibration issues for A-site, Graven Hill and C-site are detailed separately below.

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## **A-site**

### **Existing conditions**

- 6.3.6 Currently, there are few existing noise sources within the site, as the site is mostly used for storage purposes with no MOD personnel based on this site. The gate is manned for two working days per week and there are occasional vehicle movements associated with goods being moved to and from the site.
- 6.3.7 Land uses in the surrounding area include the Home Office site, agricultural land, an HM Prison (Bullington), residential development in Piddington and minor and major roads. Noise sources are therefore likely to include daytime and night-time road traffic noise from the B4011 adjacent to the western boundary of the site and from intermittent traffic on Widenell Lane/Amcott Road which runs to the south of the site. There is no noise from the existing Home Office site which is currently disused, however, there is a planning application to redevelop this land as an Immigration Centre, which Cherwell District Council (CDC) have resolved to approve.
- 6.3.8 Therefore, noise sensitive receptors in the surrounding area which have the potential to be affected by noise from the construction and operation of the development and the road traffic it produces comprise:
- existing sensitive receptors (residential properties, schools etc.) within the ribbon development running north-south on Lower End in Piddington to the east of the site and at Lower Farm to the north;
  - HM Prison Bullington;
  - proposed Immigration Centre on Home Office land adjacent to A-site;
  - sensitive receptors located on or close to any road segments that experience an increase in total traffic volumes of 25% or more<sup>3</sup> due to the development; and
  - wildlife using the site (see also Biodiversity Section 6.6).

### **Potential impacts and significance**

- 6.3.9 Table 6.6 below sets out the receptors with potential to be affected by the proposed development, the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

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<sup>3</sup> Based on screening criteria set out in Highways Agency (2008) *Design Manual for Roads and Bridges: Volume 11, Section 3, Part 7, Noise and Vibration* (HA 213/08).

**Table 6.6: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Existing residents in the area and users of commercial premises.	Increased ambient noise and vibration levels due to demolition/ construction activity on site.	Unknown at this stage – however, the effect is temporary and standard measures can be implemented to minimise effects.	Contractors will be required to implement a Construction Environmental Management Plan which will incorporate noise and vibration control measures such as those outlined in BS528:2009 Parts 1 and 2, Environment Agency Guidance (PPG 6) and register with the Considerate Constructors Scheme.
	Increased road traffic noise levels due to construction and demolition traffic.	Unknown at this stage – however, the effect is temporary and standard measures can be implemented to minimise effects.	Routing of HGVs and method of operation to be agreed with the Local Authority.
Wildlife (see Biodiversity Section 6.6).	Temporary disturbance to wildlife using the site.	Unknown at this stage of the assessment.	Wildlife is protected by legislation, mitigation will be implemented as recommended from the relevant surveys as detailed in Section 6.6.
<b>Operational Phase</b>			
Existing residents in the area and users of commercial premises.	Change in ambient noise levels from activities on-site.	Unknown at this stage of the assessment.	Industrial / commercial premises will be designed to ensure that BS4142: 1997 criteria are met at nearest residential properties.
Existing residents (and other sensitive receptors), both near the site and across the wider transport network.	Increased ambient noise levels from road transport related sources.	Unknown at this stage of the assessment - dependent on results of the traffic assessment.	All internal roads to be designed with noise and vibration impacts taken into consideration.
Wildlife (see	Disturbance to wildlife	Unknown at this	Wildlife is protected by legislation,



Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
Biodiversity (Section 6.6)	using the site	stage of the assessment	mitigation will be implemented as recommended from the relevant surveys as detailed in Section 8.6.

### Scope of further investigation

6.3.10 Further assessment is required to determine the potential effects from noise and vibration on the sensitive receptors that have been identified above.

6.3.11 The proposals for monitoring and the noise sensitive receptors to be included in the assessment will be discussed and agreed with an Environmental Protection Officer at Cherwell DC prior to any assessment being undertaken. See Annex F for the proposed noise and vibration assessment monitoring and methodology. The assessment and further detail on the measures incorporated into the proposed development to mitigate noise and vibration effects will be provided in the ES.

### Graven Hill

#### Existing conditions

6.3.12 Existing noise sources within the site are mostly associated with storage activities and noise from road and rail movements.

6.3.13 The surrounding area generally comprises agricultural land. The closest residential development is located on the southern fringes of Bicester to the north of the site. In addition, there are several isolated farm developments including Langford Park Farm, Wretchwick Farm, premises adjacent to Langford Land along the south-western boundary of the site and Home Farm as well as minor and major roads. There is also a Sewage Treatment Works (STW) to the north-west of the site. Noise sources in the surrounding area are therefore likely to include daytime and night-time road traffic noise from the A41 to the north east and north west. Rail traffic using the MOD rail network to access C-site will also influence the noise climate in the area as will noise from agricultural activities in the surrounding fields and operations at the STW particularly at night.

6.3.14 Therefore noise sensitive receptors both in the surrounding area and new receptors on site which have the potential to be affected by noise from the construction and operation of the scheme and the road and rail traffic it produces comprise:

- existing sensitive receptors (residential properties, public houses/hotels, small businesses etc.) surrounding the site;
- wildlife using the site (see also Biodiversity Section 6.6);

- future sensitive receptors (residential properties, schools and other community facilities, small businesses etc.) to be located within the site boundary; and
- sensitive receptors located on or close to any road segments that experience an increase in total traffic volumes of 25% or more due to the development.

6.3.15 There are no existing residential properties within the site at this time.

#### Potential impacts and significance

6.3.16 Table 6.7 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

Table 6.7: Potential impacts and their likely significance

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Existing residents of the area, and users of commercial premises. (Also occupants of the early phases of the residential development in the north of Graven Hill Site, if a phased construction programme is planned).	Increased ambient noise and vibration levels due to demolition/ construction activity on site.	Unknown at this stage – however, the effect is temporary and standard measures can be implemented to minimise effects.	Contractors will be required to implement a Construction Environmental Management Plan which will incorporate noise and vibration control measures such as those outlined in BS528-2009 Parts 1 and 2, Environment Agency Guidance (PPG 6) and register with the Considerate Constructors Scheme
	Increased road traffic noise levels due to plant and equipment traffic.	Unknown at this stage – however, the effect is temporary and standard measures can be implemented to minimise effects.	Routing of HGVs and method of operation to be agreed with the Local Authority.
Wildlife (see Biodiversity Section 6.6).	Temporary disturbance to wildlife using the site.	Unknown at this stage of the assessment	Wildlife is protected by legislation; mitigation will be implemented as recommended from the relevant surveys as detailed in Section 6.6.

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Operational Phase</b>			
New residents of the residential development, school and users of commercial premises.	Site suitability for residential/commercial development.	Unknown at this stage of the assessment.	Proposed development layout and residential units to be designed so that BS8233:1999 criteria on internal noise levels are met. School to be designed so that criteria in BS93 on internal noise levels and outdoor teaching spaces are met. PPG 24 assessment will identify need to amend design layout so that sensitive noise uses are appropriately located if required.
Existing and future residents and commercial users.	Change in ambient noise levels from activities on site.	Unknown at this stage of the assessment.	Industrial/commercial activities designed to ensure BS4142:1997 <sup>6</sup> criteria are met at residential properties. Internal noise levels within commercial premises are not to exceed the relevant criteria from BS8233:1999.
Existing and future residents (and other sensitive receptors), both near the site and across the wider transport network.	Increased ambient noise levels from road and rail transport related sources.	Unknown at this stage of the assessment - dependent on results of the traffic assessment.	All internal roads to be designed with noise and vibration impacts taken into consideration. Rail infrastructure to be designed to ensure noise and vibration criteria met at nearby residential properties.
Wildlife (see Biodiversity Section 6.6)	Disturbance to wildlife using the site.	Unknown at this stage of the assessment.	Wildlife is protected by legislation; mitigation will be implemented as recommended from the relevant surveys as detailed in Section 6.6.

#### Scope of further investigation

<sup>6</sup> BS4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas



6.3.17 Further assessment is required to determine the potential effects from noise and vibration on the sensitive receptors that have been identified above

6.3.18 The proposals for monitoring and the noise sensitive receptors to be included in the assessment will be discussed and agreed with an Environmental Protection Officer at Cherwell DC prior to any assessment being undertaken. See Annex F for the proposed noise and vibration assessment monitoring and methodology. The assessment and further detail on the measures incorporated into the proposed development to mitigate noise and vibration effects will be provided in the ES.

### **C-site**

#### **Existing conditions**

6.3.19 Existing noise sources within this site are mainly associated with storage activities and road and rail traffic movements.

6.3.20 Land uses in the surrounding area include MOD depots (to the east), agricultural land (to the north west), residential development in Arncott and Upper Arncott, several isolated farm properties including Castle Farm, Arncott Manor Farm and Brook Farm as well as minor and major roads. Noise sources are therefore likely to include daytime and night-time road traffic noise along Ploughley Road, Norris Road and Murcott Road adjacent to the eastern and southern boundaries of the site. In addition, intermittent rail traffic using the rail network to the Graven Hill site will also influence the noise climate in the area as will noise from agricultural activities in the surrounding fields. Therefore, noise sensitive receptors in the surrounding area which have the potential to be affected by noise from the construction and operation of the development and the road and rail traffic it produces comprise:

- existing noise sensitive receptors (residential properties, hotels, schools, small businesses etc.) within the ribbon development running along Ploughley Road, Norris Road and Murcott Road. In addition, isolated properties such as Castle Farm, Arncott Manor Farm and Brook Farm will also be considered noise sensitive receptors;
- noise sensitive receptors within close proximity of the MOD railway line connecting D and G sites;
- sensitive receptors located on or close to any road segments that experience an increase in total traffic volumes of 25% or more due to the development; and
- wildlife using the site (see also Biodiversity Section 5.6).

#### **Potential impacts and significance**

6.3.21 Table 6.8 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls



that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.8: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Existing residents of the area, and users of commercial premises.	Increased ambient noise and vibration levels due to demolition/ construction activity on site.	Unknown at this stage – however, the effect is temporary and standard measures can be implemented to minimise effects.	Contractors will be required to implement a Construction Environmental Management Plan which will incorporate noise and vibration control measures such as those outlined in BS528:2009 Parts 1 and 2, Environment Agency Guidance (PPG 6) and register with the Considerate Constructors Scheme.
	Increased road traffic noise levels due to plant and equipment traffic.	Unknown at this stage – however, the effect is temporary and standard measures can be implemented to minimise effects.	Routing of HGVs and method of operation to be agreed with the Local Authority.
Wildlife (see Biodiversity Section 6.6)	Temporary disturbance to wildlife using the site.	Unknown at this stage of the assessment.	Wildlife is protected by legislation; mitigation will be implemented as recommended from the relevant surveys as detailed in Section 6.6.
<b>Operational Phase</b>			
Existing residents in the area and users of commercial premises	Change in ambient noise levels from activities on-site. As all JSCS activities are to be rationalised on to G-site the noise levels are likely to increase.	Unknown at this stage of the assessment.	Industrial / commercial premises will be designed to ensure that BS4142:1997 criteria are met at nearest residential properties.
Existing residents (and other sensitive receptors), both	Increased ambient noise levels from road and rail transport related sources.	Unknown at this stage of the assessment – dependent on results	All internal roads to be designed with noise and vibration impacts taken into consideration. Rail infrastructure to be designed to

Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
near the site and across the wider transport network.		of the traffic assessment.	ensure noise and vibration criteria met at nearby residential properties. See also the Transport Section 6.1.
Wildlife (see Biodiversity Section 6.6).	Disturbance to wildlife using the site.	Unknown at this stage of the assessment.	Wildlife is protected by legislation; mitigation will be implemented as recommended from the relevant surveys as detailed in Section 6.6.

### Scope of further investigation

6.3.22 Further assessment is required to determine the potential impacts from noise and vibration on the sensitive receptors that have been identified above.

6.3.23 The proposals for monitoring and the noise sensitive receptors to be included in the assessment will be discussed and agreed with an Environmental Protection Officer at Cherwell DC prior to any assessment being undertaken. See Annex F for the proposed noise and vibration assessment monitoring and methodology. The assessment and further detail on the measures incorporated into the proposed development to mitigate noise and vibration effects will be provided in the ES.

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## 6.4 AIR QUALITY

### Introduction

- 6.4.1 A desk-based study has been undertaken by Entec (December 2010) to assess the baseline air and odour quality at the redevelopment sites. This involved gathering relevant information from the Cherwell District Council's (CDC) Air Quality Review and Assessment Reports and reviewed against the proposed developments. Local maps of the area have also been studied to identify the surrounding land use and consideration given to whether this is likely to impact upon air quality as well as to identify receptors with the potential to be affected by changes in air quality.
- 6.4.2 Assessments and data gathering are undertaken in compliance and with consideration to relevant policy and legislation. The UK Air Quality Strategy 2010 sets out air quality objectives and policy options to further improve air quality in the UK. UK legislation, such as Environmental Protection Act 1990 and the Environment Act 1995, controls the amount of air pollutant emissions. JSP 418 contains MOD's policy relating to air quality and climate. See also the References Section 8 for other sources of information used to compile this report.
- 6.4.3 It was considered more appropriate to address all sites together for this topic.

### Existing conditions

#### Air Quality

- 6.4.4 The baseline conditions at MCD Bicester have been assessed using CDC's Local Air Quality Management (LAQM) process. As part of CDC's LAQM obligations, CDC performs a regular review of air quality within the district to determine whether the air quality objectives are being met. CDC undertook Updating and Screening Assessments (USA) in 2004 and 2006 alongside progress reports in 2005 and 2007 and 2008. These reports detail CDC's decision to not declare any air quality management areas (AQMA) based upon monitoring data and predictive dispersion modelling. The most recent LAQM report is the 2009 Air Quality Updating and Screening Assessment (USA). The conclusion of the 2009 USA was that a detailed assessment should be conducted in three areas in the district. The closest of these three areas is located approximately 1.25km from the north of Graven Hill site at Queens Avenue. It was concluded that this detailed assessment was required due to high monitored roadside concentrations at the Queens Avenue diffusion tube monitoring location and relates to annual mean nitrogen dioxide ( $\text{NO}_2$ ) concentrations potentially exceeding the limit value ( $40 \mu\text{g m}^{-3}$  as an annual average) contained within the air quality strategy.



- 6.4.5 CDC does not conduct any automatic air quality monitoring near to Bicester. The monitoring regime in Bicester consists of three diffusion tube locations located in the urban area. Details of these monitoring locations alongside the data from 2006-2009 are presented in Table 6.9.

**Table 6.9: Air Quality Monitoring in Bicester – Nitrogen Dioxide Diffusion Tubes**

Location Name	Designation	Location	Annual Mean NO <sub>2</sub> Concentration $\mu\text{g m}^{-3}$			
			2006	2007	2008	2009
Tamansk Gardens	Urban Background	458332.224432	22.2	21.6	22.3	21.0
Market Square	Kerbside	458528.222392	34.6	34.9	35.4	33.7
Queens Avenue	Roadside	457968.222353	36.0	27.2	40.1	46.9

- 6.4.6 The data shows exceedences of the Nitrogen Dioxide air quality objective of  $40 \mu\text{g m}^{-3}$  as an annual average at the Queens Avenue roadside monitoring location. This is a busy junction in the centre of the town and does not represent conditions in other areas of Bicester and the surrounding area. Air quality at the redevelopment sites is best represented by the Tamansk Gardens urban background location where the maximum measured annual average concentration was  $22.3 \mu\text{g m}^{-3}$  in 2008.

- 6.4.7 The NETCEN background concentration maps published by DEFRA provide background air quality concentrations at a  $1\text{km}^2$  resolution across the UK with projections up until the year 2020. Baseline conditions for each of the sites have been assessed by using the grid square that the site is located within alongside the results from the eight surrounding grid squares. The maximum concentration within this area has been used to represent worst case conditions. The results for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are presented for A-site, Graven Hill site, and C-site in table 6.10.

**Table 6.10: NETCEN background Concentrations – Annual Average Concentrations**

Site	NO <sub>2</sub> concentration ( $\mu\text{g m}^{-3}$ )			PM <sub>10</sub> Concentration ( $\mu\text{g m}^{-3}$ )			PM <sub>2.5</sub> Concentration ( $\mu\text{g m}^{-3}$ )		
	2010	2012	2015	2010	2012	2015	2010	2012	2015
A	9.0	8.3	7.4	15.3	15.0	14.7	9.4	9.2	8.8
Graven Hill	12.3	11.3	9.7	17.1	16.9	16.5	10.3	10.0	9.7
C	12.4	11.3	9.6	16.5	16.2	15.8	10.1	9.8	9.5



- 6.4.8 The maximum concentrations across all sites were  $12.4 \mu\text{g m}^{-3}$ ,  $17.1 \mu\text{g m}^{-3}$  and  $10.3 \mu\text{g m}^{-3}$  for  $\text{NO}_2$ ,  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  as an annual average respectively. The NETCEN dataset shows a gradual reduction in air quality pollutants into the projected future years. The background concentrations show compliance with the air quality standards.

#### Odour

- 6.4.9 Baseline odour conditions are not available for the sites. However, the only potential source of odour based on a review of Ordnance Survey mapping is Bicester wastewater treatment works (WWTW) which are located adjacent to the boundary of northwest of Graven Hill site.

#### **Potential impacts and significance**

- 6.4.10 This section identifies the potential air quality effects of the development upon existing sensitive receptors. Sensitive receptors are considered to be properties such as residential dwellings and schools where there is the potential for people to be exposed to increased levels of pollutants over long periods of time. Sensitive receptors can also include flora which can be sensitive to increased levels of pollutants as well as dust. In addition, the scope of the assessment has also considered the suitability of the north side of the Graven Hill site for development which may be sensitive to air pollutants and odour as this is the area to be redeveloped for residential and community uses.
- 6.4.11 Table 6.11 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.11: Potential impacts and their likely significance (all sites)**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Existing receptors within 100-200m of demolition and construction activities at	Potential off-site migration of dust produced by demolition/construction activities.	Unlikely to be significant – dust mitigation methods will be employed. Effects are short term and temporary and will only occur when demolition and construction	The contractors will operate in accordance with a dust management plan. Dust management methods in this plan may include: <ul style="list-style-type: none"> <li>• sheeting of HGVs;</li> <li>• appropriate covering of stockpiled material;</li> </ul>

Receptor	Potential impact	Likely Significance of effect	Mitigation Controls
each site		activities are conducted near to the site boundaries	<ul style="list-style-type: none"> <li>regular access road cleaning;</li> <li>wetting of potentially dust producing surfaces where necessary.</li> </ul> <p>More detail on these measures will be included in the ES.</p>
Existing receptors along access routes used by construction traffic.	Potential for increased air quality pollutant concentrations along access routes due to vehicular emissions.	Unknown at this stage of the assessment – this is dependant on the number of vehicles travelling on the local road network.	Management measures (if required) are likely to comprise routing vehicles so that congested roads and residential areas are avoided. See also Transport Section 6.1.
<b>Operational Phase</b>			
Existing and proposed residential receptors located close to routes used by traffic accessing the new developments	Potential for increased air quality pollutant concentrations due to additional traffic generated by the proposed developments	Unknown at this stage of the assessment - the proposed developments would result in an increase in both HGV and car traffic at all sites which could increase road traffic pollution levels (NO <sub>2</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> ) and have an effect on air quality levels experienced by residential properties fronting these roads.	The need to avoid effects on air quality as a result of traffic flows will be taken into account in refining the design of the master plan. It is likely that the proposed developments will also incorporate measures to encourage those within the developments to use public transport. Rail access will be maintained into south of Graven Hill and C site in order to facilitate freight movements by rail, potentially reducing HGV traffic. See also Transport Section 6.1.
Existing and proposed residential receptors (within vicinity of proposed CHP boiler – southern part of Graven Hill and	Potential for increased air quality pollutant concentrations due to emissions from the CHP boiler.	Unlikely to be significant – as design measures will be incorporated into CHP design to mitigate potential effects.	Further technical work will be undertaken to inform the design of the proposed CHP and identify the appropriate sizing of the exhaust stack to ensure that the dispersion of pollutants will be imperceptible (as defined in the EPUK guidance) at receptor locations.

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
temporary CHIP in northern part of Graven Hill)			
Proposed residential receptors at north part of Graven Hill	Potential exposure of new receptors within north of Graven Hill site to odour from Bicester WwTW	Unknown at this stage of the assessment.	Further odour assessment work will take place to identify a buffer zone which will be incorporated into the master plan design to ensure that new residential properties are not exposed to significant levels of odour.

#### Scope of further investigation

6.4.12 The following methodology will be applied to the assessments and details provided in the ES.

#### Potential air quality effects from changes in traffic flows (if the Traffic Assessment indicates and increase of 10%)

6.4.13 In accordance with the Environmental Protection UK's Development Control: Planning for Air Quality (2010 Update), a proposed development requires an air quality assessment if the proposals will give rise to a significant change in traffic volumes, typically a change in annual average daily traffic (AADT) or peak traffic flows of greater than 5% or 10%, depending on local circumstances (a change of 15% will be appropriate for traffic flows within an AQMA). As the proposed area is not within an AQMA, 10% is likely to be appropriate but will need to be agreed with the Council. The level of traffic increase is not yet known; a Transport Assessment has been recommended in 6.1 above, the results of this assessment will dictate if an air quality assessment is required.

6.4.14 The assessment will consider all existing receptors close to potentially affected routes where either the total traffic level or the number of HGVs on the local road network are predicted to change by more than 10%<sup>7</sup> both during construction and operation of the proposed developments. Potential effects will be assessed using an appropriate quantitative methodology which will be agreed with the CDC Environmental Health. The Design manual for Roads and Bridges scoping tool will be used in order to predict the air quality (NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>) effects of additional traffic movements. Predicted concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at receptor locations will be assessed against the air quality objectives set in the 2010 air quality strategy for England, Scotland and Wales. Significance will be determined using the

<sup>7</sup> Environmental Protection UK's Development Control: Planning for Air Quality (2010 Update)



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criteria defined in Environmental Protection UK's Development Control: Planning for Air Quality (2010 Update) document.

#### Potential odour annoyance from Bicester WwTW

- 6.4.15 A baseline odour assessment from the Bicester WwTW will be undertaken to assess the likelihood of an odour annoyance at the proposed residential receptors within the north of Graven Hill and identify the extent of a buffer zone to be incorporated into the master plan design in order to mitigate potential odour effects on new residents. A full odour survey of the Thames Water operated WwTW will be undertaken using olfactometry analysis of samples collected using a Lindvaal sampling hood. The odour emission rates will be inserted into the AERMOD dispersion model in order to predict odour concentrations at the proposed receptor locations. The results will be compared against the commonly used odour annoyance criterion of 5 ou<sub>e</sub> m<sup>-2</sup> as the 98<sup>th</sup> percentile of hourly averages. Odour annoyance is considered likely when dispersion modelling results are in excess of this criterion.

#### Potential air quality effects from the proposed CHP boiler

- 6.4.16 The proposed development at Graven Hill will include a temporary CHP boiler facility within the northern part of the development which will supply heat and power during the initial phases of the development. Once the development is complete a larger CHP facility within the southern part of the site will supply heat and power to the entire development. The permanent facility will be more than 500m from any existing or proposed residential properties and therefore significant effects unlikely. However there will be a requirement to assess the temporary CHP in the northern part of the site.
- 6.4.17 As with all fossil fuel energy generating facilities, the fuel in the CHP boiler would be combusted in a controlled manner in order to produce the heat required to generate electricity. Further technical work will be undertaken to identify appropriate process controls and an appropriately sized stack in order to mitigate the potential air quality effects from the CHP. Concentrations of NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and CO will be predicted at the nearest existing and proposed receptors. The approach to the assessment will be agreed in advance with CDC. Either the ADMS 4.2 or AERMOD dispersion modelling tool would be used to predict air quality effects of the CHP. Emissions will be assessed against the air quality objectives set in the 2010 air quality strategy for England, Scotland and Wales. Where appropriate, significance will be determined using the criteria defined in Environmental Protection UK's Development Control: Planning for Air Quality (2010 Update) document.



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## 6.5 LAND QUALITY, GEOLOGY AND SOILS

### Introduction

- 6.5.1 A Phase 1 and 2 Land Quality Assessment (LQA) has been undertaken at each of the proposed development sites to assess the ground and likely contamination conditions. The aim of the assessments was to identify the health and environmental risks and liabilities posed by the sites which may affect its valuation or future use.
- 6.5.2 Assessments and data gathering are undertaken in compliance and with consideration to relevant policy and legislation. It is MOD policy that the disposal of estate assets is accompanied by a LQA to reduce uncertainties over likelihood or extent of contaminants and to help develop plans for remediation if required. The two principal legislative regimes for regulating contaminated land in the UK are: Environmental Protection Act 1990 Part 2A for current land use; and the Town & Country Planning Acts for a change in land use/redevelopment. Both regimes are designed to deal with existing land contamination that meets the legal definition of contaminated land and so poses an unacceptable risk to human health or the environment. See also the References Section 8 for other sources of information used to compile this report.
- 6.5.3 The scope of works for the Phase 2 investigations was reviewed by the Environmental Protection Officer at Cherwell District Council who indicated that the scope would allow an assessment of whether the sites would be developable and therefore support an application for outline planning permission.
- 6.5.4 If the proposed developments were not implemented, the baseline conditions would be unlikely to change in the future.
- 6.5.5 The land quality, geology and soils issues for each of the sites are detailed separately below.

### A-Site

#### Existing conditions

- 6.5.6 The results of the Phase 1 LQA identified a moderate risk to designated receptors (construction workers, future commercial and industrial site users and surface water) from identified hazards that include the areas of bulk fuel storage, former burning grounds and land-filled areas around building A33.

- 6.5.7 The results of Phase 2 LQA identified little if any contamination present in the areas investigated. There were no recorded radiological readings significantly in excess of the natural background levels and the risks to sensitive receptors from hazards previously identified in the Phase 1 were all considered as moderate/low to negligible.
- 6.5.8 The intention is for the MOD to dispose of the site with outline planning permission including the findings of the Phase 1 and 2 LQA; as such, this would facilitate transfer of environmental liabilities to the purchaser under exclusion test, Test 3 ("Sold with Information") in the Environmental Protection Act Part 2A statutory guidance.

#### Potential impacts and significance

- 6.5.9 Table 6.12 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.12: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Site Users	Health and safety considerations e.g. from ground disturbance and potential hazardous materials from the demolition of buildings such as asbestos.	Unlikely to be significant – assessment findings found risk as moderate/low to negligible.	Existing controls – legislation; adoption of Considerate Constructor Scheme and implementation of the Construction Environment Management Plan (CEMP) will address potential adverse environmental effects. Disposal of hazardous waste in accordance with Environment Protection Act 1990.
Site Users	Waste from demolition/construction activities.	Unlikely to be significant	CEMP. Reuse waste materials from demolition in the construction where possible.
Ground and surface water	Potential contamination during demolition/construction.	Unlikely to be significant – controls can be put in place.	As above.
<b>Operational Phase</b>			
It is not anticipated that there will be impacts from contamination once the site is operational due to the current levels not being deemed significant to affect future redevelopment of the site.			

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### Scope of further investigation

- 6.5.10 The results of the Phase 2 LQA conclude that the localised areas of contamination would not significantly constrain future development and, as such, the site is considered suitable for redevelopment and/or continued commercial/industrial use. No further investigation will be undertaken.
- 6.5.11 The LQAs will be submitted in support of the planning application.

### Graven Hill

#### Existing conditions

- 6.5.12 The Phase 1 and 2 LQAs were undertaken for the areas north and south of Graven Hill and this is summarised below. The LQA for the hill itself is currently being undertaken, details of which will be included in the Environmental Statement.
- 6.5.13 The results of the Phase 1 LQA identified risks as moderate (or higher) to designated receptors (future residents and groundworkers) from identified hazards that include the former railway workshops, fire training building, the railway lines, POL (petrol, oil and lubricant) stores, Oil Water Interceptors, Made Ground and the former waste tip near building E15.
- 6.5.14 The results of the Phase 2 LQA identified only localised levels of contamination present across the site. It is anticipated that due to the current proposed commercial/industrial end use along the south of the site, that these discrete areas would require little or no further assessment or remediation, although should the proposed end use change then further assessment/work may be required.
- 6.5.15 On the north side of the site, a more sensitive proposed development of residential and 'local' facilities e.g. schools is proposed. As such, it is likely that the development would involve the removal of above and below ground fuel storage tanks which may encounter some localised hydrocarbon contamination. In addition, moderate risks to future residents were identified in the E15 tip area from hydrocarbons, metals and asbestos. A moderate risk to surface water was also assessed in this area from a single occurrence of benzo(a)pyrene (a pollutant that bio-accumulates in aquatic organisms).
- 6.5.16 The risks to sensitive receptors from hazards previously identified in the Phase 1 were all considered as moderate/low to negligible.



- 6.5.17 The intention is for the MOD to dispose of the site with outline planning permission including the findings of the Phase 1 and 2 LQA; as such, this would facilitate transfer of environmental liabilities to the purchaser under exclusion test, Test 3 ("Sold with Information") in the Environmental Protection Act Part 2A statutory guidance.

#### Potential impacts and significance

- 6.5.18 The future end use of the E15 tip area is anticipated to be woodland but the proximity of future residents and thus recreational users of the woodland would likely require some form of mitigation i.e. capping.

- 6.5.19 Table 6.13 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.13: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Site Users – south of site	Health and safety considerations.	Unlikely to be significant – assessment findings found risk as moderate/low to negligible.	Existing controls – legislation; adoption of Considerate Constructor Scheme and implementation of the Construction Environment Management Plan (CEMP) will address potential adverse environmental effects. The LQA identified that the discrete areas of contamination would require little or no further assessment or remediation (which will be implemented as part of re-development if required).



Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
Site Users – north of site	Health and safety considerations.	Unlikely to be significant – assessment findings found risk as moderate/low to negligible, but it is a more sensitive area due to the proposed end use as residential.	Existing controls – legislation; adoption of Considerate Constructor Scheme and CEMP. Removal of above and below ground fuel storage tanks may encounter some localised hydrocarbon contamination which would be remediated as part of the redevelopment.
Site Users – north of site by E15 Tip Area.	Health and safety considerations.	Potential to be significant due to hydrocarbons, metals and asbestos if the identified mitigation is not implemented. However mitigation will be implemented as part of the redevelopment.	Existing controls – legislation; adoption of Considerate Constructor Scheme and CEMP. Measures will be implemented during construction to remediate as needed – e.g. capping of the tip area.
Site Users	General and hazardous waste from demolition/ construction activities.	Unlikely to be significant with mitigation in place.	Disposal of hazardous waste in accordance with Environment Protection Act 1990. Implement CEMP. Reuse waste materials from demolition in the construction where possible.
Surface water	Potential contamination	Unlikely to be significant – a single occurrence of benzo(a)pyrene has been recorded.	Existing controls – legislation; adoption of Considerate Constructor Scheme and CEMP.
<b>Operational Phase</b>			
It is not anticipated that there will be impacts from contamination once the site is operational due to the current levels not being deemed significant to affect future redevelopment of the site and the remediation recommended during the construction phase is implemented e.g. capping of the tip area.			

#### Scope of further investigation

6.5.20 The Phase 2 LQA concludes that the localised areas of contamination would not significantly constrain future development and the site is considered suitable for redevelopment for a residential (with gardens) end use and further commercial/industrial use. No further investigation will be undertaken at these areas, however, it is recommended the proposed

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measures outlined in the Phase 2 LQA will be implemented during the redevelopment of the site to mitigate the localised contamination issues that were identified.

- 6.5.21 The results of the LQA of the centre of the site, the hill, will be included in the ES. The LQAs will also be submitted in support of the planning application.

### **C-site**

#### **Existing conditions**

- 6.5.22 The results of the Phase 1 LQA identified a moderate risk to designated receptors (construction workers, future commercial and industrial site users and surface water) from identified hazards that include the areas of bulk fuel storage, former burning grounds and land-filled areas around buildings C32 and C33.
- 6.5.23 The results of Phase 2 LQA identified only localised levels of contamination present in the investigated areas. There was trace evidence of hydrocarbons and chlorinated solvents from soil samples around building C33, however, all the concentrations were below the screening criteria for a commercial/industrial end use. Three small areas of elevated radiological readings were identified, however, the levels detected are not considered to represent a significant radiological risk or matter for regulatory concern. The risks to sensitive receptors from hazards previously identified in the Phase 1 LQA were all considered as moderate/low to negligible.

#### **Potential impacts and significance**

- 6.5.24 Table 6.14 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.14: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Site Users	Health and safety considerations e.g. from ground disturbance and potential hazardous materials from the demolition of buildings such as asbestos.	Unlikely to be significant – assessment findings found risk as moderate/low to negligible.	Existing controls – legislation: adoption of Considerate Constructors Scheme and implementation of the Construction Environment Management Plan (CEMP) will address potential adverse environmental effects. Disposal of hazardous waste in accordance with Environment Protection Act 1990.
Site Users	Waste from demolition/ construction activities.	Unlikely to be significant	CEMP. Reuse waste materials from demolition in the construction where possible.
Ground and surface water	Potential contamination during demolition/ construction.	Unlikely to be significant – controls can be put in place.	As above.
<b>Operational Phase</b>			
It is not anticipated that there will be impacts from contamination once the site is operational due to the current levels not being deemed significant to affect future redevelopment of the site.			

#### **Scope of further investigation**

6.5.25 The results of the Phase 2 LQA conclude that the localised areas of contamination would not significantly constrain future development and, as such, the site is considered suitable for redevelopment and/or continued commercial/industrial use. No further investigation will be undertaken.

6.5.26 The LQAs will be submitted in support of the planning application.



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## 6.6 BIODIVERSITY

### Introduction

- 6.6.1 Entec undertook a baseline ecological desk-study and an extended Phase One habitat survey in 2008 for all proposed development sites including land within 100m of the site boundaries where accessible. The purpose of the survey was to ascertain the potential for any protected / notable species and/or other sensitive ecological receptors to exist on the sites. This survey has been used to inform this section of the scoping report.
- 6.6.2 Assessments and data gathering are undertaken in compliance and with consideration to relevant legislation and policy. PPS9 outlines the Government's commitment to the conservation of wildlife and natural features, and provides an emphasis on restoration and enhancement of these. MOD policy on Nature Conservation is detailed in the Defence Lands Handbook (JSP 362) along with details of EU and UK legislation protecting the natural environment. The guidance document 'Biodiversity and Planning in Oxfordshire' explains those habitats and species that are protected by legislation and planning policy in the area. The Cherwell Biodiversity Action Plan highlights the habitats and species important in the district. See also the References Section 8 for other sources of information used to compile this report.
- 6.6.3 There are no statutory designations on the sites; however, there are several Sites of Special Scientific Interest (SSSIs) and County and Local Wildlife sites (C/LWS) within approximately 2km of the site including the Gravenhill Wood CWS within the centre of the Graven Hill site.
- 6.6.4 In the absence of the development, it is likely that biodiversity would remain broadly unchanged, notwithstanding the likelihood that populations of some species are likely to change in line with trends elsewhere in the region particularly in terms of predicted changes with climate change.
- 6.6.5 The biodiversity issues for each of the sites are detailed separately below.

### A-site

#### Existing conditions

- 6.6.6 There are four SSSIs and five CWSs within 2km of the site. The site comprises large hangars, hardstanding and amenity grassland, with scattered trees, some areas of broad-leaved plantation, a ditch system and five square water tanks. The entire site is fenced, and bordered by a combination of scrubby hedgerows and trees, and improved/semi improved grassland.



6.6.7 The habitats themselves are of little conservation value apart from the woodland. The following species were identified as potential users of the site: bats, water voles, birds (common and notable and water bodies providing breeding habitat for waterfowl), reptiles, great crested newts, and invertebrates. Further survey work is currently being undertaken to identify which species are present at the site, along with a botanical survey and what mitigation may be required, see paragraph 6.6.9 for further details.

#### Potential impacts and significance

6.6.8 Table 6.15 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.15: Potential impacts and their likely significance**

Receptor	Potential impact	Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Species of Conservation Importance	Disturbance to species, and destruction of their habitats. See also Noise Section 6.3.	Unknown at this stage of assessment.	<p>Species are protected by legislation. If protected species are seen during work, that work should cease and appropriate advice sought and mitigation implemented.</p> <p>Further surveys have been commissioned to identify the presence/absence of species of conservation importance and any mitigation that may be required.</p> <p>Within the draft master plan (Annex B), the majority of the woodland has been retained which is important habitat for species.</p> <p>Mitigation identified from the commissioned survey work has the potential to provide data to improve the biodiversity potential of the development proposal.</p>
Habitats/notable	Destruction of	Unknown at this	There are no protected habitats on

Receptor	Potential impact	Significance of effect	Mitigation/Controls
vegetation species	habitats/vegetation.	stage of assessment.	site, however, a botanical survey will be undertaken to identify notable vegetation species and mitigation required. The retention of the majority of the woodland and identified important trees will be retained and has been factored into the master plan.
Statutory/non-statutory designated sites	Damage to local designated sites	Unlikely to be significant	Implementation of Considerate Constructor Scheme
<b>Operational Phase</b>			
Species of conservation Importance/Habitats	Disturbance/damage	Unknown at this stage of assessment.	Mitigation identified from the survey work has the potential to provide data to improve the biodiversity of the development proposal. In addition, mitigation identified in the hydrology and landscape sections have the potential to benefit biodiversity.
Statutory/non-statutory designated sites.	Damage to local designated sites.	Unlikely to be significant.	N/A

### Scope of further investigation

- 6.6.9 Further surveys have been commissioned to more clearly determine the presence/absence of the following species: bats (scoping survey, activity survey, summer roost survey, hibernacula survey); dormouse; water vole; breeding birds; reptiles; invertebrates; badgers; and great crested newts and to identify the mitigation measures required to support the proposed development. A botanical survey will also be undertaken.
- 6.6.10 Feedback from Natural England and Oxfordshire County Council on the biodiversity implications of the development has helped to identify requirements and further survey work will be discussed and agreed with these organisations and addressed in the ES

## Graven Hill

### **Existing conditions**

- 6.6.11 The site is set around a hill rising out of an otherwise largely flat agricultural landscape, with fields delineated by hedgerows and standard trees. It comprises a set of fenced compounds, a barracks site with residential accommodation and sports facilities, and areas of agricultural land (principally arable or poor improved/semi-improved grassland) and woodland. Surrounding the foot of the hill are large warehouses and hardstanding with amenity grassland, scattered trees, areas of plantation woodland, scrub, ponds and water tanks. Gravenhill Wood, in the centre of the site, is an ancient woodland site.
- 6.6.12 There is one SSSI within 2km of the site, Arncott Bridge Meadows. There are five County Wildlife Sites within 2km, one of which is Gravenhill Wood in the centre of the site and Bicester Wetland Reserve is 40m north-west of the site.
- 6.6.13 Apart from the ancient woodland, the habitats are not protected but have the potential to support a range of species, such as, bats, dormice, water voles, birds, reptiles, and great crested newts. Further survey work is currently being undertaken to identify species are using the site, along with a botanical survey and what mitigation may be required, see paragraph 6.6.15 for further details.

### **Potential impacts and significance**

- 6.6.14 Table 6.16 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.16: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Species of Conservation Importance	Disturbance to species, and destruction of their habitats. See also Noise Section 6.3.	Unknown at this stage of assessment.	Species are protected by legislation. If protected species are seen during work, that work should cease and appropriate advice sought and mitigation implemented.



Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
			<p>Further surveys have been commissioned to identify the presence/absence of species of conservation importance and any mitigation that may be required.</p> <p>Within the draft master plan (Annex C), the majority of the woodland has been retained which is important habitat for species and additional planting has been proposed.</p> <p>Mitigation identified from survey work has the potential to provide data to improve the biodiversity of the development proposal.</p>
Habitats/notable vegetation species	Destruction of habitats/vegetation.	Unknown at this stage of the assessment.	Apart from the ancient woodland, there are no protected habitats on site, however, a botanical survey will be undertaken to identify important vegetation species and mitigation required. In addition, the majority of woodland throughout the rest of the site has been retained in the master plan. Trees identified as important will also be retained.
Gravenhill Ancient Woodland CWS and other Statutory/non-statutory designated sites	Damage to Gravenhill Wood and other local designated sites	Unlikely to be significant.	There will be direct effects (ie removal of woodland) as all woodland is retained in the master plan. Implementation of Considerate Constructor Scheme will minimise effects from noise and dust.
<b>Operational Phase</b>			
Species of Conservation Importance / Habitats	Disturbance/damage	Unknown at this stage of assessment	Mitigation identified from the survey work has the potential to provide data to improve the biodiversity of the development proposal.



Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
			Locations for proposed new tree planting has been identified and included on the master plan; in addition, mitigation identified in the hydrology and landscape sections have the potential to benefit biodiversity.
Gravenhill Ancient Woodland GWS and other Statutory/non-statutory designated sites.	Damage to Gravenhill Wood due to increased recreational use and damage to other local designated sites.	Unlikely to be significant.	Management of the Gravenhill Wood will improve the biodiversity of the wood. Footpaths through the wood will be designed to restrict access to certain areas to provide less disturbed areas for wildlife. In addition to the Wood, other areas of woodland and public open space have been included in the master plan to accommodate the recreational use of the area.

#### Scope of further investigation

6.6.15 Further surveys have been commissioned to more clearly determine the presence/absence of the following species: bats (scoping survey, activity survey, summer roost survey, hibernacula survey), dormouse, water vole, breeding birds, reptiles, invertebrates, badgers, and great crested newts and to identify the mitigation measures required to support the proposed development. A botanical survey will also be undertaken. Further survey work will also be undertaken for the centre of the site, the Gravenhill Wood and surrounding area.

6.6.16 Feedback from Natural England and Oxfordshire County Council on the biodiversity implications of the development has helped to identify requirements and further survey work will be discussed and agreed with these organisations and addressed in the ES.

#### G-site

##### Existing conditions

6.6.17 There are two SSSIs (Amcott Bridge Meadows and Whitecross Green and Oriel Woods) and five CWSs within 2km of the site. The site consists of large hangar-type buildings with areas of hardstanding, with a network of roads and railway tracks across the site. The habitats consist of extensive areas of amenity grassland with scattered trees, scattered and continuous scrub/wood.

6.6.18 The majority of the area around the buildings and hardstanding is amenity grassland. There are dense areas of scrub and broadleaved woodland along the boundary fence, two ponds, a ditch system and water tanks. The habitats themselves are not of particular conservation importance but have the potential to support a number of protected/notable species. The following species were identified as potential users of the site: bats; birds; dormouse; water vole; reptiles; great crested newts and invertebrates. Further survey work is currently being undertaken to identify species are using the site, along with a botanical survey and what mitigation may be required; see paragraph 6.6.20 for further details. Survey work has already been undertaken for reptiles and no reptiles were recorded on the site.

#### Potential impacts and significance

6.6.19 Table 6.17 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.17: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Species of Conservation Importance:	Disturbance to species, and destruction of their habitats. See also Noise Section 6.3.	Unknown at this stage of assessment.	<p>Species are protected by legislation. If protected species are seen during work, that work should cease and appropriate advice sought and mitigation implemented.</p> <p>Further surveys have been commissioned to identify the presence/absence of species of conservation importance and any mitigation that may be required.</p> <p>Within the draft master plan (Annex D), the majority of the woodland has been retained which is regarded as important habitat.</p>

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
			Mitigation identified from the survey work has the potential to provide data to improve the biodiversity of the development proposal.
Habitats/notable vegetation species	Destruction of habitats/vegetation.	Unlikely to be significant.	There are no protected habitats on site, however, a botanical survey will be undertaken to identify notable vegetation species and mitigation required. The majority of the woodland has been retained in the master plan and those trees identified as important will also be retained.
Statutory/non-statutory designated sites.	Damage to local designated sites.	Unlikely to be significant.	Implementation of Considerate Constructor Scheme.
<b>Operational Phase</b>			
Species of conservation importance/ Habitats	Disturbance/damage.	Unknown at this stage of assessment	Mitigation identified from the survey work has the potential to provide data to improve the biodiversity of the development proposal.  Locations for proposed new tree planting have been identified and included on the master plan.  In addition, mitigation identified in the hydrology and landscape sections have the potential to benefit biodiversity.
Statutory/non-statutory designated sites.	Damage to local designated sites.	Unlikely to be significant	N/A

#### Scope of further investigation

6.6.20 Further surveys have been commissioned to more clearly determine the presence/absence of the following species: bats (scoping survey, activity survey, summer roost survey, hibernacula survey); dormouse; water vole; breeding birds; invertebrates; badgers; and great crested

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newts and to identify the mitigation measures required to support the proposed development. A botanical survey will also be undertaken. The reptile survey is completed and no reptiles have been recorded, therefore, reptiles will not be considered further for C-site. Feedback from Natural England and Oxfordshire County Council on the biodiversity implications of the development has helped to identify requirements and further survey work will be discussed and agreed with these organisations and addressed in the ES.



## 6.7 CULTURAL HERITAGE

### Introduction

- 6.7.1 A study was undertaken to support the Bicester Establishment Development Plan produced in 2008. The purpose of the study was to:
- identify any archaeological/cultural heritage remains within the site;
  - identify any risk to cultural heritage from any proposed developments; and
  - set the site in the archaeological context within the wider area.
- 6.7.2 This study includes data received from the Historic Buildings, Sites and Monuments Record (HBSMR) at Oxfordshire County Council, The English Heritage National Monument Record at Swindon and conversations with Richard Oram, Development Control Archaeologist at Oxfordshire County Council.
- 6.7.3 In addition, a geophysical survey was undertaken on the north side of Graven Hill where the line of the Roman road has been projected through the site by Archaeology Surveys Ltd in August 2010 and January 2011 and the results are detailed under the Graven Hill section below.
- 6.7.4 Assessments and data gathering are undertaken in compliance and with consideration to relevant policy and legislation. Planning Policy Statement 5 (PPS5), Planning for the Historic Environment sets out planning policies on the conservation of the historic environment. MOD policy regarding the Historic Environment is set out in Defence Lands Handbook (JSP 362), Chapter 6. See also the References Section 8 for other sources of information used to compile this report.
- 6.7.5 The historic environment issues for each of the sites are detailed separately below.

### A-site

#### Existing conditions

- 6.7.6 The Bicester complex of sites has been in use since the Second World War. There are no Scheduled Ancient Monuments or Listed Buildings within the MOD holding but there are such features nearby that could affect proposals for the site.
- 6.7.7 The Oxfordshire HBSMR records no archaeological data within the main A-site. The only record for the entire complex is a report of Romano-British material being found during works on the internal railway line in the 1950s. The location of the discovery is imprecise as a result of the finder waiting 30 years or more before reporting the discovery. It is believed to centre

around SP 628 175, southwest of A-site. As with Graven Hill, there are tales that Arncott Hill is the location of an Iron Age hillfort, but once again there is no archaeological evidence to support this theory.

- 6.7.8. The areas of rough pasture have no archaeological data because they have not been disturbed in recent years and no archaeological surveys have been carried out. Aerial photographs consulted for this study showed nothing, although neither the vegetation cover nor the geology is ideal for air photo results.

#### Potential impacts and significance

- 6.7.9. Table 6.18 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.18: Potential impacts and their likely significance**

Receptor	Potential impact	Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Archaeological remains	Damage from demolition/construction activities	Unlikely to be significant – controls to be implemented	An archaeological watching brief to be undertaken during this phase.
<b>Operational Phase</b>			
Listed buildings (Lower End, Piddington)	Indirect effects on setting from the presence of new development	Unlikely to be significant – the development proposals will retain the woodland at the eastern end of the development site	The proposed master plan will retain existing woodland which will help to screen the proposed development. The development is also likely to be similar in scale, height and extent to the existing development. The landscape and visual assessment will also assess potential effects on visual receptors in Piddington where required.

#### Scope of further investigation

- 6.7.10. There are unlikely to be serious archaeological issues arising in this area. The response of the County Archaeologist was that areas of previously developed ground would be unlikely to

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incur archaeological conditions but that the areas of pasture should be subject to evaluation if they were to be developed.

- 6.7.11 No further assessment of potential archaeological effects will be undertaken, however an archaeological watching brief will be undertaken during the construction phase. If identified as sensitive visual receptors, effects on views from and the setting of listed buildings in Piddington will be assessed further.

### Graven Hill

#### **Existing conditions**

- 6.7.12 There are no known sites or findspots within the site itself, however, the western edge of the site lies within 250m of the Roman Town of Alchester (SAM OX18). This includes the remains of a small fort built for a detachment from a main Legion and its associated town, with a cemetery to the east. There is also evidence of further Iron Age to Romano-British settlement to the north. There is, therefore, some potential for archaeological features, associated with the Roman Town of Alchester, to extend to within the site. Recent geophysical survey by Archaeological Surveys Ltd has shown results consistent with Romano-British activity extending into the eastern edge of the Graven Hill site.
- 6.7.13 In the vicinity, there is varying evidence for archaeological sites. It has been proposed that the site of Graven Hill is an Iron Age fort although there is no archaeological evidence to support this. The suggested line of the Roman road, Akeman Street, is believed to extend across the north of the site towards the Roman Town of Alchester. To the north east of the site, are the remains of the Deserted Medieval Village of Wretchwick (SAM 2B14B).
- 6.7.14 Informal consultation with the County Archaeologist's office at Oxfordshire County Council suggested that existing development within the Depot/Barracks would be unlikely to attract much archaeological interest as it is felt that the existing development and its supporting infrastructure will have truncated any remains. However, the recent geophysical survey does demonstrate the potential for remains to survive where the ground has not been significantly disturbed.
- 6.7.15 The geophysical survey located a number of positive linear anomalies within Field 1, on the north-west boundary, closest to the archaeological remains associated with Alchester and its surrounding environs. These anomalies appear to relate to cut ditch-like features which are probably archaeological remains themselves. The remaining survey areas contained widespread magnetic debris and disturbance indicating the presence of buried strongly magnetic objects and material, as well as modern features such as services. With the exception of Field 1, no other anomalies of archaeological potential could be confidently



identified although a number of anomalies of uncertain origin were located. Early archaeological field evaluation of these anomalies will confirm or deny their archaeological nature.

- 6.7.16 Currently, none of the identified remains offer cause for significant concern. Early evaluation to test the results of the geophysical survey will provide data on the significance of any remains. While further work to clear the site with appropriate archaeological mitigation is required, currently none of the potential remains appear to be an impediment to development.

### Potential impacts and significance

- 6.7.17 Table 6.19 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.19: Potential impacts and their likely significance**

Receptor	Potential impact	Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Linear anomalies in Field 1	Damage from demolition /construction activities.	Unlikely to be significant – controls can be implemented.	The area is left in its current state on the development master plan. Fence off area during demolition/ construction to prevent unauthorised use as stores, vehicle park etc.
The other geophysical survey areas.	Damage from demolition /construction activities.	Unknown at this stage - will require further archaeological works.	Evaluate to assess significance and develop any subsequent necessary mitigation.
<b>Operational Phase</b>			
Linear anomalies in Field 1	Damage from unauthorised disturbance.	Unlikely to be significant	Ensure fencing and/or signage is in place if deemed necessary.
Scheduled Monuments (SMs)	The development will have no direct impact on any SMs, however, there is potential effect on the setting of the SM at Alchester Roman	Unknown	The setting of SMs is a consideration in the planning process and the potential effects will be assessed further. The master plan will incorporate measures (such as retention of existing and



Receptor	Potential impact	Significance of effect	Mitigation/Controls
	Town to the south-west if the views to the surrounding landscape are affected.		implementation of new planting) to avoid and reduce effects on the setting of the SM.
Listed Buildings (LBs)	The development will have no direct impact on any LBs. However, there may be settings issues if LBs outside the boundaries of the site are over-shadowed by new development, which could be considered visually intrusive.	Unknown	If identified as sensitive visual receptors, effects on the setting of LBs surrounding the site will be assessed further. The master plan will incorporate measures (such as retention of existing and implementation of new planting) to avoid and reduce effects on the setting of the LBs.

### Scope of further investigation

6.7.18 Further work is considered necessary at Graven Hill site in areas where anomalies have been identified from the geophysical survey, or where survey was not possible due to ground conditions to characterise any remains present and to assess their significance, in line with PPS5. Potential effects on the setting of the SM at Alchester and the nearby LBs will be discussed with the LPA and assessed if required. Any archaeological works shall be to a Brief established by Defence Estates Historic Environment Adviser and conform to industry standards, as set out in the Institute for Archaeologists *Standard & Guidance for Archaeological Field Evaluation* (2008). This work will be taken forward in the EIA and results detailed in the ES.

### C-Site

#### Existing conditions

6.7.19 There are no Scheduled Ancient Monuments or Listed Buildings within C-site but there are nearby sites that could affect proposals for the site.

6.7.20 Within C-site, there are two areas classed as sites of archaeological interest; one area is adjacent to the site and one encompasses part of the north of the site. The areas of rough pasture have no archaeological data because they have not been disturbed in recent years and no archaeological surveys have been carried out. Aerial photographs consulted for this study showed nothing, although neither the vegetation cover nor the geology is ideal for air

photo results. Whilst further archaeological investigations (geophysical surveys and trial trenching) would provide more information about the archaeological baseline conditions at the site recent discussions with Richard Oram, County Archaeologist have indicated that such investigation would not be required for the outline planning application.

### Potential impacts and significance

6.7.21 Table 6.20 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.20: Potential impacts and their likely significance**

Receptor	Potential impact	Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Archaeological remains	Damage from demolition /construction activities.	Unlikely to be significant.	If required, further investigation and / or an archaeological watching brief will be implemented through planning conditions.
<b>Operational Phase</b>			
Archaeological remains	Damage from unauthorised disturbance	Unlikely to be significant	Ersure fencing and/or signage is in place if deemed necessary.
Scheduled Monuments (SMs)	The development will have no direct or indirect impact on SMs	None	N/A
Listed Buildings (LBs)	The development will have no direct impact on a LB. However, there may be effects on the setting of LBs along Ploughley Road.	Unknown – depends if the new buildings will be higher than existing.	If identified as sensitive visual receptors, effects on the setting of LBs surrounding the site will be assessed further. The master plan will incorporate measures (such as retention of existing and implementation of new planting) to avoid and reduce effects on the setting of the LBs.

### Scope of further investigation

6.7.22 There are unlikely to be serious archaeological effects arising at this site. The response of the County Archaeologist was that areas of previously developed ground would be unlikely to

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incur archaeological conditions but that the areas of pasture should be subject to evaluation if they were to be developed.

- 6.7.23 No further assessment of potential archaeological effects will be undertaken in support of the outlined planning application, however if required, further investigation and/or an archaeological watching brief will be undertaken prior to or during the construction phase. If identified as sensitive visual receptors, effects on the setting of LBs surrounding the site will be assessed further.



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## 6.8 LANDSCAPE

### Introduction

- 6.8.1 A landscape and visual appraisal was undertaken by Entec UK Limited in July 2010 for the proposed development sites which has been used to inform this section of the scoping report. The purpose of the appraisal was to outline the key characteristics and qualities of the existing landscape and visual environment within and surrounding each site to provide good sustainable design principles during the master planning process of the proposed developments and provide initial baseline data for future landscape and visual appraisal/assessment of the proposed developments.
- 6.8.2 There are no landscape designations covering the sites or the adjoining land. The Upper Thames Tributaries Environmentally Sensitive Area (ESA) surrounds the sites, however, this is a scheme to encourage farmers in the sensitive management of the grassland and surrounding features of the area and does not impact on the MOD sites.
- 6.8.3 The sites lie within the National Character Area of 'Upper Thames Clay Vales' and the Local Character Area, 'Otmoor Lowlands'. This area forms part of a larger belt of clay lowland that links the Cambridgeshire Claylands to the Avon Vales. This area consists of a broad loosely-defined clay belt of open, gently undulating lowland farmland and major river valley floodplains. The clay Vales are bounded by the limestone scenery of the Cotswolds to the north and the narrow limestone outcrop of the Midvale Ridge to the south (Natural England, Character Area 108). These landscape characteristics must be considered as part of any proposed development in line with Regional and Local planning policies. See also the References Section 8 for other sources of information used to compile this report.
- 6.8.4 The landscape issues for each of the sites are detailed separately below.

### A-site

#### Existing conditions

- 6.8.5 The site is predominantly flat and is surrounded by mixed use agricultural land of pasture and arable separated by hedgerows with trees.
- 6.8.6 The site itself comprises a large number of storage buildings with maximum heights ranging between 12 and 15m, hard-standing areas and an internal rail network connecting it to the other MOD sites in the area. A line of high voltage overhead cables with pylons passes through the north-west of the site and across the agricultural land to the north. There is a



large amount of vegetation, individual trees (some of which have been identified as 'Priority A', in the arboriculture survey) and woodland blocks within the site that acts as a screen, limiting the visual impact of the site to users of the surrounding areas. The principal views of the site are from B4011 Road, Widnell Lane, a limited number of residential properties in Piddington, and from the Public Rights of Way running along the ridgeline of both Muswell Hill and Arncott Hill. Muswell Hill forms part of a designated Area of High Landscape Value and Area of Attractive Landscape; from this location the rooflines of existing buildings within A-site are visible.

- 6.8.7 The landscape quality of the site is currently to be considered as low. New development will need to be sensitive to the character of the surrounding rural landscape.

#### Potential impacts and significance

- 6.8.8 Table 6.21 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

Table 6.21: Potential effects and their likely significance

Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
People	Temporary visual impact during demolition/construction stage.	Unlikely to be significant - the proposed works are temporary. The views into the site are limited due to the existing screening provided by vegetation.	Construction contractors will be required to adopt the Considerate Constructor Scheme. The master plan will retain areas of vegetation.
<b>Operational Phase</b>			
People	Changes in views due to redevelopment of the site.	Unknown – the design of the proposed development could utilise existing screening and incorporate additional screening.	8.4ha of woodland (existing and new) has been included on the master plan around the site boundary to act as a screen for the site – the indicative land use plan sites buildings on the existing footprints and therefore the layout is:

Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
			unlikely to change from the current layout. Height of the new buildings will be of a similar height as the existing buildings. Sensitive landscaping and the colours and finishes to the new development could minimise impact to the views from Muswell Hill and Arncliffe Hill.
Local Landscape Character	Not in keeping with character of the area.	Unlikely to be significant.	The characteristics of the area must be considered in the development proposal. As above, sensitive landscaping will be required.
Biodiversity (See Biodiversity Section 6.6).	Potential to support and enhance biodiversity.	Potentially significant (beneficial) – design of the development could integrate benefits to biodiversity.	The species mix for new woodland planting should reflect the character of local woodlands ideally using local stock. Potential to provide wildlife corridors and other habitat features within the site.

#### Scope of further investigation

6.8.9 The results of the assessment indicate that the effects to the landscape are unlikely to be significant. The opportunities to consider landscape at the design stage and the mitigation proposals identified in the above table should be sufficient to address any negative effects of the proposed development and potentially improve the landscape features of the site. No further assessment will be undertaken for A-site for landscape issues. The Landscape and Visual Appraisal will be submitted with the ES in support of the Planning Application.

#### Graven Hill

##### Existing conditions

6.8.10 The site is relatively flat and surrounds Gravenhill Wood which is 115m AOD. The majority of the site is surrounded by agricultural land. Bicester's main railway line runs along the west border of the site with a sewage works just beyond.

6.8.11 Below the hill, along the lower level of the site are large warehouses, hardstanding, railway infrastructure surrounded by large areas of mown grass, random tree planting, woodland plantations at various locations and along the north-west boundary. The southern edge of the

site borders the flat plain of the River Ray, while the northern edge borders a more enclosed vegetated landscape of enclosed fields which adjoin the urban edge of Bicester. St David's Barracks is located on the wooded upper south west facing slopes of the hill itself. There is a general lack of landscape structure or strong landscape features within the features apart from the hill itself.

- 6.8.12 The views in to the north of the site are limited due to the level of vegetation at the boundary acting as a screen. The main receptors with proximate and distant views in to the rest of the site are, Ploughley Road, the Public Right of Way on the west of the site, Wretchwick Farm (with historic site), residents of Ambrosden Village, the road linking Ambrosden with Merton and longer distant views from Arnott Hill and the M40.
- 6.8.13 The landscape value of the site is considered to be medium due to the ancient woodland of Gravenhill. New development will need to be sensitive to the character of the surrounding rural landscape.

#### Potential impacts and significance

- 6.8.14 Table 6.22 below sets out the receptors with potential to be affected by the proposed development, the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.22: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
People	Temporary visual impact during demolition/ construction stage	Unlikely to be significant - the proposed works are temporary.	Adoption of Considerate Constructor Scheme.
<b>Operational Phase</b>			
People	Changes in views due to redevelopment of the site.	Potentially significant (beneficial and negative)	Development should be concentrated in the lower levels of the site to minimise intrusion to the surrounding landscape.  Areas of woodland and public open space have been factored into the



Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
			<p>master plan that benefits both landscape and wildlife.</p> <p>Height of the new buildings will be agreed with CDC with intention of minimised visual impact.</p> <p>There is opportunity to ensure that landscaping and the colours and finishes to the new development could improve the area and minimise impact to the views from the surrounding receptors.</p> <p>Part of site will be developed further up the hill than has been done previously – this potential impact will be further assessed for its significance in accordance with the Guidance for Landscape and Visual Assessment.</p>
Local Landscape Character	Not in keeping with character of the area.	Unknown at this stage of assessment.	The characteristics of the area must be considered in the development proposal. The development on the hill will require further assessment.
Biodiversity (See Biodiversity Section 6.6)	Potential to support and enhance biodiversity.	Potentially significant (beneficial) – design of the development could integrate benefits to biodiversity.	The species mix for new woodland planting should reflect the character of local woodlands ideally using local stock. Potential to provide wildlife corridors and other habitat features within the site.

### Scope of further investigation

6.8.15 The results of the assessment indicate that effects to the landscape have the potential to be beneficial, there are opportunities to consider landscape at the design stage and mitigation has been identified in the above table. However, it is proposed to develop further up the hill in the centre of the site and further investigation will be required to determine the significance of effects and will be undertaken in accordance with Guidelines for Landscape and Visual Assessment. The receptors whose views will be assessed and any requirement for



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photomontages will be agreed in advance with a Landscape Officer from CDC; the potential visual receptors are detailed in the attached Landscape and Visual Appraisal attached at Annex G.

### C-site

#### **Existing conditions**

- 6.8.16 C-site is relatively flat and is principally surrounded by flat arable land apart from the embankments of the M40 to the west and south of the site.
- 6.8.17 The site comprises mainly buildings, both large and small, hardstanding areas, and an internal railway. The areas between the infrastructures are covered with amenity grassland, scattered scrub and some vegetated ditches and ponds in the north of the site. There is dense scrub/tress along the boundary to the north and west of the site which acts as a screen limiting local views from the neighbouring footpath. With respect to distant views, the roofs can be seen from the road linking Ambrosden with Merton. These are seen as large grey masses within a low lying rural landscape.
- 6.8.18 There are a number of receptors in the surrounding area with views into the site; principal views are from the pub along Ploughley Road, Merton Road to the west, the Public Right of Way also to the west and the residential area to the east of the site. Most views into the site are limited by the existing screening at the boundary but this could be enhanced along the east of the site by the residential area.
- 6.8.19 There is little of landscape value within the site apart from the trees along the boundary and a number of trees that have been identified for retention. New development will need to be sensitive to the character of the surrounding rural landscape.

#### **Potential impacts and significance**

- 6.8.20 Table 6.23 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.23: Potential impacts and their likely significance**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
People	Temporary visual impact during demolition/construction stage.	Unlikely to be significant - the proposed works are temporary. The views into the site are limited due to the existing screening provided by vegetation.	Adoption of Considerate Constructor Scheme.
<b>Operational Phase</b>			
People	Changes in views due to redevelopment of the site.	Unknown – the design of the proposed development could utilise existing screening and incorporate additional screening.	<p>Retention of existing woodland has been included on the master plan around the site boundary to act as a screen for the site - buildings should be sited to make best use of this screening.</p> <p>Additional proposed tree planting has also been included on the master plan to further screen the site.</p> <p>Height of the new buildings will be of a similar height as the existing buildings.</p> <p>Sensitive landscaping and the colours and finishes to the new development could minimise impact to the views from the surrounding receptors.</p>
Local Landscape Character	Not in keeping with character of the area.	Unlikely to be significant.	The characteristics of the area must be considered in the development proposal. As above, sensitive landscaping will be required.
Biodiversity (See Biodiversity Section)	Potential to support and enhance biodiversity.	Potentially significant (beneficial) – design of the development could integrate benefits to	The species mix for new woodland planting should reflect the character of local woodlands ideally using local stock. Potential to provide

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
6.6)		biodiversity	wildlife corridors and other habitat features within the site.

#### Scope of further investigation

6.8.21 The results of the assessment indicate that the effects to the landscape are unlikely to be significant. The opportunities to consider landscape at the design stage and the mitigation proposals identified in the above table should be sufficient to address any negative effects of the proposed development and potentially improve the landscape features of the site. No further assessment will be undertaken for C-site for landscape issues. However, the potential effects on visual receptors will be assessed further. The visual receptors will be agreed in advance of the assessment with Cherwell DC. The Landscape and Visual Appraisal will be submitted with the ES in support of the Planning Application.



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## 6.9 SOCIO ECONOMICS

### Introduction

- 6.9.1 The purpose of this section of the report is to identify the scope of the assessment in relation to socio-economic effects which include for example, potential effects on local people using local services and facilities (i.e. schools, health care facilities and leisure facilities), local people in terms of local housing need and effects on local people in terms of the local economy and employment rates.
- 6.9.2 It was considered more appropriate to address all sites together for this topic but it is particularly relevant to the Graven Hill site due to its proximity to the villages of Ambrosden and Langford and Bicester town centre.
- 6.9.3 The following national planning policies are relevant to the assessment of socio-economic effects:
- PPS1: Delivering Sustainable Development;
  - PPS3: Housing;
  - PPS7: Sustainable Development in Rural Areas; and
  - PPG17: Planning for Open space, Sport and Recreation.
- 6.9.4 See also the References Section 8 for other relevant sources of information.

### Existing conditions

- 6.9.5 There are no community facilities within any of the sites as they are mostly used by the military for storage and warehousing purposes. No Public Rights of Way exist within the sites. Therefore, the baseline information has concentrated on those facilities in the areas surrounding the sites. The following issues have been considered: education, health, retail, sports and recreation and community safety.

### Education

- 6.9.6 Table 8.24 lists the closest schools to the Graven Hill site, the current number of pupils and estimated spare capacity in these schools.

Table 6.24: Existing school provision

School	School type & age range	Number of pupils#	Total Capacity#	Space capacity#	Spare capacity in 2011 *
Langford Village Community School	Primary (4 to 11 years),	530 pupils	420 places	110 places	39 places
Five Acres Primary School, Ambrosden	Primary (5 to 11 years),	265 pupils	252 places	13 places	63 places
Bicester Community College	Secondary (11 to 18 years),	1119 pupils	1414 places	295 places	59 places
The Cooper School, Bicester	Secondary (11 to 16 years)	926 pupils	1129 places	203 places	117 places
* OCC, Oxfordshire Schools Organisation Plan 2004-2009					
# Department of Education, Edubase2					

6.9.7 The information in the above table indicates that there is no capacity at the closest primary schools to the Graven Hill and that capacity is less than predicted in the Schools Organisation Plan. The reverse is true for the secondary schools in Bicester.

#### Health

6.9.8 The nearest doctors' surgeries to Graven Hill are Langford Medical Practice (7 doctors) which also has a branch in Ambrosden village centre (4 doctors). There are a further four doctors' surgeries in central and northern Bicester and six dental practices in and around Bicester town centre. Bicester Community Hospital provides a minor injuries unit.

#### Retail

6.9.9 Bicester's retail provision is concentrated in the town centre (500m from north of Graven Hill site) as well as in Bicester Village, an outlet shopping centre comprising 135 retail units, located to the south of the town centre and adjacent to the A41. A study in 2007, (Cherwell District Council (CDC), 2007, Bicester Town Centre Health Check 2007) found that there are approximately 76 retail units in the town centre, the majority of which are for retail use (A1), with other uses comprising restaurants, cafes and drinking establishments, financial and professional services, charity shops and hot food takeaway. The town centre provides a selection of foodstore operators, mixed goods retailers and fashion retailers with independent and niche retailing located mainly on the periphery of the town centre in Wesley Lane, Deans Court and Evans Yard. Planning permission has also been granted to redevelop parts of the town centre to the rear of Sheep St, and east of Manorsfield Road to provide a new supermarket, a seven screen cinema, a range of further shops and restaurants, 560 new

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public car parking spaces, replacement bus stops and other public facilities. Within Ambrosden there is a local Spar shop, as well as a Post Office and small shop.

#### Sports and recreation

- 6.9.10 Sports and recreation facilities in and around Bicester include Bicester Leisure Centre in the centre of the town which provides a swimming pool, gym, group exercise studio, sports hall, squash courts Floodlit 5-a-side astro turf pitches, activity hall and 10 pin bowling alley. Studies investigating the existing provision, current and future needs in relation to sports pitches<sup>8</sup> and green spaces on behalf of CDC have shown that currently, there is a need for junior football and rugby pitches in the Bicester area. In the future, it is estimated that there will be a need for some junior football, mini-soccer, a cricket and a rugby pitch in the Bicester South and Ambrosden and Chesterton wards. Graven Hill site lies within the Ambrosden and Chesterton ward, whilst Bicester South is to the north of A and C sites.
- 6.9.11 Studies into the provision of green spaces<sup>9</sup> have shown that within the rural south area (which all proposed redevelopment sites lies within) there is a need currently for natural/semi-natural greenspaces, amenity green space and play spaces with further needs predicted in the future up to 2016.
- 6.9.12 Within Ambrosden, there is an Army Education Centre, which has an Army Learning Centre and library available for all Serving Personnel and their dependants to use, as well as Civil Servants working in the Garrison area. The Garrison also has a gym, indoor sports hall and Indoor heated Swimming pool.
- 6.9.13 There are no PRoWs within any of the sites due to their military use. There are PRoWs adjacent to the north of A-site, west of C-site and to the south of Graven Hill site.

#### Employment/economy

- 6.9.14 Table 6.25 indicates that for the wards which the sites fall within (Launton and Ambrosden and Chesterton) there are lower levels of unemployment than within Cherwell and the country as a whole.

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<sup>8</sup> CDC, 2008, Playing Pitch Strategy Background Document

<sup>9</sup> CDC, 2008, Green Space Strategy



**Table 6.25: Employment statistics**

	Launton Ward	Ambrosden and Chesterton Ward	Cherwell	Great Britain
Economically active (of working age population, 2001)	66.7%	89.6%	63.8%	76.0%
In employment (of working age population, 2001)	64.6%	87.6%	61.5%	71.6%
Unemployed (of economically active, 2001)	3.2%	2.2%	2.7%	5.8%
JSA Claimants, Oct 2010	1.0%	0.7%	1.7%	3.5%
Source: NOMIS Official Labour Market Statistics				

### Community safety

6.9.15 The Sustainability Appraisal (SA) of the emerging Cherwell Core Strategy notes that *"crime is not a major issue in Cherwell, but is higher in Banbury and Bicester than in the rural areas."* The SA Scoping Report identifies the following characteristics of crime in Cherwell:

- the overall level of crime in Cherwell is low;
- the levels of crime have remained significantly lower than the Thames Valley, South East Region and England and Wales;
- crime in parts of Cherwell, particularly Banbury, is an issue; and
- the fear of crime in Cherwell is comparable to that of the Thames Valley Area.

6.9.16 The SA Scoping Reports indicates that across Cherwell between 1998 and 2001, 22% of offences occurred within the urban areas of Bicester (as opposed to 43% in urban areas of Banbury) and 8% within the rural areas of Bicester. Public perceptions of crime within Bicester were around drug use, vehicle crime (around M40 service area) and public nuisance and damage.

### Factors influencing future baseline conditions

6.9.17 There are several consented developments in the area surrounding the proposed development. The potential influences these developments could have on future baseline conditions are summarised below.

- Land to South and East of the A41: this development would create new employment opportunities for the local community.
- Immigration Centre within A-site: this may create some new jobs in the local area.
- Kingsmere/Bicester South West: this mixed use development would create new houses, including affordable homes, addressing local housing needs. The associated increase in population could increase demands on local educational, leisure, recreation and health services. However, the development will include three schools, open spaces and community and recreational facilities which are likely to accommodate this increase in

demand for services. The development will also include employment development which again would create new employment opportunities for the local community.

- Oxford – Bicester Rail link improvements: this will improve rail access for the existing local community.

### Potential impacts and significance

6.9.18 Table 6.26 below sets out the receptors with potential to be affected by the proposed development; the potential effects that could occur at both the construction and operational phases; whether or not these effects are likely to be significant; and the mitigation and controls that would be incorporated into the proposed development (both the design and management) to mitigate or avoid environmental effects. Where the significance of an effect is unknown at this stage, that effect will be taken forward and assessed in further detail in the EIA.

**Table 6.26: Potential impacts and their likely significance (all sites)**

Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
<b>Demolition/Construction Phase</b>			
Local economy and existing community	Creation of new jobs as a result of the demolition/construction of proposed development	Unlikely to be significant. The scheme will be built over several years. Although the proposed development could create some local construction jobs, the numbers created are unlikely to result in significant effects on the local economy.	None
Existing local community	Potential effects upon health created by demolition/construction work and disruption.	See section 6.3 (noise) and 6.4 (air quality).	See section 6.3 (noise) and 6.4 (air quality).
<b>Operational Phase</b>			
Local economy and existing community	Creation of new jobs and provision of new premises allowing new companies to re-locate to Bicester.	Potentially significant (beneficial)	The master plan for each site will include land to be developed as B1, B2 and B8 employment uses.

Receptor	Potential Impact	Likely Significance of effect	Mitigation/Controls
Local economy and existing community	Effects of spending by people employed within the proposed development (induced effects) and indirect effects (the effects through the supply chain of businesses operating within the proposed development)	Unknown at this stage of the assessment.	None at this stage of the development design.
Existing local community	Increased demand for and usage of existing indoor and outdoor sports and recreation facilities.	Unlikely to be significant as the scheme will include measures to prevent significant effects occurring.	In consultation with CDC, and in accordance with planning policy and guidance and studies completed by CDC the Scheme design for the north of the Graven Hill site will include facilities such as sports pitches and childrens play areas which will help to absorb the increased demand for such facilities.
Existing local community	Increased demand for and usage of green and open spaces.	Potentially significant (beneficial)	The master plan for the Graven Hill site will open up Gravenhill Wood to the public as well as opening up previously inaccessible land within the site. Opening up this woodland to the public could have beneficial effects for the local community.
Existing local community	Increased demand for and usage of health services.	Unlikely to be significant as the scheme will include measures to prevent significant effects occurring.	Significant effects will be avoided. The master plan will include space for a health centre, or if appropriate, developer funding will be provided towards local health services.
Existing local community	Increases in the number of children living in the local area could have an effect on local schools.	Unlikely to be significant as the scheme will include measures to prevent significant effects	In consultation with the Local Education Authority, the master plan design for the north of Graven Hill site will include space for a primary school, or developer



Receptor	Potential impact	Likely Significance of effect	Mitigation/Controls
		occurring.	funding will be provided to expand existing local schools in order that significant effects on local schools are avoided.
Existing local community	Potential effects on the local community (and their ability to purchase/rent properties) as a result of changes in the availability of new housing.	Unknown at this stage of the assessment.	The scheme will include affordable housing. The mix, type and amount of affordable housing will be agreed in consultation with CDC.

### Scope of further investigation

6.9.19 In summary the effects which will be assessed further are:

- potential direct, indirect and induced effects on the local economy and community as a result of increased population and the potential creation of new jobs;
- potential beneficial effects on the local community as a result opening up previously inaccessible green spaces, such as Gravenhill Wood; and
- potential effects on the local community and housing needs as a result of the provision of new housing including affordable housing.

6.9.20 These potential effects will be taken forward in the EIA and detailed in the ES, they will be assessed as follows.

- **Employment and economy:** The number of jobs that the proposed development would create will be estimated by defining the population associated with the amount and type of housing provided in the proposed development, and in turn the potential labour supply. The potential job yield from the proposed level of employment floorspace will then be derived and compared with the labour supply to provide an idea of the level of self-containment that the proposed development might be able to achieve. An assessment of the level of indirectly generated jobs that would be created in the wider region through analysing potential multiplier effects (the 'external' employment generated through induced and indirect multiplier effects) will also be undertaken.
- **Open spaces:** The information set out in CDC's Green Space Strategy and background document will be used to identify the current amount of open space within the study area and current and future needs for green spaces. The population predictions for the

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proposed development will be used to determine the change in the number of people per hectare of open space once the Scheme is complete, taking into account the provision of green space within the proposed development. The assessment will also take into account the changes in population and green spaces brought about by other consented developments in the study area as part of the future baseline conditions.

- **Housing:** Population predictions and housing need identified through CDCs Local Development Framework documents (e.g. Cherwell Housing Needs Assessment) will be used to identify the likely demand for housing, taking into account other consented developments in the study area. The amount of housing that will be provided by the proposed development will then be compared against this demand to determine what effects will occur.

6.9.21 The determination of the significance of effects will be based on the use of professional judgement, with reference where appropriate, to the extent to which the population will be affected by changes that are expected to result from the proposed development, the sensitivity of the receptors to the changes that are likely to occur, and the likely magnitude, duration and other characteristics of the effects. What can be considered significant at one geographic level (e.g. the ward), may not be considered significant at another (the District and sub-region). Therefore, the assessment of significance will also consider both the geographic extent of the effects and the likely significance of the effects within particular geographic levels. For socio-economic effects, the significance of an effect may be guided by the policy importance of the effect and judgement will be required to assess how an effect may either contribute or be counter to policy objectives.

## 6.10 CUMULATIVE EFFECTS

### Introduction

6.10.1 It is a requirement under the EIA Regulations that the characteristics of projects must be considered having regard to the cumulative effects of individual impacts, for example noise, dust and visual impacts from the proposed development on a receptor and also the combined impacts with other proposed development projects in the area.

6.10.2 There is relatively little guidance on the approach to assessing cumulative effects. However, the consultation draft Circular on Environmental Impact Assessment<sup>12</sup> states that *“there are occasions where the existence of other development may be particularly relevant in determining whether significant effects are likely, and local planning authorities should always have regard to the possible cumulative effects with any existing or approved development. Generally, it would not be feasible to consider the cumulative effects with other applications which have not yet been determined, since there can be no certainty that they will receive planning permission”*

### Existing conditions

6.10.3 The cumulative effects of individual impacts have been considered under the themes of the report where relevant, these will be expanded upon as required as further assessment and research is undertaken as part of the EIA.

6.10.4 Table 6.27 lists the current consented developments (including those which CDC have resolved to approve) in the vicinity of the sites, sourced from the Cherwell Planning Applications search page.

**Table 6.27: Current proposed development projects**

Application	Information on scheme	Application No	Consented?
Land To South And East Of The A41	Outline - Construction of a 60000 sqm business park incorporating offices (B1) and hotel (C1), parking for up to 1837 cars, associated highway, infrastructure and earthworks	07/01106/OUT	Yes (Oct 2010)
Immigration Centre within A-site	Demolition of existing buildings and erection of an Immigration Removal Centre including an Accommodation Building (seven wings plus a Central	08/02511/F	No (pending legal agreement –

<sup>12</sup> Department for Communities and Local Government, June 2006, Amended Circular on Environmental Impact Assessment: A Consultation Paper



Application	Information on scheme	Application No	Consented?
	Facilities Block) a Gate House, Visitor Centre and Energy Centre, car parking, access road, 5.2m fence and ancillary hard standing and landscaping		CDC has resolved to approve)
Kingsmere/ Bicester South West (Land At Whitelands Farm)	Outline - Up to 1585 no. dwellings; health village to include health and employment uses and elderly persons nursing home; B1 and B2 employment uses; local centre comprising of shops, a pub/restaurant, children's day nursery, offices and a community centre; 2 no. primary schools and 1 no. secondary school; a hotel; a sports pavilion; formal and informal open space; a link road between A41 and Middleton Stoney Road/Howes Lane junction; associated new roads, junctions, parking, infrastructure, earthworks and new accesses to agricultural land.	06/00967/OUT	Yes (2008) – some construction work has started
Oxford – Bicester Rail link improvements	Upgrade to railway – including section running north south by E site,	N/A	Yes

### Potential Impacts/Scope of further investigation

6.10.5 The impacts from the proposed developments will be assessed using the findings of the EIA technical studies and professional judgement. The consented developments to be considered in the assessment of cumulative effects will be agreed in advance of the assessment with the development control officer at CDC. It is proposed that the assessment of cumulative effects will take into account the effects from the development listed in Table 6.27 above.

6.10.6 A planning application was recently submitted for an 'Exemplar' development of approximately 400 residential properties and associated supporting infrastructure, facilities and open space which will comprise the first phase of the a large proposed eco-town to the north-west of Bicester which will comprise a total of up to 5000 residential properties plus employment land uses and associated infrastructure, open space and facilities. As this proposed development has not yet received consent from CDC it has not been included in Table 6.27. However it should be noted that Entec and Defence Estates are in consultation with Oxfordshire County Council highways to identify potential traffic modelling scenarios some of which will include predicted levels of traffic from the eco-town (as well as other consented development). This traffic modelling will be used to provide data for the traffic, air quality and noise assessments

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for the EIA and therefore, cumulative effects from eco-town, although not consented will be assessed in relation to these topics.

- 6.10.7 The approach will be to factor in the potential environmental effects from other committed developments within the study area into the future baseline conditions. The potential effects from the development in relation to those future baseline conditions will then be assessed both with and without the development.
- 6.10.8 The potential impacts and significance of cumulative effects of the proposed redevelopment will be taken forward in the EIA and results and any mitigation required will be addressed in the ES.

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## 7.0 SUMMARY AND CONCLUSIONS

7.1 The content of the ES will follow the requirements set out in Schedule 4 of the EIA Regulations. The following themes have been identified as requiring further work to determine whether the potential impacts are likely to be significant and will be scoped in to the Environmental Statement (ES):

- Travel and Transport (all sites)
- Noise and Vibration (all sites)
- Air Quality (all sites)
- Land Quality, Geology, and Soils (centre of Graven Hill site only)
- Natural Environment (all sites – species surveys)
- Cultural Heritage (all sites)
- Landscape (Graven Hill site only)
- Visual (all sites)
- Socio-economics (all sites)
- Cumulative Effects (all sites)

7.2 The baseline data obtained for the following themes has provided sufficient detail to identify that the effects are not likely to be significant. They will be detailed in the ES to demonstrate that they have been considered and that appropriate controls and mitigation have been identified to minimise any potential effect on the environment:

- Hydrology and Water Quality
- Land Quality, Geology and Soils (A-site, area surrounding Gravenhill Wood, C-site)
- Landscape (A-site and C-site)

7.3 The following table provides a summary of this scoping assessment.



Table 7.1: Summary of EIA scoping assessment

Theme	Site	Potential impacts	Significance	Proposed further work for EIA	ES
Travel and Transport	A	Increase in traffic; also resulting in increased air pollutants.	Unknown	A traffic assessment	Results will be detailed in the ES.
	Graven Hill	Increase in traffic; also resulting in increased air pollutants.	Unknown	A traffic assessment	Results will be detailed in the ES.
	C	Potential decrease in traffic due to centralising activities on to one site.	Unknown	A traffic assessment	Results will be detailed in the ES.
Hydrology and Water Quality	A	Decreased water quality; increased flooding risk; increase surface water run-off.	Unlikely to be significant	None	Mitigation measures will be detailed in the ES.
	Graven Hill	Decreased water quality; increased flooding risk; increase surface water run-off.	Unlikely to be significant	None	Mitigation measures will be detailed in the ES.
	C	Decreased water quality; increased flooding risk; increase surface water run-off.	Unlikely to be significant	None	Mitigation measures will be detailed in the ES.
Noise and Vibration	A	Increase in noise and vibration from activities; increased noise from increased traffic and rail; disturbance to wildlife.	Unknown	Noise monitoring work	Results will be detailed in the ES.
	Graven Hill	Increase in noise and vibration from activities; increased noise from increased traffic and rail; disturbance to wildlife; suitability of site for residential use.	Unknown	Noise monitoring work	Results will be detailed in the ES.
	C	Increase in noise and vibration from activities; increased noise from increased traffic and rail; disturbance to wildlife.	Unknown	Noise monitoring work	Results will be detailed in the ES.
Air Quality	A	Increased dust from construction; increase in air pollutants from additional vehicles.	Some unknown.	Further assessment of air pollutants from increased vehicle	Mitigation measures already identified will be detailed in the ES

Theme	Site	Potential impacts	Significance	Proposed further work for EIA	ES
Land Quality, Geology and Soils			some unlikely to be significant	emissions may be required if results of the traffic assessment indicates a 10% traffic increase.	along with the results from the additional assessments.
	Graven Hill	Increased dust from construction; increase in air pollutants from additional vehicles; odour annoyance from Bluester Wastewater Treatment Works (WWTW).	Some unknown, some unlikely to be significant	Odour assessment of WWTW. Further assessment of air pollutants from increased vehicle emissions may be required if results of the traffic assessment indicates a 10% traffic increase.	Mitigation measures already identified will be detailed in the ES along with the results from the additional assessments.
	C	Increased dust from construction; increase in air pollutants from additional vehicles.	Some unknown, some unlikely to be significant	Further assessment of air pollutants from increased vehicle emissions may be required if results of the traffic assessment indicates a 10% traffic increase.	Mitigation measures already identified will be detailed in the ES along with the results from the additional assessments.
	A	Health and safety risks; contamination of local water resources.	Unlikely to be significant	None	No
	Graven Hill	Health and safety risks; contamination of local water resources; health and safety risk from tip area.	Some unknown, some unlikely to be significant	LOA of centre of the site to be undertaken.	Mitigation measures for the tip area will be detailed in the ES along with the results from the additional assessment.
	C	Health and safety risks; contamination of local water resources.	Unlikely to be significant	None	No
Biodiversity	A	Disturbance to species, damage to habitats, damage to local designated sites.	Unknown	Species assessments to be undertaken.	Results will be detailed in the ES.
	Graven	Disturbance to species, damage to habitats.	Unknown	Species assessments to be undertaken.	Results will be detailed in the ES.

Theme	Site	Potential impacts	Significance	Proposed further work for EIA	ES
Historic Environment	Hill	damage to local designated sites.		undertaken.	
	C	Disturbance to species, damage to habitats, damage to local designated sites.	Unknown	Species assessments to be undertaken.	Results will be detailed in the ES.
	A	Disturbance to archaeological remains. Potential effects on the setting of listed buildings	Unlikely to be significant.	None (archaeology) Further assessment (listed buildings – if identified as sensitive visual receptors in the landscape and visual assessment)	Results will be detailed in the ES.
	Graven Hill	Disturbance to archaeological remains. Visual impact to Scheduled Monuments and Listed Buildings outside boundary of development.	Unknown	Further survey work.	Results will be detailed in the ES.
	C	Disturbance to archaeological remains. Visual impact to Listed Buildings outside boundary of development.	Unknown	Further survey work.	Results will be detailed in the ES.
Landscape	A	Impact on landscape. Potential improvements for biodiversity. Potential changes in views from sensitive visual receptors.	Unlikely to be significant (landscape) Unknown (visual)	Further assessment work (visual).	Landscape and Visual Impact Assessment to be attached with ES.
	Graven Hill	Visual impact on landscape. Potential improvements for biodiversity. Potential negative impact from development on the hill.	Unknown	Landscape and Visual Impact Assessment of the centre Graven Hill site.	Results will be detailed in the ES.
	C	Visual impact on landscape. Potential improvements for biodiversity. Potential changes in views from sensitive visual	Unlikely to be significant (landscape)	Further assessment work (visual).	Landscape and Visual Impact Assessment to be attached with ES.

Theme	Site	Potential impacts	Significance	Proposed further work for EIA	ES
		receptions.	Unknown (visual)		
Socio-Economics	All sites	Effects on local economy from creation of new jobs; creation of new open spaces; impact on housing availability including affordable housing.	Unknown	Further assessment work proposed.	Results will be detailed in the ES.
Cumulative Effects	All sites	Impacts from combined effects of air, noise etc.; impacts from other proposed developments in the area.	Unknown	Further assessment work proposed.	Results will be detailed in the ES.



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## 8.0 REFERENCES

8.1 The following Planning Policy Statements (PPSs) and Planning Policy Guidelines (PPGs) are some of the main documents to be considered in development proposals. It is not an exhaustive list:

- PPS1: Delivering Sustainable Development - sets out the Government's overarching planning policies on the delivery of sustainable development through the planning system.
- PPS3: Housing - underpins the delivery of the Government's strategic housing policy objectives.
- PPS5: Planning for the Historic Environment - sets out planning policies on the conservation of the historic environment.
- PPS7: Sustainable Development in Rural Areas.
- PPS9: Biodiversity and Geological Conservation - sets out planning policies on protection of biodiversity and geological conservation through the planning system.
- PPG13: Transport - objectives are to integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices both for carrying people and for moving freight.
- PPG17: Planning for Open space, Sport and Recreation.
- PPS 23: Planning and Pollution Control - is intended to complement the pollution control framework under the *Pollution Prevention and Control Act 1999* and the *PPC Regulations 2000*.
- PPG 24: Planning and Noise - guides local authorities in England on the use of their planning powers to minimise the adverse impact of noise.
- PPS 25: Development and Flood Risk - sets out Government policy on development and flood risk.

8.2 Regional Planning Policy is contained within the South East Regional Spatial Strategy which although was revoked in July 2010, challenges by GALA Homes (South) Ltd have reinstated Regional Spatial Strategies until the outcome of a hearing into the validity of written advice provided by the Government is known. The hearing is scheduled for January 2011. The Regional Spatial Strategy is therefore still part of the development plan and is a material consideration in determining planning applications.

8.3 Local Planning Policy is currently in draft in the form of Cherwell District Council Draft Core Strategy.

8.4 The Environment Agency (EA) produced a number of Pollution Prevention Guidelines (PPG) some of which includes:

- EA PPG 1 - General guide to the prevention of water pollution
- EA PPG 2 - Above ground oil storage tanks;
- EA PPG 3 - The use and design of oil separators in surface water drainage systems;
- EA PPG 5 - Works and maintenance in or near water;
- EA PPG 6 - Working at construction and demolition sites;
- EA PPG 8 - Safe storage and disposal of used oils;

8.5 The main MOD policy relating to the environment is contained within the following documents:

- MOD JSP 418: Sustainable Development and Environment Manual
- MOD JSP 382: Defence Lands Handbook

8.6 Other sources of information used in the collation of this report:

- Ministry of Defence Establishment Development Plan, 2008
- Defence Estates Contaminated Land Management - Land Quality Assessment (LQA) Management Guide
- Ministry of Defence Land Quality Assessment Summary Report, November 2010
- Flood Risk Assessment and Drainage Strategy Documents, Entec, October 2010
- Baseline Ecology Report, Entec, October 2010
- Magnetometer Survey Report, Archaeological Surveys Ltd, August 2010
- Landscape and Visual Appraisal Documents, Entec, October 2010
- Natural England's National Character Areas
- CIRIA Report C502: Environmental Good Practice on Site;
- CIRIA Report C532: Control of Water Pollution from Construction Sites;
- CIRIA Report C697: The SuDS manual;
- BS8031: 1981 Code of Practice for Earth Works;
- Good Practice Guide for Handling Soils (MAFF 2000); and
- Local and Regional Land Drainage Byelaws.
- The National River Flow Archive: [www.ceh.ac.uk/data/nfra.htm](http://www.ceh.ac.uk/data/nfra.htm)
- [www.metoffice.gov.uk](http://www.metoffice.gov.uk)
- [www.streetmap.com](http://www.streetmap.com), which displays Ordnance Survey mapping at 1:25,000 scale
- Emapaite GroundSure EnviroInsight Report, January 2010
- Environment Agency Source Protection Zone maps [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)
- Natural England <http://www.naturalengland.gov.uk>
- Noise Policy Statement for England, March 2010
- BS5228:2009 Code of practice for noise and vibration control on construction and open sites: Part 1 Noise & Part 2 Vibration
- BS8233:1999 Sound insulation and noise reduction for buildings - a code of practice

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- BS4142:1997 - Method for rating industrial noise affecting mixed residential and industrial areas
  - Calculation of Road Traffic Noise – CRTN (1988)
  - Design Manual for Roads and Bridges Vol 11 Environmental Assessment (2008)
  - Calculation of Rail Noise (1995)
  - World Health Organisation Guidelines for Community Noise (1999)
  - DIES Building Bulletin 93: Acoustic Design of Schools (2003)
  - 2010 *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*
  - Baseline Air Quality Conditions: LAQM reports from Cherwell District Council
  - Air Quality Monitoring Results: Results provided by Cherwell District Council
  - Background Air Quality Data: NETCEN mapped background air quality concentrations
  - Location of Receptors: OS Mapping provided by Client and online mapping sources
  - Baseline Odour Conditions: Survey of OS Mapping for potential sources