Culham Storage

Environmental Impact Assessment

Volume 1: Environmental Statement Main Report

Prepared for:
Statera Energy Limited

Date:
April 2024

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Chapter 1: Introduction and EIA Methodology

INTRODUCTION

1.1 This Environmental Statement (ES) has been prepared on behalf of Statera Energy Limited (hereinafter referred to as 'the Applicant') in accordance with the statutory procedures set out in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017[1] (as amended) (hereinafter, 'the EIA Regulations').

1.2 The Applicant is seeking detailed planning permission for the proposed development of a Battery Energy Storage System (BESS), comprising a 500 megawatt (MW) battery storage facility with a connection into the Culham Jet Substation, with associated infrastructure, access and landscaping (the 'Proposed Development') in South Oxfordshire, north of Culham Science Centre and near Clifton Hampden (the 'site'). The site covers a total area of 26.8 hectares (ha) and is located within the administrative boundary of South Oxfordshire District Council (SODC). The site location is shown in Figure 1.1. Figure 1.2 provides the planning application red line boundary.

1.3 Environmental Impact Assessment (EIA) is a process carried out which examines available environmental information to ensure that the likely significant environmental effects of certain projects are identified and assessed before a decision is taken on whether a project is granted planning permission. This process allows environmental issues to be identified at an early stage and projects can then be designed to avoid or to minimise adverse environmental effects, and appropriate mitigation and monitoring can be implemented.

1.4 Given the scale and nature of the Proposed Development and therefore the potential for likely significant environmental effects, an EIA has been undertaken, which has been reported upon within this ES.

1.5 In accordance with the EIA Regulations (see section '*The Legislative Requirements for an EIA*' of this ES chapter), this ES describes the likely significant environmental effects of the Proposed Development during construction, completion and operation, and following decommissioning.

Figure 1.1 Site Location[2]

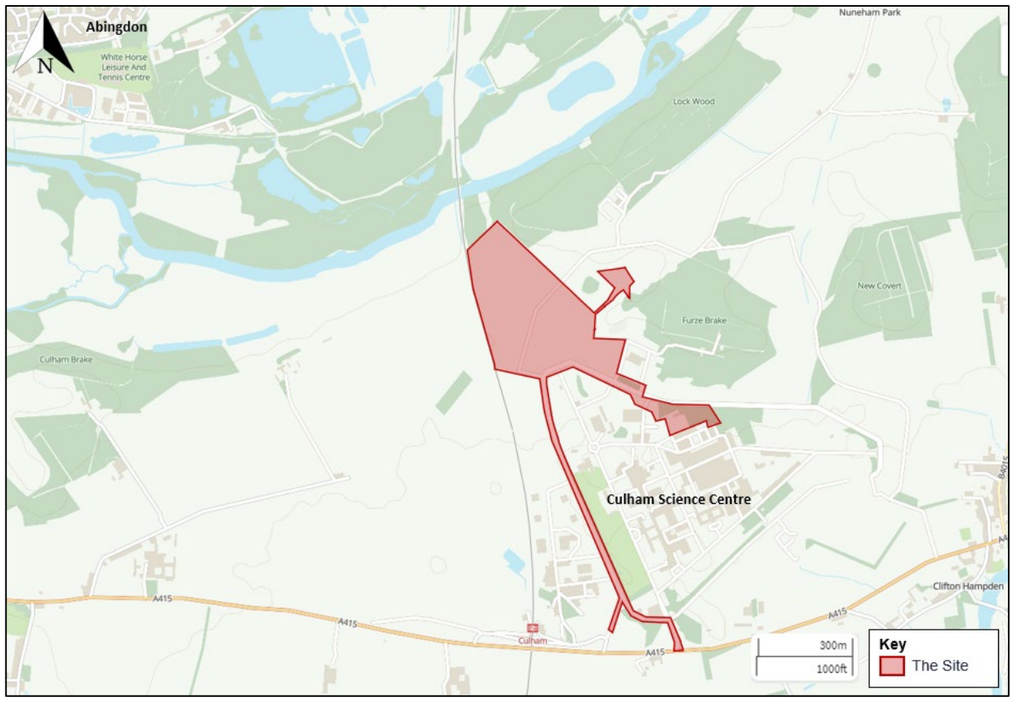
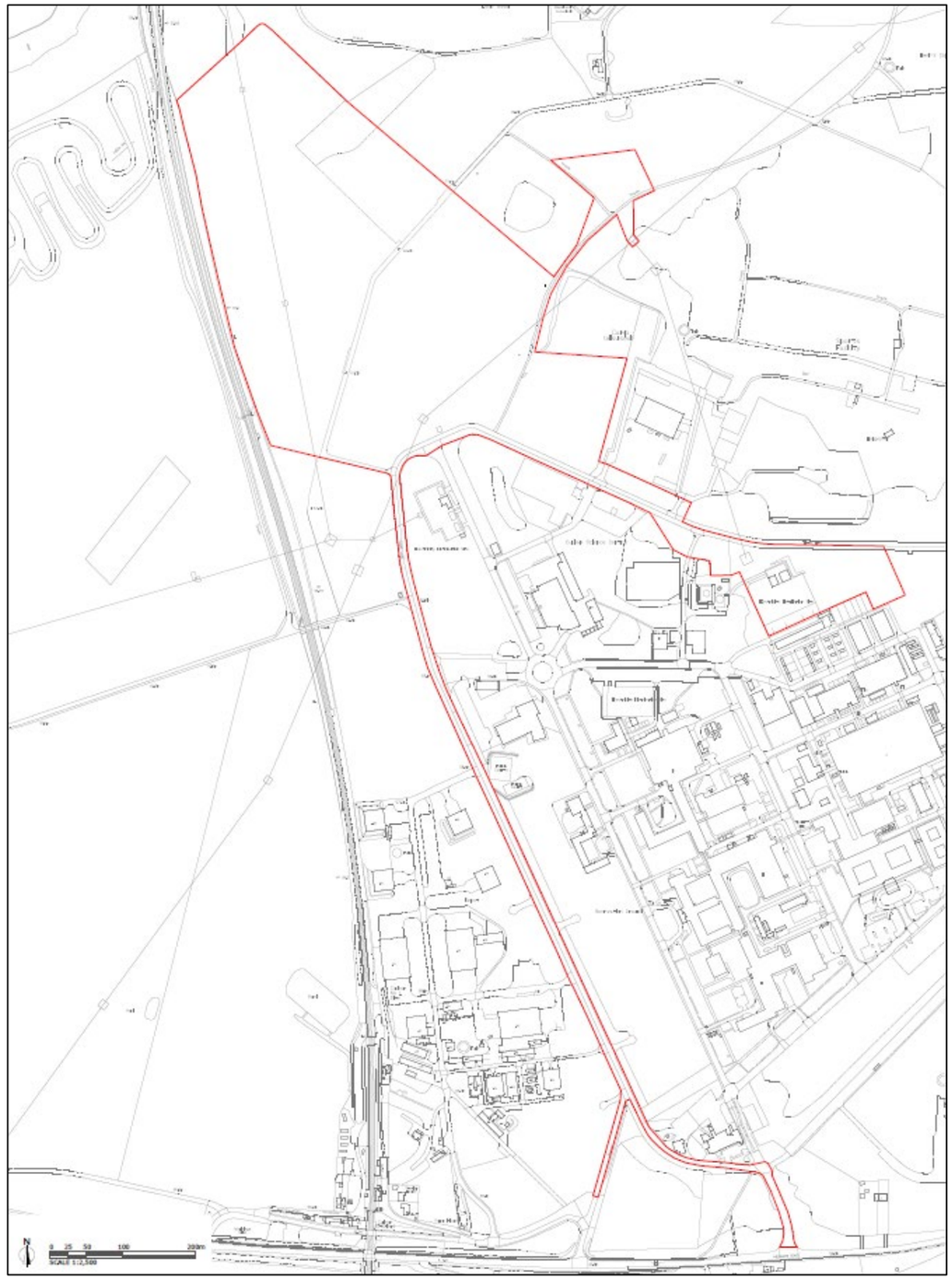


Figure 1.2 Planning Application Red Line Boundary



[1] *His Majesty's Stationery Office (HMSO) 2017. Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (As amended)*

[2] *Note: site red line boundary included in this figure is indicative for the purposes of illustrating site location.*

SITE DESCRIPTION

1.6 The following section presents a summary of the location of the site, existing site conditions and existing site context. A description of the key features and designations associated with the site and surrounding environment are discussed in **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**. Further detail describing the existing baseline context is presented within **ES Volume 1, Chapters 3** to **5**, insofar as there are particular features of relevance to the various topic chapters, as well as the supporting environmental reports presented within **ES Volume 2** and **ES Volume 3**.

1.7 The site is irregular in shape and is centred around National Grid Reference SU529965. The site is located approximately 2.5km to the east of Abingdon. The site is bordered by:

- Woodland to north, beyond which lies the River Thames;
- Agricultural land, an area of woodland, and Thame Lane to the east;
- Thame Lane to the south of the site, with Culham Science Centre to the south-east, beyond which is Abingdon Road (A415) and Culham Rail Station further south; and
- A railway line to the west (servicing Great Western Railway), adjoined by Oxford Green Belt Way, beyond which lies agricultural land and Culham Park Mx (off-road race track).

1.8 The site is accessed from the east, south-east and south by Thame Lane, which connects to Abingdon Road (A415) to the south.

1.9 The site predominantly comprises areas of open fields (typically harvested for hay and silage) and is crossed by a tarmac track (Thame Lane, a non-public highway) and an existing farm track. High voltage overhead transmission lines pass through the western and central areas of the site. The south-eastern extent of the site includes part of the exiting Culham substation and an area of land adjoining the substation comprising bramble scrub and neutral grassland.

1.10 Images of the existing site are shown in Figure 1.3 and Figure 1.4.

Figure 1.3 **View from Footpath 183/1/60 Looking North towards the Site**

Figure 1.4 **View from the Oxford Green Belt Way Looking North-East towards the Site**

THE LEGISLATIVE REQUIREMENTS FOR AN EIA

1.11 EIA is a process carried out which examines available environmental information to ensure that the likely significant environmental effects of certain projects are identified and assessed before a decision is taken on whether a project is granted planning permission. This means environmental issues can be identified at an early stage and projects can then be designed to avoid or to minimise significant environmental effects, and appropriate mitigation and monitoring can be put in place.

1.12 Applications for development that are covered by the EIA Regulations are termed 'EIA Applications'.

1.13 The requirement for an EIA is based on the likelihood of significant environmental effects arising from a proposed development; and it is either mandatory or conditional depending on the classification of the development project. EIA applications are divided into Schedule 1 and Schedule 2 applications under the EIA Regulations.

1.14 Schedule 1 developments constitute those that are likely to have significant effects on the environment, such as major chemical or petrochemical projects and construction of ground or air transport infrastructure, and for which EIA is mandatory. For all other developments which fall under Schedule 2, the need for an EIA is determined based on set criteria as follows:

- It is within one of the classes of development stated in Schedule 2; AND
- EITHER it exceeds the applicable threshold criteria for that class of development in Schedule 2; OR it is to be carried out in part or all of a sensitive area; AND
- It is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

1.15 The Proposed Development does not fall under any of the project descriptions within Schedule 1, and therefore it is not a 'Schedule 1 Development' that would automatically require an EIA.

1.16 The Proposed Development does fall within the definition under paragraph 3(a) (Energy industry – Industrial installations for the production of electricity, steam and hot water), as listed in Column 1 of Schedule 2. For this type of development to be 'Schedule 2 Development', consideration must be given to whether the site is either:

- (a) located in a 'sensitive area' (as defined under Regulation 22), or
- (b) one where the relevant screening thresholds and criteria for paragraph 3(a) categories of development are met or exceeded, which in this case are that the area of the development exceeds 0.5 hectares.

1.17 Based on the above, the Proposed Development exceeds the applicable threshold for site area. When considering the scale and nature of the development proposed and the surrounding area (potentially sensitive receptors in the vicinity of the site), with due consideration of Schedule 3 of the EIA Regulations, it is considered that there is the potential for significant environmental effects to arise. As such, the Proposed Development is considered to constitute Schedule 2 Development under the EIA Regulations.

1.18 On this basis, the Applicant has undertaken an EIA and prepared an ES (this document) to support the planning application for the Proposed Development.

Location of Information within the ES

1.19 Regulation 18(3) of the EIA Regulations specifies the information that is reasonably required to assess the environmental effects of the development and which an applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile.

1.20 Regulation 18(3) of the EIA Regulations provides that *"an environmental statement is a statement which includes at least -*

(a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;

(b) a description of the likely significant effects of the proposed development on the environment;

(c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;

(e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and

(f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected."

1.21 The information required by Schedule 4 of the EIA Regulations and its location within this ES is presented in **ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 1.**

EIA GUIDANCE AND PLANNING POLICY CONTEXT

1.22 The EIA has been prepared in accordance with applicable legislation, guidance, and case law for the preparation of such documents. Specifically, this ES has been undertaken in accordance with the Institute of Environmental Management and Assessment (IEMA) Quality Mark indicator checklist and with due consideration to the following:

- At a European level, considerations have been made to the European Commission's (EC) various EIA guidance documents available here: *http://ec.europa.eu/environment/eia/eia-support.htm;*
- At a domestic level, considerations have been made to the Ministry of Housing for Communities and Local Government's overarching Planning Practice Guidance[3];
- In addition, the Highways England 'Design Manual for Roads and Bridges 'Sustainability and Environment"[4]' has been considered as applicable;
- In relation to publications from professional bodies, considerations have been made to the IEMA publications as these include best practice/suggested improvements to the EIA process. This includes:
  - IEMA ES Review Criteria (COM3-6)[5];
  - IEMA 'Guidelines for Environmental Impact Assessment' (2004)[6];
  - IEMA 'Special Report into the State Environmental Impact Assessment Practice in the UK' (2011)[7];
  - IEMA 'Shaping Quality Development' (2015)[8];
  - IEMA 'Delivering Quality Development' (2016)[9];
  - IEMA 'Delivering Proportionate EIA' (2017)[10];
  - IEMA 'Materials and Waste in EIA' (2020)[11];
  - IEMA 'Major Accidents and Disasters in EIA: A Primer' (2020)[12];
  - IEMA 'Principles of Cultural Heritage Impact Assessment in the UK' (2021)[13];
  - IEMA 'Climate Change Resilience and Adaption' (2020)[14];
  - IEMA 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (2022)[15];
  - IEMA 'A New Perspective on Land and Soil in Environmental Impact Assessment' (2022)[16];
  - IEMA 'Determining Significance for Human Health in Environmental Impact Assessment' (2022)[17];
  - IEMA 'Effective Non-Technical Summaries for Environmental Impact Assessment' (2023)[18]; and
  - IEMA 'IA Outlook Journal Volume 15: Public Participation, Stakeholder Engagement and Impact Assessment' (2023).

1.23 Whilst primarily written for major infrastructure projects, reference is also made to guidance/advice notes published by the Planning Inspectorate in relation to National Infrastructure Planning[19] where appropriate, as these can include relevant/helpful information.

Relevant Planning History

1.24 The area of the site proposed for the battery storage facility has minimal planning history. A request for an EIA Scoping Opinion (Ref. P17/S3719/SCO) regarding a proposed residential led mixed use development at the

[3] *http://www.gove.uk/guidance/environmental-impact-assessment*
[4] *Highways England, 2020. Design Manual for Roads and Bridges 'Sustainability and Environment' – LA104 Environmental assessment and monitoring.*
[5] *Institute of Environmental Management and Assessment, undated; EIA Quality Mark – ES Review Criteria COM 3-6.*
[6] *Institute of Environmental Management and Assessment, 2004, Guidelines for Environmental Impact Assessment.*
[7] *Institute of Environmental Management and Assessment, 2011. The State of Environmental Impact Assessment Practice in the UK.*
[8] *Institute of Environmental Management and Assessment, November 2015. Shaping Quality Development.*
[9] *Institute of Environmental Management and Assessment, 2016; Delivering Quality Development.*
[10] *Institute of Environmental Management and Assessment, 2017; Delivering Proportionate EIA.*
[11] *Institute of Environmental Management and Assessment, 2020; Materials and Waste in EIA.*
[12] *IEMA, 2020, Major Accidents and Disasters Guidelines*
[13] *IEMA, 2021. Institute of Environmental Management and Assessment (IEMA) Guide to: Principles of Cultural Heritage Impact Assessment in the UK*
[14] *Institute of Environmental Management and Assessment, 2020; Climate Change Resilience and Adaption'*
[15] *IEMA, 2022. Institute of Environmental Management and Assessment (IEMA) Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2nd Edition*
[16] *IEMA, 2022. Institute of Environmental Management and Assessment (IEMA) Guide to: A New Perspective on Land and Soil in Environmental Impact Assessment*
[17] *IEMA, 2022. Institute of Environmental Management and Assessment (IEMA) Guide to: Determining Significance for Human Health in Environmental Assessment*
[18] *IEMA. 2023. 'Effective Non-Technical Summaries for Environmental Impact Assessment'. Available at: IEMA - Effective Non-Technical Summaries for Environmental Impact Assessment.*
[19] *https://infrastructure.planninginspectorate.gov.uk/*

site, including land to the east and west of the site, was submitted in 2017, however no formal application was submitted at the site relating to this development.

1.25 A number of planning applications have been submitted in relation to land at the Culham substation area and along Thame Lane which fall within the planning application red line boundary. This includes a proposed energy storage facility within and to the south-east of the site (Ref. P16/S2368/FUL) for which planning permission was granted in 2016, although the scheme was not implemented.

Planning Policy

National Planning Policy and Guidance

1.26 The ES has regard to the National Planning Policy Framework (NPPF) 2023[20]. The NPPF sets out the Government's economic, environmental and social planning policies for England. The policies contained within the NPPF articulate the Government's vision of sustainable development, which are intended to be interpreted at a local level, to meet the requirements of local aspirations.

1.27 As relevant to the EIA, specifically to the scope, methodology and assessment of effects for the EIA technical topics, the NPPF has been considered throughout undertaking of the EIA and preparation of the ES.

1.28 The EIA also refers to the National Planning Practice Guidance (PPG)[21], which is an online resource. The PPG aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date.

Local Planning Policy and Guidance

1.29 As relevant to the EIA technical topic scope, methodology or assessment of effects, the ES has regard to the following key planning documents. Any additional planning policy and guidance documents considered relevant to the technical assessments will also be considered:

- The South Oxfordshire Local Plan[22] (adopted December 2020) indicates that the whole of the site lies within the Oxfordshire Green Belt (Policy STRAT6) and part of the site lies within Nuneham Courtenay Grade 1 Registered Park and Garden (covered by Policy ENV10). The site lies adjacent to the Nuneham Courtenay Conservation Area (ENV8). The Culham Science Centre lies immediately to the south-east of the site (STRAT8 – Culham Science Centre), with the proposed extension to the substation partially within this STRAT8 site, and an urban expansion area lies immediately to the to the west of the site (STRAT 9 – Strategic Allocation). The STRAT9 – Strategic Allocation is for 217ha to be developed to deliver approximately 3,500 new homes, with approximately 2,100 homes within the plan period, a net increase of at least 7.3ha of employment land in combination with the adjacent Science Centre and supporting services and facilities. Relevant policies of the South Oxfordshire Local Plan include:
  - Policy ENV1 – Landscape and Countryside;
  - Policy ENV2 – Biodiversity – Designated Sites, Priority Habitats and Species;
  - Policy ENV3 – Biodiversity;
  - Policy ENV4 – Watercourses;
  - Policy ENV5 – Green Infrastructure in New Developments;
  - Policy ENV6 – Historic Environment;
  - Policy ENV7 – Listed Buildings;
  - Policy ENV8 – Conservation Areas;
  - Policy ENV9 – Archaeology and Scheduled Monuments;
  - Policy ENV10 – Registered Parks and Gardens and Historic Landscapes;
  - Policy ENV11 – Pollution – Impact from Existing and/or Previous Land Uses on New Development (Potential Receptors of Pollution);
  - Policy ENV12 – Pollution – Impact of Development on Human Health, the Natural Environment and/or Local Amenity (Sources);
  - Policy DES1 – Delivering High Quality Development);
  - Policy DES2 – Enhancing Local Character;
  - Policy DES3 – Design and Access Statements Policy DES4 - Masterplans for Major Development;
  - Policy DES7 – Efficient Use of Resources;
  - Policy DES8 – Promoting Sustainable Design;
  - Policy DES9 – Renewable and Low Carbon Energy;
  - Policy DES10 – Carbon Reduction;
  - Policy STRAT1 – Overall Strategy;
  - Policy STRAT4 – Strategic Development;
  - Policy STRAT6 – (Green Belt) and Policy STRAT1 (Overall Strategy);
  - Policy STRAT8 – Culham Science Centre;
  - Policy STRAT9 – Land Adjacent to Culham Science Centre;
  - Policy INF1 – Infrastructure Provision;
  - Policy INF2 – Electronic Communications;
  - Policy INF4 – Water Resources;
  - Policy TRANS2 – Promoting Sustainable Transport and Accessibility;
  - Policy TRANS3 – Safeguarding of Land for Strategic Transport Schemes;
  - Policy TRANS4 – Transport Assessments, Transport Statements and Travel Plans;
  - Policy TRANS5 – Consideration of Development Proposals;
  - Policy EP1 – Air Quality;
  - Policy EP2 – Hazardous Substances; and
  - Policy EP3 – Waste Collection and Recycling.
- The Culham Neighbourhood Plan[23] (adopted June 2023) represents the views of the local community with regard to the future of Culham up to 2041. It has been designed to operate within the adopted South Oxfordshire Local Plan in the Culham Neighbourhood Plan area.
- The Joint Local Plan (2041) – South Oxfordshire and Vale of White Horse District Councils are working together to prepare a new Joint Local Plan 2041. Once adopted, the Joint Local Plan 2041 will replace the adopted South Oxfordshire Local Plan 2035. The document is at an early stage of preparation, with a 'Preferred Options' Consultation held between 10 January and 26 February 2024, adoption of the Joint Local Plan is anticipated for September 2025.

1.30 Where relevant to the EIA technical topic scope, methodology or assessment of effects, the technical ES chapters will also present a summary of any pertinent recognised industry guidance documents as relevant.

EIA SCOPING AND CONSULTATION

Consultation

1.31 Consultation is an ongoing process and has been fed back into the design of the Proposed Development. **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development** of this ES provides a review of the pre-application consultation undertaken in respect of design evolution of the Proposed Development, specifically in relation to environmental considerations.

[20] *DLUHC, (2023); 'National Planning Policy Framework, December 2023'*
[21] *Gov.uk (2024). Planning Practice Guidance. https://www.gov.uk/government/collections/planning-practice-guidance*
[22] *South Oxfordshire District Council. (2020). The South Oxfordshire Local Plan 2035. Available at: https://www.southoxon.gov.uk/south-oxfordshire-district-council/planning-and-development/local-plan-and-planning-policies/local-plan-2035/adopted-local-plan-2035/*
[23] *South Oxfordshire District Council. (2023). Culham Neighbourhood Plan. Available at: https://www.southoxon.gov.uk/south-oxfordshire-district-council/planning-and-development/local-plan-and-planning-policies/neighbourhood-plans/emerging-neighbourhood-plans/culham/*

EIA Scoping

1.32 EIA Scoping forms one of the first stages of the EIA process and it is through EIA scoping that the Local Planning Authority (in this case, the SODC) and other key statutory and non-statutory consultees are consulted on those environmental topics that should be included in the scope of the EIA.

1.33 The process of EIA scoping and consultation is important to the development of a comprehensive and balanced ES. Views of consultees have helped to identify specific issues that require further investigation as part of the EIA process.

1.34 The main purpose of the EIA scoping process is to establish the approach to the EIA. This includes:

- Identification of the availability of existing baseline data and appropriate baseline surveys to be undertaken;
- Identification of sensitive receptors;
- Identification of potential environmental considerations and potential environmental effects;
- Identification of the topics to be included within the scope of the EIA and the methodology for assessment;
- Identification of any topics that can be scoped out of the EIA, with justification provided as to why likely significant environmental effects are not anticipated;
- Definition of the methodology for the assessment of the likely significant environmental effects; and
- Identification of other development schemes to be considered within a cumulative effects assessment.

1.35 The EIA Scoping Report was submitted to the SODC on 16th December 2022 to request an EIA Scoping Opinion from the SODC and statutory consultees in line with Regulation 18(4) of the EIA Regulations.

1.36 A Scoping Opinion from the SODC, including responses from key consultees, was received on the 30th January 2023. The EIA Scoping Report is presented in **ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 4**. The SODC EIA Scoping Opinion is presented in **ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 5**. This ES is based on that Scoping Opinion.

1.37 Furthermore, consultation has also been undertaken with the following stakeholders outside of the ES Scoping process to discuss and agree assessment methodologies, and is included, where relevant, within **ES Volume 1** and **ES Volume 2**:

- SODC Landscape Officer;
- Oxford County Council (OCC) Archaeologist; and
- CEG (the promoter of a potential future housing development at the STRAT 9 – Strategic Allocation site).

'Scoped-In' Disciplines

1.38 The potentially significant environmental issues that were identified during the EIA Scoping process and that have been addressed within this EIA are listed below:

- Cultural Heritage;
- Land Take and Soils;
- Climate Change; and
- Landscape and Visual.

'Scoped-Out' Disciplines

1.39 A number of technical topics / disciplines were identified during the EIA scoping process that have been scoped out of (i.e., excluded from) the EIA on the basis that significant environmental effects are not considered likely. The scoped out technical topics comprise:

- Water Resources, Drainage and Flood Risk;
- Ecology and Biodiversity;
- Geoenvironmental Conditions (Land Contamination, Ground Conditions and Groundwater);
- Traffic and Transport;
- Noise and Vibration;
- Air Quality;
- Waste and Materials;
- Project Vulnerability; and
- Socio-economics and Health.

1.40 Detailed justification for scoping out these topics, can be found in **ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 4**.

1.41 EIA scoping is a consultative and iterative process and as such, a number of EIA scoping points were discussed between the Applicant's EIA team and SODC during the EIA scoping process. Where clarifications required additions or variations to the assessment scope set out within the Scoping Report, these have been addressed where relevant as part of the ES. The introduction of each of the technical chapters included within this ES provides an overview of relevant consultation correspondence undertaken as part of the EIA, as well as context (if needed) for points raised during the EIA scoping process.

Response to the EIA Scoping Opinion and Consultation

Cumulative Schemes

1.42 In response to paragraph 6.15 of the EIA Scoping Opinion (**ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 5**), this ES considers the cumulative scheme at '*Land in the North East Corner of, Culham Science Centre, near Clifton Hampden'* (Reference: P22/S1410/FUL) as relevant within the technical assessments, as set out within the '*Cumulative Effects'* section of this ES chapter.

Geoenvironmental Conditions (Land Contamination, Ground Conditions and Groundwater)

1.43 Paragraph 9.4 of the EIA Scoping Opinion (**ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 5**) notes that the 'Geoenvironmental Conditions (Land Contamination, Ground Conditions and Groundwater)' topic should be scoped into the ES, however this contradicts Paragraph 6.3 / Paragraph 6.4 / Paragraph 7.6 of the EIA Scoping Opinion which agrees with the list of proposed scoped in/out topics set out within the EIA Scoping Report.

1.44 Paragraph 8.3 (within the Geoenvironmental Conditions (Land Contamination, Ground Conditions and Groundwater) section) of the EIA Scoping Opinion notes that "*The effect on that* site [the Culham JET site] *should be included in the EIA for the proposed application*". It is considered unlikely that significant adverse effects will be generated as a result of the Proposed Development upon the Culham JET site given its distance from the site and lack of potential pathways/mechanisms for impact, and therefore this receptor is not considered within this ES, however it is considered as relevant within the Transport Assessment and Construction Traffic Management Plan (CTMP) which have been prepared and submitted in support of the planning application.

1.45 Overall, it is considered unlikely that significant environmental effects will arise as a result of the Proposed Development with regards to Geoenvironmental Conditions (Land Contamination, Ground Conditions and Groundwater), and as such this topic remains scoped out of the ES, as per the EIA Scoping Report (page 14, **ES Volume 3, Appendix: Introduction and EIA Methodology – Annex 4**) and Paragraph 6.3 / Paragraph 6.4 of the EIA Scoping Opinion.

Fire Risk

1.46 Although not raised in the EIA Scoping Opinion, it is understood through pre-application discussions between the Applicant and SODC.

1.47 It should be noted that a Fire Liaison Framework (FLF) has been prepared and is submitted in support of the planning application. This report sets out the principles which underpin the FLF, as well as the long-term approach with regards to fire and rescue liaison throughout the planning, commissioning and operational delivery phases of the BESS scheme. Consultation will be undertaken with the local fire service and stakeholders throughout these phases as appropriate, as set out within the FLF.

1.48 **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development** provides a summary of the fire safety related mitigation that has been embedded within the Proposed Development design. This includes design measures based upon guidance from the National Fire Chiefs Council (NFCC)[24] and design requirements as per National Fire Protection Association (NFPA) standards, such as NFPA 855 which specifies the spacing of containers (standard for the installation of stationary energy storage systems), and the testing of the batteries to be employed for the Proposed Development using the UL 9540A (Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems).

1.49 Furthermore, the Applicant wishes to strengthen the strategic support in relation to liaising with third party organisations, particularly Local Fire and Rescue Services, to assist in achieving a safer, more standardised, effective, efficient approach to the planning, building, commissioning, and operational delivery associated with their BESS schemes.

1.50 On this basis, it is considered that fire risk is appropriately managed in accordance with the relevant NFPA standards and that the FLF that has been prepared and submitted in support of the planning application sets out the risk review and management process that the Applicant has been through to date, along with the principles and consultation requirements throughout the lifetime of the Proposed Development. Collectively, the embedded mitigation as set out in **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development** and FLF reduce the likelihood of significant effects associated with fire such that they are not considered likely. No further consideration has been given to fire risk as part of the EIA process.

ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

General Assessment Methodology

1.51 Detailed methodologies for the assessment of each of the environmental topic areas scoped into the EIA are provided within each technical chapter of **ES Volume 1, Chapters 3** to **5**, however, in general terms, the assessments have been based upon:

- Desk-top studies;
- Site surveys;
- Consideration of relevant legislation;
- Consideration of relevant planning policies (national, regional and local);
- Consideration of potentially sensitive receptors that could be affected by the Proposed Development;
- Identification of likely environmental impacts, with an evaluation of their likely magnitude, and resultant effects in terms of their nature, scale, geographic extent, duration and whether they are direct or indirect or transboundary;
- Consideration of the requirement for any specific mitigation;
- Expert opinion;
- The use of technical guidance and best practice; and
- Specific consultations with appropriate organisations.

1.52 How the Proposed Development might affect the environment relies on predictions about what impact a certain action will have. Some predictions can be made using mathematical calculations (i.e., quantitative assessment). Other impacts are less easy to predict in quantitative terms, and in such cases, the EIA attempts to quantify the anticipated scale of impact using professional judgement (i.e., qualitative assessment).

1.53 As part of the EIA, an iterative approach has been adopted where significant environmental effects have been identified and avoided where possible in the first instance through consideration of alternative development parameters, as reported upon within **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**. Where able, opportunities to reduce or control impacts and effects have been identified and incorporated into the Proposed Development (i.e., primary mitigation[25]). In addition, the design process seeks to promote opportunities to enhance the beneficial environmental effects of the Proposed Development.

1.54 In accordance with the EIA Regulations[26], the method behind the EIA process generally considers the existing conditions of the area into which the development is being introduced (the ***baseline***) and makes reasonable predictions of the likely change (the ***impact*** – in terms of magnitude) that may occur, during its construction, when the development is completed and operating as proposed, and following decommissioning. The predicted impact is considered in terms of key environmental aspects (***receptors***) found within the surrounding area, and based on their sensitivity to change, the scale of the resulting change experienced by the receptor / resource (the ***effect***) is then determined along with a statement on whether the effect is significant or not.

1.55 Mitigation is the term used to refer to the process of avoiding where possible and, if not, minimising, controlling and/or off-setting potentially significant adverse effects of a development. Mitigation measures can relate to the design stage; the construction stage; or the activities associated with the operation of the Proposed Development.

1.56 Following the initial impact assessment, any mitigation measures required to reduce or eliminate adverse effects are then considered and assessed, with the resulting residual effect scale being determined as significant or not. Effects resulting from a combination of the Proposed Development and other surrounding schemes (***cumulative schemes***) are also assessed. All the likely effects of the development are reported (within an ***environmental statement*** – this document (ES Volume 1) in addition to ES Volumes 2 and 3 and the Non-Technical Summary) and the likely significant effects are specifically highlighted. Further detail on how the assessment methodology is applied to each topic is presented within the respective technical chapters of this **ES Volume 1**.

Potentially Sensitive Receptors

1.57 When undertaking an EIA, it is important to identify potential receptors which may be impacted by the Proposed Development and may need to be considered as part of the assessment.

1.58 Within each of the technical ES chapters (**ES Volume 1**, **Chapters 3** to **5** and **ES Volume 2**), a list of sensitive receptors is presented which are considered to have the potential to be affected by the Proposed Development.

1.59 The sensitive receptors identified within the technical ES chapters have been identified from a review of the available information collected as part of the description of the surrounding environmental context for each technical assessment, from historic and currently available information relating to the site itself and through EIA Scoping consultation. Potentially sensitive receptors have also been identified from a review of the description of the Proposed Development (**ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**) sought for approval and the potential impacts and resultant effects which may occur as a result of the Proposed Development.

Baseline Conditions

1.60 The purpose of the EIA is to predict how environmental conditions may change as a result of the Proposed Development. The assessment of the nature and scale of a predicted change is undertaken against a reference condition, known as the baseline. In most cases, the baseline represents the environmental condition of the site and the surrounding area at the time of the assessment.

1.61 Baseline assessments utilise any existing and available information, as well as new information either collected through baseline surveys undertaken during the course of the EIA process or additional information provided as part of the EIA Scoping and the consultation process. This information has been used to present within the

[24] *NFCC (2022) Grid Scale Battery Energy Storage System planning – Guidance for FRS*
[25] *IEMA July 2016, Environmental Impact Assessment Guide to: Developing Quality Development) https://www.iema.net/assets/newbuild/documents/Delivering%20Quality%20Development.pdf.*

[26] *The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018. The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2020.*

ES (within the individual technical chapters (**ES Volume 1, Chapters 3** to **5**, and **ES Volume 2**)) an up-to-date description of the current baseline conditions of the site and surrounding area.

Evolution of the Baseline

1.62 In accordance with the requirements of the EIA Regulations, consideration as to how the existing baseline conditions may evolve in the future in the absence of the Proposed Development. The EIA Regulations state (Schedule 4(3)):

"A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."

1.63 This requirement is presented within each of the individual technical ES chapters (**ES Volume 1, Chapters 3** to **5**, and **ES Volume 2**) under the heading '*Evolution of the Baseline Conditions'*. The evolved baseline is a baseline condition at an indeterminate point in the future, for a scenario which assumes cumulative schemes are built in the surrounding environment and that the surrounding environment, including the site, has naturally evolved in the absence of the Proposed Development being implemented. In most cases this is a qualitative approach (professional opinion), but in some instances may be quantitative.

1.64 The approach taken to providing an outline of the evolution of the baseline is described within each of the individual technical ES chapters (**ES Volume 1, Chapters 3** to **5,** and **ES Volume 2**).

Identification of Impacts, Effects and Effect Significance

Terminology and Definitions

Reference to 'Impact' and 'Effect'

1.65 It is noted that the terms 'impact' and 'effect' are distinctly different. Having gained an understanding of the likely impact it is then important to know whether the change in environmental or socio-economic conditions results in a significant environmental effect. The impacts of the Proposed Development may or may not result in significant effects on the environment, depending on the sensitivity of the resource or receptor and potentially other factors (such as duration). The assessment of the likely significant effects of the development is a requirement identified by Schedule 4 of the EIA Regulations.

Receptor Sensitivity and Magnitude of Impact

1.66 To achieve a consistent approach across the different technical disciplines addressed within the **ES Volume 1** and **ES Volume 2**, assessments have broadly defined the sensitivity of the receptors that could be affected by the Proposed Development and the magnitude of impact or change from the baseline conditions in order to derive the resultant effect. Technical specialists have used their own approach or amended the approach stated below based on what is appropriate for their assessments. The approach to assessment is clearly presented within each technical chapter (**ES Volume 1, Chapters 3** to **5** and **ES Volume 2**).

1.67 Terminology to describe the sensitivity of receptors and magnitude of impact or change from the baseline conditions is broadly as follows:

- High;
- Medium;
- Low; and
- Negligible.

1.68 Where there is no impact/change, no assessment will be required due to there being no potential for significant effects.

1.69 Each of the technical assessment chapters of the **ES Volume 1** and **ES Volume 2** provide further detail on the definition of each of the above terms specific to the topic in question and also provide the criteria, including sources and justifications, for quantifying the different levels of receptor sensitivity and 'impact magnitude'. Where possible, this is based upon quantitative and accepted criteria, together with the use of value judgement and expert interpretation.

1.70 Some technical ES chapters may differ in the terminology adopted to describe the magnitude of impact or change from the baseline conditions. Where this occurs, the alternative terminology adopted has been clearly set out within the individual ES chapter.

Likely Significant Effects

Identification of a Resultant Effect

1.71 The basis for determining the resultant effect generally takes into account the sensitivity of the receptor and magnitude of impact or change from the baseline conditions. A generic matrix that combines the sensitivity of the receptor and the magnitude of impact to identify the resultant effect is provided within Table 1.1 – where this differs for a technical topic, this has been clearly stated in the topic's assessment methodology (**ES Volume 1, Chapters 3** to **5** and **ES Volume 2**).

Table 1.1 Resultant Effects

Receptor Sensitivity	Magnitude of Impact			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor/Negligible*	Negligible
Negligible	Minor	Negligible	Negligible	Negligible
*To be determined using professional judgement				

Identification of Scale of Effect

1.72 The scale of the predicted effect has then been classified according to the following scale. The definitions of the scale used follow either that set out below, or, as specified within the individual technical ES chapters to suit the technical topic in question:

- **Negligible** - Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision-making, irrespective of other effects;
- **Minor** - These effects may be raised as local issues and may be of relevance in the detailed design of the project, but are unlikely to be critical in the decision-making process;
- **Moderate** - These effects, if adverse, are likely to be important at a local scale and on their own could have a material influence on decision-making; and
- **Major** - These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.

Effect Nature

1.73 The definitions of the 'nature' of the resultant minor, moderate or major effect[27], i.e., definitions of Adverse, Beneficial and Neutral[28] which are used throughout the ES, are provided below:

[27] *As negligible effects are defined as being imperceptible, the nature of the effect is not relevant. However, where a technical author considers that applying a nature to a negligible / imperceptible effect would benefit the assessment, this has been done in the relevant technical chapters.*

[28] *Note, 'neutral' effects are relevant to the landscape and visual impact assessment, as presented in **ES Volume 2**.*

- **Adverse** – Detrimental or negative effects to an environmental resource or receptor. The quality of the environment is diminished or harmed;
- **Beneficial** – Advantageous or positive effect to an environmental resource or receptor. The quality of the environment is enhanced; and
- **Neutral** - Where the quality of the environment is preserved or sustained or where there is an equal balance of benefit and harm.

Geographic Extent of Effect

1.74 The ES (**Volume 1** and **Volume 2**) identifies the geographic extent of the identified effects. Generally, at a spatial level, 'site' or 'local' effects are those affecting the site and neighbouring receptors, while effects upon receptors in the SODC beyond the vicinity of the site and its neighbours are at a 'district' level. Effects affecting Oxfordshire are considered to be at a 'regional' level, whilst those which affect different parts of the country, or England as a whole, are considered being at a 'national' level.

Effect Duration

1.75 For the purposes of the ES, effects that are generated as a result of the enabling and construction works will be classed as 'temporary'; these maybe further classified as either 'short term', 'medium-term', or 'long-term' effects as applicable to each technical assessment, for example depending on the duration of the enabling and construction works or the effect generated in question.

1.76 Effects that result from the battery storage element of the completed and operational Proposed Development will also be classed as 'temporary' effects given that the battery storage infrastructure will not be in place permanently (i.e., as set out **in ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**, the development will be decommissioned after 40 years of operation). Given that the substation extension and connection tower will be permanent features of the Proposed Development and not decommissioned, effects specifically arising as a result of these elements (for example, any impact to views directly resulting from these scheme elements) are considered 'permanent'. Similarly, the proposed landscaping and biodiversity enhancements will be permanent features of the landscape and not removed following the operational phase of the Proposed Development. Effects that result from the decommissioning activities of the Proposed Development (i.e. the actual removal works) will be temporary, with the effects associated with the decommissioned Proposed Development classed as 'permanent' effects.

Direct and Indirect Effects

1.77 The ES identifies whether the effect is 'direct' (i.e., resulting without any intervening factors) or 'indirect' or 'secondary' (i.e., not directly caused or resulting from something else).

Effect Significance

1.78 Following identification of a residual effect, the effect scale, nature, geographic extent and duration and whether the effects are direct or indirect, using the above summarised terminology, a clear statement is then made within the ES (**Volume 1** and **Volume 2**) as to whether the effect is significant or not significant. Each technical assessment determines at what scale an effect is deemed to be significant, as this varies depending on the topic.

1.79 As a general rule, the following applies:

- 'Moderate' or 'major' effects could be deemed to be 'significant';
- 'Minor' effects are 'not significant', although they may be a matter of local concern; and
- 'Negligible' effects are 'not significant' and not a matter of local concern.

1.80 Where this differs for a particular technical assessment, an explanation is provided within the methodology section of the relevant technical ES chapter.

1.81 Where mitigation measures are identified to either eliminate or reduce likely significant adverse effects, these have been incorporated into the ES, for example either through the design, or will be translated into construction commitments; or operational or managerial standards / procedures. It should be noted that mitigation is not required for effects that are deemed to be negligible as the effect will be imperceptible.

1.82 The ES then highlights the 'residual' effects (those effects which remain following the implementation of suitable mitigation measures) and classifies these in accordance with the terminology defined above.

Impact Assessment – General Methodology

1.83 Impact assessments are undertaken for the following stages of the Proposed Development:

- During enabling and construction works;
- Once the Proposed Development is complete and operational; and
- Following the decommissioning of the Proposed Development.

Enabling and Construction Effects

1.84 **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**, provides an outline of the anticipated enabling works and construction programme and related activities.

1.85 This information informs the enabling works and construction impact assessments of each technical chapter of the ES. Throughout the construction impact assessments, the assumption has been made that the standard environmental controls required under legislation and best practice guidance are met as a matter of course (i.e., have been assumed to be embedded mitigation) and any controls are clearly presented within the respective technical ES chapter with an explanation provided as to how they are accounted for within the corresponding assessment. The controls are then presented within **ES Volume 1, Chapter 7: Environmental Management, Mitigation and Monitoring**.

1.86 The assessment of the potential likely significant effects arising during the enabling and construction works is addressed within each of the individual technical assessment chapters of the ES. The enabling works and construction assessments presented within the technical chapters of the ES identify the need for any additional or bespoke environmental management or mitigation measures in order avoid, prevent, reduce or off-set any significant adverse effects identified.

1.87 Where relevant and required, a description of any proposed monitoring arrangements has also been presented and defines (where appropriate) the procedures regarding the monitoring of any relevant significant adverse effects; the types of parameters to be monitored and the monitoring duration.

1.88 All the measures proposed within the technical ES chapters have been compiled and presented in a mitigation and monitoring schedule for ease of reference in **ES Volume 1, Chapter 7: Environmental Management, Mitigation and Monitoring**.

1.89 The required enabling and construction related environmental management / mitigation and monitoring measures identified within the ES would be secured and controlled through an appropriate Construction Environmental Management Plan ('CEMP') (or equivalent) and it is proposed that the requirement for this document be secured by means of suitably worded planning conditions attached to the permission or (where appropriate) via a planning obligation. Key mitigation and management controls that would later form part of a CEMP are presented in **ES Volume 1, Chapter 7: Environmental Management, Mitigation and Monitoring**.

Completed and Operational Effects

1.90 The ES presents a description of the Proposed Development in **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development** in order to provide suitable context to enable the assessment of potential and likely significant environmental effects. Enough information on the Proposed Development, in terms of the key physical and operational aspects, has been presented to allow an understanding of the development being proposed, to enable the assessment of potential and likely significant environmental effects of the completed and operational development in each of the technical ES chapters. Any assumptions made are clearly presented in the narrative.

Decommissioning Effects

1.91 The assessment of potential and likely significant environmental effects following the decommissioning of the Proposed Development assumes that following the 40-year operational period of the Proposed Development

(as set out in **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**), the development is then dismantled and the land returned to its original state for agricultural purposes. The decommissioning phase assessment is presented as relevant in each of the technical ES chapters, with any assumptions made clearly presented in the narrative.

Cumulative Effects and Effect Interactions

1.92 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration should also be given to the likely significant effects arising from the "*cumulation with other existing and/or approved projects*" (Schedule 4, 5(e)). There are no legislative or policy requirements which set out how a cumulative impact assessment should be undertaken, however consideration has been given to Planning Advice Note 17 Cumulative Effects Assessment[29].

1.93 Cumulative effects can occur as interactions between the effects associated with a number of projects in an area which may, on an individual basis be insignificant, but together (i.e., cumulatively), result in a significant effect. Cumulative effects arising from the Proposed Development in combination with other development schemes ('cumulative schemes') has been considered throughout the ES. The potential for cumulative effects arising during the enabling and construction works, once the Proposed Development is complete and operational, and following decommissioning is considered.

1.94 Two tiers of cumulative schemes are identified and described below and the potential for cumulative effects arising during the enabling and construction works, once the Proposed Development is complete and operational, and following decommissioning are considered. A two-tiered cumulative assessment approach has been taken in order to differentiate between those schemes that are currently within the planning system (i.e., have full planning permission, a resolution to grant permission, or have been submitted (but not yet permitted) where considered appropriate) and those schemes that are not yet submitted for approval, but represent major local schemes at varying stages of the pre-application stage which are considered to have the potential to have significant in-combination effects with the Proposed Development.

1.95 Each individual technical ES chapter presents an assessment of the cumulative effects of the Proposed Development coming forward alongside other surrounding cumulative schemes as relevant within the '*Assessment of the Future Environment'* section.

Cumulative Effects with Other Developments

Tier 1 Cumulative Schemes

1.96 Generally, the 'Tier 1' cumulative schemes that are included within the cumulative effects assessment fall under one (or more) of the following criteria:

- Schemes that will produce an uplift of more than 10,000m^2 (Gross External Area (GEA) of mixed-use floorspace) or provide over 150 residential units, or any office to residential conversions (granted under the General Permitted Development Order) giving rise to more than 150 residential units, whereby they:
  - have full planning permission, a resolution to grant permission; OR
  - have been submitted (but not yet permitted), where considered appropriate;
- Development/change of use adjacent to the site.

1.97 These parameters have been set to allow all the schemes coming forward within the surrounding area of the site to be subject to an initial screening exercise to determine the schemes that, based on the scale of redevelopment (amount and mix of uses), could potentially have a cumulative effect with the Proposed Development and should be considered further within the cumulative effects assessment of the EIA. By applying these parameters, the cumulative effects assessment of the EIA becomes more focused on the larger schemes (i.e., those with the potential to interact in a cumulative manner). Where there are schemes of a smaller scale located within proximity of the site, these are considered where deemed necessary.

1.98 Generally, cumulative schemes considered within the cumulative effects assessment are located within 1km of the site as this represents an appropriate area for the majority of technical topics / disciplines where significant in-combination effects could occur.

1.99 The cumulative schemes have been subject to an initial screening exercise (as part of the EIA Scoping process. In response to the EIA Scoping Opinion (**ES Volume 3, Appendix: Introduction and EIA Methodology - Annex 5**), the Tier 1 scheme '*Land in the North East Corner of, Culham Science Centre, near Clifton Hampden'* (Reference: P22/S1410/FUL), as presented in Table 1.2 and illustrated in 0, has been considered within this ES as a cumulative scheme where relevant.

Tier 2 Cumulative Schemes

1.100 'Tier 2' cumulative schemes are defined (for the purposes of assessment) as relevant major local schemes which have the potential to result in significant in-combination effects when considered alongside the Proposed Development, but are not yet sought for approval.

1.101 As noted in the '*Planning Policy'* section of this ES chapter, an urban expansion area lies immediately to the west of the site (STRAT 9 of the South Oxfordshire Local Plan). The STRAT9 - Strategic Allocation is for 217ha to be developed to deliver approximately 3,500 new homes. Furthermore, the STRAT8 strategic allocation located to the south of the site aims to deliver a net increase in employment of 7.3ha.

1.102 As a formal planning application (or applications) for development in relation to the STRAT9 – Strategic Allocation has not yet been submitted, it is not possible to undertake a quantitative cumulative impact assessment of the Proposed Development in combination with any future development within this area (for example in relation to the potential visual cumulative impact) as part of this EIA. With regards to the STRAT8 strategic allocation, existing cumulative schemes of relevance to this EIA comprise the planning applications submitted for the Fusion Demonstration Plant (see Tier 1 scheme, Ref: 1 – P22/S1410/FUL) and Energy Storage Facility (see Tier 1 scheme, Ref: 3 – P16/S2368/FUL), which are considered separately. As such, this ES considers the STRAT9 and STRAT8 strategic allocations as Tier 2 cumulative schemes (as presented in Table 1.2 and shown in Figure 1.5) and where relevant includes qualitative consideration of the strategic allocations to assess the potential for any likely significant future cumulative effects, although noting that this will be subject to future design and permissions sought within the respective strategic allocation areas.

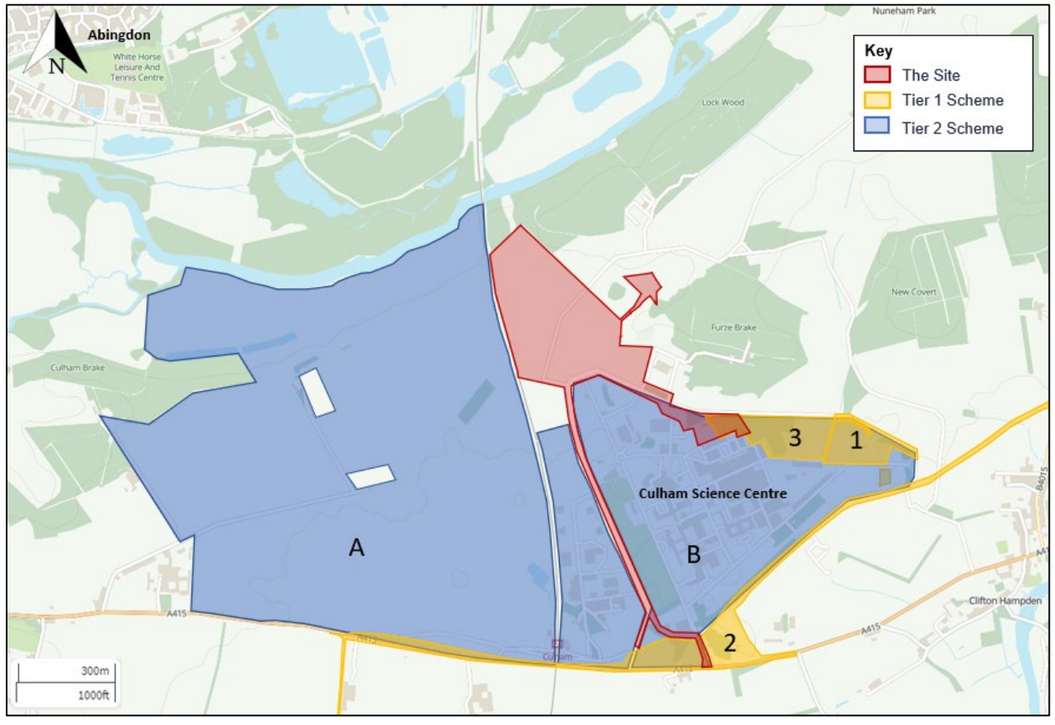
Table 1.2 Cumulative Schemes

Ref	Name / Address	Planning Application Reference	Scheme Description	Status
Tier 1 Scheme				
1	Land in the North East Corner of Culham Science Centre near Clifton Hampden OX14 3DB	P22/S1410/FUL	Erection of a Fusion Demonstration Plant with ancillary office space, parking, landscaping and associated infrastructure, including plant and machinery.	Planning permission granted 28th March 2023
2	Various sites across South and Vale From Clifton Hampden to Milton Exchange Via Appleford	P23/S2955/CM	The dualling of the A4130 carriageway, construction of the Didcot Science Bridge, road bridge over the Appleford railway sidings and road bridge over the River Thames and associated works between the A34 Milton Interchange and the B4015 north of Clifton Hampden, Oxfordshire..	No decision issued
3	UK A E A Culham Science Centre near Clifton Hampden OX14 3DB	P16/S2368/FUL	Development of an Energy Storage Facility (Sui Generis) comprising: a battery building to house plant, an administrative building, security fencing and landscaping; the excavation of land for the installation of a 250MW High Voltage Transformer; extension to existing electricity substation to provide additional plant equipment and building; and the provision of underground cabling between the battery building, transformer and the substation extension.	Planning permission granted 15th November 2016 – scheme not implemented.

[29] *The Planning Inspectorate: Planning Advice Note 17 'Cumulative Effects Assessment'(August 2019)*

Ref	Name / Address	Planning Application Reference	Scheme Description	Status
Tier 2 Scheme				
A	STRAT9 – Strategic Allocation (South Oxfordshire Local Plan) – Land Adjacent to Culham Science Centre	-	Approximately 3,500 new homes, a net increase of at least 7.3ha of employment land in combination with the adjacent Science Centre and supporting services and facilities.	No formal planning application submitted relating to the strategic allocation.
B	STRAT8 strategic allocation (South Oxfordshire Local Plan) – Culham Science Centre	-	To deliver a net increase in employment of 7.3 hectares.	Current relevant planning applications within the STRAT8 strategic allocation include the Fusion Demonstration Plant (see Tier 1 scheme, Ref: 1 – P22/S1410/FUL) and Energy Storage Facility (Tier 1 scheme, Ref: 3 – P16/S2368/FUL).

Figure 1.5 Cumulative Schemes[30]



Effect Interactions

1.103 Effect interactions comprise a secondary aspect to cumulative assessment and pertain to interactions between effects associated with just one project, i.e., the combination of individual effects arising as a result of the Proposed Development on a single receptor.

1.104 Effect Interactions from the Proposed Development itself on receptors at the site and within the surrounds are considered during the enabling and construction works, once the Proposed Development is completed and operational, and also following decommissioning. Dependent on the relevant sensitive receptors, the assessment focuses either on key individual receptors or on groups considered to be most sensitive to potential effect interactions.

1.105 Based on the definitions of what negligible effects comprise for each of the technical assessments, these do not warrant further consideration in relation to cumulative effects. Only residual effects described as minor and above will therefore be considered in the assessment of effect interactions.

1.106 There is no established methodology for assessing the significance of effect interactions on a particular receptor. The interaction of a combination of individual effects has however been determined to be either 'not significant' or 'significant', but a scale (minor, moderate or major) has not been applied to the effect interaction. Generally, if one of the individual effects is significant the combination of effects is regarded as 'significant'. If none of the individual effects are significant, consideration will be given as to whether or not the combination of many not significant effects could result in a combined significant effect, based on professional opinion.

1.107 Further information on the methodology and the results of the effect interactions assessment are presented within the **ES Volume 1, Chapter 6: Effect Interactions**.

STRUCTURE OF TECHNICAL ASSESSMENTS

1.108 This ES reports on the potential (before mitigation) and residual (after mitigation) environmental effects of the Proposed Development during enabling and construction works, on subsequent completion and operation, and following the decommissioning phase. The ES also concludes with a summary of the likely significant beneficial and adverse environmental effects of the Proposed Development (**ES Volume 1, Chapter 8: Summary and Conclusions**).

1.109 Each of the environmental topics considered in the EIA have been assigned a separate chapter in **ES Volume 1, Chapter 3** to **Chapter 5** inclusive. Within each of the **ES Volume 1** technical chapters the assessment is presented and reported in the format listed below. While the Landscape and Visual Impact Assessment (**ES Volume 2**) broadly follows a similar approach, given relevant guidance and best practice, where necessary the structure is amended to suit the specific assessment.

- An Introductory Table - setting out the author of the technical topic assessment, identification of relevant appendices, key topic related considerations and consultation as part of the EIA Scoping process;
- Assessment Methodology – an explanation of the approach to defining the baseline conditions and assessment scenarios and evolved baseline conditions, undertaking the impact assessment (construction operation, and decommissioning and any key assumptions and limitations made) and the definitions of the nature and scale of effect and what effects are deemed to be significant;
- Baseline and Future Baseline Conditions – a description of the baseline and any future baseline conditions of the site and surrounding area (as relevant to the technical topic in question);
- Receptors and Receptor Sensitivity – identification of the existing receptors on the site and in the surrounding area that may be affected by the Proposed Development and identification of their sensitivity;
- Embedded (Primary) Mitigation – a description of embedded mitigation measures (also known as 'primary' mitigation measures) that are already embedded within the Proposed Development prior to design freeze and are a fundamental part of the design the planning application is seeking consent for and which have been accounted for in the assessment of potential environmental effects.
- Potential Effects – an assessment of the likely significant effects of the Proposed Development during enabling and construction works, upon completion and operation, and following decommissioning, and an evaluation of their significance against defined criteria without the implementation of mitigation;
- Mitigation Measures, Monitoring and Residual Effects - a description of the mitigation measures that are being committed to ('secondary' mitigation measures) and a summary of the residual effects and likely significant effects of the Proposed Development;

[30] *Note: site red line boundary and cumulative scheme application boundaries included in this figure are indicative for the purposes of illustrating location.*

- Cumulative Effects – an assessment of any cumulative effects of the Proposed Development coming forward in conjunction with other cumulative schemes, as relevant; and
- Likely Significant Effects – confirmation of which (if any) residual and cumulative effects are considered to be significant.

KEY ASSUMPTIONS AND LIMITATIONS

1.110 The principal assumptions that have been made, and any limitations that have been identified, in undertaking the EIA are set out below. Assumptions specifically relevant to each technical topic have been set out in each technical chapter of the ES.

- Baseline conditions have been established from a variety of sources, including historical data and are accurate at the time of writing;
- It is assumed that information received from third parties is accurate, complete and up to date;
- The assessments contained within each of the **ES Volume 1** technical ES chapters are based on the assumption that embedded mitigation measures are implemented – be it as set out in application drawings, through regulatory regimes or via the management controls described in **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development**;
- Enabling and construction works across the site would take place substantially in accordance with the programme of works described in **ES Volume 1, Chapter 2: Design Evolution, Alternatives and the Proposed Development** and **ES Volume 1, Chapter 7: Environmental Management, Mitigation and Monitoring**;
- Following the decommissioning of the Proposed Development, the site will be returned to agricultural use, whereby the site use and condition is assumed to be as existing with the exception of the landscaping delivered as part of the Proposed Development;
- Where quantitative impact assessment is not possible, the limitations and justification are identified within the relevant technical ES chapter and as appropriate, qualitative assessment is presented;
- Where detailed information has not been available, reasonable assumptions have been made, and have been clearly set out, based on professional experience of the author of the ES chapter and this may be based on other developments of similar type and scale for example, to enable an assessment of likely significant effects;
- The Tier 1 and Tier 2 cumulative schemes will be implemented substantially in accordance with information that is publicly available and subject to the same regulatory regimes and good practice management controls as identified for the Proposed Development; and
- The aim of the EIA is not to assess the Proposed Development's compliance / performance against planning policy, as this is considered within the Planning Statement that accompanies the planning application. Instead, reference is made to relevant national, regional and local policy and guidance to inform the scope of the assessment, the assessment methodologies applied, and the existence of any sensitive receptors to be considered.

ENVIRONMENTAL STATEMENT STRUCTURE

1.111 This document is the main body of the ES and is divided into a number of background and technical chapters supported with figures and tabular information for clarity of reading. A complete set of appendices is provided for reference. These comprise background data, tables, figures and surveys.

1.112 The ES comprises two technical volumes:

- ES Volume 1: ES Main Report, comprising the following chapters:
  - Chapter 1: Introduction and EIA Methodology;
  - Chapter 2: Design Evolution, Alternatives and the Proposed Development;
  - Chapter 3: Cultural Heritage;
  - Chapter 4: Land Take and Soils;
  - Chapter 5: Climate Change;
  - Chapter 6: Effect Interactions;
  - Chapter 7: Environmental Management, Mitigation and Monitoring; and
  - Chapter 8: Summary and Conclusions.
- ES Volume 2: Landscape and Visual Impact Assessment.
- ES Volume 3: Technical Appendices, including:
  - Appendix: Introduction and EIA Methodology;
    - Annex 1: Location of Information within the ES;
    - Annex 2: Competent Experts and Relevant Experience;
    - Annex 3: Glossary of Terms and Abbreviations.
    - Annex 4: EIA Scoping Opinion Request Report;
    - Annex 5: SODC Scoping Opinion;
  - Appendix: Cultural Heritage;
    - Annex 1: Archaeological Desk-Based Assessment;
    - Annex 2: Geophysical Survey Report 2022;
    - Annex 3: Geophysical Survey Report 2023;
    - Annex 4: Written Scheme of Investigation for Archaeological Trial Trenching;
  - Appendix: Land Take and Soils;
    - Annex 1: Agricultural Land Classification Report;
  - Appendix: Climate Change;
    - Annex 1: Climate Change Technical Note;
    - Annex 2: Policy and Guidance Background;
    - Annex 3: Greenhouse Gas Calculations;
  - Appendix: Ecology and Biodiversity
    - Annex 1: Ecological Impact Assessment; and
    - Annex 2: Biological Impact Assessment.

Non-Technical Summary

1.113 A separate document is presented, referred to as the Non-Technical Summary (NTS) and which provides a concise summary of the ES written in non-technical language. The NTS presents a summary of the Proposed Development, the alternatives analysis considered by the Applicant and the scheme design evolution, the identified residual likely significant environmental effects, and any required mitigation measures.

COMPETENT EXPERT AND RELEVANT EXPERTISE

1.114 The EIA Regulations require that to ensure the completeness and quality of the ES, *'(a) the developer must ensure that the environmental statement is prepared by competent experts;*' and *'(b) the environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.'*

1.115 Trium is an environmental consultancy with excellent experience of undertaking EIA projects and understand the expectations of Local Planning Authorities (LPAs). Trium's Partners and Employees have extensive experience in managing the environmental issues and impacts for a wide range of development projects, including battery storage schemes. The Partners and Employees of Trium have, over the course of their careers to date, project directed, managed or contributed to over 600 EIAs across the UK.

1.116 Further detail on the expertise and experience of those preparing the ES is provided in **ES Volume 3, Appendix: Introduction and EIA Methodology - Annex 2.**

ES AVAILABILITY AND COMMENTS

1.117 The ES is available for viewing on the SODC Planning Portal, and can be accessed by using the following link:

https://www.southoxon.gov.uk/south-oxfordshire-district-council/planning-and-development/comment-on-planning-applications/find-and-comment-on-a-planning-application/

1.118 Comments on the planning application can be provided online via the SODC's Planning Portal, via email to registration@southandvale.gov.uk (quoting the application number), or can be forwarded to the address below (again, quoting the application number):

South Oxfordshire District Council, Abbey House, Abbey Close, Abingdon, OX14 3JE.

1.119 Electronic Copies of the ES and NTS are available free of charge and can be provided via a downloadable file provided by email. Printed copies of the NTS and ES Volume 1, 2 and 3 would incur a printing and postage charge. For further details please contact hello@triumenv.co.uk with reference in email header of "Environmental Statement Request – Culham Storage" or Tel: +44 (0) 203 887 7118.