Culham Storage

Environmental Impact Assessment

Volume 2: Landscape and Visual Impact Assessment

Prepared for:
Statera Energy Limited

Date:
April 2024

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BATTERY ENERGY STORAGE FACILITY ADJACENT TO THE CULHAM SCIENCE CENTRE, OXFORDSHIRE

Landscape and Visual Impact Assessment

Client:
Culham Storage Ltd

Date:
March 2024

Document Ref:
Culham BESS_ LVIA

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Issue	Status	Date	Revision Notes
	For Planning	March 2024	
A			
B			
C			

This report has been prepared by Sightline Landscape with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between Sightline Landscape and the Client.

SUMMARY

1. The Applicant is seeking planning permission to construct a Battery Energy Storage Facility (BESS) on farmland adjacent to the Culham Science Centre (CSC) in Oxfordshire. This report determines the landscape and visual effects that may arise as a result of the Proposed Development. The part of the Site where it is proposed to locate the BESS electrical infrastructure, including a customer substation and extension to an existing CSC substation is not subject to a protective landscape designation. The area where it is proposed to undertake landscaping to create an area of permissive accessible green space lies with Nuneham Park, a Grade 1 Registered Park and Garden. An existing high voltage transmission line passes through the park and garden, and it is proposed to erect a connection tower within it, adjacent to the existing line. This connection tower will primarily serve the existing (to be extended) CSC substation. The Nuneham Courtenay Conservation Area lies immediately beyond the northern boundary of the Site. The whole of the Site lies within the Oxford Green Belt. The Oxford Green Belt Way passes through the Site, skirting the perimeter of the CSC. The Site lies within the Wooded Estatelands Landscape Character Type.

2. While the Site potentially has a High sensitivity to development, because of its location within and adjacent to Nuneham Park, this part of the park is substantially adversely affected by existing high voltage transmission lines and the CSC. In future its setting is likely to affected by the build out of a large mixed use urban development immediately west of the Site (allocated as STRAT9, in the South Oxfordshire Local Plan). The areas where it is proposed to locate the BESS and substations and their immediate setting has a strong urban fringe character. As a result, the sensitivity of the Site to the type of development proposed is considered to be Medium.

3. The Proposed Development, a 500MW Battery Energy Storage System (BESS), comprises:
   - Approximately 296 sound insulated lithium-ion battery units housed within standard shipping containers and 37 larger (12m x 9.5m x 4.05m) noise insulated inverter houses to accommodate the inverters and transformers;
   - Vehicle tracks 4.5m wide and vehicle hardstanding areas;
   - Loose permeable gravel around the battery units and buildings;
   - A weld mesh compound fence on the northern and western boundaries of the BESS compound and a 4m high solid panel timber acoustic fence along the west and south boundaries;
   - CCTV security cameras mounted on 4m high posts:
   - An electricity substation compound with a seven 33kV switch house/control room (13m x 5.5m x 3.5m), comprising transformers, busbars and other equipment of up to 9m in height;
   - A storm water attenuation lagoon;
   - Removal of the non-public highway track (Thame Lane) within the site, and the upgrading of the existing farm track to a 4.5m wide macadam surface; and
   - Extensive landscaping in the form of hedge and woodland planting.

4. The application includes an extension to one of the existing substations within the CSC as part of a wider upgrade of its electrical infrastructure. The extension will be on the east side of the northern substation. A high voltage underground cable will run from this extension to a proposed connection tower, which will be situated within the Registered Park and Garden, north of the BESS. The tower will allow the underground cable to connect aerially across to the existing overhead line. In terms of functionality, this is the only practical point of connection. The connection tower will be set within a compound protected by palisade fencing with proposed scrub and tree planting to reduce its visibility within the landscape.

5. The main driver for locating the BESS at this location is its proximity to an existing substation, the ability to connect to it and the value it brings with regards to increasing grid stability and efficiency. The main spatial constraints are:
   - Avoid, wherever possible, built infrastructure being located within Nuneham Park.
   - Avoid electrical equipment under the overhead power lines.
   - Maintaining an exclusion zone around the transmission towers for their stability and maintenance.
   - Avoid development over a water main which passes through the Site from a Thames Water reservoir to the north.
   - Avoid development within an exclusion zone alongside the railway line.
   - Avoid development adjacent to the existing concrete perimeter track to maintain access for large vehicles/loads.

6. Landscape constraints include a need to minimise any adverse effects on the landscape setting of the Registered Park and Garden and where possible enhance it, having identified that it has been significantly degraded over the centuries.

7. Visual constraints include:
   - Minimise adverse effects to those walking through the area on the Oxford Green Belt Way.
   - Minimise adverse effects to people within the potential future STRAT9 urban expansion area.

8. No trees or hedges will need to be removed to construct the Proposed Development apart from a group within the CSC to accommodate the proposed extension to the existing substation. All root protection areas will be respected within the main development area. The change in character to the Site will not be completely out of character with that of the immediate locality, where electrical infrastructure is a notable feature. The electrical infrastructure is, however, perceived as a negative aspect of landscape character and the Proposed Development will reinforce that. In Year 1, the electrical infrastructure associated with the BESS and substations will only be visible for less than 3.8% of the total area of registered parkland, resulting in a less than significant Moderate adverse effect on the character and setting of this small area of the parkland. The proposed connection tower will have a slightly wider visual influence, but it will always be seen in context with the existing transmission line into which it will connect. The electrical infrastructure component of the Proposed Development will not be visible from the

remaining 96.2% of the Registered Park and Garden, including the core area around Nuneham House and will have no effect on its character or setting.

9. Primary mitigation is achieved through the spatial arrangement and the earthworks, which seek to sit the electrical infrastructure as low as possible within the landscape. Acoustic fencing on the west and south side of the BESS compound will screen the electrical infrastructure from view, with native planting screening the fencing. It is also proposed that the containers and buildings are finished in a recessive green colour, rather than the standard white or light grey. It is also proposed to re-establish a historic tree belt along the southwest boundary of the Registered Park and Garden, which once followed the Parish Boundary and enhance this part of the parkland for aesthetic effect and biodiversity net gain. This will minimise the visibility of the proposed electrical infrastructure from the Registered Park and Garden and improve the setting of the parkland in relation to the existing electrical infrastructure, the CSC and the potential future STRAT9 urban expansion area. New parkland trees will be planted to provide a succession of native trees within the parkland.

10. The Proposed Development will only be visible from a small area of countryside and this area of visibility will only become more constrained as the allocated urban expansion area is built out and as the buffer landscaping and buildings within it block views from the landscape further to the west and southwest. Visibility to the north and northeast is curtailed by rising ground and tree cover. The CSC and the part of the allocated urban expansion area on the east side of the railway, will block views from the wider landscape further to the south and southwest.

11. The only significant receptors affected by the operational Proposed Development will be walkers on the Oxford Green Belt Way as they move along the west side of the railway and along Thame Lane as it skirts the CSC. The setting of the section of the Oxford Green Belt Way east of the railway is already significantly adversely affected by the existing electrical infrastructure and the CSC. The route is not an unpaved rural footpath but follows a broad concrete track which runs immediately adjacent to the CSC security fence. The proposed electrical infrastructure will be screened by a combination of earthworks, native tree, shrub and hedge planting and acoustic fences. This will result in a loss of openness, but only for a short eight hundred metre section of the footpath as it passes through an existing urban fringe landscape. This will be compensated for by proposed permissive access to an extensive area of enhanced parkland, including access to a viewpoint which affords exceptional views over the Thames Valley towards Abingdon. An additional permissive footpath link will also be provided through the parkland to the north.

12. It is concluded that overall, on balance, the Proposed Development will have at worst, a Neutral effect on visual amenity as adverse effects are offset by beneficial effects and ultimately it will have a net beneficial effect as the landscaping matures. It is likely that the landscaping proposed to minimise intrusion to users of the Oxford Green Belt Way will be effective within less than 10 years, while the landscaping to enhance the setting of the parkland will take 15 - 25 years. This is deemed acceptable because the creation of parkland landscapes has required patience throughout the centuries.

13. The Proposed Development will have no adverse effect on the landscape setting of other heritage assets in the vicinity.

14. This report also assesses the effect of the Proposed Development on the openness of the Green Belt. The majority of the land to the west and south has been inset from the Green Belt to allow the build out of STRAT8 and STRAT9. Views of the Green Belt land in which the Site lies as seen from allocation STRAT9 are likely to be restricted by the buildings and landscaping within STRAT9. As a result, the area of countryside from where the proposed BESS compound will be visible is limited to a small area of parkland to the north and northeast. There is currently no public access to this area. The Proposed Development seeks to increase the sense of openness to this part of the Green Belt by establishing a woodland buffer which will substantially reduce the perceived urbanising influence of STRAT8, STRAT9 and the CSC.

15. The only significant loss of openness will be experienced by users of a short section of the Oxford Green Belt Way but this will be offset by permissive access to the enhanced area of parkland. On balance the effect of the Proposed Development on the openness of the Green Belt is considered to be Neutral.

16. The most significant landscape and visual effects arising from the construction process will be the earthworks and moving machinery. Once the earthworks have been completed the new landform will significantly reduce the visual effects of the works required to install the electrical equipment. The majority of the equipment will be manufactured off site and can be rapidly craned into place. Once in place the remainder of the construction period comprises wiring up and testing, which has very little visual impact.

17. At the end of the operational life of the proposed BESS all equipment, buildings, concrete foundations, fencing and underground cables and drainage pipes can be removed, particularly as the majority of it is modular and has been designed to be delivered as complete units on a HGV. The area occupied by the BESS compound and substation can then be returned to agriculture if no other preferential use is identified. The tree planting will have matured into woodland and will be retained to leave the legacy of an enhanced setting to the Registered Park and Garden. Any future permissive public access to this area will be by agreement with the landowner. As a result, all the adverse effects identified will be long term, but temporary, while the beneficial effects will remain.

18. To conclude, the beneficial aspects of the Proposed Development, in terms of parkland restoration, public access and Biodiversity Net Gain are considered to be greater than the limited adverse landscape and visual effects identified in this report. The temporary adverse landscape

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and visual effects will need to be weighed against the benefits of the BESS to the robustness and functionality of the grid, consumers and its contribution to tackling climate change.

CONTENTS

1 INTRODUCTION

1.1. The Applicant is seeking planning permission to construct a Battery Energy Storage System (BESS) within an area of agricultural fields, which lies immediately north of the Culham Science Centre (CSC) in Oxfordshire. The site location is outlined in **Figures 1 and 2** , **(Appendix A)**. This report determines the landscape and visual effects that may arise as a result of the Proposed Development.

Purpose of the LVIA

1.2. The main objectives of the LVIA are:

- To describe the landscape character of the site and its surroundings, evaluate its sensitivity to change and, taking into account the magnitude of change, assess the effect that the proposal would have on the local landscape character.
- To identify potential visual receptors (i.e. people who would be able to see the development), evaluate their sensitivity to change and, taking into account the magnitude of change, assess the effect that the proposal would have on visual amenity. Residential visual amenity issue is excluded from this LVIA because the Proposed Development is considered to be sufficiently distant from residential properties that it will not fall into the threshold of requiring an assessment.
- To identify landscape elements associated with the site, evaluate their sensitivity to change and, taking into account the magnitude of change, assess the effect the proposals would have on landscape elements.
- To identify mitigation measures and opportunities for landscape character and visual amenity enhancement, in order to mitigate, offset or reduce the predicted adverse effects.

1.3. The LVIA assesses the effects of the construction phase, the operational phase and the decommissioning phase. The effects are assessed at Year 1, immediately post completion, and at Year 10 and Year 20 to take into account embedded mitigation and enhancement measures (e.g., landscaping).

Methodology

1.4. This assessment has followed guidance set out in the 'Guidelines for Landscape and Visual Impact Assessment', Third Edition (Landscape Institute and the Institute of Environmental Assessment, 2013). The full method of assessment is presented in **Appendix B**. The assessment seeks to identify impacts which are either so beneficial or so adverse that they should be a significant consideration in determining the application. The levels of impact are set out in Table 1.

Table 1: Levels of effect and their significance	
Level of Impact	**Description of effect and significance**
Major adverse	The Proposed Development will cause substantial degradation of the landscape character/landscape features/existing views. These adverse effects are key factors in the decision-making process and are **Significant.** These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Moderate to Major adverse	The Proposed Development will cause easily noticeable degradation of the landscape character/landscape features/existing views. These adverse effects are key factors in the decision-making process and are **Significant.**
Moderate adverse	The Proposed Development will cause a noticeable degradation of the landscape character/elements/existing views. These adverse effects may be important but, are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor. Multiple Moderate adverse effects may be Significant.
Minor adverse	The Proposed Development will cause a perceptible but small degradation of the landscape character/elements/ existing views. These adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process and are not Significant..
Negligible adverse	A barely perceptible Adverse change to the landscape/view. Not significant.
Neutral	Adverse effects are equally offset by Beneficial effects of a similar nature.
Negligible Beneficial	A barely perceptible Beneficial change to the landscape/view, not significant.
Minor Beneficial	The Proposed Development will cause a perceptible small improvement to the landscape character/elements/ existing views and are not significant.
Moderate Beneficial	The Proposed Development will cause a noticeable improvement to the landscape character/elements/ existing views. Multiple Moderate beneficial effects may be Significant.
Moderate – Major beneficial	The Proposed Development will cause readily noticeable improvement in landscape character/elements/existing views. In making a decision about the proposal this advantageous effect may be considered to compensate to some degree for other, non-landscape, adverse effects. Such effects are **Significant.**
Major Beneficial	The Proposed Development will cause substantial improvement in landscape character/elements/existing views. In making a decision about the proposal this advantageous effect may be considered to compensate to some degree for other, non-landscape, adverse effects. Such effects are **Significant.**

Data Collection

1.5. Existing background Information on the study area has been sourced from:

1. Ordnance Survey – 1:50,000 and1:25,000 scale maps.
2. Countryside Agency – Character Map of England.
3. Countryside Agency – Countryside Character Initiative Website.
4. Magic Website (www.magic.gov.uk).
5. South Oxfordshire Council website.
6. Google Earth and measuring tools within it.

Limitations to Survey Methods

1.6. Site visits have been undertaken on the 12th July 2022, the 19th January 2023 the 8th and 15th March 2023 enabling assessments to be made when the deciduous vegetation is in leaf and out of leaf. At time of the surveys visibility was good. The change in the visual landscape since March 2023 has been negligible and so further surveys have not been undertaken.

Photography and Imaging

1.7. Photographs illustrating views from each viewpoint were taken using a Sony Alpha 7 digital camera with a Sony SEL200F 18 lens, set at a focal length of 50 mm. The camera has a full frame sensor, and is set level both vertically and horizontally, 1.5 m above ground from publicly accessible locations. For each view two photographs are presented, one a panorama to show the view in context. This is taken as a continuous pan with at a focal length of 50mm set in portrait format.

1.8. The second photograph is a single frame shot taken at a 50mm in landscape format. If this image page is printed at A3 the view is of a similar scale and extent to that which the human eye perceives, if the A3 sheet is held 400 – 500m in front of the viewer.

1.9. Accurate Verifiable Representations (AVR) of the Proposed Development have been produced (**Appendix C**) in accordance Landscape Institute published Technical Guidance Note (06/19) for the 'Visual Representation of Development Proposals'. The camera used for these was a Nikon D800 with a fixed 50mm, F11 lens.

Determination of the study area

1.10. The extent of the visual study area has been determined by running software (ESRI ArcGIS Viewshed run on 3D LiDAR topographical map data) which calculates the potential visibility of the Proposed Development based on the dimensions of the Proposed Development topography and certain elements within the landscape such as large blocks of woodland and large buildings. LiDAR is a radar-based system which picks up forms within the landscape (and has a distance error of 0.5 – 2 m and a height error of 10 cm) but it may not record all potentially screening elements such as hedgerows, walls or even

deciduous woodland if the LiDAR data was gathered in winter. The software creates a raster image that indicates the potential visibility of the Proposed Development, known as the Theoretical Zone of Visibility (TZVI).

1.11. The model takes into account the curvature of the earth and light refraction, with observer heights of 2 m. The publicly accessible areas where visibility is indicated were visited to see if the site is likely to be visible or whether views will be blocked by trees, hedges or buildings. The TZVI's are presented in **Figure 7**. Two TZVI have been produced, one for the BESS infrastructure and a separate TZVI for the connection tower, which has a different extent of visibility due to the height of the structure and its elevated position.

1.12. The study area for landscape character extends as far as a 5 km radius.

2 LANDSCAPE PLANNING CONTEXT

Landscape and Historic Designations

2.1. There are no international or national landscape designations relating to the application site or its immediate surroundings. The site is not in a National Park or an AONB and is classified as Countryside within the Local Plan. The Site does lie within Green Belt. This application proposes an area for landscape and ecological enhancement within Nuneham Park, a Grade I Historic Park and Garden, but avoids locating electrical infrastructure within this area.

National Planning Policy Framework December 2023

2.2. The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. There are three overarching objectives of which (c) is the most relevant in relation to this assessment:

" c) an environmental objective – to protect and enhance our natural, built and historic environment, including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".

2.3. The following chapters provide further guidance:

2.4. 13, Protecting Green Belt Land

14, Meeting the challenge of climate change, flooding and coastal change

15, Conserving and Enhancing the Natural Environment are relevant to the landscape and the proposed development.

16, Conserving and Enhancing the Historic Environment.

2.5. Chapter 13, para 142, states that "The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence".

2.6. And para. 155. "Certain other forms of development are also not inappropriate in the Green Belt provided they preserve its openness and do not conflict with the purposes of including land within it", and includes "b) engineering operations";

2.7. Section 14, Meeting the challenge of climate change, flooding and coastal change states in para 163.

"When determining planning applications for renewable and low carbon development, local planning authorities should:

a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to significant cutting greenhouse gas emissions;

b) approve the application if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas";

2.8. Section 15, Conserving and enhancing the natural environment, para 186 states:

"When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate".

2.9. Chapter 16, para 203 states:

"In determining applications, local planning authorities should take account of:

a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;

b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and

c) the desirability of new development making a positive contribution to local character and distinctiveness".

Local Plan Policy

2.10. The relevant document of the Development Plan is the South Oxfordshire Local Plan 2035. Policies relevant to landscape and visual considerations and the nature of the proposal and its location are:

STRAT1: The Overall Strategy

STRAT6: Green Belt

STRAT8: Culham Science Centre

STRAT9: Land Adjacent to Culham Science Centre

ENV1: Landscape and Countryside

ENV2: Biodiversity – Designated Sites, Priority Habitats and Species

ENV3: Biodiversity

ENV4: Watercourses

ENV5: Green Infrastructure in New Developments

ENV6: Historic Environment

ENV7: Listed Buildings

ENV8: Conservation Areas

ENV9: Archaeology and Scheduled Monuments

ENV10: Historic Battlefields, Registered Parks and Gardens and Historic Landscapes

DES1: Delivering High Quality Development

DES2: Enhancing Local Character

DES9: Renewable Energy

2.11. The CSC is allocated as an Employment Area within the Plan (STRAT8) and land immediately west of the CSC and west of the railway line is a Strategic Allocation (STRAT9), a large mixed use area. For the purposes of this assessment it is assumed that the Strategic Allocations is a cumulative effect. Key designations are plotted on **Figures 3 and 4, Appendix A**.

Culham Neighbourhood Plan 2020 – 2041

2.12. This has been preparedby Culham Parish Council under the Neighbourhood Planning (General) Regulations 2012and was adopted in June 2023. The plan covers the entire parish area, the Site lies in the northeast corner. The key objectives of the Neighbourhood Plan are:

- To manage the incremental growth of the village through sensitive infill and to protect the surrounding countryside from harmful development.
- To conserve the special heritage character of the village and its landscape setting.
- To protect and improve the ecological value and connectivity of the green infrastructure assets of the village and wider parish.
- To sustain community facilities and services that are essential to community life.

2.13. The plan does not set out any specific policies or constraints for the Site but does set out Design codes for areas "Outside the Main Village Settlement".

Ecological Designations

2.14. An Ecological Impact Assessment has been prepared and submitted with the planning application in which the likely effects of the Proposed Development upon ecological receptors have been assessed. The ecological environment is, however, relevant to landscape in terms of how habitats influence the perception of landscape character and how landscape mitigation can contribute to enhancing biodiversity and habitat connectivity. Two internationally designated sites of nature conservation importance within 7km of the site, one nationally designated sites of nature conservation importance within 5km and three non-statutory sites within 2km of the site.

International Sites

1) Little Wittenham SAC SSSI, 4.7km SW (69ha designated for it's Great Crested Newt, *Triturus cristatus*)

2) Cothill fen SAC 7km NW (43ha of the largest surviving alkaline fen in central England with rare M13 Schoenus nigricans vegetation type).

National designations

3) Culham Brake, SSSI, 1.8km W (1.5ha of wet willow woodland by the River Thames containing one of the largest British populations of the summer snowflake, *Leucojum aestivum*, a Red Data Book plant species.

Local non-statutory sites

4) Furze Brake Local Wildlife Site, 760M NE, (17.8ha of woodland, it houses the most important heronry in the upper Thames basin, with nearly 50 active nests).

5) Radley Gravel Pits Local Wildlife Site, 851m NW, (171ha of restored gravel works and landfill into large waterbodies with sedge and reedbeds valuable for birds, plants, invertebrates and bat)s.

6) Abbey Fishponds Local Nature Reserve, 1.65km NW (5.6ha of fen with dry rough grassland banks, tall herb and woodland, water vole, bats and notable birds).

Public Rights of Way (PRoW) and Open Access Land

2.15. Thame Lane is a Restricted Byway (183 4/20) which extends from the highway section of Thame Lane to the west, crosses the railway via a bridge and then as 183 4/30, 183 4/60, 183 4/70 and 171/16/70 skirts around the northern boundary of the Culham Science Centre along the existing concrete road (which is included as part of the Site as an access road). It is part of the Oxford Green Belt Way. Footpath 183 1/50 links up with Footpath1 83 1/40 which heads west along the south bank of the Thames. Footpath 183 1/50 is also part of the Oxford Green Belt Way.

2.16. There are several permissive paths within the estate to the northwest of the Culham Science Centre. The footpath network is illustrated in **Figure 19**, **Appendix A.** The effect of the Proposed Development on the visual amenity of users of the PRoW network is assessed in this report.

Designated historical assets

2.17. ES Volume 1, Chapter 3: Cultural Heritage assesses the effect of the Proposed Development on Cultural Heritage but the any potential effects of the Proposed Development on the landscape character and quality or setting of historical assets, such as of the Nuneham Park, a Grade I Historic Park and Garden, is considered in this assessment. The Nuneham Courtenay Conservation Area lies immediately beyond the northern boundary of the Site. Other Conservation Areas within the locality include Clifton Hampden (1.6km to the east) and Culham (2.2km to the southeast).

2.18. The development is also within the wider setting of the Grade II listed Thame Lane Bridge, the Grade II listed Europa School and the village conservation area of Clifton Hampden. The magnitude of the effect of the Proposed Development on the setting and character of these assets is determined in this report but the determination of effects is assessed within the Cultural Heritage section of the ES.

2.19. Designations are plotted on **Figures 3 and 4 (Appendix A).**

3 PRE-APPLICATION CONSULTATION

3.1. South Oxfordshire Council was consulted on a preliminary design proposal prior to the application being made, which is presented in **Appendix D.** The officer response, dated 13th September 2022 concluded that:

> *"Having regard to the quantum, scale, massing and height of the proposal and associated works, the council considers the proposal constitutes inappropriate development in the Green Belt. The site character would change from an open, rural historic landscape to an industrial battery facility. Batteries, structures and bunds would lead to a loss of visual openness as well as spatial openness. Furthermore, the harm to the Green Belt and the countryside in this location, having regard to the sensitive historic and unbuilt character of the site, is very unlikely to be outweighed by other considerations. However, limited information has been submitted to assess the suitability of the land having regard to the objectives of Green Belt. Moreover, an assessment to demonstrate very special circumstances has not been submitted for consideration".*

3.2. And with regard to the Nuneham Park and Garden:

> *"The current proposal would drastically change the character and setting of the Grade I Listed Nuneham Park. The change would not be neutral, as it would introduce 625 batteries and associated structures into an open parkland and rural estate setting. Whilst bunds would be included, such structures are completely alien and at odds with the existing protected historic character. Some woodland planting would not mitigate and indeed would introduce a further degree of change into the site context".*

3.3. With regard to landscape generally:

> *"In conclusion, the proposal would cause a significant adverse impact on the landscape, contrary to Policy EN1 (Landscape and Countryside), Policy DES1 (High Quality Design), Policy DES2 (Design and Character) which requires proposals to reflect the local landscape character. If a planning application were to be submitted the council is unlikely to be supportive of the proposals in principle".*

3.4. Following receipt of the response the preliminary masterplan has been significantly changed to remove or reduce the adverse effects identified and provide a package of mitigation and compensation measures. The most significant change is the removal of the electrical infrastructure component from the Registered Park and Garden, while providing landscape enhancement within the park and garden.

3.5. A scoping response was received from SODC which included comments from the Landscape Officer (17 January 2023), including a request for Accurate Visual Representations of the Proposed Development. The following growth rates were also achieved:

3.6. Subsequent to this the proposed Representative Viewpoints were agreed, including those for which AVR's are to be produced. Agreement was reached that they should show average growth rates of 400mm per year from year 3 onwards, for whips and feathered trees, with less growth in the first two years, say 300m in total. For standard trees 300mm per year from year 4 onwards, with say 300 mm growth in total in the first 3 years (Ref: Email from Hazel Osbourne These Representative Views are presented in **Appendix C** of this report and the AVR's in **Appendix D.**

4 LANDSCAPE BASELINE

Topography and Water Courses

4.1. The River Thames flows 140m north of the Site at around 53m Above Ordnance Datum (AOD). Heading south towards the Site the land rises steeply to 65m AOD and further east up to 94m AOD, essentially an escarpment cut by the river. The land falls gently south from the crest of the escarpment and the Site is part of this dip slope which falls gently over 3km before it meets the Thames (which loops around) at around 49m AOD. The high point of the Site the northeast lies at 69m AOD, while the low point to the south lies at 64m AOD. This 5m fall is over 450m and so represents an average fall over 1:90. The lower part of the Site, where it is proposed to locate the electrical infrastructure is, however, almost level.

4.2. The field in which it is proposed to locate the substation is also flat, in the range 63 – 65m AOD, while the land where it is proposed to extend the existing substation is also level at 61m AOD. The land occupied by the CSC is also largely level in the range 59 - 63m AOD.

4.3. The land allocated for the urban expansion to the west of the Site also lies on the gentle dip slope, at around 60m AOD. The parkland to the northeast of the Site rises gently to crest over a kilometre away at 91m AOD. A railway line runs north to south along the western boundary of the Site but is set within a cutting at around 61m AOD as it inclines down through the escarpment to cross the Thames on a viaduct.

4.4. The topography of the wider landscape is illustrated in **Figure 5, Appendix A** and a more detailed plan of the topography of the Site is presented in **Figure 6, Appendix A.**

4.5. No watercourses flow through the Site.

Description of the Site and the immediate surroundings

The Site

4.6. The majority of the Site comprises open farmland which was pasture at the time of the survey. It is crossed by a tarmac track, which is not Highway or Public Right of Way. The track provides access to the wider estate including a Thames Water reservoir and some distant residential properties. Two high voltage overhead transmission line passes through the Site, one heading north and one heading northeast. Three towers lie within the Site. There are no hedgerows within the Site but a clump of trees lie to the north and northeast. Trees also grow in the area where it is proposed to extend the existing substation. A series of panoramic photographs taken from within the Site are presented in **Figure 10, Appendix A** to illustrate the character of the Site and its potential visibility within the wider landscape. The locations where the photographs have been taken are presented in **Figure 9, Appendix A.**

Land to the west

4.7. A railway line lies immediately to the west of the Site, passing the Site in cutting. East of this lies open farmland which is a strategic Allocation for a mixed-use urban area. A high voltage overhead line passes through this area. The only notable feature within this area is Warren Copse, a rectilinear block of woodland 120m west of the Site. Warren Farm and farmhouse lie within this area, 780m west of the Site and there is

a property on Thames Lane, 770m to the southwest of the Site. An area of land on the north facing escarpment slope is a motocross track, comprising sculptured earth forms.

4.8. Farmland continues to the west, within which lies the Europa School (Grade II listed) and fourteen residential properties, all over 1.45km to the southwest. The village of Culham (part of which is a Conservation Area) lies 2.1km to the southwest.

Land to the south

4.9. The southern boundary of the Site is currently open, south of which the field extends to where Thames Lane crosses the railway. The intermediate land is the confluence of two high voltage lines and contains a tight cluster of three transmission line towers which constrain any development within this area. Land south of this area lies within Strategic Allocation STRAT8 with the masterplan proposing large commercial units which will extend down as farm as the northern edge of this part of the CSC. Land further south is the CSC, extending down as far as the A415 Abingdon Road, which is the main highway through the area. Culham railway station lies immediately north of the A415, adjacent to the CSS. Land south of the A415 is open farmland which slopes gently down the Thames; this section of the river is 2.2km south of the Site.

Land to the east

4.10. The east side of the Site is open, with estate farmland continuing for over 2.5km up to and along the ridge. This is an open corridor of arable land with few internal hedges, but it is flanked to the north and south by extensive blocks of mature woodland. Several clumps of mature trees are scattered across this area, remnants of the historic parkland. It is, however, the route of a high voltage transmission line, which adversely affects the character and quality of the landscape. There are no public roads through this area and few footpaths. The nearest property lies 1.2km to the northwest, accessed via a private track.

4.11. A band of recent tree planting lies immediately east of the site of the Proposed substation. This has been planted to screen a large metal clad steel frame building. A block of woodland lies to the east of this.

Land to the north

4.12. A northern boundary of the Site is defined by Lock Wood, which is a large block of woodland which occupies the north facing slope of the escarpment. The wood screens the Site from the landscape further north. An underground reservoir, operated by Thames Water, lies 370m northwest of the Site, but the above ground infrastructure is largely hidden from view by topography and trees. Currently the reservoir is accessed via a macadam track which runs through the Site.

Landscape Character

4.13. Landscape character is defined as:

> "*A distinct, recognisable and consistent pattern of elements, be it natural (soil, landform) and/or human (for example settlement and development) in the landscape that makes one landscape different from another, rather than better or worse."* (Natural England).

4.14. Impacts on the landscape may arise where the landscape character of the area is modified by the development. It is important to place the application site in its landscape context.

National Character Assessment

4.15. The Site lies within National Character Area (NCA) 109 The Mid-vale Ridge, while land south of the A415 and west of Warren Farm lies within NCA 108 the Upper Thames Clay Vale.

Regional Character Assessment

4.16. The Oxfordshire Landscape Assessment interactive map places the Site within the Nuneham Courtenay Ridge LCA, which comprises the following Landscape Types:

- Wooded Estatelands (in which the Site lies and the farmland west of the railway)
- Vale Farmland (to the south and southeast of the Site)
- River Meadowlands (the low lying areas flanking the Tames to the north)
- Institution Landscape (the Culham Science Centre).

4.17. These LCA are plotted on **Figure 11 (Appendix A)**.

4.18. The Wooded Estatelands landscapes comprise the formal C18 designed parkland and associated estate landscape of Nuneham Courtney and a smaller scale area with parkland characteristics associated with Culham House. The key characteristics are:

- well-managed parkland character with formal features such as avenues and free-standing mature trees in pasture, clumps and blocks of woodland, exotic tree species, formal structures and boundary features;
- associated 'estate' landscape extending into a few areas beyond listed parkland and characterised by large blocks of woodland, open grassland and mature trees;
- rural and unspoilt character;
- generally enclosed character with strong landform, woodland and tree cover, low inter-visibility but with some visually prominent hilltop and valley side locations.

4.19. The Key landscape enhancement priority is to encourage the maintenance and restoration of historic parkland landscapes and features at Nuneham Park and Culham.

Culham Local Plan

4.20. Landscape character analysis is also presented in the Culham Local Plan, which states:

9. Institutions

- Culham Laboratories is located within this area and comprises a complex of institutional buildings within landscaped grounds.

- Landscaped setting with mature trees and semblance of parkland character but lacking its formal features.
- Dispersed complex of buildings, signs and land uses have an urbanising influence on rural context of the site.

13. Open farmed hills and valleys

- Rolling plateau landform.
- Large-scale farmland, mostly in arable cultivation.
- Large fields, with rectilinear field boundaries, typical of parliamentary enclosures.
- Weak structure of tightly clipped or gappy hedgerows, with few hedgerow trees.
- Open, denuded and exposed character, with prominent skylines and hillsides and high intervisibility.
- Distinctive elevated and expansive character on ridges and higher ground, with dominant sky and long views.
- Predominantly rural character but some localised intrusion of main roads (such as the A415), overhead power lines and built development.

5. Parkland and estate farmland

- Well-managed parkland character with formal features such as avenues and free-standing mature trees in pasture, clumps and blocks of woodland, exotic tree species, formal structures and boundary features.

Site Specific Landscape Character Assessment

4.21. The Oxfordshire Historical Landscape Assessment indicates that the north part of the Site within the Parkland was originally unenclosed rough ground until it became part of an Ornamental Designed Parkland from around 1779, it being modified by Lord Harcourt in 1795 when he needed to grow more grain when the country was threatened by famine in the French Revolutionary Wars. The southern part of the Site was an open field system until 1797, when it became Planned Enclosure in 1811 and subsequently Modified Enclosure due to interventions such as the railway and science centre was built.

4.22. Historical Ordnance Survey Maps indicate that the part of the Site within the listed Historic Park and Garden lies outside the core area of historical parkland associated with Nuneham House (and partly the work of Capability Brown). This core area is encapsulated by the Nuneham Courtenay Conservation Area, which does not extend across the Site. The northern part of the Site lies in a buffer area of Parkland Estate Farmland which included a belt of trees which followed the parish boundary, as indicated on the 1883 Ordnance Survey Map which is overlain on the current on the current landscape in **Figure 12 (Appendix A)**. This boundary forms the southern boundary of the designated Historic Park and Garden listing.

4.23. This boundary feature no longer exists on the ground. The landscape and setting of this part of the Wooded Estatelands has changed substantially since the eighteenth century due to the loss of the boundary tree belt, the construction of the railway, high voltage transmission lines, Thames Water reservoirs and the Culham Science Centre. The construction of the proposed urban expansion area will further change the character and setting of the Wooded Estatelands.

4.24. The historic OS maps indicate that the macadam track which passes through the Site is not a historical route but a 20th Century intervention.

4.25. It is concluded that there is a distinction to be drawn between the value and authenticity of the core Ornamental Parkland, as defined by the Conservation Area (CA) designation, and the wider Farmed Estatelands which is included within the Historic Park and Garden Listing. This quality and character of this western area is substantially adversely affected by the railway, transmission lines and the CSS. This area exhibits a strong urban fringe character, the negative aspects of which will increase as the allocated urban expansion area is built out.

4.26. A more detailed analysis of the character of Nuneham Park has been undertaken within the Cultural Heritage section of the ES.

4.27. The Culham Science Centre is a large facility containing large buildings, many of which are industrial in character. There is an electrical substation within it on the northern edge. It forms part of the setting to the Site, as does the cluster of transmission lines and towers adjacent to it. The two wide roads either side of the security fence around the CSC also confer industrial character. In terms of landscape the Site lies at a transitional position between the industrial urban fringe landscape to the south and the parkland landscape to the north and northeast. The urban fringe character will increase as the allocated urban mixed use expansion area and commercial areas are built out immediately to the south and west of the Site.

Landscape Value

4.28. A range of criteria is used to assess the value of a landscape to society in terms of its perceptual, cultural, recreational and ecological contribution. The landscape value of the Site and surrounding area are assessed in relation to these attributes in Table 2. It is intended to locate the proposed electrical infrastructure outside the Registered Park and Garden and so for clarity the value for this area is assessed separately to the Park and Garden.

Table 2: Assessment of criteria which contribute to Landscape Value

Element	Assessment in relation to the area where it is proposed to locate the electrical infrastructure	Value	Assessment in relation to the part of the Site that lies within the Registered Park and Garden	Value	Assessment in relation to the surrounding area	Overall Value
Landscape quality A measure of the physical state of the landscape. It may include the extent to which typical	The landscape is not subject to any landscape designation which recognises quality and is adversely influenced by the adjacent electrical infrastructure, CSS and	**Low**	A well-managed estate landscape. Elements of the Registered Park and garden remain, but quality is adversely affected by electrical infrastructure and intensive arable	**Medium**	The quality of the wooded escarpment and the riparian corridor of the Thames is High. That of the CSS is low and the farmland to the west around Warren	**Medium**

character is represented in individual areas, the intactness of the landscape and the condition of individual elements.	potentially any development within STRAT8 and STRAT9.		farming as oppose to traditional parkland.		Farm is Medium, becoming urban if developed.	
Use In terms of its value to society as a whole	The current use of the Site is for agricultural production and the PRoW which crosses it allows for walking (although it is in the process of being stopped up). The Site is part of the Green Belt and potentially part of the setting to the Strategic Allocation land.	**Low - Medium**	Agricultural production with limited access via PRoW. Part of the Green Belt.	**Medium**	High in terms of urban use, Low in terms of landscape.	**Low**
Scenic quality The term used to describe landscapes that appeal primarily to the senses (primarily but not wholly the visual senses)	The Site has no specific special landscape features that contribute to the scenic quality of the local landscape and is adversely affected by the CCS and electrical infrastructure. It will be further affected by any development within the Strategic Allocation.	**Low - Medium**	Elements of the RPG remain but quality is adversely affected by electrical infrastructure and intensive arable farming as oppose to traditional parkland.	**Medium**	CSS is an urban employment landscape, Warren Farm is adversely affected by the high voltage lines which pass through and the motocross track. The wooded escarpment and Thames corridor has a high scenic value.	**Medium**
Rarity The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type	It is a typical farmland landscape common throughout much of central England; a common Landscape Character Type.	**Low**	Estate parklands within the UK are not rare but each is unique in relation to its history.	**High**	The employment landscape of the CSS is not rare, not is the farmland to the west, particularly as it is likely to become urban.	**Low**

Representativeness Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.	The site is not of a type or includes features which are representative of a unique landscape.	**Low**	Vestiges of the original parkland in the form of tree groups are representative, but the main screening belt of trees along the parish boundary no longer exists.	**Medium**	The surrounding landscape does not contain any particularly important examples, although the wooded escarpment to the Thames is a locally important feature.	**Low**
Ecological interests The presence of features of wildlife and earth science interest can add to the value of the landscape as well as having value in their own right.	The site is not subject to a wildlife designation and is currently farmed in a way which limits its ability to develop a biodiverse habitat.	**Low**	The site is not subject to a wildlife designation and is currently farmed in a way which limits its ability to develop a biodiverse habitat. The woodlands are, however, locally valuable habitats and ecological corridors.	**Medium**	The Thames corridor and escarpment woods form an important wildlife corridor. The CSS and farmland to the west have limited value.	**Low**
Historical and Cultural Interests The presence of features of archaeological, historical and cultural interest can add to the value of the landscape as well as having value in their own right.	There are no known heritage assets on the Site but it does form part of the setting to the Registered Park and Garden.	**Low**	The Registered Park and Garden has a unique history and cultural value.	**High**	The Europa School to the southwest is locally significant and the CSS occupies a former airfield.	**Low**
Recreational value Evidence that the landscape is valued for recreational activity where experience of the landscape is important.	A PRoW crosses the Site (but may be stopped up) and the PRoW along Thames Lane (part of the Oxfordshire Green Belt Way) runs between the CSS and the Site, which contribute to its setting, although the setting is already	**Low**	The parkland is not open to the public and there are few PRoW passing through it apart from the Oxfordshire Green Belt Way.	**Medium**	PRoW within the farmland to the west allow access north to the Thames and the riverside PRoW. The land is used for motocross. Potentially the land within the Strategic Allocation to the west will include formal and informal recreation areas	**Medium**

	substantially degraded.				adjacent to the railway.	
Perceptual aspects A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity.	The Site is farmland with an overhead transmission line passing through, next to a railway and the CSS. There is no perception of wildness or tranquility.	**Low**	It is a farmed landscape with no sense of wildness. The western part of the RPG is adversely affected by the transmission lines, CSS, railway and potentially any development within the Strategic Allocation. The parkland further to the east lack of roads and habitation further to the east.	**Medium**	There is low sense of tranquility or wildness associated with the CSS but a higher sense within the Thames corridor to the north, less so within the farmland to the west.	**Medium**

4.29. It is concluded that the Landscape Value of the Site outside the Registered Park and Garden is Low. While the value of the Registered Park and Garden should potentially be high, it is adversely affected at the western end by the limited public access, electrical infrastructure, its proximity to the railway, motocross site, the CSS, and the loss of original landscape features, such as the tree belt along the parish boundary. As a result its Landscape Value of the Site is overall considered to be Medium.

4.30. The Landscape Value of the CSC to the west is mainly as an urban research facility and so in terms of landscape is considered to be Low.

Landscape Susceptibility

4.31. The LVIA Guidelines define susceptibility as "*The ability of the landscape receptor (whether it be the overall character or quality / condition of a particular landscape type or area, or an individual element and / or feature, or a particular aesthetic and perceptual aspect) to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation and / or the achievement of landscape planning policies or strategies*".

4.32. Factors which reduce the landscapes ability to absorb the type of development proposed include:

- The Proposed Development will be out of keeping with the current open grassland character of the Site.
- The Site is open to the west and southwest.
- The Site contributes to the setting of the Registered Park and Garden.

4.33. Factors which increase the ability of the landscape to absorb the type of development proposed include:

- It will introduce electrical infrastructure within an area where electrical infrastructure already has a strong influence on the character of the immediate landscape.

- The Site is also adversely influenced by the CSC and potentially by any development within the Strategic allocation STRAT 9.
- Lock Wood provides good visual screening to the north as does rising ground and woodland to the northeast and the CSC to the south.

4.34. Overall, the susceptibility of the landscape of the Site to absorb a development of this type is considered to be Medium.

Landscape Sensitivity

4.35. Combining an overall Medium quality of the Site and surrounding landscape with a Medium susceptibility results in the Site and surrounding landscape having a Medium sensitivity to the type of development proposed.

Future baseline

4.36. Planning applications have been granted or have been submitted for new buildings within the few remaining open areas within the CSC and the trend for increased building density within the CSC is likely to continue. It is assumed that the Strategic allocation STRAT 9 will be built out, but that there will be no built development within the Registered Park and Garden and it will remain as an estatelands farmed landscape. The urban expansion area will, in time, be built out. The trend for change is an increase in urbanisation clustered around the Culham Science Centre.

5 VISUAL BASELINE

5.1. Visual receptors are "the different groups of people who may experience views of the development" (GLVIA, 3rd edition, para 6.3). In order to identify those groups who may be significantly affected the ZTV study, baseline desk study and site visits have been used. Separate TZV have been calculated for the the BESS facility and the proposed connection tower, since the latter has a potentially greater visual influence due to its position and height. They are presented in **Figures 7 and 8).** The different types of groups assessed within this report encompass local residents; people using key routes such as roads; cycle ways, people within accessible or recreational landscapes; people using Public Rights of Way; or people visiting key viewpoints. In dealing with areas of settlement, Public Rights of Way and local roads, receptors are grouped into areas where effects might be expected to be broadly similar, or areas which share particular factors in common.

A series of viewpoints have been chosen and agreed with the Landscape Officer to convey the main potential visual impacts. These include some views from key sensitive receptors, such as people walking along the bank of the Thames, to illustrate that the Proposed Development cannot be seen. The selection includes close views, medium distance views and long distant views and views covering all directions of the compass around the Site. The list of representative views is presented in **Table 3.** The photographs taken from each public viewpoint are presented in **Figure 16** and are located on **Figure 15**.

Table 3: Representative Viewpoints

Viewpoint and Location	Distance from site Elevation	Visual receptors	Reason for choice	Landscape and visual receptor sensitivity
View 1: Thame Lane, close to the Europa School, as it approaches the site from the west	Direction of view: Northeast Distance to nearest site boundary: 1.3Km Elevation: 65m AOD Grid reference: SU 51573 95706 Date photo was taken: 19.01.23	Users of the lane	To illustrate likely level of visibility to users of the lane as users approach from the north	Receptor Value: Medium Susceptibility: Medium Sensitivity: Medium. Landscape sensitivity: Medium and Local
View 2: View from Thame Lane (PRoW 183/4/20) as it approaches the site from the west, before it crosses the railway	Direction of view: Northeast Distance to nearest site boundary: 320m Elevation: 61m AOD Grid reference: SU 52350 95903 Date photo was taken: 19.01.23	Users of the lane	To illustrate the visibility of the proposed development to users of the lane.	Receptor Value: Medium Susceptibility: Medium Sensitivity: Medium. Landscape Sensitivity: Medium and Local

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
View 3: Thame Lane (PRoW 183/4/20) just before it crosses the railway when approaching from the west (also where it meets the Oxford Green Belt Way)	Direction of view: Northeast Distance to nearest site boundary: 185m Elevation: 63m AOD Grid reference: SU 52790 96046 Date photo was taken: 19.01.23	Users of the lane and walkers on the Oxford Green Belt Way	To assess the likely change of view to users of the lane and footpath	Receptor Value High (Long distance Footpath) Susceptibility: Low (influenced by CSC and electrical infrastructure) Receptor sensitivity: Medium Landscape Sensitivity: Medium and Local
VIEW 4: View from the Oxford Green Belt Way (PRoW 183/5/10) which runs along the west side of the railway	Direction of view: Northeast Distance to nearest site boundary: 122m Elevation: 66m AOD Grid reference: SU 52768 96180 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area.	This view offers the clearest view of the Site as the path crests a local area of high ground	Receptor Value: High, Long distant footpath Susceptibility: Low, clear view of CSC and electrical infrastructure Receptor sensitivity: Medium Landscape Sensitivity: Medium and Local

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 5: View from the Oxford Green Belt Way PRoW 183 1/50 as it passes the site on the west side of the railway where it meets PRoW 183 1/60 which crosses the railway	Direction of view: Northeast Distance to nearest site boundary: 43m Elevation: 62m AOD Grid reference: SU 52721 96345 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area.	A junction of two PRoW although the at grade railway crossing may be stopped up.	Receptor Value: High Susceptibility: Medium Receptor sensitivity: High Landscape Sensitivity: Medium and Local
VIEW 6: The Oxford Green Belt Way (PRoW 183/5/10) as it passes west of the Site	Direction of view: East Distance to nearest site boundary: 50m Elevation: 64m AOD Grid reference: SU 52662 96512 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area.	To illustrate how the PRoW starts to drop down below the railway, restricting views.	Receptor Value High Susceptibility: Medium Receptor sensitivity: High Landscape Sensitivity: Medium and Local
VIEW 7: The Oxford Green Belt Way (PRoW 183/4/30) as it passes south of the Site after crossing the railway	Direction of view: North Distance to nearest site boundary: 200m Elevation: 62m AOD Grid reference: SU 52940 96092 Date photo was taken: 19.01.23	Users of the lane and walkers on the Oxford Green Belt Way	This is the first clear view of the Site on crossing the railway.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional.

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 8: From the Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre, south of the Site at its junction with footpath 183 1/60	Direction of view: North Distance to nearest site boundary: 0m Elevation: 64m AOD Grid reference: SU 52941 96269 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way and users of the PRoW which crosses the railway at grade (which may be stopped up).	To illustrate how the Proposed Development will block the view particularly of the Registered Park and Garden.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional.
VIEW 9: The Oxford Green Belt Way as it skirts the CSC approaching the site of the proposed substation	Direction of view: East Distance to nearest site boundary: 0m Elevation: 65m AOD Grid reference: SU 53033 96336 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way	To illustrate how the effect of the proposed substation on visual amenity and the setting of the Registered Park and Garden.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional.

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 10: The Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre	Direction of view: Northwest Distance to nearest site boundary: 0m Elevation: 65m AOD Grid reference: SU 53033 96336 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way	To illustrate how the effect of the proposed substation on visual amenity of walkers and the setting of the Registered Park and Garden.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional.
VIEW 11: from the Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from the south	Direction of view: Northwest Distance to nearest site boundary: 0m Elevation: 65m AOD Grid reference: SU 53227 96251 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way	To illustrate how the effect of the proposed substation on visual amenity of walkers and the setting of the Registered Park and Garden.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 12: The Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from further south	Direction of view: Northwest Distance 0m Elevation: 65m AOD Grid reference: SU 53330 96209 Date photo was taken: 19.01.23	Walkers on the Oxford Green Belt Way	To illustrate how woodland will limit views of the Proposed Development to walkers approaching from the south.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional.
VIEW 13: The Oxford Green Belt Way (171/16/70) as it passes the proposed extension to the Culham Science Centre substation	Direction of view: Southwest Distance to nearest site boundary: 0m Elevation: 65m AOD Grid reference: SU 53569 96172 Date photo was taken: 19.01.23	Road users	To illustrate the extent of temporary works associated with the haul route access	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: Medium and Regional.

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 14: On the northeast boundary of the Site within the Registered Park and Garden looking southeast (not currently a publicly accessible viewpoint)	Direction of view: South Distance to nearest site boundary: 130m Elevation: 74m AOD Grid reference: SU 53033 96678 Date photo was taken: 19.01.23	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space.	There is no public access to this view, it has been chosen to illustrate the effect of the Proposed Development on the setting of the Registered Park and Garden.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: High and Regional.
VIEW 15: From Viewpoint 14 within the Registered Park and Garden but looking southwest (not currently a publicly accessible viewpoint)	Direction of view: Southwest Distance to nearest site boundary: 130m to haul road access Elevation: 74m AOD Grid reference: SU 53035 96679 Date photo was taken: 19.01.23	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space.	There is no public access to this view, it has been chosen to illustrate the effect of the Proposed Development on the setting of the Registered Park and Garden. It also looks towards the site of the proposed connection tower.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: High and Regional.

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 16: From deeper within the Registered Park and Garden (further northeast, not currently a publicly accessible viewpoint)	Direction of view: Southwest Distance to nearest site boundary: 375m Elevation: 82m AOD Grid reference: SU 53258 96785 Date photo was taken: 19.02.23	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir.	There is no public access to this view, it has been chosen to illustrate the effect of the Proposed Development on the setting of the Registered Park and Garden. It also looks towards the site of the proposed connection tower.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: High and Regional.
View 17: From within the Registered Park and Garden looking southwest	Direction of view: Southwest Distance to nearest site boundary: 450m to haul road access Elevation: 81m AOD Grid reference: SU 53490 96767 Date photo was taken: 19.01.23	Farm workers.	There is no public access to this view, it has been chosen to illustrate the effect of the Proposed Development on the setting of the Registered Park and Garden. It also looks towards the site of the proposed connection tower.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: High and Regional.
VIEW 18: A track adjacent to New Cottage within the Registered Park and Garden (also PRoW 317 2/50)	Direction of view: Southwest Distance to nearest site boundary: 1.2km Elevation: 86m AOD Grid reference: SU 54147 97321 Date photo was taken: 19.01.23	Residents	To illustrate how the Site is not visible from the environs of these residential properties and this part of the Registered Park and Garden.	Receptor Value: High Susceptibility: Low Receptor sensitivity: Medium Landscape Sensitivity: High and Regional.

Table 3: Representative Viewpoints				
Viewpoint and Location	**Distance from site** **Elevation**	**Visual receptors**	**Reason for choice**	**Landscape and visual receptor sensitivity**
VIEW 19: From PRoW 183 1/40 along the south bank of the Thames, northwest of the Site	Direction of view: East Distance to nearest site boundary: 490m Elevation: 52m AOD Grid reference: SU 52281 96748 Date photo was taken: 19.02.23	Walkers on the Oxford Green Belt Way.	To illustrate how the Site is not visible from within the sensitive floodplain landscape.	Receptor Value: High Susceptibility: High Receptor sensitivity: Medium Landscape Sensitivity: High and Regional Landscape Sensitivity: High and Regional.
View 20: from the top of Wittenden Clumps within the Site North Wessex Downs AONB	Direction of view: North Distance to nearest site boundary: 5km Elevation: 118m AOD Grid reference: SU 56623 92835 Date photo was taken: 01.02.23	Walkers	A popular vantage point affording extensive views over Oxfordshire and within the AONB.	Receptor Value: High Susceptibility: High Receptor sensitivity: Medium Landscape Sensitivity: High and Regional.

Discounted Views

5.2. The following views have been discounted:

- Views afforded to railway passengers as the pass the site – the railway is in cutting, preventing views.
- Views afforded to people within the CSC – this is an urban environment which is semi-industrial. Ground level views are through one or more security fences and existing electrical infrastructure within and outside the CSC.
- Views from the A415 Abingdon Road, views are blocked by intervening hedges and will eventually be blocked by buildings within STRAT9.
- Paths and dwellings within the floodplain to the north, views are blocked by tree cover and topography.
- Views from the Culham, Clifton Hampden and Nuneham House and Conservation Area – views are blocked by topography, tree cover and built form.
- The residential property by the Thames Water Reservoir northeast of the Site, views are blocked by tree cover, including evergreens.
- Views from the buildings and environs of Warren Farm have been discounted because this will be surrounded by buildings as the STRAT9 area is built out.

Landscape and Visual baseline summary

5.3. The Site lies at a transition point in terms of landscape character and sensitivity. Land immediately to the north and northeast is sensitive, forming the western extremity of an extensive Registered Park and Gardens, and is characteristic of estate farmland, which is adversely affected by high voltage transmission lines which pass through it. The quality and character of the landscape immediately to the west and south of the Registered Park and Garden is substantially adversely affected by the railway, transmission lines and the CSS, and will in future be adversely affected by the proposed urban expansion STRAT9.

5.4. The site is not visible from residential properties and although it could potentially be visible from properties within the allocated urban expansion area, the concept plan indicates that the eastern area adjacent to the railway will be greenspace comprising a mix of formal sports areas, park and landscape buffers.

5.5. The only significant landscape receptors will be people walking along the section of the Oxford Green Belt way which passes through the Site. This section of the footpath uses the concrete access track which runs around the boundary of the CSC and its setting is substantially adversely affected by the industrial character of the CSC.

6 THE PROPOSED DEVELOPMENT

Construction and Layout

6.1. The Proposed Development is a 500MW Battery Energy Storage Facility (BESS), comprising:

- Two hundred and ninety six containers housing the batteries, thirty seven noise insulated inverter houses and seventy four transformers, sat on permeable gravel, accessed via compacted stone tracks;
- Five small buildings housing the switch gear and controls;
- Two modified shipping containers for storage and staff welfare, with parking for 6 vehicles;
- A 4m high wooden acoustic fence along the west and south side of the BESS compound;
- A large 'customer' electricity substation within a fenced compound;
- Two storm water attenuation lagoons;
- Removal of a section of the non-public highway track (Thame Lane) within the site, and the upgrading of the existing farm track to a 4.5m wide macadam surface,
- A weld mesh fence on the north and east side of the BESS compound, and
- Extensive landscaping in the form of hedge and woodland planting.

6.2. The application includes an extension to one of the existing substations within the CSC as part of a wider upgrade of its electrical infrastructure. The extension will be on the east side of the northern substation. A high voltage underground cable will run from this extension to a proposed connection tower, which will be situated within the Registered Park and Garden, north of the BESS. The tower will allow the underground cable to connect aerially across to the existing overhead line. In terms of functionality, this is the only practical point of connection. The tower will be set within a compound protected by palisade fencing with proposed scrub and tree planting to reduce its visibility within the landscape.

6.3. The layout is presented in **Figure 13** and details of the electrical infrastructure in **Figure 14.** The construction and operational access will be from the existing road which leads to the Site from the A415, on the southern end of the CSC.

Site location and design evolution

6.4. The main driver for locating the BESS at this location is its proximity to an existing substation, the ability to connect to it and the value it brings with regards to increasing grid stability and efficiency.

6.5. The main spatial constraints are:

- Avoid built infrastructure being located within the Registered Park and Garden.
- Avoid placing electrical equipment under the overhead power lines.
- Maintaining an exclusion zone around the transmission towers for their stability and maintenance.
- Avoid development over a water main which passes through the Site from a Thames Water reservoir to the north.

- Avoid development within an exclusion zone alongside the railway line.
- Avoid development adjacent to the existing concrete perimeter track to maintain access for large vehicles/loads.

6.6. Landscape constraints include a need to minimise any adverse effects on the landscape setting of the Registered Park and Garden and where possible enhance it, having identified that it has been significantly degraded over the centuries.

6.7. Visual constraints include:

- Minimise adverse effects to those walking through the area on the Oxford Green Belt Way.
- Minimise adverse effects to people within the proposed urban expansion area.

Primary Mitigation

6.8. Primary mitigation is achieved through the spatial arrangement and the earthworks, which seek to sit the electrical infrastructure as low as possible within the landscape, and where needed, provide screening with mounding. It is also proposed that the containers and buildings are finished in a recessive green colour, rather than the standard white or light grey.

6.9. Mitigation is also provided by re-establishing the historic tree belt along the southwest boundary of the Registered Park and Garden, which followed the Parish Boundary. Aerial photographs taken during the construction of Culham airfield indicate that it was removed to facilitate the construction of the airfield since it would have been an obstruction on approach and take off. The proposed tree belt, combined with the earthworks and hedge planting is designed to minimise the visibility of the electrical infrastructure from the Registered Park and Garden and improve its setting in relation to the existing electrical infrastructure, the CSC and the proposed urban expansion area. In addition, new parkland trees will be planted to provide a succession of native trees within the grounds.

6.10. Earthworks planted with trees and hedges will screen the proposed BESS electrical infrastructure from people within the STRAT9 allocation and reduce the visibility of the CSC.

Enhancement

6.11. The main enhancement will be the restoration of the area of historic parkland which lies within the Site and allowing permissive access to it for the duration of the operation of the proposed BESS. This will be particularly beneficial to future residents of the STRAT9 urban expansion area.

Timescales for the proposed mitigation to become effective

6.12. The primary mitigation in the form of earthworks will be effective within Year 1. It has been agreed with SODC Landscape Officer that the assumed growth rate for hedges and shrubs should be a 300mm increase in height per annum the first 3 years and 400mm per annum after that, and for larger stock trees, 300mm per year after 3 years (see correspondence in Appendix D). On this basis new hedge planting is likely to reach an effective screening height of 3m after 10 years. The woodland planting would need to

reach 6m high to be effective and would comprise a mix of transplants, whips, feathered trees and standards. Allowing for an average starting plant height of 1m and average growth of 350mm it is likely to take 15 - 20 years to be effective.

7 LANDSCAPE AND VISUAL IMPACT DURING CONSTRUCTION

7.1. The most significant landscape and visual effects arising from the construction process will be the earthworks, and moving machinery and workers on the Site. Vehicles will use the existing road access adjacent to the CSC and so the landscape and visual effects will be Negligible, particularly as movements will be largely screened by adjacent buildings. Once the earthworks have been completed the new landform will significantly reduce the visual effects of the works required to install the electrical equipment. The majority of the equipment will be manufactured off site and can be rapidly craned into place. Once in place the remainder of the construction period comprises wiring up and testing, which has very little visual impact. Initially the earthworks will result in a magnitude of visual impact slightly greater than the operational impacts immediately after completion, but once completed the remainder of the works are unlikely to have a visual impact significantly greater than the operational impact. The landscape and visual effects arising from the construction process will be temporary.

7.2. The construction activities will have a Moderate - Major adverse effect on the landscape character of the Site and the area of the Wooded Estatelands extending west across Warren Farm and 450m northeast within the Registered Park and Garden, a **Significant effect.** The effect on the landscape character of the adjacent Vale Farmland and River Meadowland will be Negligible. The construction activities will have a Moderate – Major adverse effect on the landscape character and setting of the western edge of the Registered Park and Garden, a **Significant effect.**

7.3. The only significant receptors likely to be adversely affected by the construction process will be users of the section of the Oxford Green Belt Way which passes through the Site. This will be a sequential effect as walkers pass to the west and south of the Proposed Development for 1.3km of the route. No other receptors will be significantly affected. The effect of the construction process on visual amenity is summarised below. For ease of reference, a red background indicates a Major – Moderate or Major adverse effect (a Significant effect), orange Moderate adverse effect (Not a Significant effect unless many) and Green for Minor, Negligible or beneficial effects, (typically Not Significant).

Table 4: Summary of the Visual Effects arising due to the Construction Process		
Viewpoint and Location	**Visual receptors**	**Visual effect**
View 1: Thame Lane, close to the Europa School, as it approaches the site from the west	Users of the lane Glimpsed views of construction activity above the hedge, mainly in winter. The proposed connection tower erection work and cranes will be visible above the skyline but in the context of the existing towers.	Sensitivity: Medium Magnitude of change – Low Effect: Minor adverse winter and summer
View 2: View from Thame Lane (PRoW 183/4/20) as it approaches the site from the west, before it crosses the railway	Users of the lane. Glimpsed views of construction activity through gaps in the hedge, mainly in winter.	Sensitivity: Medium Magnitude of change – Low Effect: Minor adverse, winter and summer
View 3: Thame Lane (PRoW 183/4/20) just before it crosses the railway when approaching from the west (also where it meets the Oxford Green Belt Way)	Users of the lane and walkers on the Oxford Green Belt Way Glimpsed views of the construction activity through the existing towers	Sensitivity: Medium Magnitude of change – Medium Effect: Moderate adverse, winter and summer
VIEW 4: View from the Oxford Green Belt Way (PRoW 183/5/10) which runs along the west side of the railway	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area. Clear view of the construction activities. declining as the bunds are formed. The proposed connection tower erection work and cranes will be visible above the skyline but in the context of the other existing towers.	Sensitivity: Medium Magnitude of change – High Effect: Moderate - Major adverse winter and summer
VIEW 5: View from the Oxford Green Belt Way PRoW 183 1/50 as it passes the site on the west side of the railway where it meets PRoW 183 1/60 which crosses the railway	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area. Restricted view of the construction activities, and largely screened once the bund has been built.	Sensitivity: Medium Magnitude of change – Medium Effect: Moderate adverse, winter and summer

Table 4: Summary of the Visual Effects arising due to the Construction Process		
Viewpoint and Location	**Visual receptors**	**Visual effect**
VIEW 6: The Oxford Green Belt Way (PRoW 183/5/10) as it passes west of the Site	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area. Clear view of the construction activities, but largely screened once the bund has been built.	Sensitivity: Medium Magnitude of change – High Effect: Moderate - Major adverse, winter and summer
VIEW 7: The Oxford Green Belt Way (PRoW 183/4/30) as it passes south of the Site after crossing the railway	Users of the lane and walkers on the Oxford Green Belt Way. A clear view of the construction activities seen through the existing towers.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse winter and summer
VIEW 8: From the Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre, south of the Site at its junction with footpath 183 1/60	Walkers on the Oxford Green Belt Way and users of the PRoW which crosses the railway at grade (which may be stopped up). A clear view of the construction activities.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse, winter and summer.
VIEW 9: The Oxford Green Belt Way as it skirts the CSC approaching the site of the proposed substation	Walkers on the Oxford Green Belt Way. A clear view of the construction activities.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse, winter and summer.
VIEW 10: The Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre	Walkers on the Oxford Green Belt Way. A clear view of the construction activities.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse, winter and summer.
VIEW 11: from the Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from the south	Walkers on the Oxford Green Belt Way. A clear view of the construction activities.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse, winter and summer.

Table 4: Summary of the Visual Effects arising due to the Construction Process		
Viewpoint and Location	**Visual receptors**	**Visual effect**
VIEW 12: The Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from further south	Walkers on the Oxford Green Belt Way. Glimpsed views of the construction activities and traffic.	Sensitivity: Medium Magnitude of change – Low Effect: Minor adverse, winter and summer
VIEW 13: The Oxford Green Belt Way (171/16/70) as it passes the proposed extension to the Culham Science Centre substation	Road users. Views of the construction activities and traffic but seen through the mesh of the perimeter fence and in the context of existing built form and activities.	Sensitivity: Medium Magnitude of change – Low Effect: Minor adverse, winter and summer
VIEW 14: On the northeast boundary of the Site within the Registered Park and Garden looking southeast (not currently a publicly accessible viewpoint)	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space. A clear view of the construction activities.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse, winter and summer.
VIEW 15: Within the Registered Park and Garden but looking southwest (not currently a publicly accessible viewpoint)	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space. A clear view of the construction activities.	Sensitivity: Medium Magnitude of change – High Effect: Moderate – Major adverse, winter and summer.
VIEW 16: From deeper within the Registered Park and Garden (further northeast, not currently a publicly accessible viewpoint)	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Glimpsed views of the construction activities of the BESS but the works to construct the connection tower will be clearly visible.	Sensitivity: Medium Magnitude of change – High in winter, and summer. Effect: Moderate- to Major adverse (but not a public viewpoint)

Table 4: Summary of the Visual Effects arising due to the Construction Process		
Viewpoint and Location	**Visual receptors**	**Visual effect**
View 17: From within the Registered Park and Garden looking southwest	Farm workers. Glimpsed views of the BESS construction activities. View of the construction of the connection tower.	Sensitivity: Medium Magnitude of change – Medium Effect: Moderate adverse winter and summer
VIEW 18: A track adjacent to New Cottage within the Registered Park and Garden (also PRoW 317 2/50)	Residents Site and activities lie out of view.	No effect
VIEW 19: From PRoW 183 1/40 along the south bank of the Thames, northwest of the Site	Users of the lane. Site and activities lie out of view.	No effect
View 20: from the top of Wittenden Clumps within the Site North Wessex Downs AONB	Visitors Site and activities lie out of view.	No effect

8 LANDSCAPE AND VISUAL IMPACTS DURING OPERATION

Potential Impacts

8.1. The landscape impact assessment is assessed using the criteria set out in Appendix A. Once operational the main features of the Proposed Development which could potentially result in landscape and visual impacts are:

- Changes to land use;
- Introduction of additional electrical infrastructure in the local landscape, reinforcing this negative impact of landscape character, and
- Tree planting and better management of the existing hedges which will reinforce this positive aspect of landscape character.

Effect on Topography and Watercourses

8.2. The Proposed Development will be located on ground which is already fairly flat, requiring minimum change between the existing levels and the finished floor levels. The lower southern boundary of the development platform for the battery storage area will be at 64.5m AOD and the upper northern edge at 66m AOD, similar to the existing slope. The ground further north will be feathered back into the existing

slope. The area where it is proposed to locate the substation is also level and so the finished platform level will be similar to the existing ground levels.

8.3. It is proposed to erect an earth bund between the railway line and the overhead power lines which will typically crest at 67m AOD but rise to the north to 69m AOD, representing a crest height above existing levels of between 3m and 5m. The aim is to screen the Proposed Development from the allocated urban expansion area and the section of the Oxford Green Belt Way on the west side of the railway. While the bunding may be perceived as an artificial feature, it will be seen in the context of the engineered railway cutting and the overhead power lines. The bunding also assists acoustically and will also reduce views of the allocated urban area from higher ground within the Registered Park and Garden, particularly once the tree and hedge planting has established.

8.4. Ground will be lowered to create the attenuation ponds, but the depth of these will be less than 2m and will be visually contained by the proposed earth bund and electrical infrastructure.

8.5. The Proposed Development will not result in any significant change to the macro topography of the Site but the proposed screening bunds alongside the railway will result in a localised change, but will be seen in the context of the existing constructed environment of the railway and transmission lines.

8.6. Since the localised changes in landform will largely occur outside the Registered Park and Garden the Medium magnitude of change combined with the Medium sensitivity of receptor will result in a Moderate adverse, Not Significant effect on topography.

Year 10– Following Establishment of Proposed Development Primary Mitigation

8.7. It is proposed to integrate the new landform into the landscape by planting the up the new landform with native trees and shrubs. Once the woodland and scrub has established the residual effect in terms of perceived changes to the landform will be Minor adverse and Not Significant, but this should be weighed against the visual and acoustic benefits that the bunding will provide.

Year 20 - Following Establishment of Proposed Development Primary Mitigation

8.8. After 20 years the continued growth of the woodland and scrub will further screen the earthworks from view resulting in a Negligible perceived effect on topography in summer and Minor adverse in winter.

Effect on trees and hedgerows and other landscape features

8.9. No trees or hedges will need to be removed to construct the BESS compound and substation and all root protection areas will be respected. A small area of trees (G2) will need to be removed to within the CSC to allow the expansion of the existing substation.

Mitigation and residual impact

8.10. Within the 27ha site the proposed development will result in the loss of approximately 4.7ha of improved grassland to compounds and new hardstanding. 11.6ha of other neutral grassland will be enhanced, 2.2ha of broadleaved woodland, 1.8ha of scrub and 1.2km of hedges will be planted as well as numerous

parkland trees. This substantial net gain in tree cover, a High magnitude of change within an area of High sensitivity will result in a Major beneficial effect. The proposed landscaping will achieve a Biodiversity Net Gain (BNG) of 59.14%, as set out within the Biological Impact Assessment which supports the planning application. This new planting will be undertaken in Year 1 and by Year 20 will have matured sufficiently to such that the magnitude of change will be High within areas of Medium sensitivity, resulting in a Not Significant Moderate beneficial effect.

Effect on the landscape character of the Site

8.11. The proposed electrical infrastructure will substantially alter the character of the area of field in which it will be situated, replacing the urban fringe character with one of an engineered landscape containing largely low level electrical infrastructure. The sensitivity of this part of the Site has been assessed as Medium, which combined with a High magnitude of change will result in Year 1 a Moderate to Major adverse effect on the character of the fields which comprise the Site. As the landscaping within the Registered Park and Garden matures it will reduce the visual influence of the proposed electrical infrastructure on the parkland. After 10 years the effect on the character of the land where it is proposed to build the electrical infrastructure will remain Moderate to Major adverse (a Significant effect) but the effect on the character of the parkland will decline to Moderate adverse. After 20 years the effect on the character of the land where it is proposed to build the electrical infrastructure will remain Moderate – Major adverse (a **Significant effect)** while the effect on the character of the parkland will become Minor beneficial.

Effect on the character of the local landscape

8.12. The change in character to the Site will not be completely out of character with that of the immediate locality, where electrical infrastructure is a notable feature. The electrical infrastructure is, however, perceived as a negative aspect of landscape character and the Proposed Development will reinforce that. The area is also has the characteristics of urban fringe, which will increase as the allocated urban expansion area is built out. The changes to the landform will significantly reduce the visual influence of the Proposed Development on the immediate landscape to the west, which has Medium sensitivity and the magnitude of change will be Low, resulting in an adverse effect on the wider Lowland Plains LCT adverse of Minor significance.

8.13. In Year 1, without the establishment of the primary mitigation the BESS electrical infrastructure component of the Proposed Development will only be visible for less than 3.8% of the total area of registered parkland. The magnitude of change to this 3.8% will be Medium, which combined with the Medium Landscape sensitivity, will result in a Moderate adverse, Not Significant, effect on the character and setting of this area. The electrical infrastructure component of the Proposed Development will not be visible from the remaining 96.2% of the Registered Park and Garden, including the core area around Nuneham House and will have no effect on its character or setting.

8.14. The proposed connection tower will be seen from a greater portion of the Registered Park and Garden, but will be seen in context with the existing overhead transmission line which passes through this part of

the parkland. Given this context, the effect on the character of the Registered Park and Garden from where it will be visible will be Moderate adverse

8.15. By Year 10 the woodland planting will partially screen the low-level BESS infrastructure from view and the Site will appear in the wider landscape as an area of parkland and woodland, which is considered to be Minor beneficial (Not significant) The woodland will also beneficially reduce the visual influence of the existing transmission infrastructure and the CSC. By Year 20 the landscaping will be sufficiently well established that the original visually contained character of the western edge of the Registered Park and Garden will have been re-established resulting in a Moderate beneficial effect (Not Significant).

8.16. The proposed scrub and tree planting around the connection tower and compound will reduce its influence on the character of the parkland and the residual effect on its landscape character will be Minor adverse.

Effect on the setting and character of the North Wessex Downs Area of Outstanding Natural Beauty

8.17. The Downs lie around 5km to the south of the Site, but in views from the Downs the Site lies to the north of the CSC and is screened by the buildings within it (see View 20). The buildings within the CSC also significantly limit views of the Downs from the Site. A result, the Proposed Development will have no effect on the setting or character of the AONB.

Effect on public access

8.18. If the development proceeds members of the public will have permissive access to the parkland greenspace within the application area and along a footpath route which will provide a connection between footpath 183/4 and 317/2, for the operational period of the facility (see **Figure 19, Appendix A).**

Visual Effects

8.19. A series of viewpoints have been chosen to illustrate the likely effect of the Proposed Development on those living, working and visiting the area. For each viewpoint photographs have been taken and are presented in Figures 13 and 15. The locations where they were taken from are located on Figures 12 and 14. The likely visual effect of the Proposed Development is then determined by combining the sensitivity of the viewer with the magnitude of change, using the criteria set out in Appendix B. The assessment below is also presented in the figures for ease of reference with the actual photographs. The Applicant is seeking a temporary consent (40 years) and so effects will be temporary, albeit for a long duration. The exception being the effects arising from the tree, scrub and hedge planting, since this is likely to remain in place once the electrical infrastructure has been removed. Visual assessments have been made for Year 1 (immediately after construction and worst case), 10 Years after construction (a time when the hedge planting is likely to be fully effective) and Year 20 (by which time the woodland planting will have a significant screening effect). It is anticipated that the screening effect of the woodland will continue to increase over a 35 year timeframe.

VIEW 1: Thame Lane, close to the Europa School, as it approaches the site from the west

The existing view

8.20. A hedge runs along the north side of this Restricted Byway, preventing views towards the Site when in leaf and affording only glimpsed views in winter when it has been cut back. The upper part of the Registered Park and Garden is visible, with the woodlands forming the skyline, although the part of the parkland within the Site and proposed as green space lies out of view. The view is adversely affected by the overhead transmission lines.

Predicted change to the view and the visual effect – Year 1

8.21. The existing hedge will screen the Proposed Development in summer and it is likely that the electrical elements of the Proposed Development will be lie below the foreground vegetation. A substantial part of the Proposed Development, including the proposed substation will be screened by Warren Copse. The planted earth bund will ensure that the proposed electrical infrastructure will be screened from view. The proposed connection tower will be visible above the skyline but will be seen in the context of the other existing towers.

8.22. The sensitivity is Medium and the magnitude of change Negligible, resulting in a Negligible, Not Significant, effect.

Predicted change to the view and the visual effect – Year 10

8.23. It will be possible to glimpse the proposed planting on the upper slopes of the parkland through gaps in the hedge, mainly in winter, but the effect on visual amenity is likely to remain Negligible, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.24. The proposed woodland planting along the parish boundary and on the upper slopes will become a feature of the landscape where glimpsed views are possible, resulting in a Minor beneficial, Not a Significant effect.

VIEW 2: View from Thame Lane (PRoW 183/4/20) as it approaches the site from the west, before it crosses the railway

The existing view

8.25. A hedge runs along the north side of this Restricted Byway, preventing views towards the Site when in leaf and affording only glimpsed views in winter (the Site lies 300m away at its closest). In the glimpsed views the scrub growing along the railway line is visible, as are the upper slopes and wooded skyline of the parkland. Some of the buildings within the Culham Science Park form the focal main view down along the lane, which is also adversely affected by the overhead transmission lines.

Predicted change to the view and the visual effect – Year 1

8.26. A substantial part of the Proposed Development, including the proposed substation will be screened by Warren Copse. The planted earth bund will ensure that the proposed electrical infrastructure will be screened from view. The sensitivity is Medium and the magnitude of change Negligible , resulting in a Negligible, Not Significant, effect.

Predicted change to the view and the visual effect – Year 10

8.27. It will be possible to glimpse the planting on the upper slopes of the parkland through gaps in the hedge, mainly in winter, but the effect on visual amenity is likely to remain Negligible, Not a Significant effect..

Predicted change to the view and the visual effect – Year 20

8.28. The proposed woodland planting along the parish boundary and on the upper slopes will become a feature of the landscape where glimpsed views are possible. The sensitivity will be Medium and the magnitude of change Low resulting in a Minor beneficial, Not a Significant effect.

VIEW 3: Thame Lane (PRoW 183/4/20) just before it crosses the railway when approaching from the west (also where it meets the Oxford Green Belt Way)

The existing view

8.29. This is the first reasonably clear view of the Site from Thame Lane when heading east, although views of the majority of the Site are blocked by the foreground vegetation along the railway. Only the slightly elevated grass slopes on the east side of the Site, which are proposed to be green space, are visible. Lock Wood occupies the skyline and the clumps of trees within the parkland are visible, but the view is substantially adversely affected by the transmission lines and towers in the foreground.

Predicted change to the view and the visual effect – Year 1

8.30. A 3m high bund will be erected along the western and southern boundaries of the compound containing the electrical equipment and the attenuation pond. The bund will be set 20m back from the railway along the western edge and will be set at least 60m back from the railway on the southern edge. The bund will

screen all but the upper metre of the inverter houses. The new tree and shrub planting with the shelters will be intrusive. The connection tower will be partially visible behind a group of trees. The sensitivity of the viewer is Medium and the magnitude of change is Medium, resulting in a Moderate to Major adverse effect on visual amenity, **a Significant effec**t.

Predicted change to the view and the visual effect – Year 10

8.31. The scrub, tree and hedge planting will disguise the proposed new landform and will screen the proposed electrical infrastructure from view. The tree and shrub shelters will have been removed and the planting will have established a 100% canopy. The magnitude of change will decline to Low in summer and winter (given the depth of the planting), resulting in a Moderate adverse effect on visual amenity, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.32. The proposed woodland planting along the parish boundary and on the upper slopes will be visible above the foreground planting and will be a feature of the landscape. The sensitivity will be Medium and the magnitude of change Low resulting in a Minor beneficial effect, Not a Significant effect.

VIEW 4: View from the Oxford Green Belt Way (PRoW 183/5/10) which runs along the west side of the railway

The existing view

8.33. A short 20m section of the footpath is slightly elevated compared with the Site and affords a view across the railway (which lies in a cutting) into the Site. Lock Wood forms the skyline. This is the best view of the Registered Park and Garden from the west side of the railway, the parkland occupies the mid to upper slopes but is setting is adversely affected by the overhead transmission line which occupies the foreground.

Predicted change to the view and the visual effect – Year 1

8.34. A 3m high bund will be erected along the western boundary of the compound containing the electrical equipment and the attenuation pond. The bund will be set 20m back from the railway along the western edge and will be set at least 60m back from the railway on the southern edge (where the gate in the field lies). The bund will screen the majority of a 4m high wooden acoustic fence which will run between the attenuation pond and the electrical infrastructure. The fence will also run along the southern edge of the BESS compound, screening the infrastructure from view. Native scrub and woodland will be planted on the new bund, with a native hedge and standard trees in front of it, to integrate it into the landscape and provide another layer of screening. Tree and scrub planting will also be planted in front of the acoustic fence on the southern boundary to soften its visual impact. The new landscaping with shelters and stakes and southern fence will initially appear intrusive and will restrict the view of the parkland. Receptor sensitivity is Medium and the magnitude of change High resulting in a Moderate - Major adverse effect on visual amenity, a **Significant effect.**

Predicted change to the view and the visual effect – Year 10

8.35. The scrub, tree and hedge planting will disguise the proposed new landform and fence. The tree and shrub shelters will have been removed and the planting will have established a 100% canopy. The magnitude of change will decline to Low in summer and winter (given the depth of the planting), resulting in a Minor adverse effect on visual amenity, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.36. The proposed woodland planting along the parish boundary and on the upper slopes will be visible above the foreground planting and will be a feature of the landscape. The sensitivity will be Medium and the magnitude of change Low resulting in a Minor beneficial effect, Not a Significant effect.

VIEW 5: View from the Oxford Green Belt Way PRoW 183 1/50 as it passes the site on the west side of the railway where it meets PRoW 183 1/60 which crosses the railway

The existing view

8.37. This view illustrates how PRoW 183 1/50 drops down to run level with the top of the cutting and vegetation within the cutting prevents views over the Site. It also illustrates how views over the Site from the Oxford Green Belt Way are reduced as the path runs at a slightly lower level than the railway. Currently the process to allow the stopping up this footpath is in progress.

Predicted change to the view and the visual effect – Year 1

8.38. The majority of the Proposed Development will be screened from view behind a 3m high bund and a 4m high wooden attenuation fence which will run between the proposed attenuation pond and the main BESS compound. The fence will also run along the southern edge of the BESS compound, screening the infrastructure from view. It is proposed to plant a hedge with trees along the base of the bund and plant the bund with native shrubs. Trees and native shrubs will also be planted in front of the acoustic fence along the southern boundary to soften its visual impact. Woodland will be planted on the bund where it broadens out further north. The fencing and new landscaping with shelters and stakes will initially appear intrusive. It will be possible to glimpse the upper part of the connection tower and wires. The sensitivity of the viewer is Medium and the magnitude of change Medium resulting in a Moderate adverse, not Significant, effect on visual amenity.

Predicted change to the view and the visual effect – Year 10

8.39. The scrub, tree and hedge planting will disguise the proposed new landform and acoustic fences and will screen the proposed electrical infrastructure from view. The tree and shrub shelters will have been removed and the planting will have established a 100% canopy. The planting will block views of the connection tower. The magnitude of change will decline to Low in summer and winter (given the depth of the planting and distance of the infrastructure), resulting in a Minor adverse effect on visual amenity, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.40. The proposed woodland planting along the parish boundary and on the upper slopes will be visible above the foreground planting and will be a feature of the landscape. The sensitivity will be Medium and the magnitude of change Low resulting in a Minor beneficial effect, Not a Significant effect.

VIEW 6: The Oxford Green Belt Way (PRoW 183/5/10) as it passes west of the Site

The existing view

8.41. This view illustrates how views over the Site from the Oxford Green Belt Way are reduced as the path runs at a slightly lower level than the railway. The Site is visible, almost at eye level but the view is marred by the overhead transmission line and the buildings within the CSC.

Predicted change to the view and the visual effect – Year 1

8.42. It is proposed to erect a 3m to 4m high landform along the western boundary of the Site which will screen the electrical infrastructure from view. It will also beneficially screen the CSC from view and reduce the visual impact of the transmission line towers. It is proposed to establish native woodland on the landform to disguise its form, provide further screening to the overhead transmission lines, but initially the planting will be intrusive. The sensitivity of the viewer is High and the magnitude of change Medium potentially resulting in a Moderate-Major adverse effect on visual amenity but while there will be a loss of an open view, the screening is on the whole considered beneficial. As a result, the effect on visual amenity is considered to be Minor adverse, not a significant effect.

Predicted change to the view and the visual effect – Year 10

8.43. The scrub, tree and hedge planting will disguise the proposed new landform and will screen the proposed electrical infrastructure from view. The tree and shrub shelters will have been removed and the planting will have established a 100% canopy. The magnitude of change will decline to Low, resulting in a Moderate beneficial effect on visual amenity, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.44. The planting will have established further but the view will not change significantly, essentially a line of trees and scrub forming the skyline, providing increased screening to the electrical infrastructure. The magnitude of change will decline to Low, resulting in a Moderate beneficial effect on visual amenity, Not a Significant effect.

VIEW 7: The Oxford Green Belt Way (PRoW 183/4/30) as it passes south of the Site after crossing the railway

The existing view

8.45. This is the first open view towards the Registered Park and Garden but its setting is adversely affected by the overhead transmission line in the foreground. The setting is also adversely affected by the CSC which lies to the right of the view.

Predicted change to the view and the visual effect – Year 1

8.46. The proposed electrical infrastructure compound will be screened from view by a 3m high earth bund along the west side of the compound and a 4m high wooden acoustic fence along the west and southern boundaries. The bund will lie beyond the existing foreground trees and cut off the view of the distant horizon. It is proposed to establish native trees and scrub on the bund and in front of the acoustic fence on the southern boundary. Initially the visible parts of the acoustic fencing and new landscaping will appear

intrusive. The sensitivity of the viewer is Medium and the magnitude of change High in summer and winter, resulting in a Moderate – Major adverse, a Significant effect on visual amenity.

Predicted change to the view and the visual effect – Year 10

8.47. The scrub, tree and hedge planting will disguise the proposed new landform and will screen the proposed electrical infrastructure from view. The tree and shrub shelters will have been removed and the planting will have established a 100% canopy. The gap in the bund will be filled with scrub which will screen the attenuation pond and equipment behind. The magnitude of change will be Low in summer and winter resulting in a Minor adverse effect on visual amenity, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.48. The scrub, tree and hedge planting will have gained greater stature and the woodland planting along the parish boundary will form a visible backdrop. The magnitude of change will be Low in summer and winter resulting in a Minor adverse effect on visual amenity, Not a Significant effect.

VIEW 8: From the Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre, south of the Site at its junction with footpath 183 1/60

The existing view

8.49. This section of the PRoW affords a clear view across the Site, but also of the Culham Science Centre. To the northwest the view extends across to the Thames Valley and to the northeast the farmland gradually rises to Lock Wood which occupies the skyline. The clumps of trees within the parkland are visible. The vista is framed by the two transmission lines which cut through the parkland, which in association with the CSC adversely affects the setting of the parkland.

Predicted change to the view and the visual effect – Year 1

8.50. The proposed electrical infrastructure compound will be largely screened from view by a 4m high solid wood panel acoustic fence, which will also block views of the countryside beyond. If the viewer looks to the right the proposed secondary access to the proposed compound will be visible, as will part of the eastern boundary where it is not possible to erect a bund due to service constraints and acoustic mitigation is not required. The electrical equipment will be visible through the weld mesh. Native trees and shrubs will be planted in front of the acoustic fence to soften its visual impact and a native hedge in front of the weldmesh fence along the eastern boundary. The sensitivity of the viewer is Medium and the magnitude of change Medium in summer and High in winter, resulting in a Moderate adverse effect in summer and Moderate to Major adverse effect in winter, a **Significant effect.**.

Predicted change to the view and the visual effect – Year 10

8.51. The proposed planting will have achieved 100% canopy and the stakes and shelters will have been removed. The hedge in front of the compound fence will have reached a height of 3m. In summer the planting will largely screen the acoustic fence electrical infrastructure from view, but it will be possible to glimpse these features in winter. The magnitude of change will reduce to Low in summer only resulting in a Minor adverse effect on the visual amenity of walkers in summer but Moderate adverse in winter,

Not a Significant effect. The view of the wider countryside will remain blocked for this short section of the footpath.

Predicted change to the view and the visual effect – Year 20

8.52. The scrub and tree planting will have gained greater stature and the woodland planting along the parish boundary will form a visible backdrop. The magnitude of change will reduce to Low in summer only resulting in a Minor adverse effect on the visual amenity of walkers in summer but Moderate adverse in winter, Not a Significant effect. The view of the wider countryside will remain blocked for this short section of the footpath.

VIEW 9: The Oxford Green Belt Way as it skirts the CSC approaching the site of the proposed substation

The existing view

8.53. The existing Restricted Byway follows the broad concrete perimeter track which runs around the outside of the perimeter security fence to the CSC. As a result the visual amenity of walkers is adversely affected by the fence, buildings and activities within the science centre. The view is also marred by an industrial shed and electrical infrastructure along the byway. Woodland forms a screening backdrop to the view. It is proposed to locate the electrical substation on the grass field in the foreground.

Predicted change to the view and the visual effect – Year 1

8.54. The Proposed Substation will occupy most of the green field visible in the foreground. Walkers will have to pass between the palisade fence to the substation and the security fence around the CSC. A hedge will be planted on an earth bund between the substation and the concrete track. The sensitivity of the receptor is Medium and the magnitude of change is Medium (as seen in the context of the existing infrastructure of the CSC), resulting in a Moderate adverse, Not Significant effect, on the visual amenity of walkers.

Predicted change to the view and the visual effect – Year 10

8.55. The hedge will have gained a height of 3m and in summer will screen the majority of the substation from view in summer, but the entrance gates will be visible as walkers pass them. The hedge will allow glimpsed views in winter. The magnitude of change will remain Medium in summer and winter and the effect will be Moderate adverse, a Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.56. No significant change in the view since Year 10 as the hedge will be managed at a similar height. The residual effect will be Moderate adverse Not a Significant effect.

VIEW 10: The Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre

The existing view

8.57. This view illustrates how the CSC, water pumping station and overhead transmission line adversely affects the setting of the route of this section of the Oxford Green Belt Way. The Site occupies the land behind the transmission tower up to the railway, which passes in cutting and can only be discerned by the line of scrub within the cutting. Warren Copse is visible.

Predicted change to the view and the visual effect – Year 1

8.58. The electrical equipment will be clearly visible, set behind the tower and seen through the proposed weld mesh compound fence. The sensitivity of the receptor is Medium and the magnitude of change Medium (in the context of the existing electrical infrastructure), resulting in a Moderate adverse effect, Not significant.

Predicted change to the view and the visual effect – Year 10

8.59. The hedge will have gained a height of 3m and in summer will screen the majority of the substation from view but the entrance gates will be visible as walkers pass them. The magnitude of change will remain Medium and the effect will be Moderate adverse, not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.60. No significant change in the view since the hedge will be managed at a similar height. The residual effect will be Moderate adverse Not a Significant effect.

8.61. It is proposed to plant a native hedge in front of the weld mesh fence which, once established (typically 10 years) will screen the proposed compound and equipment from view in the summer and offer a glimpsed view in winter. This will result in a Minor adverse effect in summer and a Moderate adverse effect in winter.

VIEW 11: from the Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from the south

The existing view

8.62. The existing Restricted Byway follows the broad concrete perimeter track which runs around the outside of the perimeter security fence to the CSC. As a result the visual amenity of walkers is adversely affected by the fence, buildings and activities within the CSC. The view is also marred by the overhead electricity lines. Shrub cover along the railway and Lock Wood form the skyline.

Predicted change to the view and the visual effect – Year 1

8.63. The Proposed Substation will occupy most of the green field visible in the foreground. Walkers will have to pass between the palisade fence to the substation and the security fence around the CSC. Native hedge and scrub planting will be implemented on the earthworks along the northeast side of the road. There will be a loss of openness. The sensitivity of the receptor is Medium and the magnitude of change is Medium, resulting in a Moderate adverse effect on the visual amenity of walkers. The view of the parkland will be blocked, although the Proposed Development will enable people to visit the parkland and enjoy a high quality view over the Thames Valley.

Predicted change to the view and the visual effect – Year 10

8.64. The hedge will have gained a height of 3m and in summer will screen the majority of the substation from view but the entrance gates will be visible as walkers pass them. The magnitude of change will remain Medium and the effect will be Moderate adverse, not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.65. No significant change in the view since the hedge will be managed at a similar height. The residual effect will be Moderate adverse Not a Significant effect.

8.66. It is proposed to plant a native hedge in front of the weld mesh fence which, once established (typically 10 years) will screen the proposed compound and equipment from view in the summer and offer a glimpsed view in winter. This will result in a Minor adverse effect in summer and a Moderate adverse effect in winter.

VIEW 12: The Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from further south

The existing view

8.67. The existing Restricted Byway follows the broad concrete perimeter track which runs around the outside of the perimeter security fence to the CSC. As a result, the visual amenity of walkers is adversely affected by the fence, buildings and activities within the CSC. The view is also marred by the overhead electricity lines. The northside of the Byway is enclosed by woodland.

Predicted change to the view and visual effect Year 1

8.68. It will just be possible to glimpse the entrance to the substation and the proposed earth bund and young landscaping. The sensitivity of the receptor is Medium and the magnitude of change Low resulting in a Minor adverse effect on visual amenity, Not a Significant effect.

Predicted change to the view and the visual effect – Year 10

8.69. The hedge will have gained a height of 3m and in summer will screen the majority of the substation from view. The magnitude of change will remain Low and the effect will be Minor adverse, Not a Significant effect.

Predicted change to the view and the visual effect – Year 20

8.70. No significant change in the view since the hedge will be managed at a similar height. The residual effect will be Minor adverse Not a Significant effect.

VIEW 13: The Oxford Green Belt Way (171/16/70) as it passes the proposed extension to the Culham Science Centre substation

The existing view

8.71. The existing Restricted Byway follows the broad concrete perimeter track which runs around the outside of the perimeter security fence to the CSC. Views of the CSC and the existing substation are through the security fence. In summer the substation is screened by trees, but in winter it is possible to glimpse its structure through the leafless trees, but seen in the context of other structures within the CSC.

Predicted change to the view and visual effect Year 1

8.72. The proposed extension will result in the loss of trees around the existing substation. The proposed extension will be clearly visible beyond the inner access track but will be seen through the mesh of the existing security fence. The magnitude of change will be Medium summer and winter and the sensitivity of the viewer is Medum resulting in a Moderate adverse effect on visual amenity (Not significant).

Predicted change to the view and visual effect Year 10

8.73. The residual effect on visual amenity will remain as Moderate adverse (Not significant).

Predicted change to the view and visual effect Year 20

8.74. The residual effect on visual amenity will remain as Moderate adverse (Not significant).

VIEW 14: On the northeast boundary of the Site within the Registered Park and Garden looking southeast (not currently a publicly accessible viewpoint)

The existing view

8.75. This elevated position affords a panoramic view over the Site and across to the allocated urban expansion area to the right and the CSC to the left. The view is substantially marred by the overhead transmission lines which radiate out from Didcot Power Station, which is also visible.

Predicted change to the view and visual effect Year 1

8.76. The proposed electrical infrastructure compound will lie at the base of the slope, seen in the context of the cluster of existing transmission lines. The majority of the compound will be screened by the gentle land forming along the northeast boundary. The proposed electrical substation will be partially visible, seen in the context of the CSC. The earth bunds along the western boundary will screen reduce the visibility of the railway. Native woodland and scrub will be planted on the new landform across the northeast edge, largely following the parish boundary and re-establishing the historical line of woodland. Scrub and woodland will also be planted on the created landforms along the western boundary. A block of woodland will also be planted northwest of the proposed substation. The intervening grassland will be converted to a species rich wildflower meadow and parkland trees planted within it. Public access will be permitted to this area for the operational lifetime of the facility.

8.77. Although there is currently no public access to this area, sensitivity is considered to be Medium. The magnitude of change is High, resulting in a Moderate - Major adverse, **Significant effec**t.

Predicted change to the view and visual effect Year 10

8.78. After 10 years the proposed landscaping will screen the proposed electrical infrastructure and the CSC and will reduce the adverse visual impact of the Didcot transmission lines. The magnitude of change will reduce to Medium, resulting in a Moderate adverse effect, although this is offset by the benefit of reducing the visibility of existing development, and so a Minor adverse effect is predicted, Not a Significant effect.

Predicted change to the view and visual effect Year 20

8.79. The woodland planting along the parish boundary and tree planting within the parkland will visually isolate the park and garden from the urban fringe landscape to the southwest, resulting in a Minor beneficial effect in summer and Neutral effect in winter.

VIEW 15: From Viewpoint 14 within the Registered Park and Garden but looking southwest (not currently a publicly accessible viewpoint)

The existing view

8.80. The parkland affords an extensive view, through the transmission wires, over the allocated urban expansion area, as far as Culham Brake and Sloven Copse. The buildings of Warren Farm are visible. Further to the right the view extends across the Thames Valley, which has a high tree cover. The only building that can easily be made out is the spire of St Helen's Church, Abingdon.

Predicted changes to the view and effect on visual amenity – Year 1

8.81. The view will be over the area of the Site which will become enhanced parkland with permissive access. A naturalistic landform will raise the ground along the western boundary. Native woodland and scrub will be planted on the new landform and across the northeast edge of proposed electrical compound (which is out of view to the left), largely following the parish boundary and re-establishing the historical line of woodland. A block of woodland will also be planted northwest of the proposed substation. The intervening grassland will be converted to a species rich wildflower meadow and parkland trees planted within it. Public access will be permitted to this area for the operational lifetime of the facility. Woodland planting has been omitted from the northern part of the greenspace to preserve this attractive view over the Thames Valley and it is anticipated that the northern part of the parkland will become a popular viewing spot once permissive access is granted. The woodland planting on the landform on the western boundary is designed to frame this view and draw attention away from the allocated urban expansion area.

8.82. The sensitivity of the viewer is Medium and the magnitude of change will be Medium, resulting in a Moderate adverse effect.

Predicted changes to the view and effect on visual amenity Year 10

8.83. After 10 years the proposed landscaping will screen the proposed electrical infrastructure and the CSC and will reduce the adverse visual impact of the Didcot transmission lines. The magnitude of change will reduce to Medium, resulting in a Moderate adverse effect, although this is offset by the benefit of reducing the visibility of existing development, and so a Minor adverse effect is predicted, Not a Significant effect.

Predicted change to the view and visual effect Year 20

8.84. The woodland planting along the parish boundary and tree planting within the parkland will visually isolate the park and garden from the urban fringe landscape to the west, resulting in a Minor beneficial effect in summer and Neutral effect in winter.

VIEW 16: From deeper within the Registered Park and Garden (further northeast, not currently a publicly accessible viewpoint)

The existing view

8.85. This view illustrates how the visibility of the Site quickly decreases on heading northeast towards the core parkland area. Only glimpsed views of the Site are visible through the parkland trees. The transmission lines detract from the view. The allocated urban expansion area is also clearly visible in the distance.

Predicted changes to the view and effect on visual amenity – Year 1

8.86. Native woodland and scrub will be planted on the new landform and across the northeast edge of proposed electrical compound, largely following the parish boundary and re-establishing the historical line of woodland. A block of woodland will also be planted northwest of the proposed substation. It will be possible to glimpse part of the battery compound at the base of the slope, seen through the trees. Sensitivity is Medium and the magnitude of change in relation to the BESS only, is Low, resulting in a Minor adverse, Not Significant effect. The proposed connection tower will be clearly visible in the foreground but seen in the context of the existing overhead line. It is proposed to plant parkland trees and native shrubs around the tower and compound to reduce its visibility within the parkland. In relation to the tower, sensitivity is Medium and the magnitude of change High, resulting in a Moderate-Major adverse effect, a **significant** effect. It should be noted that this is not a public view.

Predicted changes to the view and effect on visual amenity – Year 10

8.87. Once the trees and shrubs gain stature they will beneficially screen the substation and CSC, and will reduce the adverse visual impact of the Didcot transmission lines. The effect of the BESS on visual amenity will be Negligible. The effect of the connection tower will be will reduce to Moderate adverse as the screen planting starts to take effect (Not a significant effect).

Predicted change to the view and visual effect Year 20

8.88. The woodland planting along the parish boundary and tree planting within the parkland will visually isolate the park and garden from the urban fringe landscape to the west, resulting in a Minor beneficial effect in summer and winter. The parkland trees around the connection tower will reduce its effect but it will remain Moderate adverse (Not a significant effect).

8.89.

VIEW 17: From within the Registered Park and Garden looking southwest

The existing view

8.90. This view illustrates how views of the Site are still possible, but further reduced on moving deeper into the parkland, away from the edge of the slope. The allocated urban expansion area is visible in the distance.

Predicted changes to the view and effect on visual amenity – Year 1

8.91. The proposed electrical infrastructure compound will lie at the base of the slope, seen in the context of the cluster of existing transmission lines, but the majority of it will be screened by the lip of the slope and the intervening trees. It will be a glimpsed view with limited visibility in summer. Native woodland and scrub will be planted on the new landform and across the northeast edge of proposed electrical compound, largely following the parish boundary and re-establishing the historical line of woodland. A block of woodland will also be planted northwest of the proposed substation. Sensitivity is Medium and the magnitude of change is Low, resulting in a Minor adverse, Not Significant effect. The magnitude of change

of the connection tower will be Medium resulting in a Moderate adverse effect (but it is not a public viewpoint and Not a significant effect).

Predicted changes to the view and effect on visual amenity – Year 10

8.92. Once the trees and shrubs gain stature they will beneficially screen the substation and CSC, and will reduce the adverse visual impact of the Didcot transmission lines. The effect on visual amenity will be Negligible. The effect of the proposed connection tower will remain Moderate adverse and Not a significant effect.

Predicted change to the view and visual effect Year 20

8.93. The woodland planting along the parish boundary and tree planting within the parkland will visually isolate the park and garden from the urban fringe landscape to the west, resulting in a Minor beneficial effect in summer and winter. The effect of the proposed connection tower will remain Moderate adverse and Not a significant effect.

VIEW 18: A track adjacent to New Cottage within the Registered Park and Garden (also PRoW 317 2/50)

The existing view

8.94. This view illustrates how the Site is screened by topography and tree cover to people within land further northwest of the Site.

Predicted changes to the view and the effect on visual amenity – Year 1

8.95. The Proposed Development will lie beyond the screening trees, below the brow of the hill and will have no effect on the visual amenity of residents or those using the track.

Predicted changes to the view and the effect on visual amenity -Year 10

8.96. No effect.

Predicted changes to the view and the effect on visual amenity Year 20.

8.97. No effect.

VIEW 19: From PRoW 183 1/40 along the south bank of the Thames, northwest of the Site

The existing view

8.98. This view illustrates how users of the riverside footpath are too low in the landscape to afford a view of the Site. The valley slope is currently a Motocross circuit.

Predicted changes to the view and the effect on visual amenity – Year 1

8.99. The Proposed Development will have no effect on the visual amenity of walkers or those using the future possible green space.

Predicted changes to the view and the effect on visual amenity – Year 10

8.100. The effect will remain as no effect on the visual amenity of walkers.

Predicted changes to the view and the effect on visual amenity Year 20

8.101. The effect will remain as no effect on the visual amenity of walkers.

VIEW 20: The top of Wittenden Clumps within the Site North Wessex Downs AONB

The existing view

8.102. This is a popular viewpoint affording panoramic views over Oxfordshire, including towards the Site. The Site is, however, screened by the buildings of the CSC, which form a prominent landmark cluster.

Predicted change to the view and visual effect Year 1

8.103. The Proposed Development will have no effect on the visual amenity of visitors to the Clumps.

Predicted changes to the view and the effect on visual amenity – Year 10

There will be no effect on the visual amenity of visitors to The Clumps.

Predicted changes to the view and the effect on visual amenity Year 20

8.104. There will be no effect on the visual amenity of visitors to The Clumps.

Summary of the effects on visual amenity

8.105. It is clear from the ZTV and visiting the Site that the potential visibility of the Proposed Development covers only a small area of countryside. Visibility to the north and northeast is curtailed by rising ground and tree cover. The CSC on the east side of the railway will blocks views to the south and southwest.

8.106. The only significant receptors affected will be walkers on the Oxford Green Belt Way as they move along the west side of the railway and along Thame Lane as it skirts the CSC. The setting of the section of the Oxford Green Belt Way east of the railway is significantly adversely affected by the existing electrical infrastructure and the CSC. The route is not an unpaved rural footpath but follows a broad concrete track which runs immediately adjacent to the security fence. The proposed BESS will potentially be clearly visible to walkers and so it is proposed to build earth bunds along the west boundary of the BESS compound, with hedging on the south and southeast boundary which is constrained by existing utilities. As artificial landforms they will have an adverse visual effect, closing off views, but will be seen in the context of an urban fringe environment. It is proposed to landscape the bunds with native shrub planting and hedging to disguise their form and provide a naturalistic layer of screening to the Proposed

Development. While the residual effect will be Moderate adverse, it will be for a comparatively short 800m length section of the Oxford Green Belt Way as it passes through an urban fringe landscape.

8.107. The proposed BESS and extension to the substation within the CSC will also be visible from within the Registered Park and Garden and although the public currently do not have access to this area, the effect on its setting is an important consideration. The setting is, however, already substantially adversely affected by the CSC, the overhead transmission lines and potentially any development within the allocated urban expansion area. The Proposed Development presents the opportunity to restore the setting to the parkland, by recreating a woodland belt along the Parish boundary, for which there is some historical evidence. This combined with other landscape interventions will reduce the visual impact of the existing intrusive elements as well as screening the Proposed Development from view, resulting in a net benefit. The exception to this being the proposed connection tower and compound which will be located within the Registered Park and Garden, but it will be seen in the context of the existing transmission line to which it connects. It is a necessary piece of electrical infrastructure related to the upgrading existing high voltage transmission line infrastructure and is not a direct consequence of the proposed BESS.

8.108. A second significant benefit is allowing permissive access to the proposed landscape areas which will also allow people to enjoy this part of the parkland in its enhanced setting. It will also allow access to a viewpoint which affords stunning views over the Thames Valley towards Abingdon. Given the proximity and easy access from the allocated urban area, this is likely to be a popular destination.

8.109. It is concluded that overall, the Proposed BESS Development will have at worst a Neutral effect on visual amenity as adverse effects are offset by beneficial effects and ultimately it will have a net beneficial effect as the landscaping matures. It is likely that the mitigation proposed to minimise intrusion to users of the Oxford Green Belt Way will be effective within less than 10 years, while the landscaping to enhance the setting of the parkland will take 15 - 25 years. This is deemed acceptable because the creation of parkland landscapes has required patience throughout the centuries. The proposed connection tower is likely to have a Negligible to Minor adverse effect on views in from the surrounding landscape since the upper section will be seen in context with the existing transmission line and the compound will be largely screened by proposed scrub and tree planting, and the other tree and woodland planting associated with the BESS.

8.110. The predicted visual effects are summarised in Table 5 below. For ease of reference, a red background indicates a Major – Moderate or Major adverse effect (a Significant effect), orange Moderate adverse effect (Not a Significant effect unless many) and Green for Minor, Negligible or beneficial effects, (regarded as acceptable).

Table 5: Summary of Visual Effects				
Viewpoint and Location	**Visual receptors**	**Visual effect - Year 1 and mitigation**	**Visual effect – Year 10**	**Visual effect – Year 20**
View 1: Thame Lane, close to the Europa School, as it approaches the site from the west	Users of the lane	Negligible, winter and summer Landforming and woodland planting on the western boundary	Negligible, winter and summer	Minor beneficial winter and summer
View 2: View from Thame Lane (PRoW 183/4/20) as it approaches the site from the west, before it crosses the railway	Users of the lane	Negligible, winter and summer. Landforming and woodland planting on the western boundary.	Negligible, winter and summer	Minor beneficial winter and summer
View 3: Thame Lane (PRoW 183/4/20) just before it crosses the railway when approaching from the west (also where it meets the Oxford Green Belt Way)	Users of the lane and walkers on the Oxford Green Belt Way	Moderate – Major adverse, winter and summer Landforming, tree, scrub and hedge planting along the western and southern boundaries	Moderate adverse winter and summer	Minor beneficial winter and summer
VIEW 4: View from the Oxford Green Belt Way (PRoW 183/5/10) which runs along the west side of the railway	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area.	Moderate - Major adverse winter and summer Landforming, acoustic fence, tree, scrub and hedge planting along the western and southern boundaries	Minor adverse, winter and summer	Minor beneficial, summer and winter

Table 5: Summary of Visual Effects				
Viewpoint and Location	**Visual receptors**	**Visual effect - Year 1 and mitigation**	**Visual effect – Year 10**	**Visual effect – Year 20**
VIEW 5: View from the Oxford Green Belt Way PRoW 183 1/50 as it passes the site on the west side of the railway where it meets PRoW 183 1/60 which crosses the railway	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area.	Moderate adverse, winter and summer Landforming, tree, scrub and hedge planting along the western and southern boundaries	Minor adverse, winter and summer	Minor beneficial, summer and winter
VIEW 6: The Oxford Green Belt Way (PRoW 183/5/10) as it passes west of the Site	Walkers on the Oxford Green Belt Way, potentially people within the urban expansion area.	Minor adverse Land forming and woodland planting on the earthworks	Moderate beneficial effect winter and summer	Moderate beneficial in winter and summer
VIEW 7: The Oxford Green Belt Way (PRoW 183/4/30) as it passes south of the Site after crossing the railway	Users of the lane and walkers on the Oxford Green Belt Way	Moderate to Major adverse winter and summer Planting of native trees and scrub on the earthworks	Minor adverse winter and summer	Minor adverse winter and summer.
VIEW 8: From the Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre, south of the Site at its junction with footpath 183 1/60	Walkers on the Oxford Green Belt Way and users of the PRoW which crosses the railway at grade (which may be stopped up).	Moderate – Major adverse, winter and summer Planting of native trees and scrub on the earthworks	Minor adverse in summer, Moderate adverse in winter	Minor adverse in summer, Moderate adverse in winter

Table 5: Summary of Visual Effects				
Viewpoint and Location	**Visual receptors**	**Visual effect - Year 1 and mitigation**	**Visual effect – Year 10**	**Visual effect – Year 20**
VIEW 9: The Oxford Green Belt Way as it skirts the CSC approaching the site of the proposed substation	Walkers on the Oxford Green Belt Way	Moderate adverse, winter and summer Hedge and scrub planting along the northeast side of the track	Moderate – adverse in summer Moderate adverse in winter	Moderate adverse summer Moderate in winter
VIEW 10: The Oxford Green Belt Way (183/4/40) as it skirts the Culham Science Centre	Walkers on the Oxford Green Belt Way	Moderate adverse, winter and summer Hedge and scrub planting along the northeast side of the track	Moderate adverse, winter and summer	Hedge and scrub planting along the northeast side of the track Moderate adverse winter and Minor summer
VIEW 11: from the Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from the south	Walkers on the Oxford Green Belt Way	Moderate adverse winter and summer Hedge and scrub planting along the northeast side of the track	Moderate adverse winter and summer	Moderate adverse in winter and Minor adverse in summer
VIEW 12: The Oxford Green Belt Way (171/16/70) as it approaches the site of the proposed substation from further south	Walkers on the Oxford Green Belt Way	Hedge planting along the northeast side of the road as it passes the proposed substation Minor adverse in summer, Minor adverse in winter	Minor adverse in summer, and winter winter	Minor adverse in winter and summer

Table 5: Summary of Visual Effects				
Viewpoint and Location	**Visual receptors**	**Visual effect - Year 1 and mitigation**	**Visual effect – Year 10**	**Visual effect – Year 20**
VIEW 13: The Oxford Green Belt Way (171/16/70) as it passes the proposed extension to the Culham Science Centre substation	Footpath users for a short section	Moderate adverse	Moderate adverse	None practical
VIEW 14: On the northeast boundary of the Site within the Registered Park and Garden looking southeast (not currently a publicly accessible viewpoint)	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space.	Moderate - Major adverse Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Minor adverse	Minor beneficial
VIEW 15: From Viewpoint 14 within the Registered Park and Garden but looking southwest (not currently a publicly accessible viewpoint)	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space.	Moderate adverse Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Minor adverse	Minor beneficial in summer Neutral in winter

Table 5: Summary of Visual Effects				
Viewpoint and Location	**Visual receptors**	**Visual effect - Year 1 and mitigation**	**Visual effect – Year 10**	**Visual effect – Year 20**
VIEW 16: From deeper within the Registered Park and Garden (further northeast, not currently a publicly accessible viewpoint)	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir.	Minor adverse associated with the BESS. Moderate to Major adverse associated with the connection tower. A significant effect. Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Negligible effect associated with the BESS Moderate adverse effect associated with the Connection tower.	Minor beneficial effect associated with the BESS Moderate adverse effect associated with the Connection tower.
View 17: From within the Registered Park and Garden looking southwest	Farm workers.	Minor adverse (summer and winter) effect associated with the BESS. Moderate adverse effect associated with the Connection tower. Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Negligible effect associated with the BESS Moderate adverse effect associated with the Connection tower.	Negligible effect associated with the BESS Moderate adverse effect associated with the Connection tower.

Table 5: Summary of Visual Effects				
Viewpoint and Location	**Visual receptors**	**Visual effect - Year 1 and mitigation**	**Visual effect – Year 10**	**Visual effect – Year 20**
VIEW 18: A track adjacent to New Cottage within the Registered Park and Garden (also PRoW 317 2/50)	Residents	No effect	No effect	No effect
VIEW 19: From PRoW 183 1/40 along the south bank of the Thames, northwest of the Site	Users of the lane	No effect	No effect	No effect
View 20: from the top of Wittenden Clumps within the Site North Wessex Downs AONB	Visitors	No effect	No effect	No effect

Impact on heritage assets

8.111. The effect on the landscape setting of heritage assets is assessed as follows (for a more comprehensive assessment of the effects on heritage assets refer to the Heritage Assessment):

Nuneham Courtenhay Registered Park and Garden

8.112. Initially the proposed BESS compound will have a Major Adverse effect on the setting of the southwest part of this asset since it will be clearly visible from the southwest edge of this park and garden, although the setting of the majority of the designated area will be unaffected (see Figure 18). As a result, the overall effect on the setting of the registered park and garden will initially be Minor adverse. It is proposed to plant an enclosing woodland edge along the parish boundary to reflect a linear belt of woodland as recorded on early maps of the estate. Once established it will not only screen the proposed electrical infrastructure but also the CSC. The proposed permissive access will allow the public to visit and enjoy this part of the parkland.

8.113. Once established the tree belt will screen the parkland from views to the southwest and west, but historically this would have been the case. Although the BESS will lie immediately adjacent to the

boundary and will have a minor adverse effect on its setting in terms of the spatial arrangement, the BESS will in itself be screened within views from the southwest and west and the internal setting of the parkland will be enhanced by the restored tree belt. Once the tree belt has established the overall effect of the Proposed Development on the setting of the parkland as experienced from within it and outside it will be Moderate Beneficial. If this Moderate beneficial effect is considered along with the benefit of permissive public access to the restored parkland, then it is considered to be a significant beneficial effect in terms of the ES.

8.114. The proposed connection tower will be located within the Registered Park and Garden and so will have a direct adverse effect on its character, but it will be seen in the context of the existing overhead line which it will sit adjacent to and connect to and so overall the effect on the character of the park and garden will be Minor adverse.

Nuneham Courtenhay Conservation Area

8.115. This area lies immediately to the north of the Site and comprises the woodland on the steep slopes of the Thames valley. The main value of this CA is the protection of these wooded slopes from views further north around Oxford and as the setting to the core part of the parkland. While the proposed BESS compound will be an intrusion into the less sensitive setting to the south, the proposed green space will establish an enhanced landscape buffer between this CA and the CSC; resulting in a Neutral effect on its landscape setting.

Thame Lane Railway Bridge

8.116. This is a well-preserved, elegant flying segmental arch road bridge designed by Brunel for the Didcot-Oxford line. Primarily designated for its design, engineering and material interest., Brunel period bridge of unusual design, built of handmade brick. The bridge is difficult to see, apart from the parapets, because it bridges a cutting. Network Rail has also erected galvanised steel parapet railings either side. These, in combination with the overhead electricity lines and CSC adversely affect its setting. The Proposed Development will lie 200m to the north of the bridge, separated by three overhead transmission towers. It is proposed to screen the BESS compound with a landscaped earth bund. The proposed substation will lie on the other side of the CSC, a substation within the CSC lies 212m east of the bridge and is intervisible with it. The Proposed Development will have a negligible effect on the landscape setting of the bridge.

Culham Station Overbridge, ticket office and waiting room

8.117. These assets are not inter visible with the Site, they are separated from it by the CSC. The Proposed Development will have no adverse effect on these assets.

The Europa School

8.118. The listed building within the Europa School lies 1.5km southwest of the Site and while the building is visible from the upper slope of the Site there will be no intervisibility with the proposed electrical infrastructure. The Proposed Development will have no effect on the landscape setting of the school.

Keepers Cottage and Venison House (Grade II)

8.119. These buildings lie 1.6km to the north east of the Site and are visibly separated from it by tree cover and topography. The Proposed Development will have no effect on their setting.

Clifton Hampden and Culham Conservation Areas

8.120. The proposed BESS electrical infrastructure will not be visible from these distant Conservation Areas. The Clfton Hampden CA lies 1.6km to the east on the eastern side of the CSC and Culham CA 2.2km to the west. The Proposed Development will have no effect on their landscape setting.

9 CUMULATIVE EFFECTS

9.1 Several other large developments are being promoted through the planning system.in the vicinity of the Site. Their extent and locations are plotted on **Figure 20 (Appendix A).** There is, therefore, a significant amount of development proposed in the area and the cumulative effect of this in association with the Proposed Development is assessed in this report. The potential developments are:

1) Land immediately west of the CSC and west of the railway line is a Strategic Allocation (STRAT9) for 3,500 new homes, employment, retail and social infrastructure, including a GP surgery and 2FE primary school. The land has been removed from the Green Belt as part of the planning process. No development has taken place and only concept plans are available, but the relationship of the Proposed Development to this major allocation is addressed in the cumulative assessment section.

2) The CSC is allocated as an Employment Area within the Plan (STRAT8). The CSC is a dynamic built environment within which planning consents are regularly sought to make changes to its fabric. The science centre is largely confined within a secure perimeter fence with a large part of the internal area already densely built out. The wider development strategy for the CSC is set out in the CSC Framework Masterplan January 2022. This study assumes that the CSC will continue to expand within its allocation as an employment area in accordance with this framework.

3) One significant proposed development within the CSC is the UKAEA Fusion Demonstration Plant (Planning Application Reference P22/S1410/FUL). The site for this is located in the eastern corner of the CSC, 1.2km east of the main area of the Proposed Development. The main visible element of which will be a 38m high drum shaped building (internal diameter 41m).

4) Application No: P16/S2368/FUL is a consent for a similar BESS within the CSC land on the northern edge and east of the proposed site of the reactor building.

5) Planning application P21/S4797/CM (11 November 2021) includes a new road from the A415 across 'land to the south of CSC through to a connection with the B4015, north of Clifton Hampden'. This road is part of a wider scheme including a new river crossing of the Thames, intended to improve transport links to a proposed significant expansion of Didcot, known as Didcot Garden Town. The new bypass will branch off from the existing A415 road at a roundabout northwest, and in close proximity to, Fullamoor Farmhouse, before following the south east boundary of the CSC, and joining the B4015 just north of the built extent of Clifton

Hampden. A roundabout at the south-western end of the new road, which would also give access to a new entrance to CSC.

CSC STRAT8

9.2 Developments within STRAT8 (the CSC) are unlikely to result in a cumulative effect in association with the proposed BESS since they will be within the existing, substantially built up area of the CSC, as defined by the security fence and so are unlikely to be perceived as increased development within the countryside.

9.3 The exception is the proposed fusion reactor building, which because of its size, height and architecture will be a notable landmark building. In terms of direct visual effects, people on the east side of the CSC will afford views of the reactor building, but the proposed BESS will be screened by buildings within the CSC. Walkers along the Oxford Green Belt Way will afford views of both as they skirt the CSC, but the impact is likely to be sequential rather than direct. In terms of cumulative landscape effect the two proposed developments will be very different in character, the reactor will be tall and prominent while the BESS will be low level, industrial and largely screened. The LVIA for the Fusion Demonstration Plant assigns a Minor positive effect for users of the Oxford Green Belt Way on the basis that "the high quality proposals will positively influence perceptual qualities". Therefore the cumulative effect of the BESS with the Fusion Demonstration Plant to walkers along the Oxford Green Belt Way is considered to be Negligible.

9.4 It will be possible to see the Fusion Demonstration Plant from within the part of the Registered Park and Garden which forms the Site, since this affords oblique views down the northside of the CSC. Initially it will be seen in conjunction with the proposed substation, resulting in a Minor adverse cumulative effect on both landscape character and visual amenity. The proposed landscaping associated with the Proposed development will overtime reduce the visibility of the Fusion Demonstration Plant, the CSC, the proposed substation and BESS. This will result in a Minor beneficial effect.

9.5 Walkers will also potentially pass a battery storage scheme within the CSC, Application No : P16/S2368/FUL, although this has not been built out and the CSC Development masterplan indicates that the land is more likely to be reserved for research and development buildings . The plot lies immediately west of the proposed reactor site. As such, any development is likely to be perceived as part of the CSC campus.

9.6 These consented and proposed developments will cumulatively strengthen the trend of electrical infrastructure in all its diverse forms aggregating in and around the CSC. The CSC is, however, a large prominent facility in the landscape and so these additions, should they proceed, will only have a Minor adverse effect on the character of the landscape around the CSC.

STRAT9 and the new road from the A415 across 'land to the south of CSC through to a connection with the B4015, north of Clifton Hampden'.

9.7 STRAT9, which will result in the urbanisation of the land immediately to the west and south of the Site. This represents a substantial urbanisation of the area, of which, the Proposed Development is

comparatively small and low key and in itself will have no significant cumulative effect compared against the quantum of development proposed in the vicinity.

9.8 The mitigation associated with the Proposed Development will offer some benefits in relation to the wider development proposals. The proposed tree belt within the parkland will to a certain extent help reduce the perceived cumulative effects of these developments by screening them from the western edge of the parkland. The parkland is already adversely influenced by the CSC and electrical infrastructure and the railway was build long after the parkland was conceived and created. The re-creation of the woodland belt along the boundary will restore the western setting to the parkland once it has matured, which is particularly beneficial in that it will reduce the visibility of the urban areas within STRAT9. This is evidenced by the photomontages for Views 14 – 17. The cumulative effect of the Proposed Development in association with STRAT9 is assessed in **Table 6** below.

Table 6: Assessment of cumulative effects between the Proposed Development and STRAT9

Viewpoint and Location	Visual receptors	Visual effect - Year 1 and mitigation	Visual effect – Year 10	Visual effect - Year 20
View 1: Thame Lane, close to the Europa School, as it approaches the site from the west	Users of the lane	No effect, view of the Site blocked by development within STRAT9	No effect, summer and winter, the view of the Site will be blocked by development within STRAT9	No effect, view of the Site blocked by development within STRAT9
View 2: Thame Lane shortly after the entrance to Warren Farm, approaching from the west	Users of the lane	No effect, view of the Site blocked by development within STRAT9	No effect, view of the Site blocked in summer and winter by development within STRAT9	No effect, view of the Site blocked by development within STRAT9
View 14: from within the Registered Park and Garden looking south	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space.	Moderate - Major adverse Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Minor adverse summer and Moderate adverse in winter.	No cumulative effect as the tree planting screens the development within STRAT9
View 15: From within the Registered Park	Residents accessing the property by the	Moderate adverse Extensive landscaping	Minor adverse	No cumulative effect as the tree planting

Table 6: Assessment of cumulative effects between the Proposed Development and STRAT9

Viewpoint and Location	Visual receptors	Visual effect - Year 1 and mitigation	Visual effect – Year 10	Visual effect - Year 20
and Garden looking southwest	reservoir, farm workers and workers attending to the reservoir. Potentially users of the proposed permissible green space.	to enhance the parkland and screen the existing and Proposed Development from view.		screens the development within STRAT9
View 16: From within the Registered Park and Garden	Residents accessing the property by the reservoir, farm workers and workers attending to the reservoir.	Moderate to Major adverse effect due to the proximity of the connection tower to this view. Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Moderate adverse summer and winter	No cumulative effect as the tree planting screens the development within STRAT9
View 17: From within the Registered Park and Garden looking southwest	Farm workers.	Moderate adverse due to the proximity of the connection tower to this view.adverse summer and winter due to the proximity of the connection tower to this view. Extensive landscaping to enhance the parkland and screen the existing and Proposed Development from view.	Minor adverse summer and winter	No cumulative effect as the tree planting screens the development within STRAT9

9.9 It is concluded that once the proposed tree belt has established the Proposed Development will have a beneficial cumulative effect in association with STRAT9. The proposed woodland will also reduce views

of the proposed Fusion Demonstration Reactor. The Proposed Development will also establish permissive access to the part of the parkland that lies within the application area, which is likely to be used by residents and visitors within STRAT9, including affording a fine view over the Thames Valley towards Abingdon. This synergy between the two developments will be beneficial.

10 EFFECT ON THE OPENNESS OF THE GREEN BELT

10.1 Paragraph 142 of the NPPF states that 'the fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence'. This is elaborated in NPPF paragraph143, which states that Green high, Belts should serve five purposes, as set out below.

- To check the unrestricted sprawl of large built-up areas.
- To prevent neighbouring towns merging into one another.
- To assist in safeguarding the countryside from encroachment.
- To preserve the setting and special character of historic towns.
- To assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

10.2 The NPPG sets out the key considerations for assessments of openness, which should include:

- Both spatial and visual aspects – in other words, the visual impact of the proposal may be relevant, as could its volume and physical extent;
- The duration of the development, and its remediability – taking into account any provisions to return land to its original state or to an equivalent (or improved) state of openness; and
- The degree of activity likely to be generated, such as traffic generation.

10.3 In 2015 LUC prepared an Oxford Green Belt study which analysed the state and function of the Oxford Green Belt. The study divided the Green Belt into various land parcels and assessed the performance of each against the five criteria. The Site lies within Broad Area 5 land parcel and the result of the assessment is as follows:

1) To check the unrestricted sprawl of large built-up areas and to prevent neighbouring towns merging into one another – Performance Low (implying that it does little to serve this function, mainly because it is on the outer edge of the Green Belt with no large urban area immediately adjacent to it).

2) To assist the safeguarding of the countryside from encroachment – Performance High

10.4 The report expands on this issue, stating:

"The broad area contains five villages – Sandford-on-Thames, Nuneham Courtenay, Toot Balson, Marsh Baldon and Clifton Hampden. All are rural in character. To the west of Clifton Hampden is a large estate of science and engineering buildings, government buildings and a sewage treatment works. This large concentration of buildings, car parks and street lighting has a significant urbanising influence on the Green Belt within the southern portion of the Broad Area. The centre of the parcel contains the large Grade I listed Nuneham Courtenay Registered Park and Garden with its large ancient woodlands and open fields.

The River Thames and its floodplain flows along the western edge of the broad area. In preserving the setting and historic character of historic towns – the Green Belts performance is High (although the study qualifies this stating . *"The 'High' rating relates to the Thames Valley approach to Oxford, whilst the rest of the parcel is considered to make a 'Medium' contribution".*

3) The South Oxfordshire Local Plan 2035 was adopted at a meeting of Full Council on 10 December 2020. Policy STRAT6: Green Belt states:

"*1. To ensure the Green Belt continues to serve its key functions, it will be protected from harmful development. Within its boundaries, development will be restricted to those limited types of development which are deemed appropriate by the NPPF, unless very special circumstances can be demonstrated. Very special circumstances will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm resulting from the proposal, is clearly outweighed by other considerations.*

2. The Green Belt boundary has been altered to accommodate strategic allocations at STRAT8, STRAT9, STRAT10, STRAT11, STRAT12, STRAT13 and STRAT14, where the development should deliver compensatory improvements to the environmental quality and accessibility of the remaining Green Belt land, with measures supported by evidence of landscape, biodiversity or recreational needs and opportunities".

10.5 With regard to STRAT8, paragraph 3.7 of the Local Plan states:

"This Local Plan has inset Culham Science Centre and land adjacent to it from the Green Belt. The site is at the outer edge of the Green Belt. This location is also at a distance from the special historic setting of the City of Oxford and ….. does not make a significant contribution towards the purposes of including land in the Green Belt to check the unrestricted sprawl of Oxford City. The exceptional circumstances justifying a release of the Green Belt through the Local Plan in this area are:

- *To enable the Culham Science Centre to realise its full potential as a science campus where publicly funded science research and commercial technology growth can flourish.*
- *The additional land provides an opportunity to deliver housing adjacent to one of the major employers in southern Oxfordshire.*
- *Development in this location is at the heart of Science Vale and supports the delivery of much needed significant strategic infrastructure".*

10.6 While the Proposed Development is not seeking to be excluded from the Green Belt it still needs to meet the Special Circumstances test where are set out in a separate report which is part of this application. This report assesses the effect of the Proposed Development on the five tests. Clearly it has been established from the various studies to inform the formulation of the Local Plan that this part of the Green Belt does not make a significant contribution to preventing urban sprawl, preventing neighbouring towns merging into one another or preserving the historical setting of the city of Oxford. With regards to encouraging the use of brownfield land, the issue is whether there are sufficient areas of brownfield land

close to practical points of connection to the electricity grid, which is a assessed in the Sequential Test report. The issue addressed in this report is the likely effect of the Proposed Development on the openness of the Green Belt.

10.7 **Figure 4 in Appendix A** shows the part of the Site proposed to be electrical infrastructure in relation to the Green Belt Inset areas. It is evident that there is no Green Belt immediately to the west, south and southeast of the Site (the exception being a 2.8 hectares of land to the south containing a cluster of transmission towers and lines). It is difficult to perceive a sense of openness from within the CSC due to its urban fabric and security fence. It will also be difficult to perceive a sense of openness from within STRAT8 once it has been built out and the buffer landscaping established to ensure that the allocated urban area minimises any loss of openness.

10.8 The key issue is whether the Proposed Development will result in the loss of openness as perceived from land to the north and northwest. The area of countryside from where the proposed BESS compound will be visible is limited to a small area of parkland extending up the slope to woodland and tree cover. There is currently no public access to this area. The Proposed Development seeks to increase the sense of openness to this part of the Green Belt by establishing a woodland buffer which will substantially reduce the perceived urbanising influence of the allocated urban expansion area and CSC and allowing permissive public access. This will include access to a viewpoint from where the openness and benefits of the Green Belt can be appreciated. The original tree belt which defined the southwest edge of the parkland (which was removed to facilitate the construction of the airfield) would have blocked views and resulted in a more enclosed landscape than the present day. It was clearly planted to define the boundary of the parkland and enclose it for the benefit of the landowner. Its restoration cannot be seen as a reduction in the openness of the Green Belt.

10.9 The perceived loss of openness will be confined to a short section of the Oxford Green Belt Way, a stretch already adversely affected by the CSC and the overhead transmission lines. To reduce the loss of openness it is proposed to screen the BESS compound with hedges and trees. While this is beneficial, planning case law indicates that this is not a solution to resolving the issue of loss of openness. The adverse effect on users of the Oxford Green Belt Way needs to be weighed against the benefits offered by the green space part of the Proposed Development. If the beneficial and adverse effects on the openness of the Green Belt are weighed, on balance the Proposed Development is considered to have a Neutral effect on the openness of the Green Belt.

10.10 Once built, the Proposed Development will generate little traffic and so will not result in any secondary adverse effect on the openness of the Green Belt. The Applicant is seeking a temporary consent and so, once decommissioned, will no longer have an adverse effect on the openness of the Green Belt, while the benefit of the screening tree belt will remain.

10.11 There will be a temporary minor harm resulting from the Proposed Development in respect of Purpose 3, safeguarding the countryside from encroachment due to the replacement of agricultural land with renewable energy infrastructure. However, this harm will be localised against the Green Belt boundary where existing building clusters in the strategic allocations will be substantially urbanised and harm balanced against the significant landscape enhancements proposed.

10.12 With regard to the BESS granted planning within the CSC, Application No : P16/S2368/FUL (see **Figure 19** for location). Under "Reasons for Decision", SODC states:

"The proposed energy storage facility would represent inappropriate development in the Green Belt and would, by definition, be harmful to the Green Belt. In assessing this application significant weight has been attached to the harm to the Green Belt. However, the Council considers various circumstances outlined in the application present very special circumstances that clearly outweigh the harm to the Green Belt.

The proposed development itself, in terms of scale and appearance, would be in keeping with the nature of existing development on the Culham Science Centre. Furthermore, the landscape mitigation works proposed would not only screen the development proposal itself, but would result in long term beneficial effects on the character of the landscape more widely to the north of the science centre".

10.13 The CSC had not been inset from the Green Belt at the time of the decision.

10.14 High voltage transmission lines passing across Green Belts are commonplace, and this part of the Green Belt is no exception. The proposed connection tower should be viewed in this context and so will have no adverse effect on the key attributes which define Green Belt.

11 DECOMMISSIONING

11.1. The Applicant is seeking a temporary consent for the BESS, although over a long time period. Once the facility ceases operation the equipment, buildings, concrete foundations, fencing and underground cables and drainage pipes will be removed. Since the majority of the equipment is modular, designed to be delivered as complete units on a HGV, it can be dismantled easily within a short timeframe. The area occupied by the BESS compound and substation can be returned to agriculture if no other preferential use is identified. The tree planting will have matured into woodland and will be retained to leave the legacy of an enhanced setting to the Registered Park and Garden. Any future permissive public access to this area will be by agreement with the landowner.

11.2. The proposed extension to the substation within the CSC and the proposed connection tower will be permanent.

11.3. Once the electrical infrastructure has been removed the effect of the retained landscape on the character and setting of the Registered Park and Garden will be Moderate and beneficial, particularly if it is assumed that the build out of STRAT9 has been completed. The effect on the visual amenity of those passing the Site along the Oxford Green Belt Way will be Moderate and beneficial.

12 CONCLUSION

12.1. It is concluded that the proposed electrical infrastructure will significantly adversely affect the landscape character of the part of the Site in which it lies and initially and to a lesser extent the character of a small

part of Nuneham Park. It is proposed to enhance this part of the parkland, including restoring a historical tree belt along the Parish boundary. This will have a beneficial effect on the character, setting and visual amenity of the parkland, although this will take many years to be effective. There will be no significant adverse residual effects on the character of the wider countryside beyond the parkland within ten years. The only significant adverse effect of the Proposed Development on visual amenity will be to walkers using a short stretch of the Oxford Green Belt Way, a stretch already adversely affected by the existing electrical infrastructure and CSC. Permissive access to the parkland, which includes a fine viewpoint over the Thames Valley and along a new permissive path will be a benefit, particularly given the proximity of a large mixed use development area to the west. The beneficial aspects of the Proposed Development, in terms of parkland restoration, public access and Biodiversity Net Gain are considered to be greater than the limited adverse landscape and visual effects.