

Issue Date: June 2010	UNCLASSIFIED DIRECTORATE MAJOR PROJECT	Issue No: FINAL 2
13. Landscape and Visual	Hydrus Defence Exempt Environmental Appraisal Volume I	Reference: MER-110-009287

13. LANDSCAPE AND VISUAL

13.1 Introduction

This chapter of the Defence Exempt Environmental Appraisal (DEEA) summarises the landscape and visual effects associated with the Proposed Development. The chapter should be read in conjunction with *Technical Appendix E* of DEEA Volume II, which contains detailed technical information, figures and annexes.

The chapter has been prepared by RPS Group and provides a description and evaluation of the existing landscape on and around the Application Site and identifies visual receptors within the wider area. The baseline assessment has been used to assess both landscape and visual effects arising from the Proposed Development.

The impact assessment has considered both temporary (construction impacts) and permanent (operational impacts), together with the mitigation measures proposed to avoid or reduce potential adverse effects. The proposed permanent features will be located within the Hydrus Development Site. This chapter therefore focuses upon impacts arising from the Hydrus development Site as there is no change of use within WECE and CACE.

The Hydrus Development Site comprises an area of grassland interspersed with areas where previous structures have been demolished, access tracks, scattered deciduous trees and a small copse. It is located adjacent to the northern boundary of the AWE Aldermaston Site, within its less well developed eastern side.

13.2 Planning Policy Context

This section identifies the national, regional and local landscape policies that have informed the baseline assessment and subsequent landscape impact assessment for the re-development. The Application Site lies wholly within the county of Berkshire and administrative boundary of West Berkshire Council. The southern boundary of the AWE Aldermaston Site abuts the Hampshire County boundary and the Basingstoke and Deane District administrative area.

The Hydrus Development Site does not fall within any nationally or locally designated landscape areas. The North Wessex Downs Area of Outstanding Natural Beauty lies approximately 2.6km beyond the site boundary to the north, 13km to the west (within Berkshire) and over 5km to the south west (within Hampshire).

The District has been subject to various landscape character assessments to define and describe the area.

Landscape designations within the study area are shown on Figure 13-1: Environmental Designations.

13.2.1 National Context

13.2.1.1 PPS1: Delivering Sustainable Development

Planning Policy Statement 1 (PPS1) (Ref. 13-1) states that planning should "...protect and enhance the natural and historic environment, the quality and character of the countryside and existing communities". Planning policies should seek to "... protect and enhance the quality, character and amenity value of the countryside and urban areas as a whole." Planning authorities should seek to "... enhance as well as protect biodiversity, natural habitats, the historic environment and landscape and townscape character".

13.2.1.2 PPS7: Sustainable Development in Rural Areas

PPS7 (Ref. 13-2) sets out key principles at paragraph 1. In particular, points (iv), (v) and (vi) are of relevance to the Proposed Development:

"(iv)...the Government's overall aim is to protect the countryside for the sake of its intrinsic character and beauty, the diversity of its landscapes, heritage and wildlife, the wealth of its natural resources and so it may be enjoyed by all.

(v) Priority should be given to the re-use of previously-developed ('brownfield') sites in preference to the development of greenfield sites...

(vi) All development in rural areas should be well designed and inclusive, in keeping and scale with its location, and sensitive to the character of the countryside and local distinctiveness."

Paragraphs 21 to 23 address 'nationally designated areas' including Areas of Outstanding Natural Beauty which notes that they "have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty. The conservation of the natural beauty of the landscape and countryside should therefore be given weight in planning policies and development control decisions in these areas...as well as reflecting these priorities, planning policies in LDD's (Local Development Documents) and where appropriate RSS (Regional Spatial Strategies), should also support suitably located and designed development necessary to facilitate the economic and social well-being of these designated areas and their communities..."

13.2.1.3 Areas of Outstanding Natural Beauty

Areas of Outstanding Natural Beauty (AONB) are designated under the 'National Parks and Access to the Countryside Act (1949)' (Ref. 13-3) in order to conserve and enhance the country's finest landscapes.

The Hydrus Development Site lies outside of any areas of nationally or locally designated landscape.

At its closest point, the North Wessex Downs AONB lies just over 2.6km beyond the proposed Development boundary to the north. It sweeps in an arc around the Application Site to the north, west and south and extends across the counties of Berkshire and Hampshire.

The North Wessex Downs AONB Partnership published The Management Plan 2009 – 2014 in October 2009 (Ref. 13-4). The Management Plan deals with the AONB and its landscape character, and also sets out objectives in relation to

minimising indirect effects on the AONB from those areas outside it. Objective 13 states: "To ensure that the formulation and implementation of planning policies across the North Wessex Downs takes full account of the purposes of designation and the character and quality of the AONB and its setting". The Actions associated with this Objective include "Promote the use of Landscape Visual Impact Assessments for developments, including for those outside of but visible from the AONB, in order to maintain the area's distinctive character and setting" and "Encourage the use of planning briefs which guide developments within and on the edge of the North Wessex Downs and take account of AONB purposes."

Whilst the Hydrus Development Site is outside of the AONB, the effects on the visual amenity of views from the AONB have been considered in line with the objectives set out in the AONB Management Plan.

13.2.2 Regional Context

13.2.2.1 The South East Plan

The Regional Spatial Strategy for the South East of England (South East Plan) (Ref. 13-5) was adopted in May 2009. It sets out a vision for the South East region of England to 2026.

Policy C3: Areas of Outstanding Natural Beauty, states:

"High priority will be given to conservation and enhancement of natural beauty in the region's Areas of Outstanding Natural Beauty (AONBs) and planning decisions should have regard to their setting. Proposals for development should be considered in that context..."

The Hydrus Development Site is not located within or immediately adjacent to the boundary of the AONB.

Policy C4: Landscape and Countryside Management, states:

"Outside nationally designated landscapes, positive and high quality management of the region's open countryside will be encouraged ... In particular, planning authorities and other agencies in their plans and programmes should recognise, and aim to protect and enhance, the diversity and local distinctiveness of the region's landscape, informed by landscape character assessment. ...

Local authorities should develop criteria-based policies to ensure that all development respects and enhances local landscape character, securing appropriate mitigation where damage to local landscape character cannot be avoided."

The South East Plan also contains a number of cross-cutting policies, including policies CC6: Sustainable Communities and character of the environment and CC8: Green Infrastructure.

Policy CC6 states:

"Actions and decisions associated with the development and use of land will actively promote the creation of sustainable and distinctive communities. This will be achieved by developing and implementing a local shared vision which:

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i. respects, and where appropriate enhances, the character and distinctiveness of settlements and landscapes throughout the region

ii. uses innovative design processes to create a high quality built environment which promotes a sense of place. This will include consideration of accessibility, social inclusion, the need for environmentally sensitive development and crime reduction"

Policy CC8: states:

"Local authorities and partners will work together to plan, provide and manage connected and substantial networks of accessible multi-functional green space. Networks should be planned to include both existing and new green infrastructure. They need to be planned and managed to deliver the widest range of linked environmental and social benefits including conserving and enhancing biodiversity as well as landscape, recreation, water management, social and cultural benefits to underpin individual and community health and 'well being'. They will be created and managed as a framework of green spaces and other natural features that will boost the sustainable development of settlements and increase the environmental capacity of the locality and region as a whole, helping communities to be more resilient to the effects of climate change."

The provisions of this policy apply region-wide. However, the successful designation and management of green infrastructure will be particularly important in areas designated as regional hubs, where growth may impact on sites of international nature conservation importance or where there is a need to enhance the existing environmental capacity of an area."

13.2.3 Local Context

In accordance with the Planning and Compulsory Purchase Act 2004 (PCPA)(Ref. 13-6) local councils have reviewed their existing planning policies and any that are agreed with the Secretary of State to still be applicable have been 'saved' and continue to be a consideration for planning applications until they are replaced by the adopted Local Development Framework.

13.2.3.1 West Berkshire Local Plan

As required by the PCPA, West Berkshire Council (WBC) published its Saved Policies Written Statement in September 2007 (Ref. 13-7).

The status of West Berkshire policies of relevance to this landscape and visual impact assessment are:

- OVS.2 Core Policy – 'Saved'; and
- ENV.1 The Wider Countryside – 'Saved'

Policy OVS.2 states that development proposals should:

"... show a high standard of design including landscape treatment which respects the character and appearance of the area; and retain and protect important landscape and nature conservation features and provide for further landscape treatment where relevant to the safeguarding of local amenity ..."

Policy ENV.1 the Wider Countryside states:

"The Council in considering proposals for development will seek to conserve and enhance the special features and diversity of the different 'landscape character areas' found within West Berkshire."

Paragraph 2.11.3 of Saved Policies explains:

"The Local Plan policies highlight the importance of maintaining the diversity of character across the countryside as a whole. The 1993 District-wide Landscape Assessment identified twenty-one different landscape character areas... It is important that the character and diversity of these different areas is maintained and enhanced."

Paragraph 2.7.2 of the Saved Policies Written Statement notes:

"It is important that development does not contribute to detrimental changes in the landscape. There are opportunities within the development process and allocation of sites to conserve and enhance landscape character. The overall aim is to maintain or enrich the characteristic features which give each landscape its identity."

The 1993 Newbury District-Wide Landscape Assessment (Ref. 13-8) has been used to inform the baseline character assessment for the Proposed Development.

The Hydrus Facility utilises a previously developed site and includes a detailed landscape scheme to improve the setting of the development and to conserve existing landscape features to protect local amenity.

13.2.3.2 Basingstoke & Deane Borough Council Adopted Local Plan.

As required by the PCPA, Basingstoke and Deane Borough Council published details of its Saved Policies on 30 June 2009 (Ref. 13-9).

The Hydrus Development Site is located outside the Basingstoke and Deane Borough boundary. The policies contained within the Local Plan are, therefore, not directly applicable to the Proposed Development. The most relevant saved policy to inform and add context is Policy E6 – Landscape Character.

Policy E6 states that:

"Planning permission will only be granted where it is demonstrated that the proposals will be sympathetic to the landscape character and quality of the area concerned...Development proposals should...respect and improve...the particular qualities of the relevant Landscape Character Area as defined in the Basingstoke and Deane Landscape Assessment, visual amenity and scenic quality...the setting of a settlement, including important views to, across and out of settlements...the local character of buildings and settlements, including important open areas...trees, hedgerows, water features and other landscape elements and features".

13.3 Assessment Methodology and Significance Criteria

13.3.1 Approach

The main guidance used for this assessment is "Guidelines for Landscape & Visual Impact Assessment" (GLVIA) published by the Institute of Environmental Management and Assessment and The Landscape Institute (2002) (Ref. 13-10) and the "Landscape Character Assessment Guidance for England and Scotland" published by the Countryside Agency and Scottish Natural Heritage (2002) (Ref. 13-11).

13.3.2 Consultations

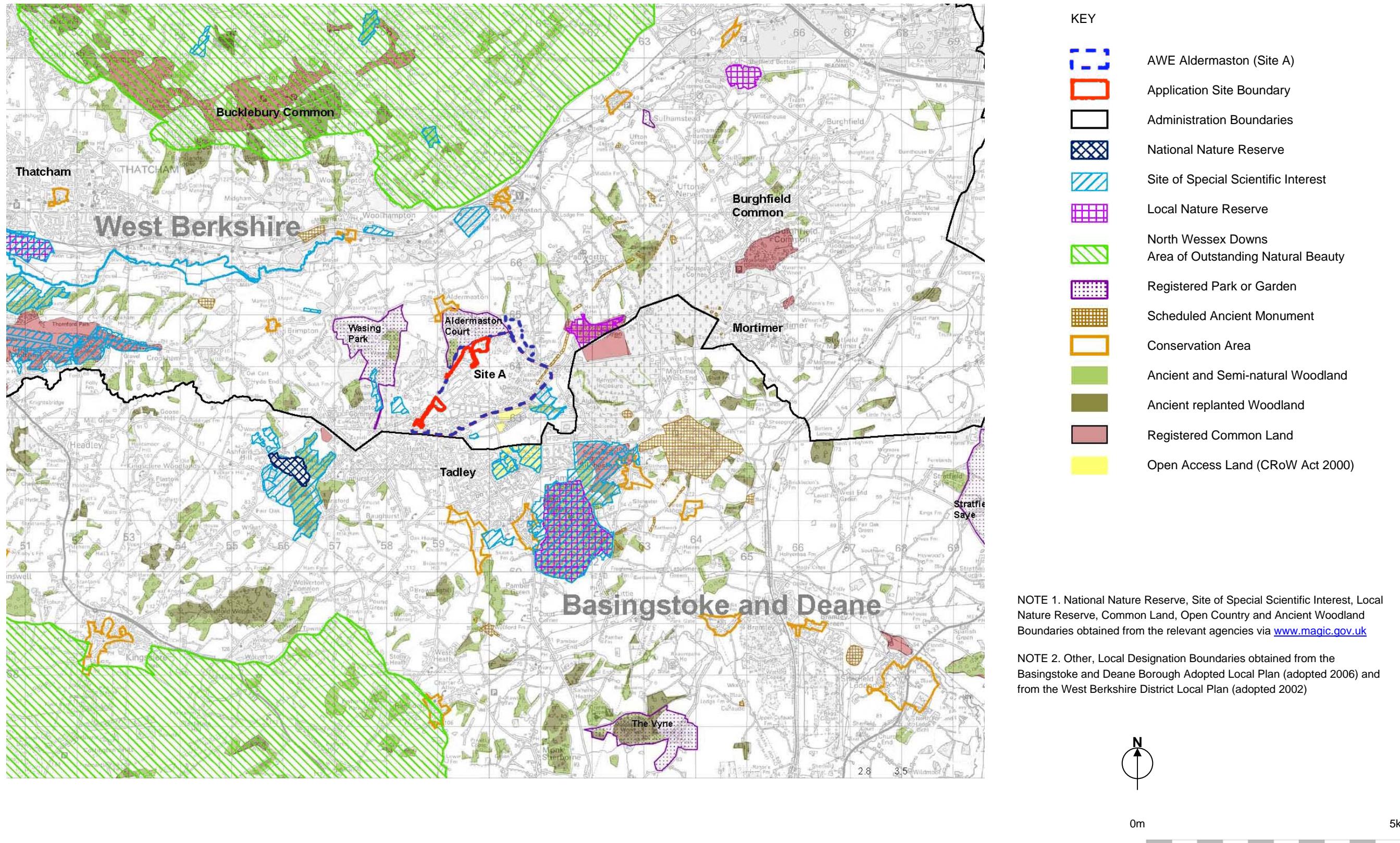
West Berkshire Council (WBC) has been consulted regarding the approach and methodology and baseline landscape character studies used for the assessment.

Pre-assessment consultations were held with WBC landscape advisor on the methodology, outline design proposals and potential effects. Key areas for consideration were identified as the effect of the proposals on Aldermaston Court and its grounds, and also on distant views from within the AONB to the north and south west of the Hydrus Development Site. These consultations, in particular, influenced the arrangement and orientation of the Operations Building, as described in Chapter 4: Alternatives and Design Evolution. In brief, the axial relationship between the Operations Building and the Lightning Protection System (LPS) and the truncated avenue of Oak trees that extends from Aldermaston Court towards the Hydrus Development Site was considered extensively to ensure that the layout of the Proposed Development was the most appropriate for the setting. At 12m tall (112.3m AOD), the Support Building may also be visible in some views. It was agreed that, in terms of visual impact from Aldermaston Court and its grounds, aligning the centre of the Operations Building along the axis of the avenue of Oak trees was preferable to an off-centre location.

A list of key viewpoints was agreed, and the locations from where photomontages or other illustrative material should be provided were also agreed.

The impact on the settings of the listed building and registered park at Aldermaston Court are considered within Chapter 14: Cultural Heritage and Archaeology of this DEEA. This landscape and visual impact assessment considers the visual impact on the hotel / conference centre and its grounds.

Figure 13-1: Environmental Designations



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13.3.3 AWE Aldermaston Context

Chapter 1: *Introduction* describes ongoing development projects within the AWE Aldermaston Site, including HEFF, NOA, Orion and Pegasus, and the associated West End Construction Enclave (WECE) and Central Area Construction Enclave (CACE).

The HEFF development was granted planning permission in February 2008 and construction is commencing in the eastern sector of AWE Aldermaston. Construction of NOA and Orion in the western part of AWE Aldermaston is complete. These have been included as part of the baseline for the purposes of this assessment. The WECE and CACE and associated construction access routes established for these developments will be used for the Proposed Development and are considered as part of the baseline scenario for this assessment. Also included in the baseline assessment is the proposed Pegasus development, located within the main industrial area within the west of the AWE Aldermaston Site, to the south of the Hydrus Development Site. Pegasus received planning permission in February 2010.

The landscape and visual assessment methodology used for this assessment is included in *Technical Appendix E.1* of Volume II of this DEEA. Assessment of the impact of the Proposed Development on historic character and the settings of Registered Parks and Gardens, Conservation Areas and Listed buildings is contained in *Chapter 14: Cultural Heritage and Archaeology*.

13.3.4 Assessment Methodology

13.3.4.1 Evaluation of the Existing Landscape and Visual Receptors

The first stage of the assessment has established the landscape and visual baseline on and surrounding the Hydrus Development Site through desktop studies and field surveys. Desktop studies have included a review of existing information from the Countryside Agency, and local planning documents, together with existing contextual survey reports for the Hydrus Development Site (as prepared by Atkins and RPS).

Baseline field surveys were undertaken in 2005, 2008 and 2009 which identified existing landform, significant vegetation, landscape character and the visual receptors within the study area.

The AWE Aldermaston Site Landscape Appraisal which was originally carried out in 2005 was updated in January 2009 and is included in *Technical Appendix E.2* of Volume II. A combination of the local Landscape Character Areas and the Site Specific Character Areas has been identified, defined and evaluated, to form the baseline landscape context for this landscape impact assessment.

The character areas have been classified in relation to current broad land-use, landform, and vegetation cover, together with other landscape characteristics within each landscape character area. The information collected in the field was recorded on survey sheets providing the opportunity to record both the objective elements within the landscape and the subjective impressions of the viewer (included in *Technical Appendix E.2*). An assessment was made as to the quality, value and sensitivity to change of the character area in question in accordance with the GLVIA, and a representative photograph was taken from each survey point wherever possible. This baseline information was then used to

describe the character of the landscape/townscape. Table 13-1 sets out the criteria and definitions which have been used to evaluate landscape condition/quality:

Table 13-1: Landscape Condition/Quality Criteria

Quality Classification	Evaluation Criteria
Exceptional	<ul style="list-style-type: none"> Beautiful, distinctive, unique or outstanding natural landscape character; Strong landscape structure, characteristics, patterns, balanced combination of landform and landcover; Good condition - appropriate management for land use and landcover; Distinct features worthy of conservation; Unique sense of place; No detracting features.
High	<ul style="list-style-type: none"> Very attractive, semi-natural or farmed landscape with distinctive or unusual features; Strong landscape structure, characteristic patterns and balanced combination of landform and landcover; Appropriate management for land use and landcover but potentially scope to improve; Distinct features worthy of conservation; Strong sense of place; Occasional detracting features.
Good	<ul style="list-style-type: none"> Attractive landscape with some distinctive features; Recognisable landscape structure, characteristic patterns and combinations of landform and landcover are still evident; Scope to improve management for land use and landcover; Some features worthy of conservation; Sense of place; Some detracting features.
Ordinary	<ul style="list-style-type: none"> Typical, commonplace farmed landscape with limited variety or distinctiveness; Distinguishable landscape structure, characteristic patterns of landform and landcover often masked by land use; Scope to improve management for land use and landcover; Some dominant features worthy of conservation; Some detracting features.
Poor	<ul style="list-style-type: none"> Monotonous, uniform landscape which has lost most of its natural features; Weak or degraded landscape structure, characteristic patterns of landform and landcover are often masked by land use; Mixed land use evident; Lack of management and intervention has resulted in degradation; Frequent dominant detracting features. Disturbed or derelict land requires treatment;

Source: Modification of criteria contained within the GLVIA (Ref. 13-10)

Landscape ‘value’ is concerned with the relative value or importance that is attached to different landscapes. The assessment has considered statutory designations and takes into account other values to society, which may be expressed by the local community or consultees. Table 13-2 sets out the criteria and definitions used in the baseline assessment to determine landscape value:

Table 13-2: Landscape Value Criteria

Value	Level of Importance	Definition*
Very High	International	<ul style="list-style-type: none"> Very attractive and rare; Exceptional landscape quality; No or limited potential for substitution. e.g. World Heritage Site, National Park, AONB or key elements/features within them.
High	National	<ul style="list-style-type: none"> Very attractive or attractive scenic quality and in part rare; High or good landscape quality; Limited potential for substitution. e.g. National Park, AONB or key elements within them.
Medium	Regional	<ul style="list-style-type: none"> Typical and commonplace or in part unusual; Ordinary landscape quality; Potential for substitution. e.g. Generally undesigned but value expressed through literature and cultural associations or through demonstrable use.
Low	Local	<ul style="list-style-type: none"> Monotonous, degraded or damaged; Poor landscape quality; Can be substituted. e.g. Certain individual landscape elements or features may be worthy of conservation and landscape either identified or would benefit from restoration or enhancement.

Source: Modification of criteria contained within the GLVIA (Ref. 13-10);

*Definitions, examples and features are not exclusive to each value category i.e. not all parts of an AONB can necessarily be considered very attractive depending upon condition.

13.3.4.2 Baseline Visual Analysis

Key TERRA-FIRMA software was used to model the zone of theoretical visibility (ZTV) of the existing buildings and structures within the AWE Aldermaston Site and of the Hydrus Development Site. The ZTV can be defined as the area from which all or part of the existing buildings may be visible, based on the relative alignment of the viewer, topography, large blocks of vegetation and settlements. The existing buildings heights on the AWE Aldermaston Site were modelled using GIS data provided by AWE. The surrounding topography is based on Ordnance Survey (OS) digital mapping information. Existing settlements were given a height of 9m and significant areas of woodland and woodland belts are assumed at 15m above ground level.

Separate ZTVs were prepared for the tallest buildings and structures on the AWE Aldermaston Site, and of the Operations Building (including LPS) and Support Building. These represent the theoretical visibility of the proposals during daylight hours. The buildings and stacks are differentiated by colour for both the existing and Proposed Development. Further details of the models are given in DEEA Volume II: *Technical Appendix E.1*.

The findings of the ZTV were supported by desktop and field studies which suggested that the visual effects of the Proposed Development could be considered in three broad categories:

- Short-distance views, defined as those from vantage points located within 2km of the Application Site;
- Middle-distance viewpoints are those that fall between 2km and 5km from the Application Site; and
- Middle to long distance viewpoints lying between 5km and 15km of the Application Site.

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No longer distance views (i.e. greater than 15km) have been considered, as part of this assessment, as the Proposed Development will appear as very small part of the wider AWE Aldermaston Site, which is itself a very small element within the wider view at such distances. The extent of the ZTVs is used as a basis for the study area for the landscape and visual assessment.

The ZTV for the baseline situation is shown on Figure 13-6. Within this study area, AWE Aldermaston is potentially visible up to 15km measured from the centre of the site, primarily from the Downs to the south west, however the majority of the potential views lie within a 10km radius. Site survey work has shown that the prevailing weather conditions can have a strong effect on distant visibility. A slight haze can significantly affect the perception of the AWE Aldermaston Site in a middle or long distant view.

The ZTVs for the Proposed Development are shown on Figures 13-7, 13-8, and combined with the baseline ZTV on Figure 13-9. As a whole, the extent of the ZTV for the proposals is smaller than that of the baseline, although the Proposed Development slightly extend the view over several small areas where there are currently no views of the existing AWE tall structures (refer to Figure 13-9). This is considered in more detail in the following section 13.7.

The ZTVs have been used to identify visual receptors potentially affected by the existing and proposed developments at AWE Aldermaston during the day and by associated lighting at night. Different types of visual receptor, from a range of distances and view orientations within the 15km radius of the study area, were selected to provide an assessment of the likely visual effects of the Proposed Development. For these receptors, the nature of the existing view is also described in the Visual Impact Schedules contained in DEEA Volume II: Technical Appendix E.6.

13.3.5 Significance Criteria

The assessment of significance requires judgment in balancing the complex relationships between the different components of the landscape or views in question. Significance criteria for the purposes of this assessment comprise:

- Scale and duration of the change;
- Capacity or sensitivity of the receptor to absorb change; and
- Combined significance criteria.

The scale of the proposed change is assessed as set out in Table 13-3:

Table 13-3: Scale of Change

Criteria	Definition
Major	The proposed changes form a dominant or immediately apparent feature that will significantly alter and change the overall character or view.
Moderate	The proposal may form a visual and recognisable new element that will affect and change the overall character or view.
Minor	The proposals constitute only a minor component of wider views, which might be missed by the casual observer or receptor. Awareness of the proposals will not have a marked effect on the overall character or view.
Negligible	Only a very small part of the proposals will be discernible and / or they are at such a distance that they will be scarcely appreciated. Consequently they will have very little effect on the character or view.
Neutral	No part of the proposals, or work activity associated with it, will affect the existing character or be discernible in views.

Source: Modification of criteria contained within the GLVIA, (Ref. 13-10).

The duration of a change may be temporary as in the case of many construction impacts or permanent as a result of the completed development.

13.3.5.1 Landscape Effects

Having identified the landscape receptors and character areas, their capacity and sensitivity to change has been considered in order to predict the nature and significance of the impacts of the Proposed Development. Table 13-4 below summarises the capacity of the landscape to undergo change.

Table 13-4: Landscape Sensitivity to Change

Criteria	Definition
Low	A landscape capable of accommodating considerable proposed change without significant effects on landscape character, features or elements.
Moderate	A landscape capable of accepting limited proposed change with some effects on landscape character, features or elements.
High	A landscape particularly sensitive to the proposed change, which will result in significant effects on landscape character, features or elements.

Source: Modification of criteria contained within the GLVIA, (Ref. 13-10).

The final significance criteria for the assessment of landscape impacts are presented in Table 13-5. These criteria represent the combination of landscape quality, scale of change and landscape capacity as described above.

Table 13-5: Combined Impacts Significant Criteria

Landscape Impact	Definition
Major adverse	Where the proposed changes cannot be fully mitigated; Would be completely uncharacteristic and would substantially damage the integrity of a valued and high quality landscape, landscape features, elements and /or their setting.
Moderate adverse	Where proposed changes can only be partially mitigated; Would be uncharacteristic and would damage a valued aspect of the landscape, landscape features or elements.

Landscape Impact	Definition
Minor adverse	Where the proposed changes are not completely mitigated; Where some elements of the proposed changes would be a little out of scale or uncharacteristic of an area which is not a designated landscape or not sensitive to change.
Negligible	Would complement the scale, landform and pattern of the landscape; Where some elements would result in a slight variance with the character of the area which is not a designated landscape or not sensitive to change.
Neutral	Where the proposals would be in keeping with the character of the area and/or would maintain the existing quality, or where on balance the proposals (including mitigation) would maintain quality (e.g. where on balance the adverse effects of the proposals are offset by beneficial effects).
Minor beneficial	Where the proposed changes would maintain and enhance the character and quality of the existing landscape; Enable some sense of place and scale to be restored through well designed planting and mitigation measures.
Moderate beneficial	Where the proposed changes would fit in well with the existing character; would improve the character and quality of the landscape, restoring landscape features and characteristics partially lost or damaged; Enable a sense of place, scale and quality to be restored or enhanced to a landscape of recognised quality or value through beneficial and sensitive landscape design.
Major beneficial	Where the proposed changes would not only fit in well with the existing character of the surrounding landscape, but would greatly improve the quality of the resource through the removal of detracting features.

Source: Modification of criteria contained within the GLVIA, (Ref. 13-10).

13.3.5.2 Visual Effects

The ZTVs predict that the Proposed Development may be visible over a wide area. However, these locations frequently overlap with locations from where there are existing views of the AWE Aldermaston Site. Figure 13-9 Zone of Theoretical Visibility – Combined – Existing Situation and Proposed Operations Building illustrates, in shades of blue, the areas where there are views of the Proposed Development where there are currently no views of the tallest buildings and structures on AWE Aldermaston Site.

This assessment has considered the effect of the Proposed Development on a representative selection of views from a range of directions and distances, rather than from all locations from which there may be a potential view. Different types of visual receptor have been considered, including: settlements, public rights of way and recreational spaces, transport corridors and employment areas.

Visual effects have been considered for the “worst-case” scenario on a winter’s day for both the construction and operational phases (i.e. least screening from vegetation). Table 13-6 sets out the visual assessment significance criteria. The assessment of potential visual effects has taken into account the following:

- Sensitivity of the views and viewers (visual receptor) affected;
- The scale of the change and duration (i.e. whether temporary or permanent);
- Degree of visual intrusion or obstruction that will occur; and
- Change in character or quality of the views compared to the existing views.

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Table 13-6: Visual Impact Significance Criteria

Visual Impact	Definition
Severe adverse	Where the proposed changes would form the dominant feature, to which other elements become subordinate, markedly affecting and substantially changing the overall character of the scene in valued views.
Major adverse	Where the proposed changes would form a major and immediately apparent part of the scene that effects and changes its overall amenity.
Moderate adverse	Where the proposed changes to views would form a visible and recognisable new element within the scene and may be readily noticed by the viewer.
Minor adverse	Where the proposed changes to the views would be a minor component of the wider view and may be missed by the casual observer.
Negligible	Where the proposed change would be imperceptible or would be in keeping with and would maintain the existing views. The balance of the proposals with proposed mitigation would maintain the quality of the views.
No change	Where none of the proposed changes would be discernible.
Minor beneficial	Where the proposed changes to the existing view would not only be in keeping with, but would slightly improve the quality of the existing view.
Moderate beneficial	Where the proposed changes to the existing views would be in keeping with, and would improve, the quality of the existing view.
Major beneficial	Where the proposed changes to the existing views would be in keeping with, and would greatly improve the quality of the scene through the removal of visually distracting features.

Source: Modification of criteria contained within the GLVIA, (Ref. 13-10).

13.3.5.3 Receptor Sensitivity

The sensitivity of visual receptors is dependent upon the location and context of the viewpoint, whether continuous, fragmented, or intermittent (i.e. the dynamic nature of a view gained while travelling through an area), the importance of views, and the occupation and activity of the visual receptor. Influences such as the number of receptors affected, popularity of views and the significance of the views in relation to valued landscapes or features also determines the importance of views. Night-time impacts have been assessed for all receptors, and where impacts are likely then these have been noted in the Visual Impact Schedules. These would generally be less significant from residential properties as generally the visual focus is not concentrated on the outdoors (for example, a large proportion of the population draw curtains in main habitable rooms for privacy, therefore closing the outside world from the residential properties).

A definition of receptor sensitivity is provided in Table 13-7.

Table 13-7: Receptor Sensitivity

Receptors	Definition
Higher sensitivity	Includes viewers within residential properties (grouped in settlement clusters) and Public Rights of Way users, in particular views from recreational and long-distance footpaths and from landscapes of acknowledged importance or value. The visual sensitivity to lighting impacts at night on residential properties is generally considered to be less sensitive than changes in daytime views as the majority of visual receptors will be located within lit rooms, often with the curtains drawn.
Medium sensitivity	May include people engaged in sports / formal outdoor recreation; dynamic views gained by the travelling population through or past the landscape.
Low sensitivity	Includes people at their place of work, whose attention may be focused on their work or activity and may be therefore less susceptible to changes in view.

Source: Modification of criteria contained within the GLVIA, (Ref. 13-10).

13.3.6 Identifying Significant Effects

For the purposes of this assessment, anything that is considered to have a moderate effect/impact or above is considered to be significant. Minor to neutral impacts are described, however they are not considered to be as significant.

13.4 Existing Baseline Conditions

13.4.1 Study Area

The study area for the landscape and visual assessment has been identified by modelling the potential Zone of Theoretical Visibility (ZTV) of the Proposed Development. This extends up to 15km from the Hydrus Development Site and is shown on Figure 13-6.

The baseline assessment of the study area has been undertaken and comprises consideration of topography and drainage; land cover; and settlement pattern. In addition, a desktop study has been undertaken to identify the county and district wide landscape character areas within which AWE Aldermaston sits to understand the local landscape context to the Proposed Development. The Site Wide Landscape Appraisal is included within *Technical Appendix E.2* of DEEA Volume II.

13.4.2 AWE Aldermaston Context

13.4.2.1 Topography and Drainage (refer to Figure 13-2)

The landform of the area is closely related to the underlying geology. The local area is sited in an area characteristic of the London Basin sequence, comprising of a sequence of mudstone, limestone and sandstone, with fluvial gravel deposits. The basin is bounded by higher ground created by chalk outcrops, which dominates the area topographically giving rise to prominent escarpments.

The study area is dominated by a series of west-east ridges and escarpments forming the watershed catchments to the river valley floors, which are also characteristic features of the local landscape. The valleys are associated with the River Kennet to the north, broadly flowing west (through Newbury and Thatcham) to east. The River Loddon lies to the southeast of the study area, flowing from the south at Basingstoke north-eastwards. Both flow towards the

settlement of Reading in the north-east of the study area to join the River Thames beyond and are set within valleys of less than 75m AOD.

The Kennet Valley is characterised by a series of watercourses, including the Kennet and Avon Canal, together with a series of water bodies and associated valley floor activities (i.e. gravel extraction – see Land Cover below). These are all set within a relatively broad valley floor, with locally incised valley sides, which form a complex, undulating landform to these slopes.

The river valleys are defined by a series of catchment ridgelines both to the north (between 130 and 155m AOD) and south (between 175 and 260m AOD) of the study area. AWE Aldermaston is sited on a local ridgeline, forming a broad plateau at approximately 105m AOD, running southwest to northeast that provides the watershed between the River Kennet and River Loddon corridors.

13.4.2.2 Land Cover (refer to Figure 13-3)

The predominant land use in the study area is that of agricultural land, including farmsteads, arable and pasture, together with land associated with equestrian uses such as riding schools and land dedicated to race horse gallops, together with smaller paddocks associated with the heathland.

Topography and vegetation patterns broadly correlate with large, often mixed woodland blocks associated with the ridgelines, and with smaller deciduous woodland blocks associated with the valley sides. Deciduous tree belts (including poplars) are characteristic features of the River Kennet valley.

Heathland is generally associated with the large mixed woodland blocks in the centre of the study area and includes a series of Commons across the area (at Silchester, Padworth, Brimpton, Burghfield and Mortimer).

Land uses associated with the Kennet valley floor are mixed. Agriculture and mineral extraction are both clearly evident. A series of past and present sand and gravel extraction areas are scattered along the valley, with past extraction evident in the presence of large water bodies, some of which are now either used for recreation, or have been restored for wildlife conservation. The area also has extensive brick-clay, cement making, silica sand, chalk and limestone resources, all of which are actively extracted. In contrast, land uses associated with the River Loddon to the south-east are intensively managed for agricultural purposes.

Pockets of recreational land, beyond the Common land, include the golf courses at Woolhampton (not in use due to construction works during Spring and Summer 2009) and Baughurst (to the north and central sections of the study area) together with the sports pitches of Tadley Rugby Football Club immediately to the east of the AWE Aldermaston Site. A series of other non-agricultural land uses are also evident within the study area, such as the sites forming part of AWE, both at Aldermaston and Burghfield and the motorway service areas of the M4, and A4 transport corridor. Whilst the areas of woodland, heathland and common land do not form part of the formal areas of open space, a series of public rights of way criss-cross through the area contributing to informal recreation and access to the countryside. Some areas of Common land to the east, south and west are designated as Open Access Land, including land at Tadley, Padworth, Silchester and Brimpton Commons (www.magic.gov.uk) (Ref. 13-12).

Figure 13-2: Topography and Drainage

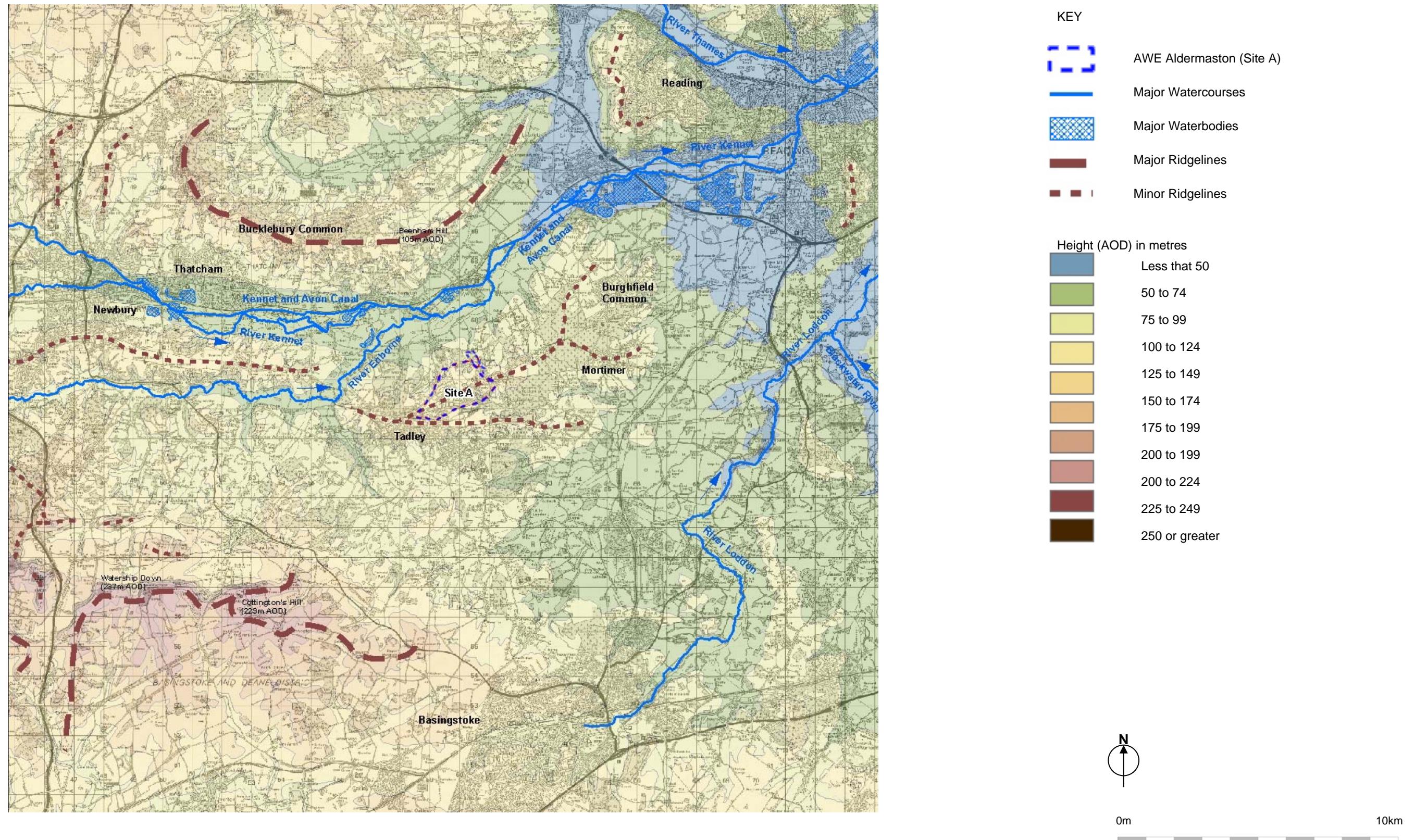
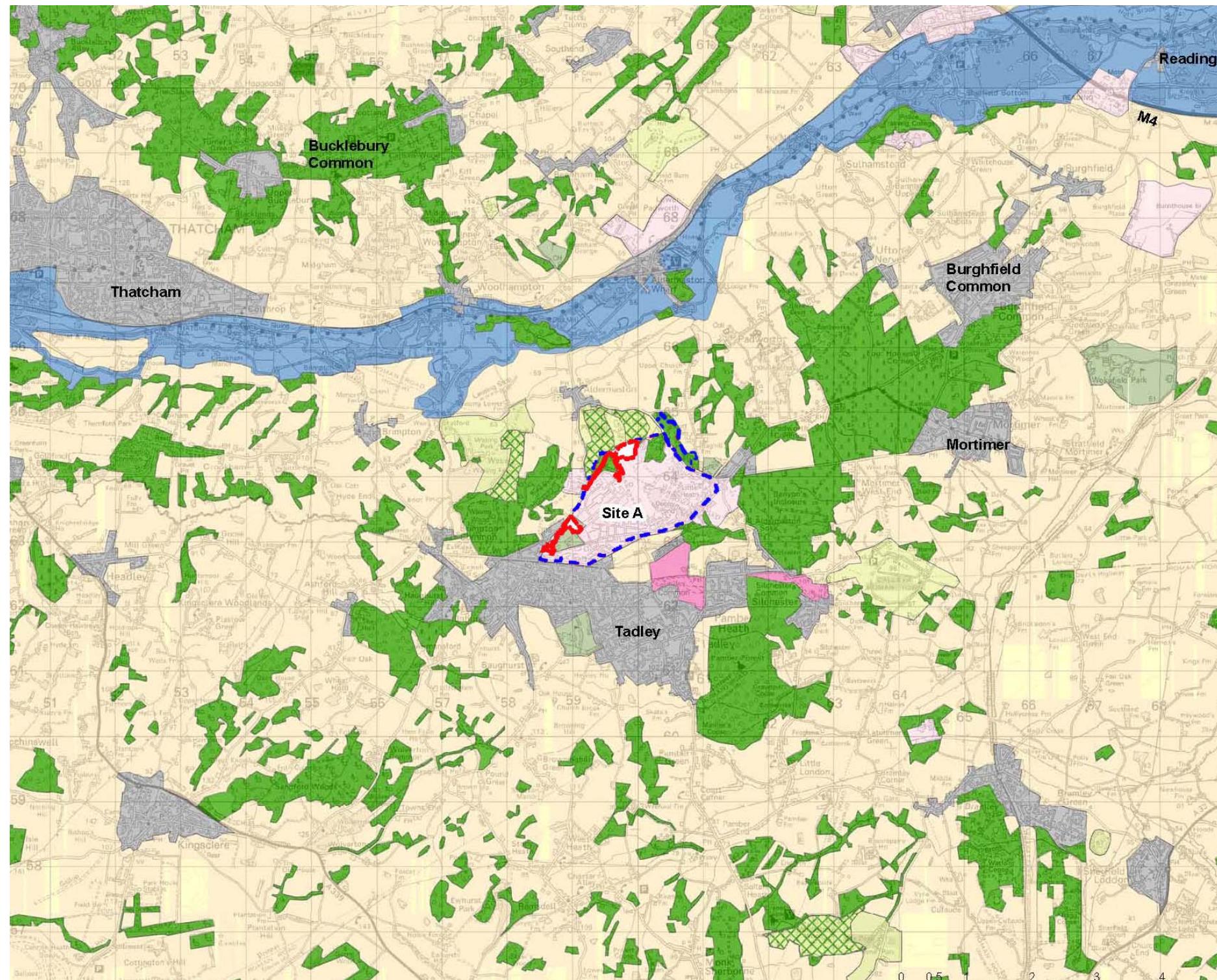


Figure 13-3: Land Cover



KEY

- AWE Aldermaston (Site A)
- Application Site Boundary
- Main Settlements
- Significant Woodland
- Significant Woodland within Historic/Heritage Landscape
- 伍oded Heathland
- Agricultural Land
- Recreation/Open Space
- Historic/Heritage
- River Kennet and Associated Waterbodies
- Other Non-Agricultural Land

NOTE 1. Significant woodland blocks and landuses have been mapped via desk-based survey only

NOTE 2. Other non-agricultural land includes industrial, commercial, mineral and other land uses



0m

5km

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13.4.2.3 Settlement Pattern (refer to Figure 13-3)

There is a broad correlation between topography and settlement pattern. The large settlements of Newbury and Reading have developed around the river valleys of the Kennet and Thames Rivers at the confluence of rivers and along the river valley sides, with Basingstoke having developed around the slopes associated with the head of the River Loddon.

The smaller settlements, such as Tadley, Mortimer, and Burghfield Common have developed on local ridgelines and valley sides. A series of small, nucleated settlements and individual properties are scattered throughout the study area.

13.4.2.4 Aldermaston Court

The former manor house, known as Aldermaston Court, lies within a parkland setting, adjacent to the northern boundary of the AWE Aldermaston Site. The building, listed Grade II*, is now a hotel and conference centre. The grounds of the hotel and those of the large modern block of office accommodation to its north (Portland House) are included within the Grade II Registered Park and Garden, also known as Aldermaston Court. The entry on the Register of Parks and Gardens of Special Historic Interest (Ref. 13-13) describes the grounds as:

"Mid and late C19 gardens and park, surrounding a mid C19 country house, with the remains of C17/C18 pleasure grounds relating to the former C17 manor house."

The house was requisitioned during the Second World War, when an airfield was constructed in the park to the south. Following the War the house was sold into corporate use, and was subsequently converted for use as a hotel and conference centre, in which use it remains (1998), the former parkland being developed as a military installation...."

The land slopes down from the south to the north-west and north-east, with long views across the Kennet Valley to distant ranges of hills. The setting is partly agricultural, with the village to the north and extensive military installations to the south."

The present grounds of Aldermaston Court occupy approximately 70 hectares, but at its peak, the parkland extended considerably further, including the land which now forms parts of the AWE Aldermaston Site. Occasional mature trees and ponds are remnants of the former parkland which are still found within the current AWE Aldermaston Site.

The remnants of an avenue of Oak trees, including some individual trees of considerable age, extends approximately south through the hotel grounds towards the AWE Aldermaston Site. Twentieth century development has impinged on this avenue, including: the water tower adjacent to one of the mature trees; telegraph poles and wires; the single storey, disused brick building which visually separates the remnant avenue from the manor house; and the hard-surfaced access route connecting the AWE Aldermaston Site to Portland House. This access road along the western side of the avenue distorts the perception of the visual axis from the hotel and conference centre towards the AWE Aldermaston Site. Dense vegetation, including a row of conifers approximately 16m in height, prevent most views into the AWE Aldermaston Site from the hotel

grounds, although the security barriers and fencing can be readily seen in between the conifers at the southern end of the remnant avenue.

At night, the tower and the main façades of the Aldermaston Court hotel are illuminated with feature lighting. The car parking areas close to the hotel are lit by bollards and short lighting columns. To the north of the hotel, the car park associated with Portland House is well lit, as is the perimeter and entrance area of this office building. In contrast, the grounds to the east, south and west of the hotel are largely unlit. Security lighting associated with the AWE perimeter fence, Cwm Road and other multiple light sources within the AWE Aldermaston Site are visible between and beneath the trees at the end of the remnant Oak avenue. Existing lighting within the AWE Aldermaston Site is described at 13.4.6. During summer months, the deciduous trees within the grounds of the hotel provide a more comprehensive screen to light sources within the AWE Aldermaston Site.

13.4.3 AWE Aldermaston Site Description

AWE Aldermaston Site lies to the south of the Kennet Valley on a flat gravel plateau between 100 and 105m AOD, sloping to 85m AOD in its far north-eastern corner. Some of the landform within the AWE Aldermaston Site has been modified by human intervention to create bunded or earth-covered buildings.

The AWE Aldermaston Site is surrounded by gravel plateau heathland and woodland with some heathland pasture. To the north it abuts the registered parkland estate of Aldermaston Court.

AWE Aldermaston is generally well contained and screened within the local landscape by extensive layers of vegetation (refer to Vegetation Appraisal Report Technical Appendix E.3 in Volume II of the DEEA).

The scale of the AWE Aldermaston Site is significant in the local landscape and the development zones are large in scale and, at times, in mass. Whilst AWE Aldermaston is set within a well-wooded plateau, it is important to note that the larger buildings and stacks are visible in middle to long-distance views from local scarpes or ridgelines above the tree canopy. Existing views of the AWE Aldermaston Site are described in the Visual Assessment Schedule in Technical Appendix E.6.

A large percentage of the AWE Aldermaston boundary is defined by mature dense vegetation. Further containment is provided by tree belts associated with the adjacent road corridors and the adjoining woodland blocks beyond the site boundary. Some sections of the boundary are more open in places due to either intermittent mature boundary vegetation or recent planting that has yet to mature (refer to Technical Appendix E.2 Landscape Appraisal Report: Landscape Analysis and Site Wide Landscape Character Plan).

AWE Aldermaston contains large expanses of unrelieved hard surfaces and buildings dating back to the 1950's, many of which are now worn and of poor quality. The existing large-scale groups of trees, woodland belts and copses are therefore important to the site. A site vegetation appraisal carried out by RPS in 2005 has identified the most important groups as A and B Amenity Value, which have been identified for retention and reinforcement on the Site Development Context Plan, (Ref. 13-14).

The south-eastern sector of the AWE Aldermaston Site contains remnant heathland with some fine groups of trees that are typical of the local heath (Birch, Pine and Oak). Where the grassland has been left unmanaged, noticeable heathland regeneration is occurring with a variety of heathland flora visible. The north-eastern sector changes in character and topography to provide an area dipping toward a large pond and watercourse surrounded by a Rhododendron-dominated shrub layer with Birch, Oak, Willow and Pine. To the east of this sector, on the opposite side of a local highway forming part of the AWE Aldermaston Site, lies an area of heathland-woodland that is dominated by Spanish (Sweet) Chestnut, Oak and Birch.

The large-scale central areas are rather urban in character and contain very little vegetation of any stature. That which exists is characterised by standard clear-stemmed trees and low-level grass or shrubs.

Buildings within the western part of the AWE Aldermaston Site are generally arranged on a rectilinear grid or relate to the principal routes created by the former runways; this structure becomes less rigid in the eastern part of the site. Structures generally vary in height from one to four-storey buildings, with localised taller blocks occurring. Building uses comprise laboratories, workshops, stores and offices. These generally date from the 1940's and 1950's and are utilitarian in appearance, comprising red brick or painted masonry, flat-roofed structures. Occasional pitched or domed-roof structures also occur.

Existing chimneys (such as those associated with the Boiler House (48.9m tall; 150.8m AOD) adjacent to Red Lane), silos, and steel-lattice lightning towers (HEFF development) add increased height of up to 24m AGL (above ground level). Chimney stacks at the new Energy Centre to the south west of the Proposed Development are 33.9m tall. New developments are emerging within the AWE Aldermaston Site, with the implementation of the SDCP. Notably, these include Orion, NOA and Pegasus. Pegasus involves the construction of a single building 16.25m high at its ridge (120.25m AOD), and a single ventilation stack 19.5m high (123.5m AOD).

There are several landscape features that exist in the eastern sector of the AWE Aldermaston Site. These include two ponds and associated copses; a remaining section of an ancient earthwork known as Grim's Bank; and a mature pine plantation containing AWE Aldermaston on its eastern edge. The western sector includes some more significant areas of boundary vegetation and peripheral woodland copses which are important in containing the site.

The night time landscape character of the AWE Aldermaston Site is described at 13.4.6.

13.4.4 Local Landscape Character

The County and District Wide Landscape Character Areas are set out in the Landscape Appraisal Report in Technical Appendix E.2 of DEEA Volume II.

An extract from the North Wessex Downs Area of Outstanding Beauty (NWD AONB) Landscape Character Assessment (Ref. 13-15) is set out in Technical Appendix E.5 of DEEA Volume II. The AWE Aldermaston Site is not within the AONB, but it is visible from various locations within it. The NWD AONB, therefore, forms part of the context for AWE Aldermaston.

A more detailed assessment of the local landscape character areas set within the context of the regional and district character area assessments has been carried out on the basis of desk studies and field survey work by Atkins (September 2005) (Ref. 13-16). These are shown on Figure 13-4.

In that study, the AWE Aldermaston Site as a whole sits primarily within two identified character areas, Aldermaston Park West and Aldermaston Park East. In addition, a small part of the northern edge of the AWE Aldermaston Site (which includes a sliver of the north eastern part of the proposed Hydrus Development Site) also lies within the adjoining Aldermaston Park Pasture and Woodland Fringe landscape character area. This local landscape character area extends into the wider landscape beyond the AWE Aldermaston Site to the north, east and west. The relative locations of these character areas are shown at Figure 13-4: Local Landscape Character. The descriptions of the landscape character areas are summarised below.

Aldermaston Park West – Principally the more densely developed half of the AWE Aldermaston Site, which contains many buildings of industrial and office character, including several that are substantial. The quality of the buildings varies. The road system reflects the former use of the AWE Aldermaston Site as an air force base. Heating pipes that run above the surface also add to the cluttered nature of the site. Tree cover is generally limited to the boundary plantations and some small copses. The area includes some new developments to the west of the site.

Aldermaston Park East – Principally the less densely developed sector of the AWE Aldermaston Site, where most buildings are contained within concrete and earth mounds, apart from some office and industrial buildings near the eastern boundary. The heating pipes are again apparent. Tree cover is scattered and creates an open heathland woodland character to the area.

Aldermaston Park Pasture and Woodland Fringe – An area of parkland, heath associated paddocks, plantations and woodland on and around the boundaries of AWE Aldermaston Site with a flat to gently undulating topography. This area includes part of the Grade II Registered Park of Aldermaston Court. Historical landscape elements include Grim's Bank and the course of a Roman Road. Occasional urban fringe land uses such as offices, garden centres and business parks are also typical. Small ponds and lakes have been created in some of the valleys, set amongst attractive woodlands and marginal planting. The ponds and trees reflect the area's parkland origins. Views tend to be constrained by vegetation. This is an area of good landscape quality; medium/high landscape value and moderate sensitivity to change.

In addition to the Aldermaston Park Pasture and Woodland Fringe local landscape character area, AWE Aldermaston is also contained within the context of two other identified landscape character areas:

Tadley Urban Area – The settlement of Tadley, which contrasts sharply with the surrounding agricultural and heathland landscapes. The town has predominantly developed since the 1950's although there are scattered thatched cottages dating from the 17th century. Historically, the area supported a brick industry at Tadley Common. The development is generally one and two storeys and suburban in character, with views restricted by the built form. This is of low landscape quality and value and low sensitivity to change.

Haughurst Hill Heath-associated Pasture and Woodland – lying to the west of the AWE Aldermaston Site this character area comprises mixed agricultural, residential and wooded areas ranging from the local hill tops at Brimpton Common and Ashford Hill to the south-facing hillside at Inhurst. The area is structured by relatively straight roads with paddocks and the low-density linear settlement patterns typical of heathland enclosure. Mature oak and pines are common along roadsides, restricting hilltop views. This area is of good landscape quality, of medium landscape value and moderate sensitivity to change.

13.4.5 Site Wide Landscape Character

A more detailed site based landscape character survey was carried out by RPS in June 2005 to determine the broad character areas across the AWE Aldermaston Site. This was updated in 2007, December 2008 and January 2009 to take account of any changes since 2005 particularly those relating to recent new development. The character areas have been classified in relation to current land-use, landform and vegetation cover together with other landscape characteristics within each area. These are shown on the Landscape Analysis and Site Wide Landscape Character Plan at *Technical Appendix E.2 Landscape Appraisal Report*.

The Hydrus Development Site lies within or adjacent to the following landscape character areas, which are described in terms of their key landscape characteristics, their landscape quality, value and sensitivity to change in Table 13-8.

The Hydrus Development Site lies largely within landscape character area 9: Open Grassy Heath Plateau with Buildings, with its easternmost point falling within character area 8: Intimate Enclosed Woodland Plateau Edge. WECE falls within landscape character area 2: Contemporary Urban Edge. The remainder of the access route traverses several landscape character areas including 1: Contained Intensive Industrial Plateau, 7: Contained Open Space, 10: Wooded Plateau Edge and 11: Wide Plateau Corridor. CACE falls within landscape character areas 1: Contained Intensive Industrial Plateau and 10: Wooded Plateau Edge.

Table 13-8: Site Landscape Character Areas

Landscape Character Area	Key Characteristics	Landscape		Sensitivity to Change
		Quality	Value	
1. Contained Intensive Industrial Plateau	<ul style="list-style-type: none"> ▪ Areas of concentrated industrial buildings; ▪ Chimneys, lighting columns, floodlights and double fencing; ▪ Flat topography; ▪ Occasional small isolated trees. 	Poor	Low	Low
2. Contemporary Urban Edge	<ul style="list-style-type: none"> ▪ Large scale offices and industrial buildings; ▪ (Landscape under construction); ▪ Flat topography; ▪ Minimal vegetation. 	Poor	Low	Low
7. Contained Open Space	<ul style="list-style-type: none"> ▪ Open hard landscape area containing roads, car parking and helipad; ▪ Flat topography; ▪ Contained by significant 	Ordinary	Med	Moderate

Landscape Character Area	Key Characteristics	Landscape		Sensitivity to Change
		Quality	Value	
	birch and oak woodland belt.			
8. Intimate Enclosed Woodland Plateau Edge	<ul style="list-style-type: none"> ▪ Sunken topography; ▪ Pond and office zone set within well vegetated landscape; ▪ Vegetation dominated by Rhododendron, but also includes woodland tree species. 	Good	Med	Moderate
9. Open Grassy Heath Plateau with Buildings	<ul style="list-style-type: none"> ▪ Large area of heathy grassland, mostly mown with Pine and Birch trees in groups; ▪ Occasional mature Oak and Beech trees and copses / ponds; ▪ Flat topography; ▪ Man made mounds and low buildings scattered in groups; ▪ Roads / fencing; ▪ Consented HEFF scheme central to this area – due for construction 2009 / 10. 	Ordinary / Good	Med	Moderate
10. Wooded Plateau Edge	<ul style="list-style-type: none"> ▪ Man-made mound and water treatment works contained by dense treebelts; ▪ Roads, fencing; ▪ Steeply undulating topography. 	Ordinary	Med	Moderate
11. Wide Plateau Corridor	<ul style="list-style-type: none"> ▪ Wide road with on street parking – former runway; ▪ Contained by high fencing on either side. 	Poor	Low	Low

13.4.6 Night-time Landscape Character

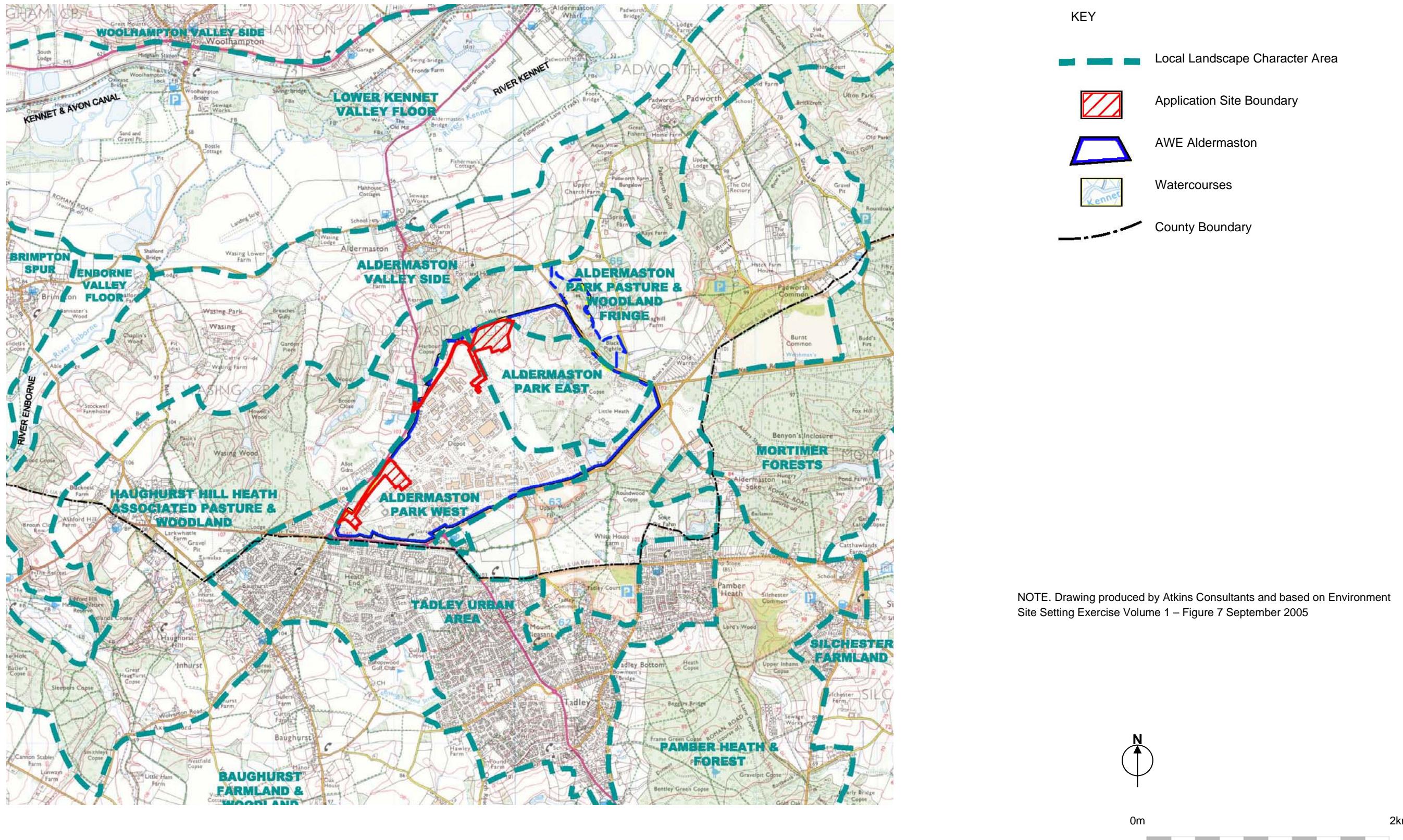
The perception of night time sky glow varies with atmospheric conditions. In the Guidance Note published in 2007 in relation to controlling light pollution (Ref. 13-17), sky glow is defined as:

"The variable brightness value of night-time sky caused by upward components of light from direct and inter-reflected light off the earth's surface [the brightness of sky glow is dependant on the amount of upward light and the presence and density of atmospheric particles and their distance above ground level]."

The dusk and night-time landscape character within the wider study area is influenced by the existing sky glow above Newbury, Thatcham and Reading. The landscapes beyond the larger settlements near AWE Aldermaston, especially areas designated as AONB, are characteristically dark landscapes, with occasional isolated lights indicating a dwelling, farmstead or hamlet.

The main sources of light locally around the AWE Aldermaston Site includes the settlement of Tadley to the south, which contains both high pressure and domestic scale sodium street lighting to the main roads and residential streets, together with lighting of individual buildings and road junctions, such as roundabouts, together with the car parks associated with the town centre uses, which all contribute to the night glow.

Figure 13-4: Local Landscape Character



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A description of the night-time character around the hotel and conference centre is set out in section 13.4.2.4 above, but generally comprises feature lighting to the building facades, and lighting to car parking areas and the Portland House entrance.

The AWE Aldermaston Site is currently lit by a high percentage of sodium lighting, together with occasional white lights associated with replacement or new lighting provisions. Lighting is generally concentrated to the western and central, more developed, section of AWE Aldermaston, identifying the routes through the site. More sporadic lighting is also evident on the eastern section of the AWE Aldermaston Site, with the lighting of the perimeter fence and the main entrance areas extending the perception of the site to the boundaries. Much of the lighting is non-directional and domestic in scale. The sodium lighting is interspersed with the white lighting contained within individual buildings, which provides lighting to stair wells, office spaces and the upper floors of the larger industrial scale buildings scattered throughout the AWE Aldermaston Site and that all contribute to sky glow in the area. The edges of the site are more evident at night in the immediate local landscape through the lighting of the perimeter fence. However, due to the extensive layers of woodland blocks in the area, the direct effects of the lighting on the wider countryside are reduced to its immediate setting.

The Hydrus Development Site is currently well lit with lighting along the perimeter boundary fence and along Cwm Road. This lighting which forms part of the AWE Aldermaston site-wide lighting contributes to the effects on the night sky. Luminaires along Cwm Road are 5m high, whilst those along Griffin Road are 11m high.

In views from the AONB to the north, AWE Aldermaston forms part of a lit ridgeline associated with settlement of Tadley, and a series of individual sodium lights set in the wider landscape. The degree of sky glow associated with Tadley seen above the ridgeline depends upon atmospheric absorption, as noted above. The lit A4 also has an influence upon the night time landscape character, with road lighting and vehicle headlights visible where roadside vegetation is sparse. During the hours of midnight to 5:30am lighting along stretches of the A4 near Beenham and Aldermaston are turned off. Other notable sources of light in the area are the illuminated facades of number of buildings along the A4 and the security lighting within the Beenham Grange Industrial Estate.

There is street lighting within the settlement of Aldermaston Wharf, but not within the village of Aldermaston.

13.4.7 Application Site Description

The Hydrus Development Site comprises predominantly level, cleared land with mainly grassed areas and a number of existing trees (refer to Figure 1-1 Application Site Red line Boundary at *Chapter 1: Introduction* of this DEEA). The Hydrus Development Site is framed by an existing perimeter access road around the northern and north western boundaries and existing research and testing buildings along the southern edges. Temporary construction huts are located towards the south west corner of the Hydrus Development Site.

Topography within the Hydrus Development Site is generally level at approximately 100m AOD, sloping slightly towards the eastern boundary, and towards the southern boundary, at approximately 97m AOD. A small surface

water ditch crosses the southern part of the Hydrus Development Site. There are no existing water bodies within the proposed boundary.

The Hydrus Development Site comprises grassland interspersed with bare ground, access tracks and mainly deciduous trees. These trees are predominantly young to middle aged birch with a few middle-aged to mature oaks (see *Technical Appendix E.4 Tree Survey Report*). It is thought that a number of the more mature trees on the Hydrus Development Site, including the veteran Oak tree to the south east of the site, may be a remnant part of former parkland, associated with Aldermaston Court to the north. However, it should be noted that this 'parkland' has been significantly altered by subsequent development relating to Second World War airfield uses and more recent use as part of the AWE Aldermaston complex.

The majority of trees are located in the southern half of the Hydrus Development Site. These are arranged in scattered small groups and as a small copse. The copse and other trees in the south eastern corner will be retained as part of the Proposed Development.

The Proposed Development site for the Operations Building, the Support Building and ancillary facilities is well contained on all sides by existing vegetation, buildings and site infrastructure. There are no clear views of the Hydrus Development Site from outside of the AWE Aldermaston Site, although glimpses of part of the site are visible from the southern end of the hotel and conference centre grounds at Aldermaston Court.

The Planning Application Boundary also contains the contractors' site entrance via the West Gate to the AWE Aldermaston Site and construction workers' car park, and encompasses part of Griffin Road which forms the main north-south access within AWE Aldermaston, together with areas off Griffin Road that will be used for a contractors' compound during the construction period (WECE and CACE). Although these areas have been included in the Application Boundary, they already have planning consent and/or are existing site access routes (see *Chapter 1: Introduction*). They are therefore considered part of the baseline situation for this landscape and visual impact assessment.

The existing temporary contractor's car parking area in the south west of AWE Aldermaston can be seen from the adjacent A340 road.

The CACE to the west of Griffin Road is contained to the north by a large mounded and vegetated area separated from the compound by a fence line. This compound is contained to the south and west by the central urban developed zone comprising large-scale industrial buildings and hard unrelieved paved areas and perimeter fencing.

13.5 Assessment and Mitigation Measures

13.5.1 Identification of Impacts

The proposed construction activities are described in *Chapter 6: Construction Phase* and the Proposed Development is described in detail in *Chapter 5: The Proposed Development* of this DEEA.

13.5.1.1 Temporary Construction Access and Compounds

The Proposed Development construction phase is programmed for a period of 60 months; this includes an 8 month commissioning period for the Operations Building. The Support Building will take 15 months to construct and this will run concurrently with the construction programme for the Operations Building (see Figure 6-1 of *Chapter 6: Construction Phase*).

Access for construction will be via the existing gate from the A340. The project will use the WECE which is currently set up for the construction of the NOA project. The CACE will be used for storage of materials and as a contractor's compound. A second contractor's compound, located within the western part of the Hydrus Development Site, will be used for the temporary siting of welfare facilities and offices up to two storeys high.

The construction will include the use of tower and mobile cranes.

The construction phase will incorporate safety and security lighting, although the number of lighting columns will be fewer than those used for the permanent scheme. These 6m lighting columns will have downward facing light sources which will help to limit the effects of light spill. Other proposed lighting will also feature downward facing light sources. Night-time working will not be a normal feature of the development. However, if working needs to continue through the night for a particular activity (e.g. during a continuous concrete pour), West Berkshire Council would be notified, in accordance with the Code of Construction Practice.

13.5.1.2 Permanent Development

The Proposed Development is located adjacent to the northern edge of the AWE Aldermaston Site. Its central location along this vegetated boundary means that in views from the south, west and east, the buildings and LPS masts will, in most cases, be seen in the context of the existing built development and infrastructure on the AWE Aldermaston Site, such as the chimney stacks (48.9m tall; 150.8m AOD) associated with the existing Boiler House located adjacent to the AWE Aldermaston eastern boundary, and also with the 33.9m high chimney stacks at the new Energy Centre to the south west of the Proposed Development, in the central area of the AWE Aldermaston Site.

The form of the Operations Building will be an 8-sided structure with a circular shallow-domed roof. The roof will be 20m tall (120.3m AOD) at its crown, and will encompass the exhaust stack and fume cupboard flues at a maximum height of 123.8m AOD. Various low level vents will also break through the domed roof line. A Lightning Protection System (LPS), consisting of 8 masts with a tapering profile (tip height 140.3m AOD) and catenaries, will surround the building.

The Support Building is located to the east of the Operations Building. It has a three level, stepped roof, with the highest point at 112.3m AOD and 15 roof-mounted LPS rods not exceeding 113.8m AOD. The stack for this building is located within the tallest, eastern roof section and will project to 115.3m AOD. The three sections of the Support Building will have 'green' roofs, planted with Sedum.

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An Electrical Substation with a maximum roof height of 5.6m AGL (105.9m AOD) will be constructed close to the western boundary of the Hydrus Development Site.

Other works will include access roads, footpath and cycleway connections, hard and soft landscape works, a water supply borehole, the construction of the SuDS detention basin and swales, security fencing and external lighting.

13.5.1.3 Permanent External Lighting

External lighting has the potential to cause effects in several ways including direct views of the light source, direct views of light on buildings or other surfaces, and a contribution to a sky glow via upward reflection of light from surfaces. The perception of the existing sky glow created by the AWE Aldermaston Site as a whole is dependant upon the amount of upward light and the presence and density of atmospheric particles and their distance above ground level (refer to definition of sky glow set out above at section 13.4.6: *Night Time Landscape Character*).

External lighting will be provided to all access routes within the Proposed Development in order to facilitate health and safety and site security requirements.

A total of fifty-six 6m high, downward facing luminaires will be provided along vehicular access routes, to provide an average illumination of 20 lux on the road surface.

Three downward facing luminaires would be attached to the eastern and southern facades of the Support Building adjacent to the service yard. A row of 13 low level bollards, providing downward illumination only, will be installed along its northern side.

Luminaires would not be attached to the Operations Building, although the lighting columns along the access roads would provide illumination to the lower sides of the building, up to approximately 3m above the ground level. At the main entrance to the building, the sides of the building will be illuminated up to 6m above ground level, due to the increased proximity of the entrance to the luminaires.

The LPS masts will not be lit at anytime.

The existing 5m and 11m high lighting columns along the perimeter security fence, Cwm Road and Griffin Road will not be affected by the Proposed Development and they will continue to provide a degree of illumination to the Hydrus Development Site.

13.5.2 Mitigation Measures

13.5.2.1 Building Layout and Design

The location of the proposed buildings and access routes partially on previously developed land, and the position and arrangement of the Operations Building and its height, form and colour will have a considerable influence on the potential impact of the Proposed Development upon its surroundings.

The tallest, and therefore, most visible elements of the scheme will be the roof of the Operations Building (20m tall; 120.3m AOD at its crown) and the LPS masts (40m tall; 140.3m AOD) and associated catenary structures.

The location and orientation of the buildings and structures within the Proposed Development has been subject to consultations with WBC's Landscape and Heritage Advisors. Various options were presented over several meetings, showing different roof profiles and building locations. It was agreed that aligning the crown of the domed Operations Building along the central axis of the remnant Oak avenue within the grounds of Aldermaston Court to the north was the preferred option in key views from within the Registered Park and Listed building. The proposed colour and finish of the roof will be important considerations in longer distant views (see *Chapter 4: Alternatives and Design Evolution* and *Chapter 14: Cultural Heritage and Archaeology*).

Discussions were also held with regard to the orientation of the LPS masts, particularly in views along the remnant Oak avenue. WBC's Landscape Advisor considered that arranging the LPS masts so that one appeared either side of the avenue, framing the view, was preferable to a single mast located on the central axis.

Feedback from WBC received at the several consultation meetings, has been incorporated into the iterative design process for the Proposed Development.

The domed roof of the Operations Building will create varying light / dark areas across its surface which will help to reduce its perceived mass in some lighting conditions. However, the multiple vents and stacks projecting at intervals across its surface will create shadow effects which may, in close range views, detract from the visual subtlety of a smooth roof outline. The proposed vents and stacks are mainly located on the southern half of the domed roof, so that they will not appear in the views from Aldermaston Court.

The base of the sides of the Operations Building will be a light coloured reconstituted stone pre-cast plinth with textured finish. The middle section will be finished in natural timber, with a continuous band of milled aluminium finish louvres above. The domed roof, the vents and the stacks will be finished in zinc, which will provide a non-reflective surface and will weather over time. These varying bands of materials have been designed to break up the visual mass of the building.

The LPS masts have been designed so that they taper towards their tip in order to help minimise their visual impact. They will be circular in section, approximately 1.8m wide at their base, tapering to approximately 0.5m wide at their tip. They will have an off-white / light grey coloured finish which will help to reduce their visual impact in longer distance views such as those from within the AONB to the north and south west. The LPS masts will not be fitted with aircraft warning lights.

The roof of the Support Building is stepped over three levels, with the highest level to the east. All three roof levels will be planted with Sedum. This will limit their visual impact in longer distance views, as well as providing biodiversity benefits (see *Chapter 15: Ecology*).

13.5.2.2 Landscape Proposals

The Landscape General Arrangement plan for the development is shown on Figure 13-5. The proposals are part of a wider landscape strategy for the whole of the AWE Aldermaston Site which will ensure continuity of design. The detailed landscape scheme, landscape and biodiversity management plan, arboricultural method statement and tree protection plan are submitted as part of the planning application.

The Proposed Development incorporates the existing copse of trees, located to the south east of the Hydrus Development Site, and other retained trees nearby. All retained trees will be protected with temporary protective fencing during the construction period.

A series of bunds will surround the Operations Building, broadly following its circular form. The bund closest to the northern boundary and visible from within the grounds of Aldermaston Court will be approximately 2m higher than the surrounding ground level. This and several other bunds will be planted with native broadleaved Hornbeam (*Carpinus betulus*) hedging along their tops. The hedges will be 1.8m high when planted to provide an immediate screening effect.

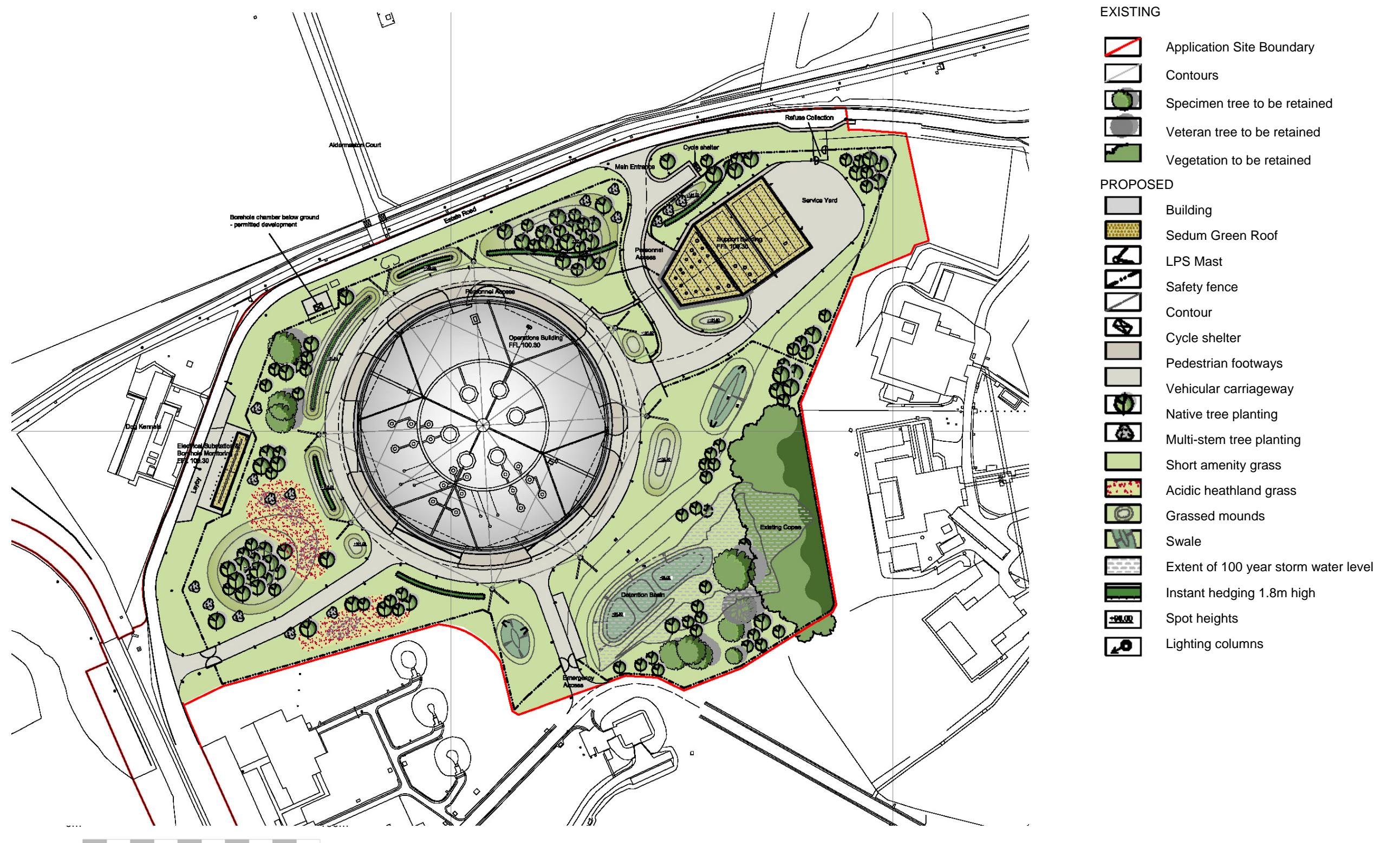
Groups of predominately native broadleaved trees will be planted at various locations around the proposed buildings, and also to reinforce the existing copse in the south east corner of the Hydrus Development Site (refer to Figure 13-5: Landscape General Arrangement Plan). The proposed planting will also include informal parkland trees as a reference to the parkland setting at Aldermaston Court.

Two swales and a detention basin are located towards the lower lying south east corner of the Hydrus Development Site. These will incorporate areas of seasonally damp grassland, rather than being permanently wet. An area of acid heath grassland close to the western site edge, and a rough grassland edge to the existing woodland copse are included to help promote biodiversity. Elsewhere, the proposed grass areas would be cut regularly to form amenity grassland.

The Support Building and Electrical Substation feature an extensive green roof system incorporating various species of Sedum.

Along with the retained copse and other trees, the proposed planting will, with time, soften close range views of the building facades from locations within the AWE Aldermaston Site. The landscape proposals will provide an attractive localised setting for the new buildings. However, given the scale of the proposed buildings and LPS masts, it is not anticipated that the proposed planting will have a significant impact on longer distance views of the Proposed Development from outside the AWE Aldermaston Site.

Figure 13-5: Landscape General Arrangement Plan



13.5.2.3 Permanent External Lighting

The external lighting scheme has been designed to incorporate mitigation measures set out in the document entitled 'Bats and Lighting in the UK' (Ref. 13-18). The photometric data provided for all of the luminaires specified indicates that these will not result in upward light emitted above the horizontal plane, and this will limit direct views of the light source and the contribution of the lighting scheme to sky glow. Horizontal illumination plots for the proposed lighting scheme indicate that illumination will be limited to a defined area around the proposed lighting targets (e.g. road surfaces), limiting the effect of the luminaires at ground level.

The proposed landscape scheme includes bunds up to 2m high with 1.8m high Hornbeam hedges planted on their tops around large sections of the Operations Building. These will prevent or limit views of the illuminated sides of the Operations Building and the bollards along the northern side of the Support Building from some close range locations, notably in views along the remnant avenue within the hotel grounds to the north of the Proposed Development. The Hornbeam plants specified for the hedges tend to retain most of their deciduous leaves throughout winter months, dropping them around the same time as the new leaves appear in the Spring. As a result, a degree of screening provided by the hedge is maintained throughout the year.

Beyond the boundary of the AWE Aldermaston Site, it is anticipated that direct views of the proposed downward facing light sources (up to a maximum of 6m in height) will be prevented or limited by other buildings within the AWE Aldermaston Site or by bands of intervening trees.

13.6 Landscape Effects

13.6.1 Temporary Effects

Temporary effects are associated with construction works and will include the construction of the two contractor's compound areas, associated welfare facilities together with construction vehicle access, materials, topsoil and subsoil storage, any cranes used to construct the buildings and night time lighting. Details of construction activities are set out in Chapter 6: Construction of the DEEA.

As noted above, the construction access routes, WECE and CACE have previously been subject to environmental appraisal as part of the NOA and HEFF planning applications. The Hydrus Development Site construction will not have any landscape effects on WECE or CACE different to those previously assessed for NOA or HEFF. Using the existing / proposed HEFF- and NOA-related activities in these areas as the base line for this assessment, the temporary construction impacts for the Proposed Development on the relevant landscape character areas within AWE Aldermaston will be Neutral. For operational and night-time effects on these character areas, the assessment considers the indirect impact of the Operations and Support Buildings with associated infrastructure.

13.6.2 Permanent Effects

The longer term effects will include the operation of the completed Hydrus Facility buildings. Night-time effects upon landscape character and visual amenity are

also considered in order to assess the likely effects of lighting elements of the Proposed Development.

The assessment of landscape and visual effects takes into consideration the mitigation measures described above to avoid, reduce and where possible remedy adverse effects.

The landscape effects upon the local and site character areas during the construction and operational phases of the Proposed Development are summarised in Table 13-10 and further described and assessed in the following paragraphs.

Table 13-10 Landscape Effects

Local Landscape Character Areas	Nature of Effects		Scale of Change	Duration	Significance of Landscape Effects
	Type	Direct/Indirect			
Aldermaston Park Pasture and Woodland Fringe	Construction	Direct / Indirect	Minor	Temporary	Negligible
	Operation	Direct / Indirect	Minor	Permanent	Negligible
	Night-time	Direct / Indirect	Negligible		Negligible
Tadley Urban Area	Construction	Indirect	Neutral	Temporary	Neutral
	Operation	Indirect		Permanent	Neutral
	Night-time	Indirect			Neutral
Haughurst Hill Heath Associated Pasture and Woodland	Construction	Indirect	Neutral	Temporary	Neutral
	Operation	Indirect		Permanent	Neutral
	Night-time	Indirect			Neutral

Site Landscape Character Area	Nature of Effects		Scale of Change	Duration	Significance of Landscape Effects
	Type	Direct/Indirect			
1. Contained Intensive Industrial Plateau	Construction	Direct	Neutral	Temporary	Neutral
	Operation	Indirect	Negligible	Permanent	Negligible
	Night-time	Indirect	Neutral		Neutral
2. Contemporary Urban Edge	Construction	Direct	Neutral	Temporary	Neutral
	Operation	Indirect	Negligible	Permanent	Neutral
	Night-time	Indirect	Neutral		Neutral
7. Contained Open Space	Construction	Direct	Neutral	Temporary	Neutral
	Operation	Indirect	Negligible	Permanent	Neutral
	Night-time	Indirect	Neutral		Neutral
8. Intimate Enclosed Woodland Plateau Edge	Construction	Direct	Moderate	Temporary	Minor Adverse
	Operation	Direct	Minor	Permanent	Minor Adverse becoming Neutral as planting establishes
	Night-time	Direct			Negligible
9. Open Grassy Heath Plateau with Buildings	Construction	Direct	Moderate	Temporary	Moderate Adverse
	Operation	Direct	Moderate	Permanent	Moderate Adverse becoming Neutral as planting establishes
	Night-time	Direct			Negligible
10. Wooded Plateau Edge	Construction	Direct	Neutral	Temporary	Neutral
	Operation	Indirect	Minor	Permanent	Negligible
	Night-time	Indirect			Neutral
11. Wide Plateau Corridor	Construction	Direct	Neutral	Temporary	Neutral
	Operation	Indirect	Minor	Permanent	Negligible
	Night-time	Indirect			Negligible

13.6.3 Local Landscape Character Areas

13.6.3.1 Aldermaston Park Pasture and Woodland Fringe

This character area contains part of the Grade II Registered Park and Garden of Aldermaston Court (consideration of the potential heritage impacts on the Registered Park and Garden at Aldermaston Court is provided in Chapter 14: Cultural Heritage and Archaeology.) The landscape is wooded to the north and south of AWE Aldermaston and this provides a wooded backdrop and containment to the site. AWE Aldermaston has little influence over the wider part of the character area to the north east as it dips away from the plateau towards Padworth. A sliver of the proposed Hydrus Development Site falls into the very edge of this character area. Therefore there will be very limited direct landscape effects in this location, but this is not considered to be significant in terms of the overall character area.

Construction Effects: The urbanising presence of construction traffic, construction compounds and a tower crane on the adjacent character area will have a **Negligible** landscape effect on the margins of this character area.

Operational Effects: There will be limited intervisibility between this local character area and the Proposed Development, although this is controlled by vegetation within the character area, resulting in a **Negligible** landscape impact. The ZTVs for the Proposed Development indicate that the LPS masts and catenaries will be the most widely seen features, although the roof tops of the Operations and the Support Buildings may be briefly seen across limited areas. Typically, the ZTVs predict that there are existing views of the current chimneys and tallest buildings at AWE Aldermaston. The proposed buildings and structures would be seen in that context. Field survey work in publicly accessible locations indicates that the presence of small bands or groups of trees restricts potential views more strongly than predicted by the ZTVs, particularly in summer months.

Night-time Effects: The proposed lighting for the Hydrus Development Site will be seen in the context of the existing lighting across the AWE Aldermaston Site, including its well-illuminated perimeter. It is not anticipated that Hydrus Development Site lighting will have an appreciable effect on this local landscape character area.

13.6.3.2 Tadley Urban Area

This urban character area borders AWE Aldermaston to the south and west. It is separated from the Proposed Development by the existing urbanised western sector of the AWE Aldermaston Site. It does however abut the southern edge of the Western Gate where construction traffic and contractors' car parking will use the areas already provided to service ongoing redevelopment of the AWE Aldermaston Site. The continuing use of the contractor's access and car parking areas will have a **Neutral** effect on the adjacent character area.

Operational Effects: The permanent development will have no landscape effect on the Tadley Urban Area due to the predicted lack of visibility of the proposals.

Night-time Effects: The night-time character of the area will not be altered by the Proposed Development.

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13.6.3.3 Haughurst Hill Heath Associated Pasture and Woodland

This character area lies to the north and west of the AWE Aldermaston Site and contains significant areas of woodland. As with the Tadley Urban Area, this character area is buffered from the Proposed Development by the urbanised western sector of AWE Aldermaston, and also by development that abuts the A340 Paices Hill. It contains some of the original features of Wasing Park, Grade II Registered Park and Garden (consideration of the potential heritage impacts on the Registered Park and Garden at Wasing Park is provided in Chapter 14: Cultural Heritage and Archaeology.) The Proposed Development will have no direct or indirect landscape character effects on this area.

Construction Effects: During construction there may be occasional glimpses of construction activity, cranes and construction related traffic in the adjacent area. However, this will be the same as for the NOA and HEFF construction projects, resulting in no change to the baseline situation and this is, therefore, assessed as a **Neutral** landscape effect.

Operational Effects: The permanent development will have no landscape effect on this local character area due to the predicted lack of visibility of the Proposed Development.

Night-time Effects: The night-time character of the area will not be altered by the Proposed Development.

13.6.4 Site Landscape Character Areas

13.6.4.1 Contained Intensive Industrial Plateau

This character area is primarily defined by the concentration of industrial buildings and flat topography. The buildings are interspersed with a range of hard spaces which include car parking, set behind an inner security fence and roads.

Construction Effects: This area contains small elements of the contractor's access and compound that was assessed for the NOA project, and are currently in use. The Proposed Development will utilise these facilities but will not change the character or appearance of the construction proposals and activities. The direct effect on landscape character will therefore be **Neutral**.

Operational Effects: The operational elements of the Proposed Development will be separated from this site landscape character area by two other character areas (10. Wooded Plateau Edge and 11. Wide Plateau Corridor). The ZTVs for the Proposed Development predict that there will be limited visibility of the taller elements of the Hydrus Development Site within the Contained Industrial Plateau character area. However, these will be seen in the context of the existing large scale industrial buildings and chimneys within the character area itself, and buildings elsewhere on the AWE Aldermaston Site. The permanent effect on the landscape character will be **Neutral**.

Night-time Effects: The existing well-lit night-time character of the area will not be altered by the Proposed Development, resulting in a **Neutral** landscape character effect.

13.6.4.2 Contemporary Urban Edge

This area has been undergoing substantial change with the construction of the NOA and Orion developments and it includes temporary access and car park areas and construction compounds for these projects. The Proposed Development will extend the use of these facilities for the construction period.

Construction Effects: There will be a **Neutral** effect on the landscape due to the continued use of the WECE for the Proposed Development.

Operational Effects: There will be no direct landscape impacts during the operational stage. However, the LPS masts and catenaries may be visible from parts of this character area. These will be seen to the rear of existing large scale buildings and structures within the Contained Intensive Industrial Plateau landscape character type. The landscape effect is assessed as **Neutral**.

Night-time Effects: The night-time character of the area will not be altered by the Proposed Development due to the intervening well-lit industrialised area. The landscape effect is therefore assessed as **Neutral**.

13.6.4.3 Contained Open Space

This landscape character area is located in the far south west corner of the AWE Aldermaston Site, separated from the Hydrus Development Site by several site landscape character areas.

Construction Effects: The existing construction access route crosses a small part of this area. As the construction of the Proposed Development will continue this current use there will be **Neutral** landscape effect.

Operational Effects: The buildings and structures of the Proposed Development will be glimpsed from a small part of this character area, but they will be seen to the rear of existing industrial facilities at AWE Aldermaston. The effect on landscape character is assessed as **Neutral**.

Night-time Effects: The night-time character of the area will not be altered by the Proposed Development due to the intervening well-lit industrialised area. The landscape effect is therefore assessed as **Neutral**.

13.6.4.4 Intimate Enclosed Woodland Plateau Edge

This character area is enclosed by quite dense parkland and woodland vegetation. Its topography falls steeply away from the main site plateau to the northeast corner and therefore its aspect is away from the main AWE Aldermaston Site plateau. It is of good landscape quality and moderate sensitivity to change. However, whilst much of this area is protected from the effects of the Proposed Development by the existing vegetation and its topographic aspect, part of the north western corner falls within the Hydrus Development Site, and therefore there will be some direct effects. The Proposed Development will have a localised effect on character.

Construction Effects: The construction effects will be temporary. The existing copse of trees to the south east of the Hydrus Development Site will be retained and protected during construction. Elsewhere, the existing top soils will be stripped and retained for reuse as part of the landscape proposals. Parts of the site will be regraded to appropriate formation levels and earth bunds will be

constructed as part of the landscape mitigation measures. Part of the Support Building and associated access roads and other facilities will fall within this character area. The construction works will have a temporary **Minor Adverse** effect on the site landscape character area as a whole.

Operational Effects: The Support Building will form a large new element in a small, currently open section of this character area. At a maximum roof height of 12.06m high with a three tiered roof, the new building will be taller and of a contrasting design when compared to other buildings within this character area. The three new roof sections will be planted with Sedum to form a 'green' roof, which will help to limit its visual impact. New copses and small groups of trees will be planted adjacent to the boundary and this will strengthen the buffering effect of the existing copse for the remainder of the character area. With time this additional planting will soften close range views of the Support Building and, in places, that of the safety fence surrounding the Hydrus Development Site. The effect on landscape character is assessed as **Minor Adverse** initially, becoming **Neutral** as the tree planting develops.

Night-time Effects: Whilst this small section of the overall landscape character area is currently not directly lit, it is strongly influenced by the lighting along the perimeter road. The lighting associated with the Proposed Development will be seen in that context and is assessed to have a **Negligible** effect on landscape character.

13.6.4.5 Open Grassy Heath Plateau with Buildings

This large area of the AWE Aldermaston Site comprises open grassland with some heathland, scattered trees, mounds and low-rise buildings. The Proposed Development occupies the northern most part of this character area and will introduce modern industrial scale and style buildings into this less intensively developed eastern sector of the AWE Aldermaston Site. However, it will be seen in the context of the major industrial and office development areas to the south west and the larger industrial buildings situated on the eastern edge of the eastern sector of the AWE Aldermaston Site.

The form and mass of the Operations Building and LPS will be distinct from any other buildings currently located within the landscape character area. Any lighting associated with the contractors' compound(s) and the proposed new buildings will intensify the amount of lighting in this part of the Hydrus Development Site, but this will be perceived in the context of the wider lit AWE Aldermaston Site and perimeter fencing.

Whilst the loss of trees to accommodate the Proposed Development will add to the initial adverse landscape impact on this area, the proposed mitigation planting will in time more than replace that lost. It will provide the eastern sector with a stronger landscape context, which will have longer-term benefits.

Construction Effects: Twenty-one trees of categories A to R will be removed in order to accommodate the Proposed Development (refer to Technical Appendix E.4: Tree Survey). Individual trees to be retained in the south eastern corner and close to the western boundary of the Hydrus Development Site will be protected during the construction phase. Top soil across the Hydrus Development Site will be stripped and retained for future use. Parts of the site will be re-graded and bunds will be constructed around the Operations Building. Whilst these works will

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have a substantial effect on the immediate area, in terms of the overall landscape character area, the effect will be **Moderate Adverse**.

Operational Effects: The Operations Building and surrounding infrastructure will be substantial new elements in this landscape character area, considerably larger than other existing buildings in the landscape character area. The HEFF building, which will also be located in this character area, will be approximately 12m tall and its LPS masts 28m high. Whilst these are not of the same scale as the Proposed Development, they are larger than other existing elements. The initial effect on landscape character of the Proposed Development is assessed as **Moderate Adverse**. As the proposed tree planting matures, this will enhance the existing landscape structure in this sector of the landscape character area, and it is considered that this will then reduce the landscape impact to **Neutral**.

Night-time Effects: Whilst the existing Hydrus Development Site is not lit at night, the surrounding access routes are well-lit for safety and security reasons. The Proposed Development will add to the existing lighting in this area, but this is likely to have a **Negligible** effect on the landscape character area as a whole.

13.6.4.6 Contained Open Space

This character area at the western corner of AWE Aldermaston will be used for the contractor's site access from the local highways. This facility has already been constructed. Its continuing use will therefore lead to no additional landscape effects. The contractor's compounds and the Proposed Development site are remote from this area. The landscape effect on this area will therefore be **Neutral**.

13.6.4.7 Wooded Plateau Edge

This area is contained with mounding and significant areas of vegetation. The contractors' access will pass through the area on established roads and one of the contractors' compounds will lie adjacent to the southern boundary of the character area.

Construction Effects: There will be no significant change in the landscape character as a result of the construction of the Proposed Development. The effect is therefore assessed as **Neutral**.

Operational Effects: The operational development will abut this area to the east. The Electricity Substation is located to the east of the Hydrus Development Site, adjacent to the existing access road, and opposite the existing building within the Wooded Plateau Open Space character area. From here, the mass of the Operations Building and the LPS masts will be visible to the rear of the proposed new planting on the grassed bunds. However, the well-treed character of the landscape character area restricts views of the Proposed Development from most areas within it. The effect on the overall landscape character is assessed as **Neutral**.

13.6.4.8 Wide Plateau Corridor

This area was a former runway and now comprises roads and large expanses of car parking and compounds. It divides the more urban and densely developed western sector from the relatively less densely developed eastern sector of the

AWE Aldermaston Site. The Hydrus Development Site and contractors' compounds will be located in the adjacent area to the east.

The Proposed Development will be set in the context of the surrounding and intervening large scale industrial buildings. This area has a poor landscape quality and low sensitivity to change.

Construction Effects: The temporary construction landscape effects will be indirect and **Neutral**.

Operational Effects: Whilst the proposed buildings and LPS masts will be visible from most of the length of this access route, there are clear existing views over much of the other existing industrial scale development within AWE Aldermaston. The effect on landscape character is assessed as **Neutral**.

Night-time Effects: The proposed lighting within the Proposed Development will have a **Negligible** effect on this landscape character area.

13.7 Visual Effects

13.7.1 Zone of Theoretical Visibility (ZTV)

The baseline ZTV for the existing AWE Aldermaston Site is shown on Figure 13-6. The ZTVs for the Hydrus Development Site are shown on Figures 13-7 and 13-8. A ZTV which combines the baseline visibility of the existing AWE Aldermaston Site with the proposed LPS masts is shown at Figure 13-9.

The existing ZTV models the area in which potential views of the existing buildings and stacks in the vicinity of the Proposed Development footprint may be seen in dark red and areas where only the top of the existing stacks may be visible in pink. The proposed ZTV for Proposed Development indicates the area where the building and the LPS masts may be seen in dark blue and the areas where only the upper part of the LPS masts may be seen in light blue. The existing buildings heights on AWE Aldermaston Site were modelled using GIS data provided by AWE. The surrounding topography is based on OS digital mapping information. Existing settlements are given a height of 9m and significant areas of woodland and woodland belts are assumed at 15m above ground level.

The tallest existing buildings currently on the AWE Aldermaston Site are over 28m tall and are located to the south west of the Hydrus Development Site. The tallest existing stacks on the AWE Aldermaston Site (those associated with the Boiler House on the eastern boundary) are over 48m tall. The crown of the roof of the Operations Building will be 120.3m AOD, with several flues and stacks projecting 3.5m further. The Proposed Development LPS masts will be 40m tall (140.3m AOD).

The Proposed Development will slightly extend the visibility of the AWE Aldermaston Site in the wider area (refer to Figure 13-9: Combined ZTV). Whilst the Proposed Development will not be seen from every location that the current tallest building and chimney stacks can be seen from, the potential visibility of the Hydrus Facility LPS proposals will theoretically extend existing views of the site in a small number of locations. These theoretical locations are indicated in shades of blue on Figure 13-9. It should be noted that field work has shown that small lines or groups of trees or hedgerows can restrict or prevent *actual* views from

publicly accessible locations. Where there are views towards AWE Aldermaston, the daytime visibility of the Proposed Development and existing site is affected by weather conditions and the angle of the sun, particularly in mid to longer distance views.

Theoretically there will be new close range views of the tops of the LPS masts to the north west and north east of the AWE Aldermaston Site. This will include land to the north of Aldermaston village to the north of Fishermans Lane / Wasing Lane. New close range views will also theoretically be available from within agricultural land to the south west of Aldermaston village. The Operations Building will not feature in these new views.

There will also be a small number of new medium range views from within agricultural and other land close to Padworth College independent school.

The ZTVs predict that there would be occasional, brief, long distance views of the LPS masts to the west and south west. In longer distance views, the LPS masts may be difficult to perceive or may be missed by the casual observer, particularly in weather conditions when there is less than perfect visibility. In most cases, the potential new views would be adjacent to locations from where there are existing views of the AWE Aldermaston Site. The potential new views of the Proposed Development would, therefore, slightly extend views of the AWE Aldermaston Site. Field visits to many of the public areas where the ZTVs predict that there are existing views towards AWE Aldermaston, have shown that high roadside hedges or other small areas of vegetation prevent or otherwise limit views towards the site, thus reducing the actual visibility.

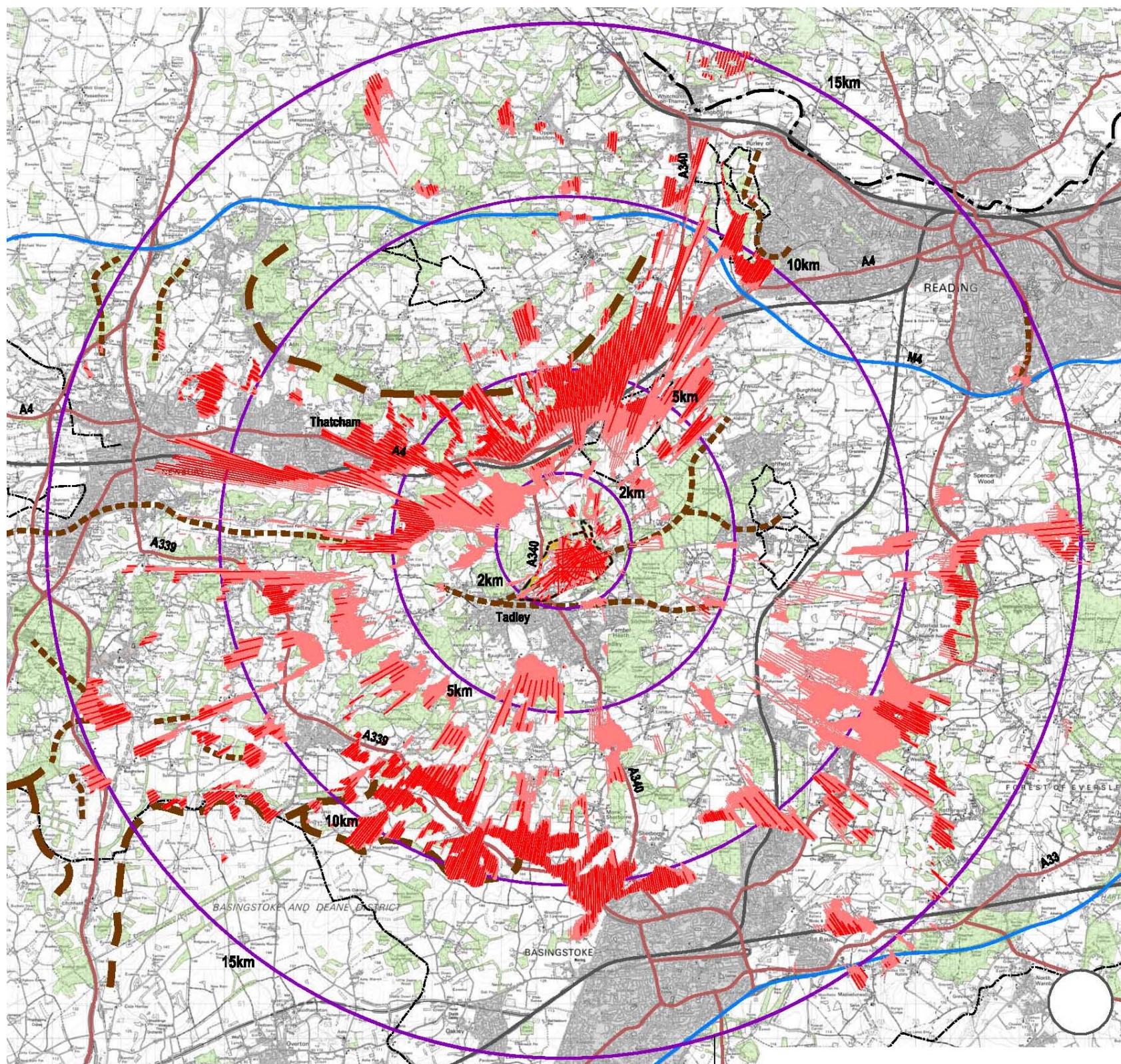
13.7.2 Visual Impact Assessment

The summary of visual effects of the Proposed Development during construction and for Operational Year 1 is illustrated on Figure 13-10. The visual impact schedules are included in *Technical Appendix E.6* of DEEA Volume II.

Photomontages of the key views agreed with WBC, taken in both winter and summer, are provided at Figure 13-13 in *Technical Appendix E.7*. These provide a comparison between the existing situation and that at Operational Year 1. The location plan for these views is at Figure 13-12. The locations of the viewpoints are shown at Figure 13-12 at *Technical Appendix E.7* of DEEA Volume II.

The following sections summarise the potential visual effects of the Proposed Development upon each visual receptor group and consider the potential night-time effects of lighting the site.

Figure 13-6: Zone of Theoretical Visibility - Existing



- Application Site Boundary
- AWE Aldermaston
- Major Settlements
- Minor Ridgelines
- Major Ridgelines
- Significant Screening Vegetation
- Motorway
- A Road
- Railway
- National Trail (Thames Path)
- Other Recreational Path
- 15km
- Computer generated Zone of Theoretical Visibility (ZTV) of existing buildings and stacks
- Computer generated Zone of Theoretical Visibility (ZTV) of existing stacks

The Zones of Theoretical Visibility (ZTV) is defined as the area within which all or part of the existing features may be visible

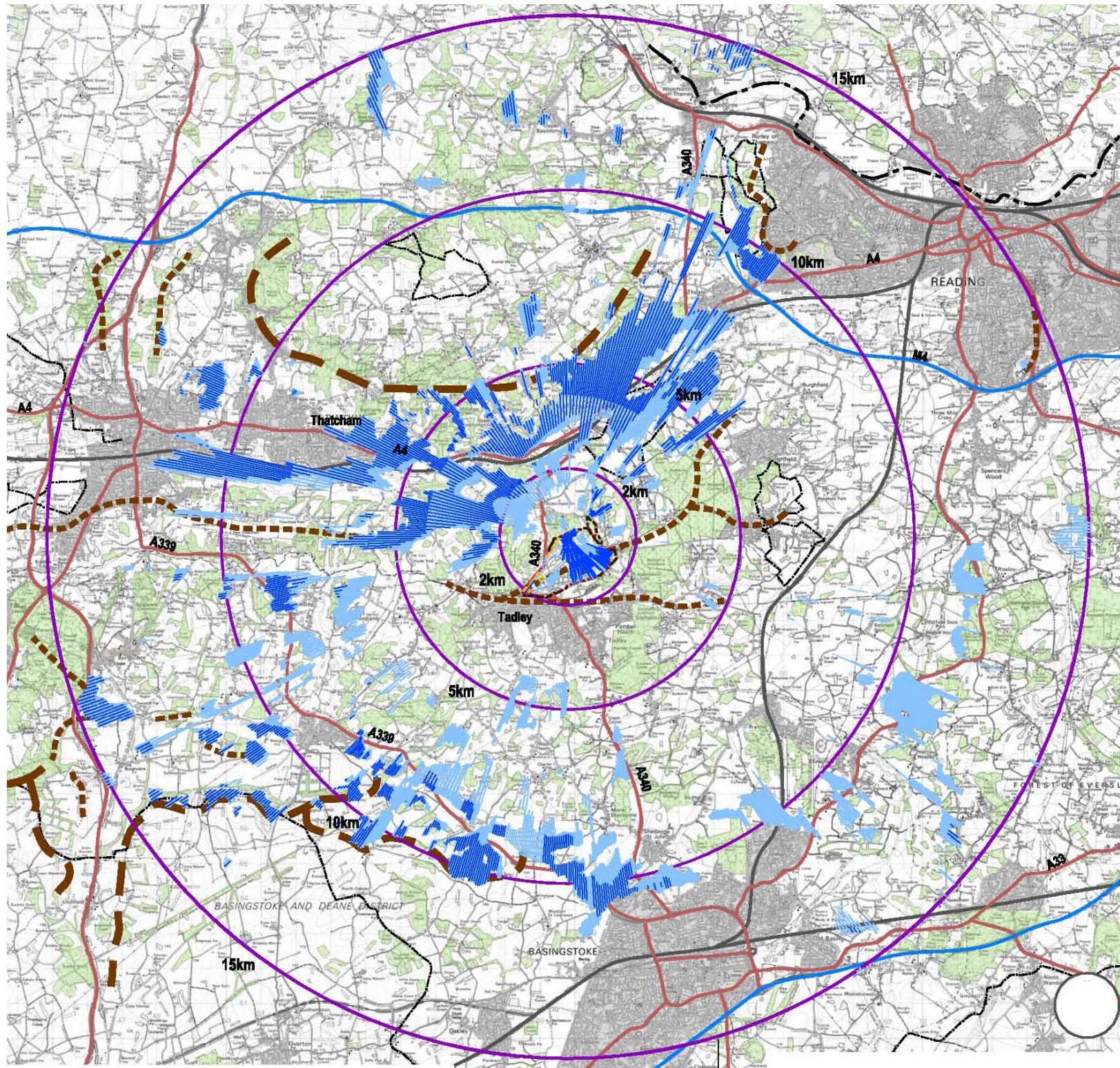
The Zones of Theoretical Visibility was calculated by Key TERRAFIRMA 7 software package using Ordnance Survey Land form PANORAMA digital height information

Eye height of viewer assumed to be 1.6m and height of screening vegetation assumed to be 15m above ground level. Height of major settlements assumed to be 9m above ground level

Existing building and Stack heights are based on a digital terrain model provided by AWE on 19/01/2009



Figure 13-7: Zone of Theoretical Visibility – Proposed Operations Building



- Application Site Boundary
- AWE Aldermaston
- Major Settlements
- Minor Ridgelines
- Major Ridgelines
- Significant Screening Vegetation
- Motorway
- A Road
- Railway
- National Trail (Thames Path)
- Other Recreational Path
- Distance from site centre
- Computer generated Zone of Theoretical Visibility (ZTV) of proposed Operations Building and LPS Masts
- Computer generated Zone of Theoretical Visibility (ZTV) of proposed LPS Masts

The Zones of Theoretical Visibility (ZTV) is defined as the area within which all or part of the building/mast may be visible

The Zones of Theoretical Visibility was calculated by Key TERRAFIRMA 7 software package using Ordnance Survey Land form PANORAMA digital height information

Eye height of viewer assumed to be 1.6m and height of screening vegetation assumed to be 15m above ground level. Height of major settlements assumed to be 9m above ground level

Crown of proposed Operations Building is shown at 120.3m AOD; Proposed LPS Masts are shown at 140.3m AOD at their tips



Figure 13-8: Zone of Theoretical Visibility – Proposed Support Building

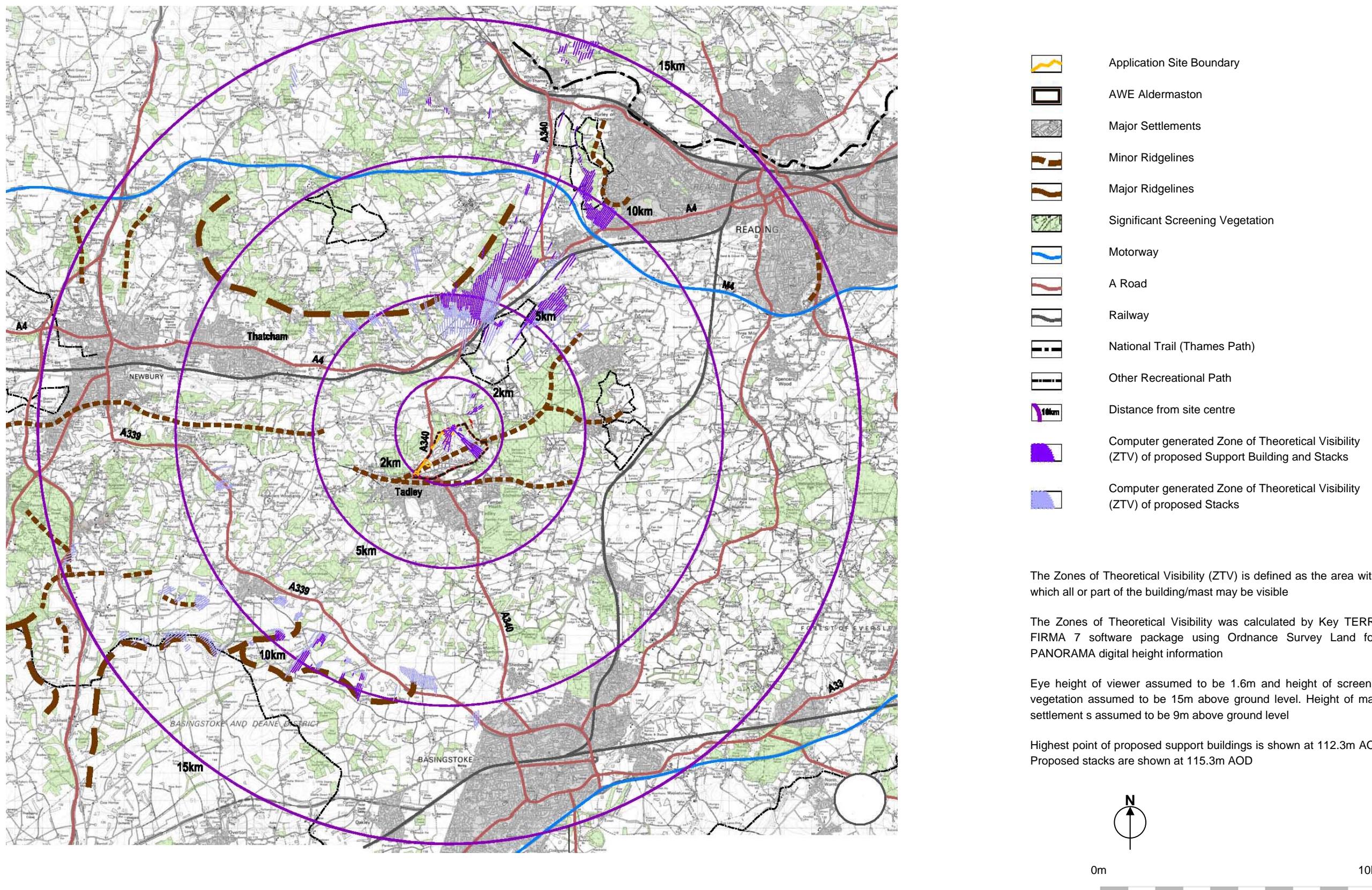


Figure 13-9: Zone of Theoretical Visibility – Combined – Existing Situation and Proposed Operations Building

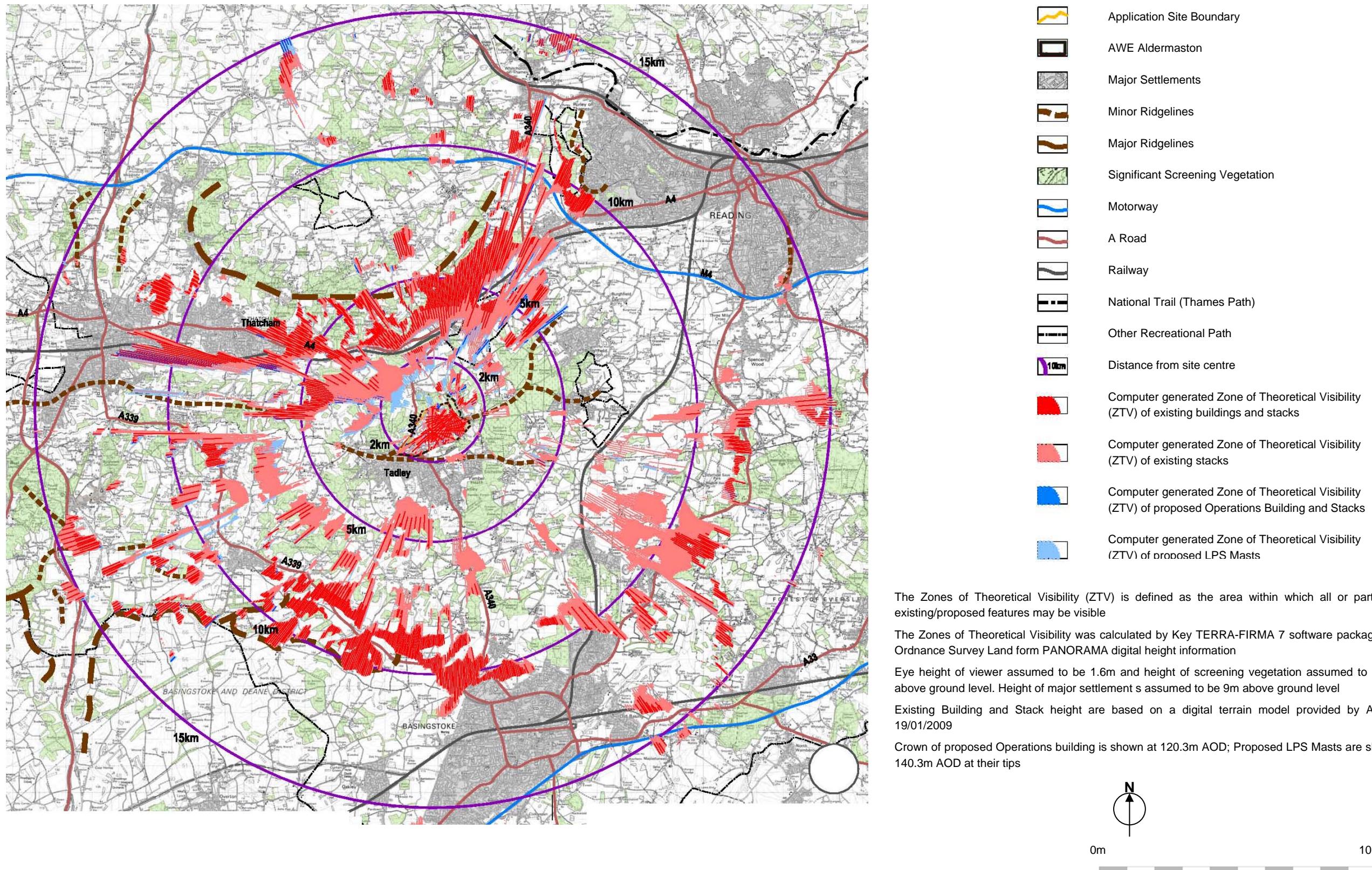
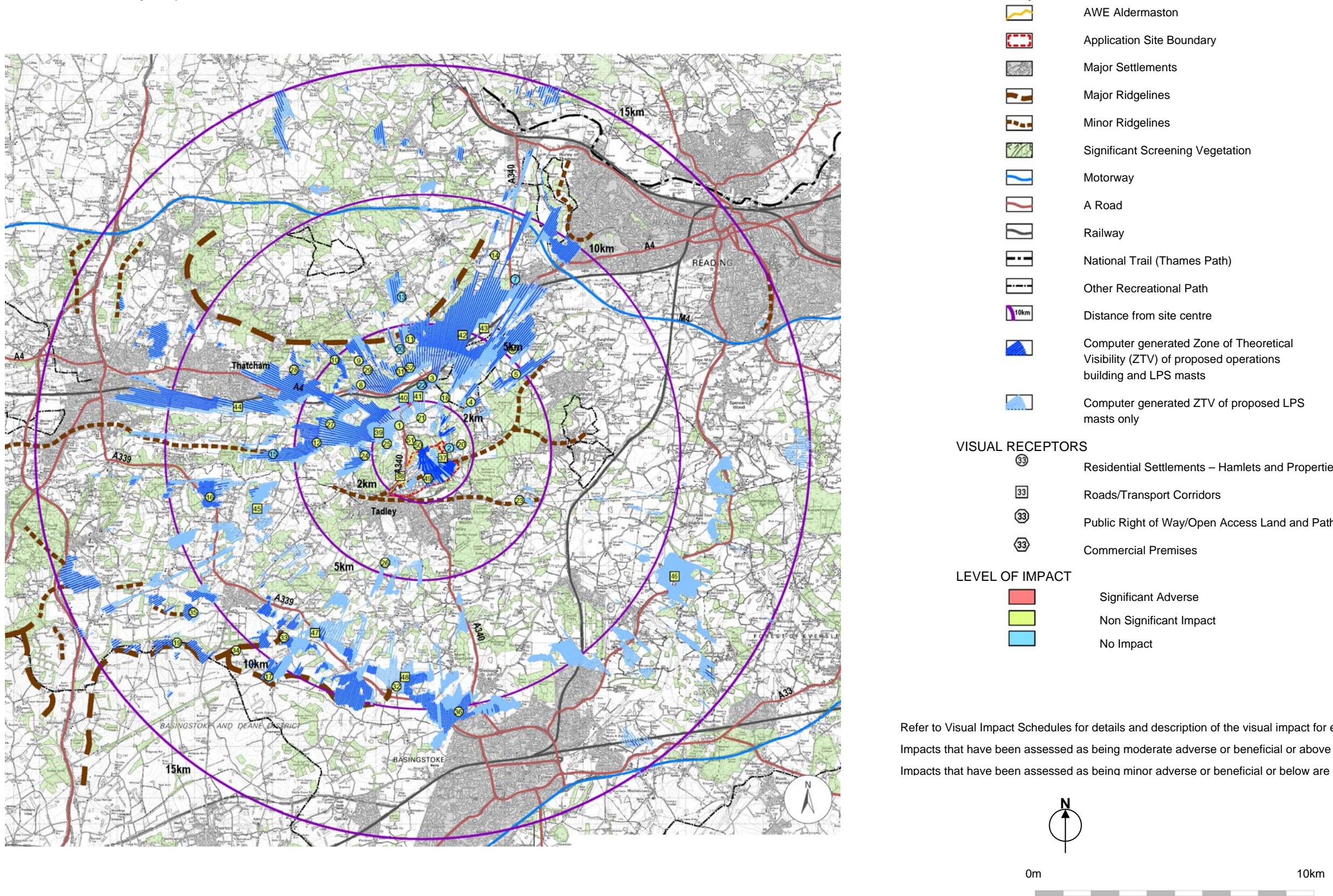


Figure 13-10: Visual Effects Summary – Operational Year



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Views of the buildings within the Proposed Development, and that of the wider AWE Aldermaston Site, are partially contained by the nature of the topography and intervening mature vegetation from many of the settlements, recreational paths, other public rights of way and transport corridors within the study area. The assessment of the visual effects of the Proposed Development upon all receptors relates to those effects likely to occur during the winter months for the worst affected receptors within any identified group i.e. the worst-case scenario. The effects have been assessed for the construction phase and the first year of operation, when the effects of planting mitigation have not been considered. The effect of planting proposals is assessed at Operational Year 10 when the tree and shrub planting will be more established. However, given the height of the LPS masts and Operations Building, the proposed tree planting is unlikely to have an impact on medium or long distance views.

In many of the views assessed, there are views of existing buildings and structures at AWE Aldermaston, and the Proposed Development would be seen in this context. The LPS masts will add new vertical structures to these existing views, but in most cases, they will be seen within the visual envelope of existing development, rather than extending it. In the limited locations where the Proposed Development will extend the apparent width of the AWE Aldermaston Site in the view, the proposals will be seen at such a distance that this will be scarcely perceptible (for example receptor 32 from the footpath at Woodgarston Farm).

The tapering design of the LPS masts results in a width of approximately 0.5m at their tips, which is narrower than the width of most chimneys or stacks on the AWE Aldermaston Site. Whilst this limits the relative visibility of the proposed masts compared to the existing individual structures, the masts will be arranged as a group of eight structures, linked by cables, and this may add visual emphasis to the masts. However, it is anticipated that the cables will be difficult to perceive in longer range views. Other vertical structures at AWE Aldermaston are also arranged as groups, for example the Boiler House chimneys and those of the new Energy Centre located towards the centre of the AWE Aldermaston Site. This grouping of structures aids identification of individual elements of the AWE Aldermaston complex, but they are often seen within an overall panorama of vertical structures.

13.7.2.1 Views from Residential Receptors

There will be limited views of the tops of the LPS masts and occasionally glimpses of the roofs of the Operations and Support Buildings from parts of a number of settlements within a close (less than 2km) to medium (between 2 to 5km) range of the Proposed Development. Generally the Proposed Development will form small components in the wider view and will add to existing views of the tallest buildings and structures at AWE Aldermaston. In places there would be no visual impact (refer to *Technical Appendix E.7*, Figure 13, Photomontage 1; and to *Technical Appendix E.6*, Receptor 2). With the exception of parts of Aldermaston village, the visual impact on these settlements is assessed as **Negligible**. Properties to the north of Wasing Lane and Fisherman's Lane in Aldermaston village will have views of the tops of the LPS masts seen over existing built form and intervening vegetation. In most cases, there are no existing views of AWE Aldermaston from these properties, so although the masts etc will form small components in the view, the effect is assessed as **Minor Adverse**.

The impact on the properties and settlements with middle distance views towards the AWE Aldermaston Site, from the ridgeline north of the A4 corridor between Beenham, Woolhampton, Midgham and Colthorpe was found to be **Negligible** (refer to *Technical Appendix E.7*, Figure 13, Photomontage 2; and to *Technical Appendix E.6*, Receptor 11). The top of the existing taller AWE Aldermaston buildings and stacks are visible above the tree line from the ridge to the north. The top of the proposed LPS masts and the roofline may add additional elements on the skyline. However, they will be small and in keeping with the existing view. The top of cranes may be visible for a temporary period during construction. The other residential settlements and properties surveyed were found to have either no view or no discernible change in their views.

13.7.2.2 Views from Public Footpaths, Open Access Areas, Recreation Paths

There will be no significant impacts on footpaths in the vicinity of the AWE Aldermaston Site.

There may be a **Minor Adverse** effect on the view from the footpath to the south of Elstree School (receptor 29) and the footpath to the east of King's Farm, Midgham (receptor 28), which are around 3.8km and 5.7km from the Proposed Development. In these views, the AWE Aldermaston complex of buildings and structures is clearly visible on the skyline. The Hydrus Development Site will be seen as part of this complex. In the brief view from close to King's Farm, the Proposed Development will slightly extend the visible width of the AWE Aldermaston complex, but this is not considered to significantly alter the character of the view.

There may be a **Minor Adverse** effect on views from publicly accessible footpaths through Wasing Park (Receptor 24). In places there are glimpses of the existing towers at the AWE Aldermaston Site, seen above the intervening tree canopy. The LPS masts and the upper parts of the roof of the Operations Building may also be visible from some locations.

There will be **Negligible** or no visual impacts during construction and operation from the network of footpaths on the south facing slope of the east-west orientated ridgeline between Midgham and Beenham (refer to *Technical Appendix E.7*, Figure 13, Photomontages 3 and 4, and to *Technical Appendix E.6*, Receptors 30 and 31).

The Proposed Development will have a **Negligible** effect on long distant views within the AONB to the south and west of the AWE Aldermaston Site. In the most distant views, the Proposed Development will be difficult to discern from other elements of the existing AWE Aldermaston complex, particularly in weather conditions where there is less than perfect visibility (refer to *Technical Appendix E.7*, Figure 13, Photomontages 5 to 6, and to *Technical Appendix E.6* Receptors 32 and 34).

13.7.2.3 Transport Corridors

There will be no significant visual effects from any roads in the vicinity of the AWE Aldermaston Site (refer to *Technical Appendix E.7*, Figure 13, Photomontages 10 to 11 and to *Technical Appendix E.6*, Receptor 37).

There may be glimpsed views of the taller parts of the Proposed Development from short sections of roads in the vicinity of the AWE Aldermaston Site. Whilst there are long distance views of the AWE Aldermaston Site as a whole from sections of roads to the south and west of the site, the Proposed Development will not be readily discernible, resulting in **No Change** or a **Negligible** visual impact.

Whilst there will be views of Proposed Development construction traffic from parts of the surrounding roads network, these will be in keeping with the baseline situation where other developments within AWE Aldermaston currently use the same compounds, access routes and parking areas. There will therefore be **No Change** to the current situation.

13.7.2.4 Employment Areas

There will be no significant visual effects on employment areas.

There are no views from most rooms within the hotel and conference centre at Aldermaston Court due to the orientation of the windows away from the AWE Aldermaston Site. A small number of south facing rooms will have views of the upper parts of the LPS masts, catenaries and small sections of the roof and walls of the Proposed Development. Similarly, there will be some locations within the grounds from where there will be views of the Proposed Development, whilst other areas will have no view. Whilst this will give higher level, localised impacts on a small number of rooms and parts of the hotel grounds, there will be an overall Minor Adverse visual impact on views from Aldermaston Court.

13.7.2.5 Night Time Lighting

The Proposed Development is located adjacent to the well-lit industrial zone of the AWE Aldermaston Site, and also to Cwm Road, Griffin Road and the perimeter fencing which have significant security lighting. The Proposed Development lighting scheme has been designed to minimise light spill beyond the areas of the site which require direct illumination.

The proposed operational lighting scenario will be directly visible from parts of the AWE Aldermaston Site. The landscape proposals will limit the degree to which the operational lighting is visible from the hotel and its grounds to the north. It is anticipated that the downward facing luminaires will not be directly visible from other locations, or they would be at such a distance that they will be barely discernible in the context of an already well lit site.

Light reflected upwards from the surfaces or the sides of buildings within the scheme may contribute to the existing sky glow created by the well lit AWE Aldermaston Site as a whole. The degree to which this is perceptible varies and is dependant upon atmospheric conditions.

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13.8 Summary of Residual Effects		
13.8.1 Landscape Effects		
<p>The Proposed Development will have no significant residual (i.e. moderate and above) permanent landscape effects on the local landscape character.</p> <p>Temporary Moderate Adverse effects will occur in the Open Grassy Heath Plateau with Buildings AWE Aldermaston Site landscape character area during construction and during the initial operational phase. As the proposed planting throughout the Proposed Development matures, this landscape effect will reduce to Neutral.</p> <p>The residual landscape effects on the local and AWE Aldermaston Site landscape character areas will be Negligible or Neutral.</p>		
13.8.2 Visual Effects		
<p>The Proposed Development will not have significant adverse visual effects on the study area.</p> <p>The proposals will add additional elements to existing views of AWE Aldermaston's tall buildings and structures seen across the study area. Whilst not appearing in all existing views of towards AWE Aldermaston, the Proposed Development (mainly the tops of the LPS masts) will extend the views slightly into a small number of new areas. These effects are assessed as Negligible, except for the limited additional views to the north of Aldermaston village, which are assessed as Minor Adverse.</p>		
13.9 Statement of Effects		
13.9.1 National Landscape Designations		
<p>There will be no significant adverse effects as a result of the Proposed Development on the quality of views available from several footpaths on the southern edge of the North Wessex Downs AONB to the north of the AWE Aldermaston Site and from elevated view points to the south west. The Proposed Development will form a small part of the existing developed wooded ridgeline. The Proposed Development therefore meets the requirement of PPS7, Policy C3 of the RSS, and of Objective 13 of the North Wessex Down's "Management Plan 2009 – 2014" which seeks "...to maintain the area's distinctive character and setting" including in relation to development "outside of but visible from the AONB"."</p>		
13.9.2 Regional and Local Policy Context		
<p>The landscape character methodology and approach has considered the local landscape character and detailed character assessments have been undertaken. The proposals seek to mitigate the landscape and visual effect of the Proposed Development. The landscape proposals and site arrangement plans will reduce the visual impact and in the longer term provide an improved and more diverse landscape structure to this section of the AWE Aldermaston Site in keeping with the landscape character of the local area. The Proposed Development will therefore accord with the saved policies OVS.2 and ENV.1 of the West Berkshire District Council Local Plan in conserving and enhancing the special features and</p>		
<p>diversity of the different landscape character areas found within West Berkshire and saved Policy E6 of the Basingstoke and Deane Borough Local Plan.</p> <p>13.9.3 Effects on Landscape Resources</p> <p>The small copse and 11 individual trees in the south east corner of the Hydrus Development Site, and three individual trees close to the western boundary are to be retained. The other scattered small groups and individual trees across the main part of the Hydrus Development Site will be removed in order to accommodate the Proposed Development. This will equate to a total loss of 21 trees of Categories A to R (as defined in BS5837: 2005) (Ref. 13-19). The one Category A tree that will be lost is a middle-aged Oak tree of Fair / Good physical condition. Landscape proposals include the planting of additional small groups of trees and tall hedgerow. Species will be predominately Oak and Birch and other native tree and understorey species which are characteristic of the area.</p> <p>The addition of more native tree stock will provide a longer term benefit.</p> <p>13.10 Conclusions</p> <p>The Proposed Development is located on the northern edge of the AWE Aldermaston Site, close to the main industrial zone. It is a 'brownfield' site.</p> <p>The modern design of the new buildings and structures, together with the landscape proposals (which will provide an attractive hard and soft landscape setting to the development), including the retention of the existing copse and other trees, will result in a Neutral effect on the local character of the site.</p> <p>There will be some temporary adverse visual effects resulting from the construction activity including cranes and temporary lighting.</p> <p>The permanent visual effects of the Proposed Development will relate to the introduction of the building rooflines (20m and 12m AGL) and the LPS masts (40m AGL) as additional elements on the ridgeline just above the tree canopy in some short to long distant views. However, these will be seen in the context of the existing AWE Aldermaston buildings which are up to 28m tall and clusters of stacks across the AWE Aldermaston Site which are approximately 49m tall.</p> <p>In summary there will be no long term adverse landscape effects and no significant adverse visual effects as a result of the Proposed Development.</p> <p>13.11 Cumulative Effects</p> <p>NOA was granted planning permission in January 2007 and construction work is now complete. HEFF was granted planning permission in February 2008 and Pegasus was granted planning permission in February 2010. NOA, HEFF and Pegasus have been assessed as part of the baseline for this assessment.</p> <p>The cumulative scenario comprises the remaining projects scheduled in the Site Development Context Plan (SDCP08) (Ref. 13-14).</p> <p>There may potentially be overlap between the construction periods of the proposed future projects.</p>		
<p>The permanent effects of the combination of future developments may slightly change the skyline views of the AWE Aldermaston Site to some extent.</p> <p>The quality of the buildings at AWE Aldermaston is improving with redevelopment. The Landscape Strategy for the site prepared by RPS in 2005 (Ref. 13-20) should improve localised views of the AWE Aldermaston Site in the longer term. The overall character of the site and its influence on the landscape character of adjacent areas will remain consistent in the short term. In the longer term the quality of the built and landscaped environment within AWE Aldermaston should improve.</p> <p>13.12 References</p> <ul style="list-style-type: none"> Ref. 13-1 PPS 1: Planning Policy Statement 1: Delivering Sustainable Development (2005) Ref. 13-2 PPS 7: Planning Policy Statement 7: Sustainable Development in Rural Areas (2004) Ref. 13-3 National Parks and Access to the Countryside Act (1949) Ref. 13-4 The North Wessex Downs Council of Partners (2009) The Management Plan 2009 - 2014 Ref. 13-5 South East Plan – Regional Spatial Strategy for the South East of England (May 2009) Ref. 13-6 Planning and Compulsory Purchase Act (2004) Ref. 13-7 West Berkshire District Council: West Berkshire District Local Plan 1991 - 2006; Saved Policies Written Statement (Amended September 2007) Ref. 13-8 Newbury (West Berkshire) District Council (1993): <i>Landscape Character Assessment</i> Ref. 13-9 Basingstoke and Deane Borough Council Local Plan 1996-2011 Schedule of Saved Policies (June 2009) Ref. 13-10 The Landscape Institute and the Institute of Environmental Management & Assessment. (2002): Guidelines for Landscape and Visual Impact Assessment (Second Edition). Ref. 13-11 The Countryside Agency and Scottish Natural Heritage. (2002): Landscape Character Assessment: Guidance for England and Scotland. Ref. 13-12 Multi-Agency Geographic Information for the Countryside www.magic.gov.uk Ref. 13-13 English Heritage: The Register of Parks and Gardens Ref. 13-14 AWE (2008): Site Development Context Plan Ref. 13-15 Countryside Agency (April 2002): North Wessex Downs Landscape 		

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Ref. 13-16 Atkins Nuclear (September 2005): Environmental Site Setting Exercise Volume I

Ref. 13-17 Scottish Executive (March 2007): Controlling Light Pollution and Reducing Lighting Energy Consumption

Ref. 13-18: Bat Conservation Trust and the Institute of Lighting Engineers (2008): Bats and Lighting in the UK

Ref. 13-19 BS5837: 2005 Trees in relation to construction. Recommendations

Ref. 13-20 RPS (October 2006) Landscape Strategy.